Pooya Alaedini · Mohamad R. Razavi
Editors

Industrial, Trade, and Employment Policies in Iran

Towards a New Agenda

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Employment of Highly Educated Labor Force in Iran: Challenges and Prospects Through the Sixth Development Plan and Beyond

Toward a Capability Approach to Development and Industrialization in Iran: An Introduction

Pooya Alaedini

The Shaping of Iran's Industrialization Framework

Under relatively favorable conditions—foremost among them increasing oil export revenues—Iran's engine of economic growth was ignited under an authoritarian political system in the 1960s to run on high speed in the decade preceding the 1979 Revolution. The industrialization drive pursued by the Iranian government through an import-substitution strategy rested upon increasing the rate of capital formation in the country's modern economic sectors. Iran's Industrial Development and Renovation Organization was created in this period to renovate old state-owned manufacturing plants toward their eventual privatization and to further establish new enterprises in areas not yet attractive to the burgeoning private sector. These activities were accompanied by the provision of incentives, including subsidized credit and tax exemptions, to domestic manufacturers. They were further augmented by foreign direct investment, which included transfer of technology. As a result, manufacturing output and manufacturing employment experienced rapid growth. The pursued import-substitution activities began with the manufacture of consumer goods but aimed to quickly move upstream to producing intermediate and capital goods. The growth of fixed capital, manufacturing output, and indeed the whole economy became particularly rapid prior to 1977 due to increasing public and private investment as well as an adequate quantity of labor supply and a growing domestic market (Karshenas 1990: 92–107; Amuzegar 1993: 3–8).

Oil revenues supported these rapid developments, but as they grew to unprecedented levels due to the success of Organization of the Petroleum Exporting Countries (OPEC), they also provided the government with a sense of confidence that a leap to the ranks of advanced industrial countries could be made easily through rapid

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spending. Yet, a number of bottlenecks and structural problems began to surface in connection with the way the oil boom was being managed—including shallow and uneven development, waste, and shortages of infrastructure and housing against the background of increasing demand and rapid urbanization (see Katouzian 1981: 275–285; Parsa 1989: 62–86; Amuzegar 1993: 9–11). In fact, the more resources were poured into the economy, the worse its performance became. The need to change course was apparently recognized by the state planners in the final prerevolutionary years. Opportunities slipped away however with the onset of political turmoil. The interplay of political, sociocultural, and economic developments influenced the rapid unfolding of the revolutionary events and the 1979 meltdown (see Abrahamian 1982: 426–446; Ashraf and Banuazizi 1985; Parsa 1989: 3–30).

The manufacturing sector was at a nascent stage of development at the time of the Revolution, although it had experienced significant growth in the preceding decade (see Amid and Hadjikhani 2005: 23–29). While a few capital goods industries had become operational by then, the sector was dominated by the production of consumer goods. Furthermore, import-substitution activities had established few linkages with the more traditional sectors of the domestic economy and were highly dependent on imported inputs. Their expansion was contingent upon export revenues from oil with its fluctuating market. The continuation of this type of industrial development—which may be called "investment-oriented industrialization" (Alaedini 2000: 46–47)—would have arguably faced serious challenges, the 1979 Revolution notwithstanding. Its framework can be abstracted in the following way:

To jumpstart the industrialization process, the state targets a range of light industries and channels the needed investment for their establishment. Those industries whose products already have a market in the country are the obvious options for development. The state makes the choice of either establishing the manufacturing firms directly or facilitating their establishment by the private sector. This is achieved by providing subsidies and tax exemptions and protection from foreign competitors through tariffs and nontariff barriers as well as facilitating technology transfer through licensing and joint ventures. The state further uses the oil revenues to build infrastructure and provide services, resulting in the expansion of the pool of both public-sector employees and private-sector actors involved in these initiatives. Yet, the links between these activities and raising manufacturing capabilities or reproducing labor can be weak. For example, while basic education is supported, tertiary education gets higher priority in the form of investment in establishing universities or sending students abroad to receive post-graduate education. In this way, the labor force becomes comprised of a large pool of undereducated and quite often illiterate workers and a small band of personnel with formal education of the kind provided in advanced countries. Provision of infrastructure and services is also likely to be highly unequal or lack any connection to productive activities. Notwithstanding, domestic firms move up the learning curve but fall well short of catching up in the absence of institutional and incentive structures conducive to rapid capability development and technological upgrading. They thrive and expand to the extent that the state secures investment flows, which are dependent on the

volatile oil market. During positive oil shocks, manufacturing activities benefit from easy access to credit, technology, and imported inputs but are likely to be hurt by rising domestic inflation, an appreciation of the domestic currency, and a rapid rise in imports as well as a boom in the non-tradable sector that both increases their costs and crowds out their activities. During negative oil shocks, while manufacturing investment is constrained, some of the former effects may also linger on. The industrial base is deepened by establishing outward-oriented, capital-intensive petrochemical industries—associated with comparative advantage offered by inexpensive oil as their input—as well as inward-oriented capital goods industries to save additional foreign exchange.[1]

Despite significant criticisms—both scholarly and ideological—leveled against the prerevolutionary economic policies, the basic elements of the investment-oriented industrialization framework have in fact remained in place through the Revolution and postrevolutionary shifts. Additional factors and circumstances have further aggravated their negative outcomes. These are probed in the next two sections of this chapter. Another section discusses the impact of oil on the development trajectory of a country like Iran. This leads to a call for an alternative approach to Iran's development that focuses on nurturing productive capabilities. The final part of the chapter provides an overview of the volume's contributions—which underscore in various ways the need for a paradigm shift in Iran's development framework.

Shift and Continuity Through Five Postrevolutionary National Development Plans

The first decade following the 1979 Revolution was characterized by calls to alter the development strategies of the previous regime, a rhetoric to change the country's oil-based political economy, and an 8-year war with Iraq which caused several hundred billion dollars in damages to the Iranian economy (Amirahmadi 1990: 65). The nationalization of Iran's industries took place in connection with these developments and the flight of some owners of large manufacturing establishments as well as schemes to contain labor movements. Strategic and heavy industries, manufacturing units owned by the associates of the previous regime, and bankrupt firms—about 800 in total—were taken over by the government and placed under the control of the National Iranian Industries Organization or the newly established revolutionary foundations (UNIDO 1995). Furthermore, many of the managers and skilled personnel of the industrial establishments either left the country or were replaced during the first postrevolutionary decade. Yet, with the breakout of the Iran–Iraq War in September 1980, most sectors of the economy became further

[1]This framework in fact has elements from all three of Lucas's (1988) accumulation models—emphasizing physical capital accumulation and technological change, human capital accumulation through education, and specialized human capital accumulation through learning-by-doing.

concentrated in the hands of the government as economic activities were reshaped to facilitate control over their operations. Production in a large number of industries declined, while product quality and diversity suffered as a result of government quotas to address war-time needs—aggravating the inward orientation of the manufacturing sector.

The Iranian economy thus underwent what has been called "structural involution," which entailed a change in the system without transforming the basic structure of the (oil-based) economy (Behdad 1994). In the industrial sector in particular, small workshops grew whenever foreign exchange shortages prohibited the import of higher-quality goods or capital and intermediate goods for production in large establishments. In terms of occupational stratification, the country experienced an increase in the share of self-employed persons among industrial workers and a decline in the employment share of the manufacturing sector in favor of services. Although the bulk of this rise in the number of service occupations was due to the expansion of government personnel, the rest came about as a result of a surge in the number of petty traders, shopkeepers, jitney drivers, etc. These circumstances were further affected by contradictory economic policies and the rise of speculative and black-market activities (see Amirahmadi 1990; Zangeneh 1998).

Postwar reconstruction was carried out under the postrevolutionary First and Second Economic, Social, and Cultural Development Plans of the Islamic Republic—for the years 1989–1993 and 1995–2000, respectively. The period coincided with the two-term presidency of Mr. Ali Akbar Hashemi-Rafsanjani (in office 1989–1997). These plans called for liberalization and welcomed international financing as they also emphasized self-sufficiency. The discernable objective was to liberalize the investment-oriented industrialization framework to increase the rate of investment. While the plans resembled those of the prerevolutionary times, the earlier resources at government's disposal had become smaller, the favorable international environment no longer existed, and the public-sector capacity for implementation of the development plans had significantly diminished. The details of Iran's 5-year national development planning system had been under scrutiny prior and during the Revolution. Yet, no serious effort was made after the Revolution to create a viable alternative—hence, the resumption of the system at the end of the war. Although generally following the prerevolutionary format, the postrevolutionary plans became more of sectoral wish lists with little strategic approach and minimal attention given to results-based monitoring and evaluation. Furthermore, the efficiency of the investment-oriented framework had significantly declined due to the postrevolutionary institutional setting and the hostile external environment.

The First Development Plan called for "reforming the structure of production toward continuously increasing the share of intermediate and industrial capital goods and progressively relying on domestic resources" as well as moving in the direction of expanding exports (Majles 1990). High levels of growth were to be achieved through increased rates of investment, a major beneficiary of which was to be the manufacturing sector. The initial years of the Plan did in fact witness a rise in investment rates in the manufacturing sector, made possible by rechanneling

resources away from the war as well as foreign borrowing. However, investment rates were not sustained, as these sources became scarce. The outcome was reduced growth rates together with the mounting debt that the country accrued. Ironically, the investment-oriented strategy had resulted in low levels of investment. Attempts were also made at a structural adjustment program as well as exchange rate unification during the First Development Plan that quickly became unsustainable due to their widespread negative social impacts as well as the rapid rise in imports and ensuing trade deficit (World Bank 1995: 19). The Plan's quantitative goals were set for the creation of 394,000 jobs on average per year—to reduce the rate of unemployment from 15.9 to 13.4%—which was overachieved (Majles Research Center 1999). Yet, this positive outcome involved overspending, ease of benefiting from underutilized capacity, dominance of low-level and traditional jobs among those generated, overstaffing various operations without economic justification, and a change in the official definition of employment—which were evidenced by reduced productivity rates (Ibid.). Furthermore, the rate of labor force participation fell during the Plan, while the share of service sector jobs that was supposed to be reduced actually grew (Majles Research Center 2006).[2]

According to the assessment report produced by the Majles Research Center (1997), during the Second Development Plan, the ratio of gross fixed capital formation to GDP hovered in the range of 12–20%. Yet, both private and government consumptions grew beyond their targets and were widely off the mark in any individual year. Furthermore, manufacturing sector performance during the Plan years was deemed unsatisfactory—registering an annual average growth of 10.6% against the Plan's target of 14.2% (Ibid.). Manufacturing sector growth was rapid at the outset with the injection of significant financial resources, including foreign exchange—which went well beyond what was stipulated in the Plan—against the background of available underutilized capacity. Yet, in the absence of any strategy to foster productive capabilities, especially those related to structural transformation and exports, it quickly slowed down—registering 11 and 15.9% below targets during the last 2 years of the Plan (Ibid.). Only steel and petrochemicals performed well. Moreover, the large number of projects initiated simultaneously were mostly slow to come on stream, whereas little attention was given to the renovation of existing plants. This problem apparently became most acute in the cement industry, in which a 15% nominal addition of capacity could not offset obsolescence of older plants in terms of production. The goal of transforming the manufacturing structure did not materialize either, as the shares of consumer, intermediate, and capital goods production moved in the opposite direction of what was targeted by the Plan. Export performance (non-oil) in each and every year of the Plan was also significantly below target, except for Persian carpets (Ibid.). Yet, imports were dictated by the availability of foreign exchange earned from oil exports and the trade balance which deteriorated toward the end of the Plan—resulting in renewed restrictions imposed

[2]For a highly critical appraisal of Iran's post-revolutionary national development plans, see Amuzegar (2014), which summarizes the author's earlier assessments.

by the government. The final years of the reconstruction period were marked by runaway inflection—close to 50% in the last year of President Rafsanjani's second presidential term—and decreased investment (CBI 2017). Furthermore, the Second Development Plan was supposed to create an average of 404,000 jobs per annum through supporting the generation of job opportunities, improving labor market information, assisting small industries, facilitating the creation of rural jobs, and improving labor market regulations, among other initiatives. The actual performance of the Plan was far below target—as only 84,000 jobs were created on average during its first 3 years—while the labor force participation rate also fell. This disappointing outcome was influenced by reductions in oil income, contractionary monetary and fiscal policies, global recession, and reduced investment (Majles Research Center 1999, 2006).

Mr. Mohammad Khatami's two presidential terms (1997–2005) were mostly associated with attempts at international détente, certain positive cultural developments, and unsuccessful attempts at political reform. Yet, better management of the oil revenues and efforts toward reducing international tensions allowed the government to carry out a number of important economic initiatives during the period of the Third Development Plan (2000–2005). These included unification of the multiple exchange rates and revision of the foreign investment law. A privatization program was also initiated, but without giving adequate attention to the necessary regulatory and market frameworks (of which more later). Based on the available assessment (Majles Research Center 2010), during the Third Development Plan, the average annual GDP growth was 5.5% (versus the target of 6%), investment grew at an annual average of 9.62% (versus the target of 7.18%), and non-oil exports expanded at an average rate of 5.63% per annum (versus the target of 6.16%). The Plan's targets for reducing unemployment—which were in fact quite timid—were realized, while the rate of labor force participation also rose. Formulated during President Khatami's tenure and by some accounts the best prepared after the Revolution, the Fourth Development Plan (2005–2010) paid particular attention to reducing the effects of oil shocks on the Iranian economy. A Foreign Exchange Reserve Fund was thus created in this period where additional oil revenues would be deposited at times of upsurge in oil revenues for use either during lean years or for especially targeted investments by the public or private sector.

However, once Mr. Mahmoud Ahmadinejad took office as president (2005–2013 in two terms), most of the Fourth Development Plan was abandoned. Based on the available assessment conducted under the parliamentary auspices (Majles Research Center 2010), investment rose at an average rate of 4.8% per annum (versus the target of 12.2%) during the Plan, while GDP grew at an annual average rate of 5.82% (versus the target of 8%). Furthermore, toward the end of the Plan, inflation which was supposed to be kept under 10% during the entire period surpassed 25%, while targets for reducing unemployment were not met in any given year (Ibid.). President Ahmadinejad had a populist platform that blamed the previous administration for failing to pay adequate attention to social justice objectives enshrined in the Constitution of the Islamic Republic. At the same time, rapid oil price hikes provided unprecedented oil export revenues during his presidency. The combination gave him

a free hand to carry out a number of far-reaching initiatives, sometimes referred to as petro populism (Alizadeh 2014; see also Pesaran 2011: 168–173). To begin with, he abolished the Management and Planning Organization (MPO)—the relatively autonomous body in charge of drafting and overseeing the implementation of the country's national development plans. This was not done to upgrade the planning system based on some informed strategy. Rather, most of MPO's operations were placed directly under the presidential office, which would no longer need to worry about any outside supervision on government spending. These circumstances naturally affected how the Fifth Development Plan (for the period 2010–2015) was devised and carried out. The situation was aggravated as the most severe sanctions were imposed on the Iranian economy after 2011—with significant consequences in terms of extraordinary operations to circumvent them, which would breed rent-seeking and corruption.

During Mr. Ahmadinejad's tenure, the exchange rate was initially fixed while the domestic inflation rate rose rapidly (CBI 2017) due to the government's expansionary fiscal policy. The ensuing import boom significantly hurt domestic producers who were unable to put up any significant competition. Subsequently, as international sanctions were intensified on Iran during President Ahmadinejad's second term, the scarcity of foreign exchange obliged the Central Bank to devaluate the rial by two thirds (Ibid.). Another undertaking was to reduce the high banking interest rates by decree, which encouraged investment in precious metals, foreign currency, and real estate. Yet, the banks were also obligated to lend at dictated rates to those preferred by the government, which was made possible by increasing borrowing from the Central Bank. In parallel, a large number of nonbank financial institutions—mostly affiliated with revolutionary and para-governmental organizations—were established, which were able to amass significant financial resources and enter various risky operations. State-owned banks were sometimes required to provide facilities to these institutions but, more ominously, to lend to the public sector, which meant that in turn they had to borrow heavily from the Central Bank. The banks eventually ended up with a huge amount of nonperforming loans which continue to bog them down to this day. Due to the upheaval in the banking system, whereby a large number of eventually nonperforming loans were given to those with connections, the manufacturing sector has faced an acute shortage of finance and high cost of borrowing until now (see Habibi 2013).

Moreover, under the Ahmadinejad administration, three important populist programs were implemented after a hurried design and formulation period—including the Mehr low-income housing scheme (see Alaedini and Fardanesh 2014: 52–54), unconditional cash transfers to every Iranian citizen (which were supposed to be financed by the removal of energy subsidies), and a small-loans program targeting projects claimed to yield quick returns. With little independence from the government, the Central Bank had to cover the funding gaps of these programs by printing money and adding to inflationary pressures. Despite the country's significant oil revenues in this period, government debt to the Central Bank continuously grew while little money was deposited in the Foreign Exchange Reserve Fund. Furthermore, manufacturers were compensated for the reduction of energy subsidies as

originally planned by the second program. The last program as well as the government's other active labor market operations was the least successful, due probably to both its flawed design and mismanagement of its implementation. Subsidized bank loans were directed to small enterprises and quick-return projects in the false hope of creating jobs swiftly, which did not materialize in any significant way (Habibi 2013).

Since Mr. Hasan Rouhani's presidential inauguration, his administration has been largely engaged in the short-terms management of various crises faced by the Iranian economy. It has formulated a set of measures to tackle recession and inflation (Office of President 2014) mostly in terms of fiscal and exchange rate policies as well as general strategies for capital account management. Yet, a main endeavor has been to tackle the international sanctions imposed on the Iranian economy. Government's negotiations with the P5+1 (USA, UK, France, China, and Russia plus Germany) finally resulted in the signing of the so-called Joint Comprehensive Plan of Action (JCPOA) in 2015. This agreement, which has brought about a degree of sanctions relief by releasing some of the country's financial resources, together with other government policies, has reduced the earlier galloping inflation in the recent period. The respectable GDP growth rate achieved in the Iranian fiscal year 2016/2017 was a one-time effect of oil and financial sanctions relief. Yet, initiatives to reduce red tape have resulted in some improvements in the business environment—as reflected, for example, in Iran's Ease of Doing Business ranking (World Bank 2017). Furthermore, aiming to streamline the management of the industrial, mining, and trade sectors, the government has merged two ministries to form the new Ministry of Industry, Mine, and Trade. Along this, the government has targeted some leading subsectors for investment and stimulation, while it has also tried to increase capacity utilization in some industries. It has further strived to revive certain industrial activities by seeking foreign cooperation—in particular in the auto, oil and gas, and power sectors. The government has also tried to shut down illegal credit institutions and merge some legal credit institutions and banks affiliated with military and paramilitary organizations (Fararu 2018). While the recent initiatives have provided some degree of relief, they have not been complemented by any specific industrial or export-oriented trade policies affecting the economy's non-oil productive sectors for sustainable and pro-employment growth. This void is also reflected in the recently adopted Sixth Development Plan (for the period 2016–2021)—which follows the same old recipe, although with some more realistic targeting.

At the time of this writing, the Rouhani administration continues to face a number of significant challenges that require immediate remedies.[3] It has revealed several large cases of corruption but is now confronted with serious obstacles to dig any deeper. Iran's environmental woes, many associated with corruption, such as land-

[3]President Rouhani's Special Aide on Economic Affairs, Masoud Nili, has counted six areas of extreme challenges faced by the country—budget deficit, unemployment, banking troubles, crumbling pension funds, environmental woes, and water crisis (see Financial Tribune 2017). He places the blame on an over-extended government, encouraged by the country's oil revenues, which is further associated with rising consumption and expectations partially addressed by overuse of natural resources.

grabbing, and/or state capture, including an earlier proliferation of dam construction, have been causing havoc in the recent period and require urgent concerted action. Although the earlier rapid rise in consumer price index has been checked, the growing debt of the commercial banking system to the Central Bank (ISNA 2018) together with government's budget deficits may result in another inflationary episode in the near future. Furthermore, JCPOA has not been as successful as expected in terms of financial and trade sanctions relief, especially with the election of Mr. Donald Trump as the US president. This is likely to have influenced the rapid depreciation of the Iranian rial in the recent period, which the government is yet to address properly (see Financial Times 2018; Reuters 2018).

Structure of Development and Its Outcomes

Notwithstanding the effects of Iran's international relations, the country's economic cycles have been associated with its levels of oil revenues. During oil booms, the government has increased public investment and provided subsidized credit and other incentives to the private sector to facilitate manufacturing investment. With little performance criteria in terms of enhanced capabilities, this would not yield the desired results while much of the resources would be diverted to other activities and/or captured by rent-seekers. Imports have also been eased during oil booms, especially to check inflation. This would increase producers' access to capital and intermediate goods but would also give rise to an import boom to eventually hurt domestic production. Some investors have been likely to use their proceeds from the earlier parts of the booms to engage in import activities or real estate speculation. As these circumstances would not result in significant development of manufacturing and export capabilities, during subsequent negative oil shocks, domestic production might get hurt again due to the shortages of foreign exchange.

Being sensitive to oil-revenue shocks, Iran's GDP growth rates have thus fluctuated wildly in the postrevolutionary years. Furthermore, against the background of a population boom experienced particularly in the 1980s and 1990s, the average economic growth rate has not been high enough to lift the per capita GDP above its prerevolutionary height. This is despite the seemingly respectable average investment rates—on a par with some of the successful newly industrializing countries (see Fig. 1). Whereas investment rates could have been higher given Iran's resources (World Bank 2003), the country's growth performance has been lower than expected given the investment record in the postrevolutionary period. While capital accumulation has acted as the main driver of growth and as investment levels have fluctuated in relation to the amount of oil revenues, investment efficiency has been low due to weak economic institutions, widespread rent-seeking, and misguided price controls and distortion of incentives (Jalali-Naini 2005, 2007). The Iran-Iraq War in the earlier postrevolutionary period and the intensification of international sanctions in more recent times have had further aggravating effects—together with highly

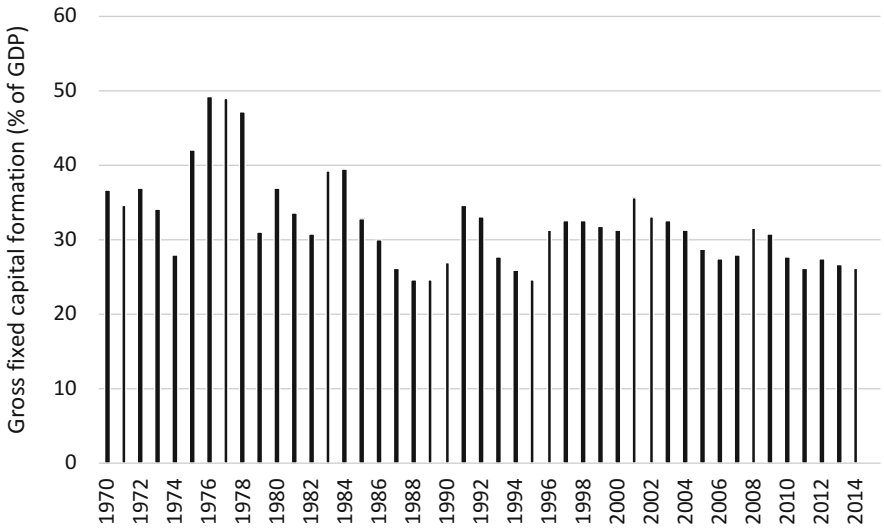

Fig. 1 Gross fixed capital formation as percentage of GDP, 1979–2014 [Source: World Bank (2016), World Development Indicators]

inflationary episodes.[4] Notwithstanding unproductive pursuits, a significant part of the investment has been allocated to infrastructure and resource-based heavy industries. Furthermore, as a result of the widespread uncertainties and market failures in Iran, amplified due to the effects of oil, the private sector has shown insufficient interest in activities that raise national productive capabilities. Given the prevailing incentive structure, it has instead concentrated on activities associated with short-term returns. Moreover, instead of investing to enhance productive capabilities and attract private investment to manufacturing and export activities by reducing uncertainties, the government has itself made a significant portion of its investment in real estate during the postrevolutionary period (see Amid and Hadjikhani 2005).

Yet, the government has carried out several initiatives in the hope of increasing private-sector investment—two of which have especially had the potential to affect the productive sectors of the economy in significant ways. Attracting foreign investment has been one policy initiative, whose principal component has involved the costly establishment of free trade and special economic zones. However, these designated territories have not been successful in attracting foreign investment or acting as export processing zones due to the country's domestic incentive structures and international relations (see Hakimian 2011). Instead, they have mostly become real estate ventures—offering significant rents to those able to capture them. Another important initiative has been a privatization program, which was not conceived as

[4]It has also been suggested that as monetary policy in Iran has been associated with government's fiscal needs rather than supporting exports, its inflationary results undermine export incentives (Molana and Mozayani 2006).

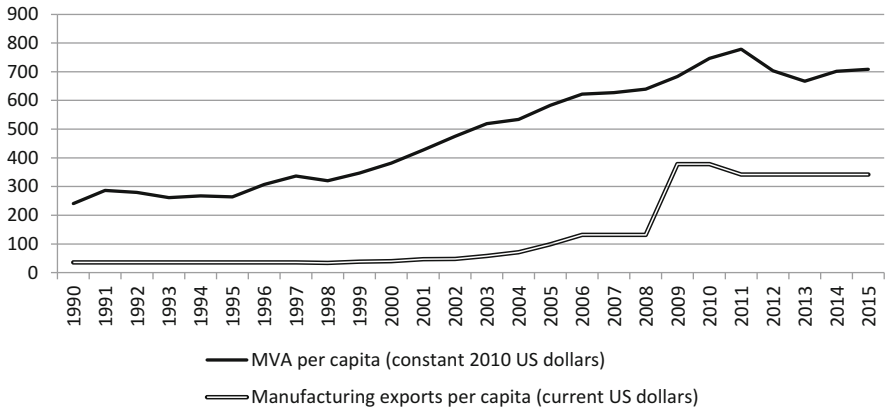

Fig. 2 Per capita manufacturing value added and exports, 1990–2015 [Source: UNIDO (2017), UNIDO statistics data portal]

part of a well-thought-out plan based on an understanding of the role of private and public sectors in the Iranian economy or the mechanisms through which the initiative would lead to improvements in production (Akhavi-Pour 1994; Khoshpur 1997). As such, most of the privatized companies have gone to those with connection (Harris 2013). Often able to exercise monopoly power, they include retired public-sector officials, para-statal firms, public-sector institutions, military and paramilitary organizations, or revolutionary foundations. Given this type of privatization as well as other political economic circumstances, some important parts of the Iranian economy have come under the control of powerful para-statal organizations and revolutionary foundations—with the latter operating outside both the traditional religious establishment and the three branches of the government (see Maloney 2000). Part of the government's credit subsidies have also been captured by these same institutions or others with political connections (Salehi-Isfahani 1989). Whereas Iran's postrevolutionary development plans have called for reducing the government's sway over the economy, control has in fact increased over time under a different guise.

Despite these problems, Iran's manufacturing sector has come a long way since its modest beginnings—although it is far from becoming competitive in today's global economy. As Fig. 2 shows, both manufacturing value added (MVA) and manufacturing exports have slowly grown over the past two decades—but not in the most recent period. Other manufacturing indicators—including the medium- and high-tech share of total MVA and manufacturing exports as well as the share of MVA in GDP and the share of manufacturing in total exports (see Fig. 3)—have also experienced some improvements over the last two decades, although again not in recent years. Iran's overall rank in terms of Competitive Industrial Performance Index (UNIDO 2017) has thus risen gradually, although its score remains below the world average. Furthermore, a closer examination reveals that these improvements have some problematic details. At the same time that the economy is increasingly

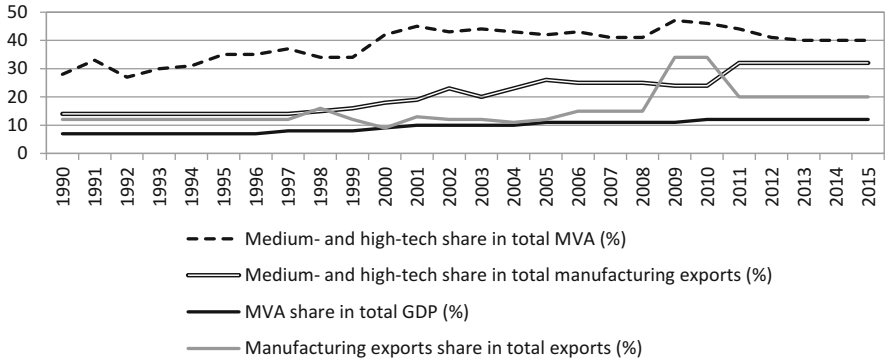

Fig. 3 Performance of MVA and manufacturing exports, 1990–2015 [Source: UNIDO (2017), UNIDO statistics data portal]

dominated by the service sector—due partly to the declining share of agriculture—the largest sectoral shares in total MVA have become associated with chemicals and chemical products (more than one quarter); basic metals (more than 17%); coke, refined petroleum products, and nuclear fuel (more than 13%); and nonmetallic mineral products (around 9%) (Ibid.). These same activities are also responsible for Iran's rising exports of manufactured products as well as those associated with medium- and high-tech activities. The share of machinery and transport equipment in total MVA, which had witnessed a rise in the 2000s, declined after 2010 due to the effects of the international sanctions imposed on the Iranian economy—while that of textiles and clothing has been on a downward slope throughout the last two decades. Beyond Iran's apparent comparative advantages, the ascendance of chemical as well as metallic and other mineral products in the country's manufacturing activities and exports has a great deal to do with the availability of subsidized energy—making energy intensity in Iran's manufacturing sector quite high (Khiabani and Hasani 2010). Yet, the loss of competitiveness in some manufacturing activities—for example, the apparel industry—is not due to comparative disadvantages. It rather has to do with organizational and institutional weakness (see Iwasaki 2017). Despite the increasing exports of manufactured products from Iran, they have not been able to cover more than 60% of the country's import bill (CBI 2017). Likewise, manufacturing activities in Iran remain highly dependent on the imports of intermediate and capital goods, which make them vulnerable to fluctuations in oil revenues, cost of foreign exchange, and other external economic factors.

Iran's impact on world manufacturing value added and its share of world manufacturing exports were on the rise prior to the onset of the intensified sanctions in 2011, while the post-JCPOA recovery has been slow (UNIDO 2017). Yet, even at their height in 2010, they were much smaller than those of comparable regional countries. Furthermore, due to the earlier intensification of sanctions, the industrial and mining sector's share in total capital formation dropped from an average of around 17% in the period 2000–2004 to barely above 10% in 2012 (Ibid.). Capital

formation in the manufacturing sector and by extension MVA declined sharply during 2011–2014. Part of this was due to increasing imports, against which domestic producers could not compete. Furthermore, as investors turned from manufacturing to short-term activities to keep up with the rising domestic prices, the construction sector's share of capital formation rose to 44% of the total (Ibid.). These events are not without precedence. In fact, apart from the resource-export sector (oil and gas as well as other minerals and petrochemicals), two leading sectors have emerged in the Iranian economy—imports and real estate (with associated construction activities). As argued by Baumol (1996), depending on the incentive structure—i.e. relative payoff of different activities—in a given society, its entrepreneurs would be induced to engage in either productive pursuits, especially building industry and innovating, or unproductive activities, such as rent-seeking, speculation in the real estate market, or even criminal operations. Significant resources in Iran have been attracted to such activities, with productive endeavors receiving lukewarm priority or used as a guise—for securing subsidized credit and foreign currency, grabbing real estate, or receiving import permit—to then pursue other profitable businesses. Rent-seeking has indeed become a structural feature of the Iranian economy (see Jalali-Naini 2007; Bjornvatn and Selvik 2008).

Iranian institutions of higher education have experienced a spectacular expansion over the last three decades at both undergraduate and post-graduate levels—presently boasting one of world's largest numbers of engineering and science students. A similar development is not discernable for basic education, as several million people remain illiterate in the country and there are still a large number of children either not attending school or dropping out early. Furthermore, despite the phenomenal growth of tertiary education in Iran, the country's manufacturing sector largely relies on nontechnical employees—with less than 12% of its workforce comprising of technical staff with tertiary education (SCI 2016). This is reflective of the polarized capital-intensive versus low-value-added manufacturing operations, low-quality tertiary education, and/or the detachment of tertiary education from the country's development aspirations. Yet, the service sector accounts for the employment of the majority of those with college/university education, including most engineering and science graduates (Ibid.). This partly reflects the strengths and potentials of the service sector in Iran. However, whereas the strengths are largely associated with imports and their distribution, the potentials have been barely realized in supporting production or in exports. Furthermore, while Iranian scientific and technological capabilities have improved and some of the country's universities and research centers can brag about their sophisticated research projects (see Soofi and Goodarzi 2017), the reality is that their significant effects on production, exports, or employment are not discernable. As the Iranian economy continues to face significant problems with generating adequate employment in quantitative and qualitative terms, low labor force participation rates as well as the rapid expansion of tertiary educational opportunities mask the extent of joblessness. A recent report prepared under the auspices of the Iranian parliament (Majles Research Center 2017) describes these problems as: high unemployment and low labor force participation rates—especially for women and the youth, despite their rapidly rising nominal

human capital levels—as well as the growing share of informal-sector, part-time, low-wage, or low-value-added jobs and a general lack of correspondence between Iran's demographic developments and the quantity and quality of job creation. A related issue is the bloated postrevolutionary government bureaucracy, accounting for about one quarter of Iran's workforce. Rather than aiming to raise public-sector capabilities to manage rapid development, it has been staffed largely based on connections and ideological considerations that aggravate inefficiency and rent-seeking.

Significant resources have been spent in Iran on subsidies and transfers against the backdrop of postrevolutionary social justice aspirations (World Bank 2016). Yet, social policy programs in Iran have had a truncated reach in the form of charity and have not been carried out in support of productive activities—reproducing labor and empowering low-income groups. For example, the conditional cash transfer program initiated during President Ahmadinejad's tenure—and still provided to a majority of Iranians and costing billions of dollars—is yet to focus on low-income groups. Given this type of approach and against the backdrop of the above-described employment and economic activity structures, social policy in Iran has not been able to reduce income inequity, let alone leveling opportunities or enabling low-income groups to realize their potentials (see Alaedini and Ashrafzadeh 2016). This said, there have been some relative successes in poverty alleviation, together with significant improvements in literacy, life expectancy as well as other health indicators, and provision of various types of services in rural and urban areas. These are respectable outcomes that can be leveraged alongside Iran's other potentials—including its industrial base, natural resource wealth, and increasing stock of highly educated labor force—toward escaping the current middle income trap.

Challenges of Government-Led, Oil-Based Development

Among popular criticisms of Iran's economic structure, two related discourses are especially noteworthy, as they are not only heard from detractors and lay citizens alike but also from government officials at highest levels and their development advisors. Certainly not without merit, they include the effect of oil on the Iranian economy and the government's excessive control over the economic structure. To be sure, in the Iranian economy, the oil sector has developed few linkages with other activities. Entailing highly capital-intensive operations, including in its downstream petrochemicals activities, its direct employment effect has been equally small. Its employment impact has been mostly via the large revenues it has generated. These have provided financial resources and foreign exchange needed for investment and circulated in the economy by the government through salaries for the bloated bureaucracy, contracts which have been prone to nepotism and corruption, popular transfers and subsidies without a well-devised social policy, or supporting the activities of pseudo-private business operations. The availability of large oil revenues has affected capital-labor, capital-output, and import-output ratios. Easy access

to imports—which has included a large amount of luxury goods—has reduced the need for export diversification as well as the development of the agricultural sector. The Iranian economy has been able to run in this way with minimal value extraction through the relations of production—or put differently, exploitation of the marginal productivity of all factors of production. Yet, against the backdrop of underdeveloped institutions, significant resources have been captured by those connected to the political elite or have been spent on public-sector projects not properly implemented or not justified against alternatives. This structure naturally resists reform, especially if a new round of oil boom is in sight.

Resource-based development has indeed been under fire for a variety of reasons since the 1960s—including high capital cost and low employment potentials, little possibility for incremental process improvement, high degree of inequality due to the rise of a dual economy, and the dominance of foreign-owned firms establishing exploitative core-periphery relations (see for example Baldwin 1956; Furtado 1976; Roamer 1979; Lewis 1978). Yet, in the case of oil-exporting countries, the capture of earnings from resource export has been large enough in many cases to create unprecedented problems of absorption (Gelb 1988; Auty 1990). The terms resource curse and Dutch disease are thus most often associated with oil-producing countries. According to the Dutch Disease model (see Cordon and Neary 1982; Auty 1990; Richards and Waterbury 1990; Lautenschlager 1986), government's spending of significant oil revenues induces labor and capital to shift from traded goods (industry and agriculture) to non-traded goods (construction), while the hike in the value of the domestic currency further stifles exports. The oil sector may also fix the direction of an economy by perpetuating its dominant role and preventing the rest of the economy to develop (see Shafer 1994). The *rentier state* argument is also largely associated with oil-producing countries (Mahdavy 1970), which refers to state's independent source of income from oil and its lack of inclination to tax the population or develop a relationship with the civil society in pursuit of their votes and in favor of a rigorous development framework. Similarly, while oil revenues can provide for higher rates of investment in oil-producing countries, they tend to have a byproduct in the form of underdeveloped financial institutions which then act to reduce their expected growth rates (Nili and Rastad 2007).

Surveying the literature on the pitfalls of resource-based development and their remedies, Frankel (2010) has identified several sets of negative effects: high levels of resource price volatility with its associated risk and transaction costs, the crowding out effect of specializing in the natural resource on the manufacturing sector, extreme political upheavals, poor institutions, and the Dutch disease. The latter not only has direct effects but also leaves a legacy in terms of government spending and weakened manufacturing sector that cannot be easily reversed. However, as argued by Frankel (Ibid.), these significant negative effects of resource-based development should not be accepted deterministically. For one thing, early industrialization processes in many of today's highly developed countries, including the USA, Canada, and Australia, were quite resource based. Also, in the recent period, once the East Asian tigers are excluded, it becomes difficult to claim that resource-rich countries have done worse than resource-poor countries. Easterly and Levine (2003:

26–37) as well as Mehlum et al. (2006: 1119) reject the independent effect of natural resource endowments once quality of institutions is taken into account.[5]

In the case of Iran, much of the country's economic, social, and institutional transformations over the last century have been made possible by using oil revenues to access international technology, knowledge, and inputs (see Salehi Esfahani and Pesaran 2009). As such, the oil wealth can hardly be called a curse. It is true that similar or potentially higher levels of improvements in the standards of living could have been realized through manufacturing exports—instead of growth in services, service-oriented infrastructure, and tertiary education—that would have entailed higher levels of learning through a much closer interaction with global markets. Yet, this has not been an easy path for most developing countries—whether oil producing or not—and has obviously not materialized for Iran. The issue now is how best Iran can take advantage of its current opportunities and strengths to engage global markets for rapid and sustainable development. The oil income can certainly be used as a major means to this, if managed with appropriate institutions and policy mechanisms—including those that alleviate its volatility effects, reduce the budget dependence on its exports, and control rent-seeking (Mohaddes and Pesaran 2014). The domestic economy must be guided to capture the stimulus from backward, forward, fiscal, and final demand linkages (Auty 1990) to rapidly move beyond investment-oriented industrialization and toward achieving long-term objectives of capability development and diversification. This arguably hinges upon effective formulation and implementation of government policies.

Toward a Capability-Oriented Industrialization Framework for Iran

Many of the negative symptoms associated with the structure of development and industrialization in Iran have been discussed in the country's press, government policy papers, and government plans. Government's remedial responses however have been ad hoc, uncoordinated, limited in scope, and without a strategic framework. The availability of oil revenues, international sanctions, and domestic political circumstances, especially postrevolutionary populism (Behdad 2000), have arguably worked together to arrest any significant reform of the investment-oriented industrialization framework. Yet, the prevalent discourses revolving around the grip of oil on the political economy and the excessive role of the government have not been helpful in that they have either minimized the role of agency or have naively called

[5] As Rodrik (2000) argues, while the significance of a number of market and non-market institutions—including property rights, regulatory institutions, institutions for macroeconomic stability, and institutions for social insurance are—can be underscored for development, the mapping that underpins them does not necessarily conform to the orthodox consensus in advanced industrial countries in the West. This implies the significance of developing a local model.

for liberalization as a simple solution. In practice, the latter has either been supplanted by more expedient populist initiatives or morphed into pseudo-privatization.

It is true that little change has been made over the past decades to the country's old-fashioned import-substitution production toward self-sufficiency—whose continuation has been associated with an array of complications: suboptimal production scales due to the limited size of the domestic market, resource misallocation, price distortions, credit rationing, technological stagnation, capital-intensive operations, and rent-seeking. Iran's challenge has been, and remains to be, moving beyond the initial stages of import-substitution—what took place in the newly industrialized countries (NICs) of East Asia (Wade 1990). As argued by Ranis (1981), East Asian NICs quickly progressed past the initial import-substitution stage—through which they had developed their capabilities in the labor-intensive production of consumer goods with low complexity—to substituting their exports of traditional products with those of light consumer goods. They ventured upstream to intermediate and capital goods production via a second stage import-substitution strategy only when their capabilities were well developed so that they could follow through with successive stages of "export substitution."

Institutionalists focusing on East Asian tigers have attributed this success to the strong role of the government in nurturing capabilities (Evans 1995; Lall 1996; Wade 1988, Westphal 1990; Amsden 1989; Chang 1996). Evans's (1995) developmental state is characterized by "embedded autonomy" that allows it to play the different roles of "custodian" of laws and regulations, "producer" of social services and infrastructure, and "midwife" to assist private firms to embark on new production activities, as well as to engage in "husbandry" in addressing firms' input and capability challenges. The role of institutions in affecting economic outcomes has been further elevated in development circles (North 1990; Acemoglu et al. 2005; Helpman 2008; Hall and Jones 1999; Stigliz 1989; Rodrik 2000). Technological upgrading, from being a follower to gaining the ability for incremental innovation to becoming a leader, is associated with the development of specific capabilities and institutions that must be pursued at the government, industry, and firm levels (see Forbes and Wield 2002: 423; Lipsey and Carlaw 2000; Lazonick 1991). With these observations and given the experience of Japan and the original East Asian tigers (see also Noland and Pack 2003), the rapid development of China in more recent times (Heilmann and Shih 2013; Prasad 2011), and the ongoing crisis faced by the advanced liberal economies, state-led industrial policy to nurture firms' capabilities has made a comeback in the recent period (Rodrik 2010; Lin 2011; Cimoli et al. 2009; Stiglitz and Lin 2013)—although it was shunned for a long time. Yet, its extent and details—for example, conforming to or defying comparative advantages (Lin and Chang 2009)—remain matters of heated debates.

Nübler (2014) has explained the complex, nonlinear, and cumulative process of catching up in terms of the mutually reinforcing and high-performing relationship between the development of society-based capabilities and productive transformation. The latter encompasses not only patterns of technological upgrading and diversification into new products and sectors but also their speed and sustainability.

It requires collective learning—including learning by the government as well as learning to export and learning to learn—for enhancing the knowledge structure alongside routines and institutions associated with social groups. These, respectively, provide options on products and technologies—beyond the accumulation of factors of production through investment—and create competences for actual industrial development. The wide-ranging capabilities should especially be developed in the national context and domestic firms—as the latter can derive diversification by switching into new activities that are unlikely to be undertaken by multinationals (see further Amsden 2009). The focus of government-led industrial policy should therefore be on building not only productive capacities by securing the right types of investment but also productive capabilities through productive transformation that can take the economy through ever higher phases of activities with increasing complexity. In this vein, comparative advantages may be defied to give more opportunities to various social and economic players for collective learning. Yet, each country must arguably develop its own evolving capability approach given its circumstances.

The rough outlines of a "capability-oriented industrialization" framework (Alaedini 2000: 47, 48) suitable for Iran are suggested here—whose details will obviously require significant endeavor to be worked out. Development of individual and group capabilities in Iran has been limited to the expansion of tertiary education or learning-by-doing, with little attention given to the development of government capabilities or other institutions for interactive and collective learning that enhance various forms of knowledge—simple labor skills, engineering and design, management, marketing, technology absorption and development, and especially learning how to learn. A capability framework for Iran should foster an environment where a wide-ranging set of capabilities can develop. These are associated with not only firms but also various levels of the government/public sector and social and economic institutions (e.g., trade associations, labor unions, universities and other research centers, and local administrative organs). Their focus in Iran should arguably be on a much speedier development and diversification of exports and on making them increasingly efficient and competitive. The tangible outcome would be the enhancement of firms' capabilities in manufacturing, product development, technological upgrading, marketing, and exports.

Continuously developing the above capabilities requires concrete action by the government. This in turn calls for the enhancement of government capabilities for formulating a rigorous industrial policy with trade, technological, infrastructure, labor, social, and institutional components that aims at building supply capacity and diversifying exports (see Shafaeddin 2012: 182–204; Wade 1990). The government should be able to improve the markets without replacing them, enhance the capabilities of entrepreneurs, develop the necessary infrastructure and institutional framework, promote learning that also includes constructive exposure and engagement of the private sector to new ways of doing things, and, last but not least, continuously develop its own capabilities (Shafaeddin 2006). The latter include those associated with providing the right incentives and disincentives in a scheduled/temporary manner to firms against clear and targeted performance criteria,

crafting trade policy with a strong diplomacy component, keeping a close relationship with the civil society while maintaining its own autonomy, mobilizing savings and directing investment into priority projects, successfully engaging in direct production of those goods and services that are vital in the social production process but may be beyond the scope of private-sector activity, and switching policies as the economy evolves and requires new strategies.

Iran's planning system must be overhauled to be able to achieve the above. At a minimum, it should have clear capability development and structural transformation targets—a great deal of which is qualitative—in addition to quantitative macro targets. It has allowed significant ad hoc, misguided, and untargeted government intervention, which must be transformed into active rather than passive government involvement to foster capabilities. It should be driven by an industrial policy, which would be both dynamic and flexible in nurturing various types of operations. These include capital-intensive activities that rely on the country's current comparative advantages with potentials for significant downstream operations; labor-intensive operations that generate jobs—among them agriculture which also provides food security and subsistence for a large number of people—but whose products may not be exportable; and knowledge-intensive industries that can leverage the country's growing stock of highly educated labor. A clear focus on diversification is crucial for Iran. The country's resource-based industries have involved limited activities and produced few jobs with restricted scope of skills. These are limiting circumstances in terms of diversifying into other export activities (see Hausmann et al. 2007). In pursuit of diversification, provision of government protection to infant industries is inevitable—including for exports. Yet, it should be different for activities at different stages of development and certainly time bound for each stage. The associated incentive structure must be contingent upon performance while their gradual reduction should also be predictable. Furthermore, a crucial endeavor would be the development of competitive supply capabilities which entails coordination of economic activities through a firm-centered system/network (Shafaeddin 2005, Chap. 4).

A highly efficient service sector that supports these activities is also required—that can ensure effective international marketing and branding, provision of customer-oriented after-sales services, and timely delivery of products. A central issue that must be addressed by the government in Iran is the lucrativeness of short-term unproductive activities especially associated with the import and real estate sectors—at the same time that longer-term productive activities remain risky. Related to this is the importance of fostering a general environment that enhances modern social capital—by some accounts a crucial missing link in Iran's industrial development (Mahdavi and Aziz-Mohammadlu 2016: 159–195). There is also a need for some decentralization, as oil-based development has caused overcentralization in Iran which has in turn increased oil-dependence (a regional option has been proposed by Karshenas and Hakimian 2005). Furthermore, social policy in Iran has not focused on supporting economic development. Nor has it been able to significantly check inequality. It must be transformed to support industrial and employment development. Finally, in calling for these policy shifts, importance

is optimistically attached to the role of agency, whose powers may be unleashed during times of crisis—a situation arguably faced by Iran at this time.

Overview of the Chapters

This introductory chapter has discussed some of the overarching challenges faced by the Iranian economy in realizing sustained and equitable growth and in generating adequate productive employment. The rest of the chapters in this volume tackle various specific aspects of these challenges. Since there are a number of crosscutting issues associated with industrial, trade, and employment development, the authors of these chapters treat many of the same issues from different perspectives. In doing so, they are likely to disagree in certain details. However, the underlying theme for all of them is developing productive capabilities in the Iranian economy, which requires active government involvement in formulating and carrying out a successful productive transformation strategy.

Chapter 2, "Industrial Development in Post-revolutionary Iran: Continuity and Reform in a Turbulent Environment" by Mohamad R. Razavi, examines Iran's industrial development performance since the 1979 Revolution and especially in the more recent period. It also analyzes major initiatives and regulatory frameworks adopted by the government to boost industrial development and manufacturing exports. Macroeconomic instability and lack of an integrated approach to industrial, trade, and technological policies have negatively affected manufacturing performance. The manufacturing sector has continued to depend heavily on imported inputs, exposing it to exchange rate shocks and affecting its competitiveness in both the domestic and international markets. Yet, manufacturing production and exports are increasingly dominated by resource-based, capital-intensive production concentrated in upstream industries. In contrast most consumer goods and labor-intensive industries have declined. Furthermore, the participation of Iranian firms in global value chains has been minimal. With exports concentrated in resource-related activities, there remains significant policy challenge in terms of what industries to target for further development. Given these challenges, exacerbated by the existence of a sanctions regime imposed against the country, there is a need for a paradigm shift in industrial development policies.

In Chap. 3, entitled "Manufacturing Exports and Employment in Iran: The Role of Economies of Scale and Human Capital," Hamid R. Ashrafzadeh and Pooya Alaedini discuss the importance of the manufacturing sector and its exports in addressing the unemployment woes faced by the growing stock of nominal human capital. They estimate a set of translog cost and production functions for the country's four-digit ISIC manufacturing subsectors to obtain economies of scale and total factor productivity. Their results indicate that, as costs have increased faster than outputs, scale economies have continuously declined during 1997–2013. Total factor productivity and subsector efficiencies—which they derive using a stochastic frontier production function—have similarly underperformed during this period.

The authors further estimate a set of models to measure the impacts of total factor productivity, economies of scale, efficiency, and human capital on manufacturing exports and employment. According to their results, human capital has affected both exports and employment positively and significantly, while economies of scale for the manufacturing subsectors have also had a set of positive and significant employment impacts. The overall impact of economies of scale on exports has been positive as well. This is however not the case for every individual subsector. Those subsectors whose exports have exhibited positive responses to economies of scale may thus be targeted by government initiatives. More generally, the authors suggest that the government should pursue an active role in enhancing economies of scale, efficiency, and productivity in the manufacturing sector and leverage improvements in human capital to raise exports rapidly.

The case of Iran's auto industry is investigated by Mohamad R. Razavi and Pooya Alaedini in Chap. 4, entitled "The Role of State, Domestic Firms, and MNCs in the Iranian Auto Industry: Improved Competitiveness or Policy Capture?". Through limited cooperation with European, Korean, and Japanese multinational corporations, the Iranian auto industry was able to increase its production levels severalfold prior to the imposition of international sanctions. Developing new extensive capacity and tapping underutilized capacity in metal-mechanical firms for component production—much of it carried out by private firms—have been among the prominent features of this growth. The authors of the chapter suggest the country's auto industry is now facing a different structure of incentives, although some of the sanctions imposed on the Iranian economy have been removed. In particular, the earlier seller's market no longer exists, nontariff barriers have effectively been removed, and there is renewed government emphasis on exports. These developments have placed the Iranian auto industry at a crossroads. One path leads the industry to closer cooperation with multinational corporations and its eventual integration into regional and global production networks and markets. Yet, there is also some evidence of another path, that of policy capture through populist economic ideologies, which is preventing the implementation of overdue changes and most likely leads to the demise of component suppliers.

Behrouz Hady Zonooz treats Iran's postrevolutionary trade policy, foreign exchange regime, and industrial development in Chap. 5, entitled "Trade Policy, Foreign Exchange Regime, and Industrial Development in Iran". According to him, Iran's trade regime has oscillated between import-substitution and de facto import promotion in response to oil-revenue fluctuations. During oil booms, domestic producers benefit from the availability of foreign exchange and capital and intermediate goods but are eventually hurt by government's expansionary fiscal and monetary policies that cause significant inflation. They additionally get hammered by government's response to mounting inflation in the form of anchoring the nominal exchange rate and easing imports. Under an import-substitution regime during oil slumps, the government resorts to devaluation and restriction of imports. Yet, as government protection provided to domestic manufacturing firms is untargeted and has little performance criteria, it tends to result in unproductive rent-seeking activities and technological stagnation. Under these circumstances, much of the country's

manufacturing growth and non-oil exports have become associated with large-scale and energy-intensive production which are the recipients of pervasive energy subsidies. The author provides a set of recommendations as minimum requirements to address these challenges. They include a much better management of the real exchange rate, inflation rate, and interest rate, using oil income to neutralize negative oil shocks, reshaping the country's trade structure, developing quality governance institutions, and carrying out a strong set of industrial policy measures to nurture manufacturing capabilities and exports.

International sanctions imposed on Iran have had significant effects on its oil-dependent international trade. Despite some sanctions relief as a result of Joint Comprehensive Plan of Action, the much lower oil prices since late 2014 have given the Iranian economy little respite. Diversifying the composition of Iran's exports has likewise remained a major challenge. Chapter 6, "Iran's Trade Policies: Connecting to the Markets" by Mina Mashayekhi, suggests that, to address these challenges, the Iranian government must design and implement a broad policy mix as part of its 5-year national development planning cycle and with the participation of all the key stakeholders toward reaping maximum benefits from international trade. As the country's educated labor force may not easily compete in terms of cost, the policy package may defy existing comparative advantages in support of long-term development goals. Iran's non-oil trade will benefit from more open markets and reduction in trade costs. It is also important for the country to participate in regional and global value chains (GVCs) to create more employment. As service exports have been on a steady rise, they constitute a major option for Iran for export diversification. They are also key in the GVCs as well as in improving efficiency, competitiveness, and productive capabilities in all or individual economic sectors.

Iran is arguably the most significant economy not yet acceded to the World Trade Organization (WTO). Chapter 7, "Iran's Accession to the World Trade Organization: An Impediment or a Catalyst for Development?" by Sadeq Z. Bigdeli, explores the potential impacts of Iran's eventual WTO membership on its development policy space. The country's late accession means that it would have to pay a higher than normal price. The author of the chapter argues the occasion should be used to implement economic reforms already envisaged by the country's planning system and its laws and regulations but never implemented. These include enhancing transparency, the rule of law, and the overall institutional quality of its trade and economic policies. These in turn can form the backbone of a well-designed industrial policy that aims to nurture domestic production capabilities. However, as the relative isolation of Iran's economy makes it highly vulnerable to unmanaged liberalization, caution is advised especially with regard to the process of removing protective measures. Rather than being implemented unilaterally, the process should be pursued in the context of bilateral and regional preferential trade arrangements. They should be further complemented by a comprehensive social policy. Yet, to reap the full developmental benefits of the WTO accession, Iran must work to remove all unilateral and multilateral sanctions currently imposed on it.

In Chap. 8, entitled "Gender and Industrial Policy: Considerations for Iran," Nadereh Chamlou discusses the importance of gender in formulating an industrial

policy in Iran. The author reviews the recent literature that highlights the significant contribution of women's work to the economy and welfare. She further observes that female labor force participation in Iran is currently among the lowest in the world, despite the fact that women's nominal human capital closely matches that of men, especially among the younger population. High affirmative public-sector quotas that favor men have not only reduced the share of women workers but most importantly discouraged potential female job seekers. The impact of women's low participation in economic activities is, among others, slow income per capita growth, slow upward economic mobility, and a wastage of the country's talent and human capital. These factors all result in low growth for Iran's economy as a whole. In fact, rather than being at the expense of men, women's full participation could give a boost to Iran's GDP by as much as 40%. In this vein, the author argues for the removal of all sex-specific and gender-based legal and social barriers that currently result in the underutilization of Iran's impressive female talent pool.

Iran's manufacturing sector has been less than successful in creating employment for the labor force with tertiary education. Most of the employed college/university graduates in science and engineering are active in the service sector. In Chap. 9, entitled "Employment of Highly-educated Labor Force in Iran: Challenges and Prospects Through the Sixth Development Plan and Beyond," Gholamali Farjadi, Alireza Amini, and Pooya Alaedini explore the challenges and prospects of manufacturing sector employment for the growing stock of highly educated labor force in Iran through the country's Sixth Economic, Social, and Cultural Development Plan. According to the authors, the supply of labor with tertiary education will be much larger than the Sixth Development Plan's employment growth targets for the manufacturing sector. Even meeting these targets—let alone surpassing them—will not be automatic or easy. This observation prompts the authors to explore manufacturing activities with higher potentials to employ highly educated labor. They use two-digit ISIC data for the period 1996–2013 to identify twelve skill-intensive manufacturing activities in Iran that can be targeted by government initiatives for further development and employment generation during the Sixth Development Plan. At the same time, the authors argue that the country's medium- to long-term policy should be directed toward moving the economy from resource-based production toward export-oriented and knowledge-based activities that require capability and technological upgrading. Generating adequate high-skilled employment will also require a well-functioning labor market and a dynamic higher education system.

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Industrial Development in Post-revolutionary Iran: Continuity and Reform in a Turbulent Environment

Mohamad R. Razavi

Introduction

It is a rather daunting task to render the forces that have shaped Iranian industrial capacities and capabilities since the Islamic Revolution in 1979. First, because periods of economic stability have been short-lived whereas discontinuities have been pervasive. Structural issues that typically inflict natural resource economies have also affected Iran—high oil revenues leading to "Dutch disease" whereby an occasional high-growth spell is followed by a dramatic growth collapse, high inflation, foreign exchange shortages, and abrupt and sizable local currency devaluations. Second, in addition to such structural features, Iran has experienced a series of unusual external shocks with adverse effects on its economy—Iran–Iraq War, D'Amato sanctions against the oil industry, extensive regional instability, and prolonged tensions with the USA that led to UN sanctions. Third, in spite of interventions by policy-makers (as embodied in 5-year economic, social, and cultural development plans), key outcomes seem to follow not their stated objectives but rather a more entrenched, structural logic in need of discerning. Thus the task in this chapter is to understand the main contours of industrial transformation in Iran since the revolution: what factors have shaped this transformation? What has been the role of state policies? And finally, what improvements can be made to policies and institutional setups in order to achieve better outcomes?

In order to get a better handle on the issues involved, three bodies of literature are leveraged. First, the structuralist literature provides an alternative understanding of structural transformation, the role of manufacturing and technical change in such transformation, and the relations among growth, current accounts, and foreign exchange management (Ocampo 2014). The second body of literature is associated with renewed interest in industrial policy in the aftermath of the global financial

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crisis of 2009. It understands the process of industrialization as learning, accumulation of technological and organizational capabilities, and appropriate policies and institutional setups that foster such capabilities (see Rodrik 2007; Cimoli et al. 2009). Lastly, the chapter draws on the literature that examines the impact of resource abundance on economic and industrial development—how resource extraction influences industrial development as well as the conditions under which resource-abundant economies either successfully diversify into "competitive industrialization" or fall into "Dutch disease" (see Auty and Gelb 2001; Humphreys et al. 2007). It is through concepts formulated by such theoretical traditions that an explanation of Iran's industrial development experiences over the past forty years is offered.

Political as well as economic policy shifts over the past four decades have had lasting impacts on the Iranian economy and its manufacturing sector. These developments may be divided into four periods: (1) the period of Islamic Revolution and the war with Iraq (1979–1989), (2) the reconstruction period and its follow-up (two-term presidencies each of Mr. Ali Akbar Hashemi-Rafsanjani and Mr. Mohammad Khatami—1989–2005), (3) 8 years of populist economic agenda and heightened tensions with the West during Mr. Mahmoud Ahmadinejad's presidential tenure, and (4) the period since the inauguration of President Hassan Rouhani, whose administration has succeeded in negotiating the Joint Comprehensive Plan of Action (JCPOA) toward reopening trade and investment relations with European and Asian nations. After a brief theoretical discussion, the impact of the immediate post-revolutionary and Iran–Iraq war period on industrial activities is succinctly reviewed. However, the focus of this chapter is on the next three periods. Each is discussed rather extensively by following the developments in macroeconomic and industrial performance, examining key issues that have influenced the course of industrial development, and exploring the outcomes of various policies. Subsequently and in order to better understand the long-term dynamics and outcomes, sectoral developments in the dominant industries are probed. The chapter concludes with an examination of the future paths of industrial development open to Iran.

Theoretical Debates

There are several relevant theoretical traditions that attend to the complex issues of industrial development in resource-abundant developing economies. They include Latin American structuralism, the resource curse formulations, and the industrial policy school. They offer explanations on the sorts of macroeconomic difficulties resource-based economies face, the extent of reliance on manufacturing for economic development, forces that prolong import substitution or push toward export promotion, and the types of learning as well as technological and organizational capabilities that are required for accelerated industrialization. Let us briefly review the arguments of each approach.

One of the critical areas in which Latin American structuralists were interested was the impact of macroeconomic policies on productive transformation. The growth experience of many Latin American economies that were dominated by the export of natural resources underscored the significance of shocks to balance of payments due to price volatility of commodities. Various studies had shown that such shocks played a key role in the emergence of business cycles. To manage those cycles and restore growth and industrial development, structuralists suggested a twofold policy initiative—a supportive macroeconomic environment together with an active policy for the diversification of production structure (Salazar-Xirinachs et al. 2014). A supportive macro environment in this approach included such measures as countercyclical policies to manage business cycles and to reach high levels of aggregate demand but also competitive exchange rates and trade policies in support of diversification efforts (Ocampo 2014). As to the second initiative, it was generally suggested that diversification into more innovative activities and building technological capabilities would take place when new industries were developed or emerged (Ibid.: 48). However, in order to improve their competitive performance, these new industries would be in need of temporary support which could be offered by protecting the domestic market until enterprises enhanced their performance through learning by doing. This is the "infant industry" argument that was one of the pillars of "import-substituting industrialization" often associated with the Latin American economic development experience. Support for the development of "infant industries" was to provided through low-interest loans, higher tariffs temporarily placed on the import of goods that had local production, lower tariffs for the import of capital goods, tax relief, public procurement, and other measures. It was argued, in case foreign exchange for the purchase of machinery and technology was in short supply, capital would be borrowed from abroad to support diversification efforts and the introduction of new and innovative activities (ECLAC 1990).

Structuralists were however criticized for encouraging developing countries to overcome their backwardness by promoting advanced industries that had developed in high-income industrial countries. Developing capital-intensive industries defied the logic of comparative advantage as it placed heavy demand on capital, a highly scarce resource in developing countries (Lin 2009). Gradually, mainstream criticisms led to the formation of a body of literature that focused on the problems of resource-rich developing countries. In its "resource curse" or "Dutch disease" renditions, it argues that the introduction of revenues from natural resource sales leads to a number of problems that slow or regress economic performance (see Humphreys et al. 2007; Auty 1993; Corden and Neary 1982). One of these problem areas is the promotion of infant industry supported by structuralists. Auty and Gelb (2001: 140) argue that this policy has three flaws: first, such promotion provides rents to a select number of enterprises or entrepreneurs in a relatively nontransparent process. This process leads to misallocation of resources and causes economic distortion and corruption. Second, such industries are usually capital-intensive and create few jobs. To cope with the problems that arise in this situation, governments are pushed to provide nonproductive employment in order to avoid social tension. Third, experience shows that technology- and capital-intensive industries take some

time to mature and in the process demand foreign exchange from the primary sector. When such demands accumulate, efficiency of investment falls, and level of investment flattens or declines. Increases in those demands also create fiscal and external deficits, making growth more erratic and open to collapse (Ibid.: 141). As economic diversification does not move forward and at times regresses, growth becomes more dependent on natural resources and gets affected by their price fluctuations. For example, a rise in the price of natural resources or commodities causes an appreciation of the real exchange rate. In such circumstances, non-natural-resource exports become more difficult, while competing with growing imports is even tougher for domestic manufacturers (Humphreys et al. 2007: 5). If this situation is prolonged, it can result in premature deindustrialization.

Yet, accelerated industrial development in East Asian economies, and the fact that their policy initiatives did not conform to what was prescribed by mainstream economists, led to the emergence of a "revisionist" body of literature (Amsden 1989; Wade 1990). Although the initial focus of this literature was largely on East Asian economies, more recently, proponents of industrial policy have also investigated resource-abundant economies, particularly by looking at the challenges of Latin American nations in their new resource-based specialization (Ocampo et al. 2009). They agree that the onset of the Dutch disease in resource-rich economies leads to the appreciation of exchange rate which in turn causes industrial output to become less competitive internationally. They also concur on other negative impacts of the Dutch disease on the economy—observing that as production in resource-based activities is capital intensive with low demand for skilled labor, it often leads to polarization in income distribution and is prone to corruption. Meanwhile, limited technological learning and spillovers erode the overall economic benefits from natural resource exports (Cimoli et al. 2009: 556). Unlike the proponents of the Dutch disease approach, analysts such as Cimoli et al. (2009) and Salazar-Xirinachs et al. (2014) focus on the process of technological learning and capabilities accumulation and point out that as manufacturing lies at the core of technological learning, Dutch disease particularly compromises future learning prospects. "In fact, in order to avoid the resource curse, rents have to be purposefully distributed against comparative advantages, fostering diversification of production in knowledge-intensive activities (Cimoli et al.: 556)." However, in order to be successful, an incentive structure is needed that would promote "learning-based" rent-seeking as opposed to rent-seeking in general (Ibid.: 543).

Although there are a number of differences among the above bodies of literature, similarities also abound. They offer a rather rich toolbox to utilize in examining various trends in the Iranian manufacturing developments during the past three decades. In what follows, the patterns of industrial development in Iran are discussed in relation to the country's prevailing macroeconomic environment. In addition, the status of manufacturing in the Iranian economy, changes in the mix of industries, and trade policies are examined together with investment trends and targeting.

Economic Context for Industrial Developments in Iran: Challenges and Opportunities

Almost 40 years ago, Iran experienced a revolution and, subsequently, a devastating war with tumultuous impacts on several levels. Iran's interactions with the USA and, to a lesser degree, major European economies faced significant tension. As a result, Iran's relations with international markets were restricted to energy exports and trade of goods. Notwithstanding Iran's oil and gas (O&G) sector, multinational corporations (MNCs) were only interested in the sales of finished or semi-finished goods to Iran and not in making investment, transferring technology, or integrating the country within their value chains. The Iranian economy faced extreme difficulties during the Iran–Iraq war. Yet, there were other effects as well. The situation forced local industrialists, managers, and engineers to find ways to keep their facilities operational and engage in technological imitation, copying, reverse engineering, and minor innovation. This led to an enduring emphasis placed on "self-sufficiency," which has arguably prolonged the country's import substitution approach to industrialization. It also focused policy-makers and industrialists on "production" capacity (satisfying the domestic market) as opposed to "technological learning capabilities" (developing competitive products for export). Another early development with long-term impact on the manufacturing profile of the country was the confiscation of industrial firms after the revolution. Such takeovers took place as a number of factory owners left the country and as revolutionary courts transferred certain enterprise ownerships to the state. The result led to a bloated state ownership of industrial firms. In spite of several rounds of "privatization" over the past decades, state or quasi-state (public) entities still control the lion's share of Iran's key industries, including steel, petrochemicals, auto, cement, and others. Notwithstanding, as a result of the above developments in the early post-revolutionary and Iran–Iraq war period (1979–1989), Iran's gross domestic product (GDP) shrank by a significant factor.

Since the signing of the peace agreement between Iran and Iraq in 1988, the Iranian government has drafted and implemented several 5-year economic, social, and cultural development plans. Their objectives and actual performances are reviewed below—especially the economic outcomes at the macro level and their relationship to industrial policies. In doing so, we make a central argument that a developing economy, in order to achieve accelerated industrial development, must enjoy macro policies that provide an enabling environment for various types of learning. Such policies include (but are not limited to) economic stability through sustained growth, predictable foreign exchange rate, stable fiscal policies and public expenditure, controlled inflation, predictable trade policy, and a fair and equitably enforced taxation policy. It is such a combination of policies that encourage accumulation of capabilities at various levels. In what follows it is shown that successive Iranian administrations have not been able to provide such an environment. Thus, mismanagement of available oil revenues, abrupt liberalization followed by restrictive trade policies, and a highly unstable growth pattern have been accompanied by high inflation and sizable devaluation of local currency. At the same time, the Iranian

government has not succeeded in stabilizing demand and controlling output volatility because it has lacked proactive countercyclical fiscal and public procurement policies. Such missteps have led to, or have been accompanied by, significant financial difficulties faced by manufacturing enterprises and waves of bankruptcy that have destroyed accumulated capabilities.

During the last year of Iran–Iraq war (1988), the Iranian economy experienced a very difficult situation. Oil revenue income was less than $10 billion, the economy had contracted by −5.5%, while the inflation rate had risen to 25% (MEAF 2004). Faced with such dire conditions and under pressure to satisfy the pent-up demand and reconstruction needs, President Hashemi-Rafsanjani's administration embarked on the (post-revolutionary) First Development Plan (1989–1993). This was basically a crisis management and reconstruction plan that relied heavily on foreign loans in pursuit of two goals: first, toward importing consumer, intermediate, and capital goods and upgrading the infrastructure; second, toward investing in the revival of industrial capacities and establishing new activities. Foreign direct investment (FDI) would additionally be deployed for O&G and manufacturing capacity buildup. It was envisaged that, by exporting part of the products from existing capacities and attracting FDI to newly established export processing zones (EPZs), exports would rise to earn the required foreign exchange for debt servicing. To achieve these goals, the government adopted measures from the economic reform packages prevalent throughout the developing world during the 1980s—including trade liberalization and privatization as well as enforcing "real" prices and reducing public debt.

In practice, whereas Iran was able to raise $23 billion in short-term foreign loans, it did not attract any meaningful FDI—even less so to EPZs for producing exportable products (Razavi et al. 2018). From a discouragingly low base (at the end of the war), however, the Iranian economy grew by a respectable average of 7.3% per annum during the First Development Plan (see Table 1). Imports, improved capacity utilization rates, and investment in new capacities for construction materials and in

Table 1 Key indicators of economic performance during Iran's 5-year development plans

Five-year development plans (FYDP)	Annual average oil revenues ($ billion)	Annual average GDP growth (%)	Annual average manufacturing growth (%)	Average inflation rate (%)	Annual average growth of manufacturing exports (%)
First FYDP (1989–1993)	14.7	7.3	9.3	21.7	4
Second FYDP (1995–1999)	14.1	2.6	7.4	25.5	4
Third FYDP (2000–2004)	26.2	5.8	10.6	14.2	21
Fourth FYDP (2005–2009)	73.2	4.4	6.3	14.8	27
Fifth FYDP (2011–2015)	65.9	−0.5	2.1	22.8	−2

Source: Reproduced from Shafie and Mobasser (2018)

badly needed infrastructure, as well as demand improvement, contributed to economic recovery. However, the meager 4% annual growth rate of manufacturing exports limited earning the badly needed foreign exchange. Injection of short-term external finance into an economy geared toward self-sufficiency and import substitution industrialization (ISI), and in particular into projects with long gestation periods, invited trouble. This together with a drop in oil prices led to a debt crisis and growth collapse in the last year of the plan in 1993—which further aggravated inflationary pressure and obliged devaluation.

Due to the instabilities at the end of the First Development Plan, the authorities decided to postpone the launching of the Second Development Plan. During the hiatus of 1994, economic growth turned negative, inflation surpassed 35%, imports—at $12 billion—decreased to half of the previous year, and foreign exchange rate appreciated by 59% (MEAF 2004). In order to cope with such imbalances, the Second Development Plan (1995–1999) was drafted with two key objectives: (1) controlling inflation and exchange rate appreciation in the short term and (2) continuing economic liberalization and privatization initiatives as well as relying on domestic sources of capital for investment and imports together with export promotion. However, low levels of oil export income, a debt crisis, restrictions placed on the country during the foreign loan renegotiations, and high rates of inflation imposed severe limitations on achieving the Plan's goals. The average annual rate of economic growth dropped to 2.6% during the Second Development Plan, average rate of inflation rose to 25.5%, and the growth of manufacturing exports averaged at the slow pace of 4% per annum (Table 1). Yet, toward the end of the Plan, the government's stabilization measures gradually lowered inflationary pressures and eased foreign exchange shortages. The election of Mr. Mohammad Khatami to the office of president in 1997 and his conciliatory approach to foreign policy led to improved cooperation with European and Asian countries and MNCs. There were few noticeable changes in the direction of economic policies during President Khatami's administration. Nonetheless, experiences gained during the previous two plans led economic planners to take into account certain factors that had adversely affected the Iranian economy: (1) the adverse effect of oil income fluctuations on economic growth and their magnification in association with a weak financial system and (2) distortions due to lack of economic transparency in such areas as (a) foreign exchange allocation under a system of multiple rates, (b) proliferation of taxes and duties on businesses, and (c) extent of trade limitations and nontariff barriers.

The Third Development Plan (2000–2004) was influenced by the above observations to call for continued economic reforms toward "developing a competitive economy." Its related objectives included liberalizing trade and financial markets, addressing monopolies, limiting government's role in the economy through privatization and improved private sector participation, and significantly increasing exports (Majles 2017). Several important changes in the existing laws and institutions were carried out during the Plan. In the financial sector, these included the establishment of a foreign exchange reserve fund and the passage of Foreign Investment Protection and Promotion Act (FIPPA), placing limits on the

government's ability to dole out loans through the commercial banking system, allowing the establishment of private banks, and unifying the multiple foreign exchange rate system. Additional policy initiatives targeted the improvement of business climate by reducing permit requirements, reducing tariffs (as well as tariffication of nontariff barriers), streamlining import duties, reducing price controls, and decreasing energy subsidies. These, coupled with rising oil revenues, improved economic indicators and made the Third Development Plan the most successful after the revolution. During the Plan, GDP grew by an average of 5.8% per annum, inflation dropped to an annual average of 14%, and manufacturing exports grew by an annual average of 21% (Table 1). Valuation of privatized state-owned enterprises grew by a factor of 15 in comparison with the previous plan, while private sector investment rose considerably (Iranian Privatization Organization 2015).

By 2004, the last year of the Third Development Plan, the economy had stabilized, oil revenues had risen to $36 billion, trade balance had witnessed a surplus of $5 billion, and the foreign exchange reserve fund had accumulated more than $10 billion (CBI 2005). It was in this environment that the Fourth Development Plan was drafted with the following objectives: (1) to continue economic reforms of previous plans, (2) to expand linkages to the global economy, and (3) to make the transition from a resource-based to a knowledge-based economy. Assuming a stable environment, the Plan emphasized undisrupted high economic growth and diversification of production structure by promoting knowledge-based technologies as well as controlling inflation, promoting exports, and reducing poverty (Majles 2017). However, the Iranian economy soon faced a very different milieu from the one presumed during the conception of the Fourth Development Plan. Four new developments are worth mentioning:

1. The Plan was passed during the last year of Khatami's government whereas the new administration of President Ahmadinejad that took office in 2005 had a different populist agenda.
2. Within a year, oil prices increased to an unprecedented level of more than $100 a barrel, opening the door for an intoxicated government to spend without restraints and dole out various types of low-interest loans—leading to the resurgence of inflationary pressures. To control inflation, the government resorted to record level imports (which almost doubled from $35 billion in 2004 to $65 billion in 2010), setting the conditions for Dutch disease and financial difficulties for many manufacturing firms (Nili 2017, vol 1: 429).
3. A major public housing scheme (*maskan-e mehr*) was initiated and built by the government. The scheme financed the construction of more than one million housing units for low-income families through the Central Bank of Iran. By providing demand for construction material at such a high level, this initiative was able to postpone the negative impact of abovementioned policies for a couple of year.

4. Increasing tensions with world powers over the nuclear dossier began to exert its impact on the economy, gradually limiting access to foreign investment, technologies, and markets.

Economic indicators in the first year of the Fourth Development Plan were sound, and oil revenues during the Plan were quite high. However, mismanagement of foreign exchange and unprecedented levels of imports paved the way for the onset of Dutch disease, again leading to growth collapse. During the Fourth Development Plan, the average annual economic growth rate was 4.4% but only around 1% in its last 2 years. Although inflation averaged around 15%, it jumped to 25% in 2008, the penultimate year of the Plan (CBI 2010). Yet, the foreign exchange rate was kept unchanged. Furthermore, resorting to patronage schemes, the government started several initiatives: (1) a large number of employees were hired by the state, (2) job creation loan schemes were launched, and (3) part of the rising oil income was transferred to all Iranian nationals through fixed monthly payments. On the positive side, earlier investments in industrial capacities, especially in intermediate goods such as petrochemicals, refinery products, metals, and nonmetallic minerals reached fruition and pushed the annual average growth rate of manufacturing exports to 27% (Table 1).

The Fifth Development Plan (2011–2015) was drafted during 2010—coinciding with another burst in economic growth driven by high oil revenues that topped $90 billion in that year. Yet, a number of drastic internal and external shocks overturned the entire economic scene. First, a long-awaited policy of reducing subsidies on energy and some other essential goods was implemented under a government act (aimed to make the subsidies targeted). Such a radical economic surgery coincided with the arrival of a second shock due to the onset of UN-sponsored sanctions. Finally, if one adds these shocks to the cumulative impact of populist policies of Mr. Ahmadinejad's administration, they account for the reasons why the Iranian economy plunged into another growth collapse during 2011–2012. This growth collapse was accompanied by several unpleasant developments. To begin with, the mismanagement of foreign exchange rate led to shortages and caused a two-thirds devaluation of the rial. In response to currency shortages, the government reintroduced foreign currency rationing and returned to multiple exchange rates. In effect, trade policies were made subservient to foreign exchange policies. Furthermore, the onset of sanctions directly impacted many areas of activity—banking, oil and gas, autos, shipping, and aviation. Indirectly, sanctions caused severe restrictions on the import of raw materials and intermediate and capital goods that were essential for the operation of manufacturing activities. Inflation soared again—reaching 35% in 2013—and manufacturing export experienced negative growth rates (Table 1). In 2012, the Iranian economy witnessed its worst performance in almost three decades as it contracted by 5.8% (CBI 2015). The situation improved after 2013, when Mr. Hassan Rouhani was elected into office as president—promising negotiations with world powers and relief from international sanctions. In anticipation, the economy began to gradually recover so that the growth rate reached

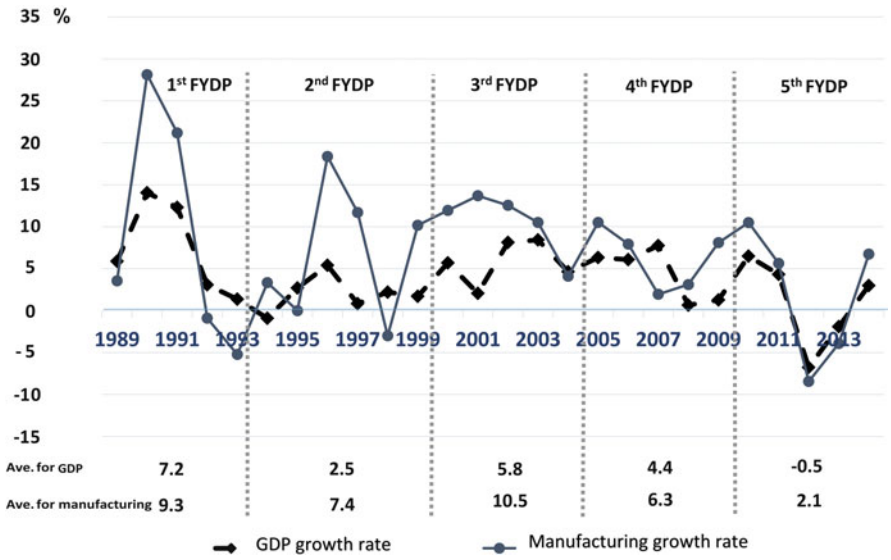

Fig. 1 GDP and manufacturing growth rates in Iran during 5-year development plans (FYDP) (1989–2015) [Source: CBI (1989–2016), Economic Report and Balance Sheet]

3.2% in 2014 and 4.6% in 2015 (CBI 2016). A year later, the inflation rate was also brought down to 10% (Ibid.).

Iran's experiences since the end of the war with Iraq may thus be summarized as follows: erratic economic growth (growth spurts followed by growth collapse), high rates of inflation, pro-cyclical fiscal policy, exchange rate mismanagement leading to prolonged periods of domestic currency overvaluation followed by sudden devaluation, and trade liberalization punctuated by periods of trade restrictions. More specifically:

1. Between the end of Iran–Iraq war in 1989 and 2014, the average annual growth rate of the Iranian economy was 3.9%, which was below the corresponding figure for developing countries as a whole. At the same time, economic growth rates in Iran exhibited significant fluctuations. That is, a growth surge would be followed by a growth collapse (Fig. 1). This pattern would be accompanied by foreign currency shortages, strong inflationary pressures, widening trade gap, and diminishing competitiveness of non-resource-based manufacturing activities—leading to high bankruptcy rates in a large number of firms, especially small and medium enterprises (SMEs). Such outcomes have been predicted in the structuralist and resource curse literature that mismanagement of oil revenues and foreign exchange rate together with pro-cyclical fiscal and monetary policies and sudden trade liberalization would result in missed opportunities for turning periods of high oil revenues into stable and prolonged growth patterns.

2. In the period 1989–2014, the average annual growth rate of manufacturing was 7.1%—nearly double the economic growth rate. However, fluctuations were even more pronounced in the sector's growth pattern (Fig. 1). Between 1999 and 2014, the directions of economic and manufacturing growth rates were alike except for the years 2001 and 2007. The similarity of the two patterns reflect their association with oil price volatility—although further studies are required to establish a definite relationship in terms of lead-lag and direction of causality. What is of concern is the fact that after several years of above average growth since 1998, industrial growth rates have been quite unstable, and the annual average growth rates have decreased from 10.5% during the Third Development Plan to 6.3% and then to 2.1% during the Fourth and Fifth Development Plans. This pattern has had severe impacts on employment, development of networks of learning and technological upgrading, and generation of organizational capabilities.
3. According to a study on the relationship between economic and industrial growth in Iran (Nili 2017, vol 1: 36) over the past 20 years, drivers of growth have been oil revenues, domestic demand, services, and industry. The latter two sectors have accounted for 85% of economic growth in that period. What is not clear is the importance of industrial growth in recent economic growth recovery.

Critical Issues in Iran's Industrial Development

The previous section presented a rather brief overview of the Iranian economic and industrial performance over the last 25 years. In order to examine the performance of the manufacturing sector more closely, several key issues are probed—which have loomed large in recent debates in Iran and can provide a more nuanced and detailed understanding of the forces that have shaped the manufacturing sector in the country. These include the changing share of manufacturing sector in the economy, structural transformation, directions in trade policy, investment patterns, and industrial policy and targeting.

Manufacturing in the Iranian Economy

The share of manufacturing in GDP has been rising steadily when looked at in terms of real prices. As exhibited in Fig. 2, this share increased from 8.2 to 16.6% between 1989 and 2014. This trend demonstrates that the process of industrialization has been continuous and progressive (except for a few years in early 1990s as well as in 2007 and 2013). It also shows that external shocks and growth fluctuations have not had major impacts on the relative status of manufacturing. However, when one considers the GDP share of manufacturing in current prices, a different picture emerges. At its highest, the share of manufacturing in GDP was 17.5% in 1997 and 2001 but declined to 11.8% in 2014. The period exhibits a rising secular trend of the

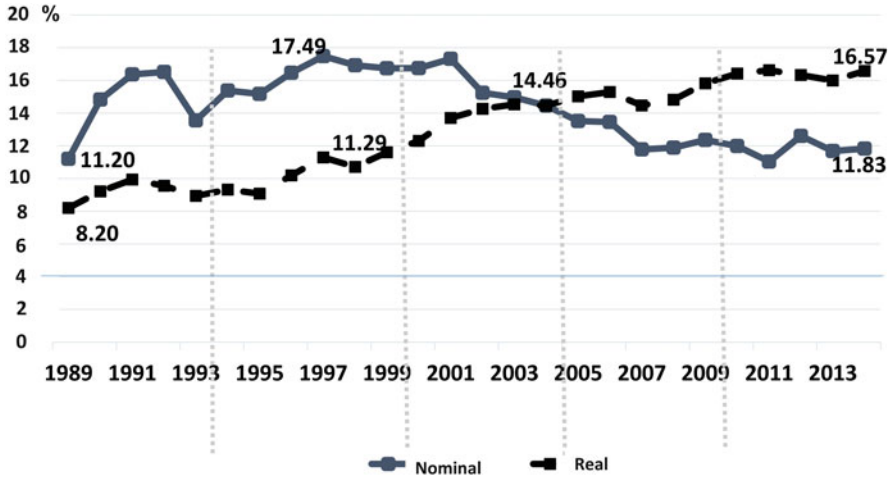

Fig. 2 Share of manufacturing in GDP—nominal and in constant 2004 prices [Source: Reproduced from Tashkini (2016)]

share of manufacturing in the economy up until 2001, followed by a declining secular trend over the next decade and a half. This demonstrates that since 2001 the market value of manufacturing production has been declining relative to other sectors. There are several reasons for this. First, trade liberalization and high levels of imports in this period have put pressure on the price of tradables, whereas prices of non-tradables have increased substantially. Second, terms of trade between the manufacturing sector and the other sectors—agriculture, services, and especially construction—have worsened. Government intervention in controlling the prices of final and intermediate goods such as dairy products and cement, iron, and petrochemicals contributed to the worsening terms of trade between manufacturing and other sectors. The declining share of manufacturing in terms of market value is attributable to the workings of the Dutch disease. In addition, this decline shows that due to the Iranian government's inability to adopt the necessary industrial and technological policies, the economy has failed to generate new competitive industries and high value-added ones or to promote developmental blocs around new technologies.

Changes in the Industrial Mix

The next issue is the extent of change in the mix of key manufacturing industries in Iran. This is of interest from two perspectives. The first has to do with the question of whether the changes are a sign of structural transformation, that is, the extent to which the changes in industry mix have been a reflection of high-productivity industries replacing low-productivity ones and generating new employment and contributing to value added and exports in the process. However, changes in the industry mix in a resource-abundant economy can also be looked at through the

prism of deindustrialization—to what extent they are accompanied by loss of jobs, technological capabilities, and learning networks in industries that are employment-generating and engineering-intensive. Table 2 exhibits changes in shares of key variables such as employment and production value that have taken place in major manufacturing activities during the period 1994–2015. It compares these shares over three periods: the year 1994 and the average shares for the Third and Fifth Development Plans. Three significant trends can be observed:

1. Consumer goods industries that include "food and beverage" as well as "textile and apparel" industries have continuously lost share by more than one-half—from 45.6 to 22.1% in total production value of manufacturing and from almost 38 to 16.4% in total manufacturing value added. Textile and apparel have taken the main brunt of this decline, whereas the impact on food and beverage industries has been moderate.
2. In contrast, there has been an extraordinary rise in the share of intermediate goods (commodities) including petrochemicals, refinery products, basic metals, and nonmetallic minerals. During the three periods shown in Table 2, the share of intermediate goods has more than doubled, increasing from 24 to 53% of production value, from 30 to 60% of value added, and from 55 to 89% of exports. However, since intermediate goods are capital-intensive process industries, increases in their share of employment have been quite moderate, from 27.6 to 32.8%.
3. The final observation is related to motor vehicle and machinery industries. Although these industries do not produce competitive products and therefore have a negligible export capacity, relatively speaking, they are high-productivity, engineering-intensive industries. The two industries together increased their share in all indices (except for exports) when data for 1994 are compared to averages for the Third Development Plan. However, as a result of economic reforms that went into full swing during that Plan, the engineering-intensive industries lost share in almost all indices between the Third and the Fifth Development Plans.

Transformations in manufacturing activities have thus resulted in a twofold outcome: first, there has been an unmistakable change in favor of intermediate goods that produce exportable resource-based commodities. Second, consumer goods industries have been hit relatively hard, while engineering-intensive industries have lost ground as well. High levels of imports and absence of industrial and technology policies have contributed to this process. Both consumer goods and engineering-intensive industries have been entirely focused on the domestic market—except for the food industry that has been able to make inroads into regional markets.

Table 2 Changes in the mix of key manufacturing activities—1994 and averages for 3rd and 5th 5-year development plans (FYDP) (percentages show share of the type of industry in the relevant variable)

	Production value			Value added			Employment			Export		
Type of manufactured goods	1994	3rd FYDP	5th FYDP	1994	3rd FYDP	5th FYDP	1994	3rd FYDP	5th FYDP	1994	3rd FYDP	5th FYDP
Consumer (food, beverages, textiles, and apparel)	45.6	27.6	22.1	37.9	15.7	16.4	30.9	24.5	21.4	6	6.7	6.5
Intermediate (chemicals, refinery products, basic metals, and nonmetallic minerals)	24.4	31.2	52.7	29.8	41.2	60.2	27.6	29	32.8	55	63.1	88.8
Motor vehicles (assembly)	3.3	15.5	8.3	3.3	11.2	5.5	3.6	6.6	4.1	ng.	ng.	1
Machinery (electrical and mechanical)	7.2	8.2	5	8.2	8.6	4.9	15	10.6	11.3	ng.	ng.	1.5
Total (for above industries)	80.5	82.5	88.1	79.2	76.7	87	77.1	70.7	69.6	61	69.8	97.8

Note: ng. stands for negligible

Source: Author's calculations based on SCI (1994–2015), Census of large industrial establishments

Trade Policy and Exports

Despite the stated export promotion intentions, Iran primarily followed an import substitution policy until the Third Development Plan. Experiences with the war and sanctions contributed to a commitment to self-sufficiency. However, starting from the Third Development Plan, trade liberalization was promoted as part of economic reforms. In practice, this policy resulted in a substantial increase in imports but also of exports. During periods of soaring oil revenues, the policy of fixing the foreign exchange rate in an inflationary environment worked in favor of imports and against exports of manufactured products. But exports of resource-based commodities grew considerably, leading to a new pattern of export specialization completely dominated by commodities (Table 2). Overall, macroeconomic uncertainties associated with high growth followed by growth collapse have made it quite difficult for firms to accumulate technological capabilities and produce non-resource-based manufacturing goods for export markets.

The following observations have been offered on the relationship between exports and growth (Hausmann et al. 2007): (1) countries that have higher rates of growth specialize in the export of high-technology products; (2) economies that export goods with intermediate as well as low technologies have lower growth rates; (3) however, the lowest growth rates are experienced by economies that export natural resources and commodities. These outcomes may not be obvious in the short run when commodity prices increase substantially. In the long run, however, export of products incorporating high and/or low technologies tend to be more stable and have a more positive influence on growth compared to exports of natural resources and commodities that have volatile prices and transmit external shocks to the domestic economy.

Table 2 records the highly uneven pattern of Iran's industrial exports. During the decade spanning the First and Second Development Plans, industrial exports grew at a low annual average rate of 4%. However, in the next two plans, with major investments in steel, petrochemicals, cement, refinery products, and nonmetallic minerals coming to fruition, the growth rate of exports jumped to 21 and 27%, respectively. Yet, restrictions associated with sanctions imposed on the Iranian economy, such as market access and banking limitations, reduced the average annual growth rate of manufacturing exports to −2% during the Fifth Development Plan. This means that except for the decade of Third and Fourth Development Plans, manufacturing export growth was not sustained. Furthermore, exports tended to rely heavily on investment toward the production of commodities (Table 2 showed that export growth was associated with intermediate goods or commodities). Iran's export structure thus fell in the category of low rates of growth and least contribution to economic growth. Yet, imports grew at an average annual rate in excess of 30% between 1999, at the outset of the Third Development Plan initiating trade liberalization, and 2010, just before the height of international sanctions imposed on the Iranian economy. They multiplied almost five times from $13 billion to $65 billion over that period. Growth of imports at such a rate had an undesirable impact on the

production of consumer and labor- and engineering-intensive goods, as well as their related networks of learning and technological capabilities.

In terms of diversification of export products and markets, a number of issues should be further highlighted. As shown in Table 2, close to 89% of the country's exports in recent years have been concentrated in intermediate commodities—mostly petrochemicals, refinery products, and metals. To diversify beyond such export items, Iranian policy-makers have encountered two major challenges. First, moving along the value chain of commodities into downstream products with higher value added has proven to be quite difficult—facing major delays. The second hurdle has been faced in diversifying into new export-oriented manufacturing areas. As discussed in the literature (Hidalgo et al. 2007), resource-based economies are likely to face significant difficulties in diversifying their production and export structure due to the position of commodities in non-dense "product spaces." In addition to the challenges regarding the types of products, Iran has encountered major obstacles in diversifying its export markets. Furthermore, as discussed by Sadeq Z. Bigdeli in another chapter of this volume, the number of export markets has actually decreased, mostly due to sanctions. That is, Iranian export diversification has encountered many challenges in terms of products and markets.

In summary, despite increases in both imports and exports subsequent to economic reforms, an unsustainable pattern has set in. Import hikes have resulted in the contraction of labor- and engineering-intensive industries that, respectively, generated employment and shaped a network of learning and technological capabilities. Yet, a pattern of export specialization has emerged that depends on natural resources and commodities—which are capital intensive and have limited employment and domestic value added. Diversifying out of such products has posed major policy challenges for several reasons. First, both natural resources and resource-based commodities are positioned in non-dense "product spaces," which limit learning opportunities and technological spillovers from existing capabilities. Second, commodities tend to require low levels of local research and development (R&D) and have few interactions with domestic sources of knowledge and technology. Furthermore, diversifying into technology-intensive, export-oriented manufacturing has faced difficulties in accessing technologies and markets. The existing trade structure has led to periodic trade deficits and shortages of foreign exchange. Since price fluctuations in most items of Iranian commodity exports resemble fluctuations in oil prices, they have not been able to have a countercyclical effect to prevent or slow down incidents of growth collapse.

Industrial Investment and the Issue of Targeting

In this subsection, we take a closer look at investments in industrial capacities in Iran—including their priorities, sources of finance, and fluctuations. A key debate in the industrial policy literature has been over horizontal versus vertical policies. Vertical policies or selective targeting have been criticized for "choosing winners"

and allocating resources not on the basis of efficiency and market mechanism but according to bureaucratic decisions that are highly prone to corruption and rent-seeking (Krueger 1974). However, as proponents of industrial policy argue, effective horizontal policies like encouraging technological upgrading or improving the business environment are few, quite costly, and usually take a long time to implement. At the same time, a look at the wide spectrum of such policies as allocating finance and foreign exchange, developing infrastructure, and investing in education or skill formation shows that governments are "doomed to choose" (Hausmann and Rodrik 2006). If governments necessarily choose or target, then two questions arise: first, should these choices strictly follow "comparative advantages" or can new technologies be targeted in order to develop "good path dependencies" that lead to "competitive advantages" (Lin 2012; Cimoli et al. 2009: 545). The second question is whether governments can develop the institutional mechanisms to direct "rents" toward innovative activities and the development of technological and organizational capabilities.

Let us look at the choices that have been made by successive administrations in Iran on industrial investment projects. Coming out of a devastating war with Iraq, the government of President Hashemi-Rafsanjani was preoccupied with satisfying the pent-up demand for consumer goods as well as reconstruction of war-damaged areas and infrastructure. As Table 3 shows, there arose a certain division of labor between the government and the private sector, in which the former concentrated on developing capacities in capital-intensive intermediate goods and commodities, while the latter invested in the production of consumer goods and construction materials. Before going into further detail, it must be pointed out that during Iran's five post-revolutionary development plans, the share of government in fixed capital formation in industrial and mining activities averaged around 30%—fluctuating between 32% in the Second Development Plan and 25% during the Fifth Plan (CBI 1989–2015). As indicated by Table 3, average annual growth rate of fixed capital formation in the sector surpassed 28% during the First Development Plan as the economy came out of the war, redirected its financial resources, and received a high amount of short-term loans from outside. After this initial recovery, the best performance was recorded for the Third Development Plan, whereas in the Second and Fourth Development Plans, the corresponding growth rates were around 5%. The Fifth Development Plan was associated with a disappointing growth rate of −6% (of which more later). Table 3 also highlights the top three "priority" industries in terms of actual investment by the government and the private sector. Metal, petrochemical, and chemical industries were among the top three priorities for government investment during the first three development plans. The logic behind such choices was adherence to "comparative advantages" in terms of mineral deposits such as iron ore, copper, and ethane gas and derivatives. In addition, Iran has been ranked second globally in terms of combined oil and gas reserves. Therefore, investing in energy-intensive industries such as steel, glass, cement, and the like appeared quite rational. With a time lag of 2–4 years, investments in such large-scale, capital- and energy-intensive industries generated the capacities that led to an export leap during the Third and Fourth Development Plans. Since the Third Development Plan and with the transfer of ownership in such

Table 3 Investment growth rates in Iranian manufacturing and actual investment shares in priority sectors during the 5-year development plans (FYDP)

FYDPs	Annual growth of fixed capital formation (%)	Declared priority industries	Government or private sector	Top three priority industries based on actual share of in fixed capital formation		
				Priority #1 (%)	Priority #2 (%)	Priority #3 (%)
First	28.5	Metals, food, textiles	Gov.	Basic metals (43)	Chemicals (13)	Mechanical (4)
			Priv.	NMM (17)	Textiles (16)	Food and beverage (12)
Second	5.4	Minerals, agricultural processing industries	Gov.	Basic metals (20)	Autos –	Chemicals –
			Priv.	Oil-based products (20)	NMM (19)	Food and beverage (19)
Third	9.6	Petrochemicals, electronics, biotech industries	Gov.	Petrochemicals and chemicals –	Basic metals –	Autos –
			Priv.	NMM (17)	Food and beverage (17)	Basic metals (13)
Fourth	5.6	Knowledge-intensive industries	Gov.	–	–	–
			Priv.	Chemicals (19)	NMM (18)	Basic metals (16)
Fifth	−6.0	Downstream of petrochemicals and minerals	Gov.	–	–	–
			Priv.	Fabricated metals (17)	Chemicals (13)	Basic metals (13)

Notes: NMM stands for nonmetallic minerals, such as cement, glass, tile, and plaster, which are mostly used in the construction industry. Numbers in parentheses are percentages and represent share of named industry in government or private sectors' average fixed capital formation during the respective FYDP. Missing government priorities and investment shares are due to changes in the reporting categories of the Central Bank since the Third Development Plan
Source: Author's calculations based on CBI (1989–2016), Economic Report and Balance Sheet

industries to the "private" sector (in reality to "semipublic" entities), basic metals and petrochemical/chemical industries have continued to attract investment. Yet, this time, these industries have become priorities of the "private" sector. During the first three development plans, top investment priorities for the private sector included food and beverages as well as textiles and nonmetallic minerals—mostly construction materials (Table 3).

Before discussing the changes in actual industrial investment, a number of observations are in order:

1. State and private actors have both made decisions about industrial and mineral investments according to natural resource endowments and market demand.
2. There appears to be a rudimentary division of labor, with the state investing in capital-, scale-, and energy-intensive industries and the private sector focusing on consumer goods industries and products with high domestic demand like construction materials.
3. Several of the development plans set new priorities aiming to develop high-tech industries. For example, the Third Development Plan focused on the electronics and biotechnology industries, while the Fourth Development Plan considered knowledge-based industries as a priority area. However, the state has not made any sustained and meaningful investment in these industries. Nor has it been able to develop the hard and soft infrastructure to promote and facilitate private sector investments in high-tech industries. Therefore, aside from the commodity sector, no new competitive developmental blocs have emerged in the Iranian industrial sector.
4. It was toward the end of the Third Development Plan that a new foreign investment law (FIPPA) was adopted. However, except for a brief period in early 2000s, the government has not been able to attract significant Foreign Direct Investment (FDI) aside from the oil, gas, and telecom sectors.
5. Across the globe, FDI is looked upon not only as a source of finance but also as the wellspring of managerial know-how and organizational capabilities, technological knowledge, and information about global markets. However, Iranian managers and policy-makers have focused on its financial aspect only. Instead of resolving the difficulties of attracting FDI and negotiating with MNCs, they have found it easier to take out loans on international markets. This has led to the prevalence of a problematic formula according to which "Iranian management + foreign finance" can move important national projects forward. However, such a formula has led to long project delays, low productivity, limited technological learning, and major gaps in the formation of organizational capabilities.

An important study by Nili (2017), President Rouhani's economic advisor, provides a particular account of investment decisions and the resulting structural changes in Iranian industries. It reports that in 2007 the government lowered the interest rate below the inflation rate, while the average annual growth rate of real wages was kept above inflation. Such government decisions encouraged industrial firms to take out low-interest loans and replace labor with capital. This account highlights relative prices as the main reason behind the rapid growth of capital-

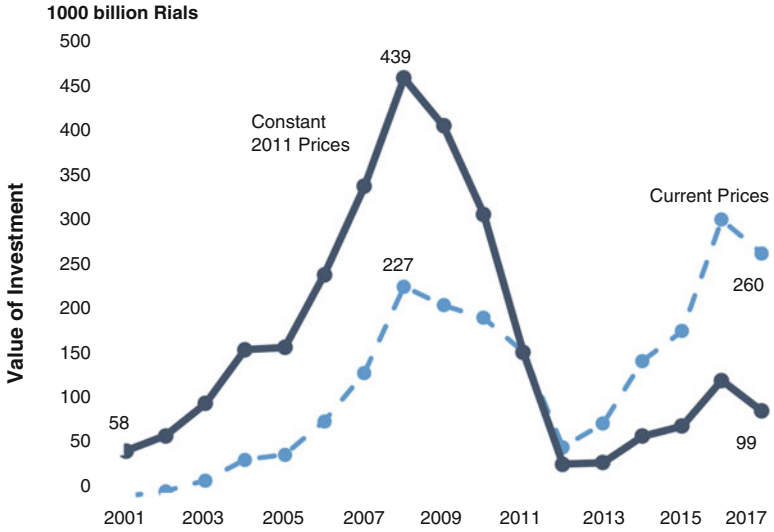

Fig. 3 Value of industrial investment according to utilization permits, 2001–2017 [Source: MIMT (2001–2017), Annual performance report (utilization permit data)]

intensive industries. In addition, the study suggests that excessive imports adversely affected production of consumer goods and forced firms to exit these industries, which led to a major loss of jobs—especially among SMEs (Ibid.: 434). In order to better analyze manufacturing investment and reexamine the above argument, its trends over the past decade and a half are probed here through Fig. 3. Because of the inflationary environment, trends are presented in both current and constant 2011 prices. Three periods may be distinguished.

First, 2001–2008 was a sustained period of relatively high growth in industrial investment. There is a lag of 2–4 years between the time an investment decision is made and when the "utilization permit" is issued after a plant become operational. It can be argued that the bulk of projects that received such permits in 2007–2008 were conceived during or after the last years of Mr. Khatami's presidency that ended in mid-2005. These projects were mostly based on public and private sector priorities discussed earlier. In the second period, there was a sharp decline (collapse is a better description) in investment between 2008 and 2012. This does not support the argument by Nili (2017) that government's lowering of interest rates in 2007 led to major industrial investments that substituted capital for labor and accelerated the growth of capital-intensive industries. Thus, not only there was no investment increase during that period, but manufacturing actually experienced an investment collapse—for which the reasons must be found beyond such arguments and time frames. Withholding industrial investment was a precursor to the overall industrial and economic collapse that occurred 3 years later in 2011 (Fig. 1). The investment collapse that began in 2008 was a reaction by industrialists to macroeconomic mismanagement, tensions with global powers, and signs of emerging sanctions

but, more directly, to trade liberalization and an unprecedented import boom. Starting in 1999, when the Third Development Plan's trade liberalization initiatives began, until 2010 just before the height of sanctions, imports soared at an average annual rate in excess of 30%. By the end of the investment collapse in 2012, the value of investment in real terms would not match that of 2001, a decade earlier, and even in current prices, it was lower than the corresponding 2006 value. As for the third period, there has been a slow recovery since 2013, the year Rouhani was elected. The recovery has been at a snail's pace and, in constant prices after 5 years of gradual increase, 2017 values barely resemble 2003 figures.

To conclude this section on targeting and investment, the following points should be highlighted:

1. Various administrations in Iran have chosen to give priority to the development of manufacturing capacity on the basis of "comparative advantages." At the same time, they have encouraged the private sector to manufacture products that would satisfy the domestic demand. During the first four Development Plans, no long-term strategy or industrial policy was conceived and implemented. The only serious attempt was made toward the end of President Khatami's administration when an industrial development strategy was formulated. However, this document was not presented for approval to the cabinet or the parliament. It was soon shelved as President Ahmadinejad took office, and his supporters criticized the document for having a neoliberal orientation.
2. Very few sustained and targeted investment projects have been formulated and launched by the government or the private sector to develop new competitive technology-intensive manufacturing. As such, Iranian industrial activities have remained limited to two broad sectors: first, a competitive natural resource-based commodity sector that exports more than half of its production and second, a non-competitive consumer goods and engineering-intensive sector that caters to the domestic market only. The reasons for lack of development of an export-oriented technology-based manufacturing industry should be sought in (a) the failure to formulate and ratify an industrial policy that would target promising sectors, (b) the lack of commitment to allocate resources in a sustained way; and (c) the inability to develop institutional mechanisms that would direct resources toward innovative activities and technological learning and away from "rent-seeking."
3. It is true that in the past industrial investment in Iran has been driven by oil revenues. Yet, developments over the past decade raise new issues. As oil prices reached new heights in the mid-2000s and the government reduced the interest rates below inflation, a boom in industrial investment was expected. But there was an investment collapse in 2008 which points to the importance of other factors such as macroeconomic instability, external tensions, and soaring imports that influence investment decisions by the private entrepreneurs and state/quasi-public enterprises. Once an erosion of investment confidence occurs, it is difficult to restore it in a short period of time as the very slow recovery of industrial investment since 2013 demonstrates.

Conclusion

This chapter set out to examine the role that industrial development has played in the Iranian economy from the time reconstruction efforts were launched in the aftermath of the Iran–Iraq war in 1989. Since then and in broad terms, the Iranian economy has experienced economic reforms, a populist government, gradual tightening of sanctions, and regional instability. A number of key factors that have influenced developments in the manufacturing sector were probed. These factors included the role of the state (its direction, clarity of plans, and continuity of support), macroeconomic stability, changes in the specialization patterns of both production and exports, role of trade policy and imports, and industrial investment trends.

An investigation of the growth trends in the Iranian economy and industry demonstrated the predominance of an erratic pattern of high growth followed by growth collapse. The intensity of such fluctuations has been even more pronounced for the case of industrial growth. Despite several attempts from the time of the Third Development Plan onward, successive administrations and the parliament have failed to create appropriate legal and institutional buffers for the management of oil revenues in ways that would withstand populist and distributional pressures. With the periodic episodes of rise and fall in oil prices, a pattern is observable whereby injection of oil revenues into the economy results in inflationary pressures, overvaluation of domestic currency, soaring imports, price controls, and pro-cyclical fiscal policy—gradually leading to foreign exchange shortages, sudden devaluation, and growth collapse. Relating this experience to that of Latin American economies, one is struck by the divide and especially the lack of cohesion between macroeconomic measures and policies supporting the production structure in Iran. It appears that overreliance on macro policies without an integrated industrial and trade policy component has been a contributing factor to repeated spurs in growth and their collapse in the Iranian economy.

In probing the role of industrial activities in the economy, it was shown that the share of industry in GDP has been gradually rising in real terms (constant prices). However, in an economy that has not been able to control and manage the impact of external shocks (especially oil price fluctuations), that share exhibits a decreasing trend when calculated in current prices. First, in a relatively high-inflation economy, the surge in the imports of tradables and control of prices of domestically produced goods keep their value in check. Second, prices of non-tradable goods and services have increased. Due to the impact of both developments, terms of trade between manufacturing and other sectors have worsened—thus, industrial activities have lost GDP share throughout the period under study.

Another important development has been transformation in the mix of industries. It was shown that most consumer goods and labor-intensive industries have lost their share in production value, value added, and other relevant indicators by almost 50%. In contrast, resource-based, capital- and energy-intensive industries have approximately doubled their share in terms of the same indicators. Thus there has been a clear shift in the production specialization of the country. Overall, consumer goods,

especially the labor- and engineering-intensive industries, have lost share to a rapidly rising commodity sector. This has been reflected in the Iranian trade as well. Although the value of both imports and exports has risen since the implementation of economic reforms, the specialization pattern that has emerged in exports has not been in line with the diversification goals of the economy—as close to 90% of manufacturing exports are either directly derived from oil and gas or are highly energy-intensive.

Investment priorities for industrial development have been based on "comparative advantages," while major delays and policy challenges have emerged in moving along the value chains into downstream industries and/or diversifying into new, more knowledge- and technology-intensive industries. Overall, the Iranian economy has suffered from the distortions predicted by the Dutch disease model. Manufacturing activities have been highly affected by such distortions, and specialization patterns have moved in a direction that requires limited technological learning, R&D, and interactions with local networks of knowledge. Given these circumstances, economic planning in Iran must pay serious attention to productive sector development policies directing macroeconomic measures. Specifically, Iran needs an industrial policy to expedite the accumulation of technological and organizational capabilities that would stabilize economic performance and achieve accelerated industrial development. In order to support such an endeavor, appropriate macro policies are further required to provide an enabling environment for various types of learning and and improving competitiveness.

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Manufacturing Exports and Employment in Iran: The Role of Economies of Scale and Human Capital

Hamid R. Ashrafzadeh and Pooya Alaedini

Introduction

The right to employment for every adult citizen is enshrined in Iran's postrevolutionary constitution.[1] Idealism notwithstanding, reducing the unemployment rate has featured prominently in Iranian national development plans—most recently, the Sixth Economic, Social, and Cultural Development Plan (Majles 2017). Decreasing the country's reliance on oil revenues has been another goal emphasized by the constitution as well as postrevolutionary national development plans calling for the expansion of non-oil exports. These aspirations have both faced serious challenges in practice. The Iranian economy remains heavily dependent on oil export receipts, whereas non-oil export revenues continue to cover only a small part of the country's import bill (CAI 2015). Also, the share of employment in the manufacturing sector has stayed small despite the gradual growth in the manufacturing value added and exports in recent years (CBI 2016). Furthermore, the overall unemployment rate has continued to hover in the two digits at the same time that the rate of labor force participation has remained low by international standards (SCI 2016). Available forecasts suggest increasing rates of unemployment for the general population as well as college/university graduates until 2021—that is, through the entire period of the Sixth Economic, Social, and Cultural Development Plan—under an

[1]English translations of the Constitution of the Islamic Republic of Iran are available through World Intellectual Property Organization's website (WIPO 2016) or the World Bank's (2016) Financial Disclosure Law Library.

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optimistic scenario of an annual average 5% growth of the gross domestic product (GDP) (Majles Research Center 2015a).

These significant challenges faced by the Iranian economy are the focus of our discussions in the first half of this chapter. We start out by describing Iran's unemployment as well as productivity woes in connection with improvements in its stock of nominal human capital. We also underscore the relatively disappointing performance of manufacturing employment. We then discuss the country's manufacturing exports, including the high level of resource dependence and low level of employment generation associated with their recent growth. We maintain that manufacturing is a key in Iran for creating productive jobs, generating export revenue, and escaping the middle-income trap. We are thus prompted in the second half of the chapter to probe the major factors influencing the country's manufacturing exports and employment. We focus on parameters that are associated with the activities of firms—including economies of scale and human capital as well as total factor productivity (TFP) and efficiency. Our analysis relies on four-digit international standard industrial classification (ISIC) data to estimate translog production and cost functions for Iran's manufacturing subsectors. Deriving TFP, economies of scale, and efficiency allows us to assess their impacts—along with that of human capital—on total employment of the manufacturing sector and on each subsector's export and employment. The final section provides our conclusions and policy recommendations.

Employment, Human Capital, and Productivity

Figure 1 records the persistently high unemployment rates in Iran over the past quarter century. Unemployment rates for the youth between the ages of 15 and 24 and for women have been much higher and on the rise as compared to the general population. Furthermore, reduced participation in the labor force in comparison with a decade ago has concealed the full extent of unemployment woes in the recent period. Lower participation rates are at least partly a reflection of high unemployment rates and especially dim job prospects for women and the youth as well as increasing educational opportunities. High unemployment rates among the youth of both genders as well as legal and social restrictions placed on women's employment (Alaedini and Razavi 2005) are likely to have dampened their labor force participation. Reduced job prospects faced by the youth have gone hand in hand with increasing demand for higher education. Rapidly expanding higher educational opportunities have responded to this demand, thus delaying the entry of the youth into the job market. Yet, the unemployment rate among those with tertiary education is rising rapidly with ever more college/university graduates entering the labor market (Majles Research Center 2015b).

Literacy rates and average years of schooling for both genders have improved gradually in Iran (SCI 2016), while the expansion of tertiary education has been much more dramatic. As illustrated by Fig. 2, total enrolment at the country's

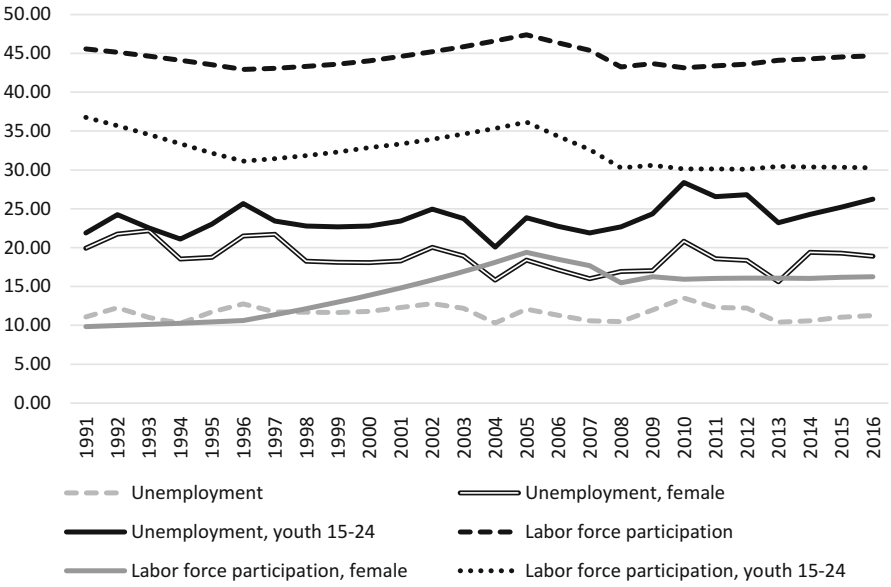

Fig. 1 Rates of unemployment and labor force participation (%) [Source: World Bank (2017), World Development Indicators (ILO model estimates)]

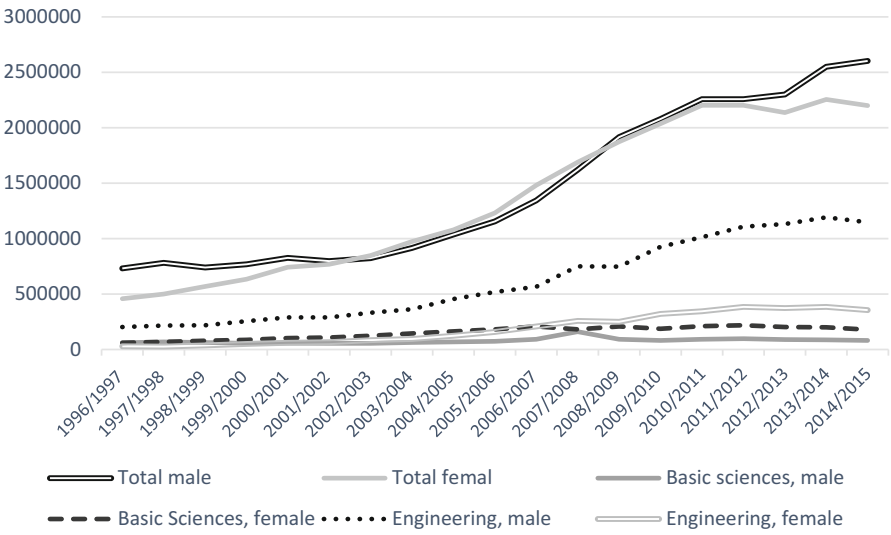

Fig. 2 Enrolment at institutions of higher education [Source: SCI (2016), Time series data]

institutions of higher education rose from 1,284,668 in 1995/1996 to 4,804,037 in 2013/2014. Furthermore, in this period, the number of students majoring in basic sciences more than doubled, while the number of those enrolled in technical and

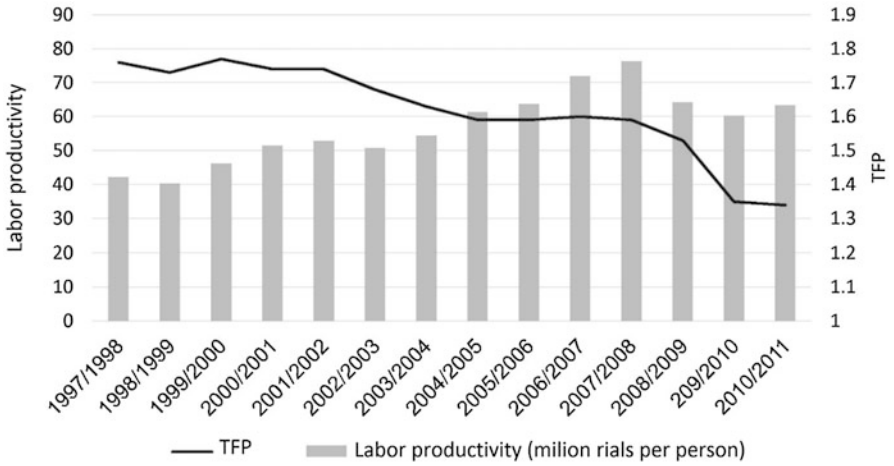

Fig. 3 Labor productivity (value added per worker at constant [Iranian fiscal year] 1997/1998 prices) and total factor productivity [Source: Based on SCI (2016), Time series data]

engineering fields rose by a factor of close to 3.5 to reach the astonishing figure of 1,578,331. With this rapid growth, by 2013/2014, around 11.2 million persons in Iran had some level of tertiary education (Majles Research Center 2015b: 10). Given these impressive figures, endogenous growth theories—and especially more recent studies (Jones 2014; Lucas 2015) that identify differential human capital stocks as the main culprit behind the income divide between poor and rich countries—would suggest a favorable economic outcome for Iran. Yet, evidence for the impact of human capital on the growth of the Iranian economy is mixed (e.g., Jalali-Naini 2007; Yavari and Mohseni 2012; Ahmed et al. 2016), while the wider effects of improvements in Iran's nominal stock of human capital are not readily apparent. Notwithstanding its ups and downs in response to oil shocks, GDP per capita remains below its height achieved four decades ago (World Bank 2017). Furthermore, accumulation of nominal human capital as well as rising consumption in the Iranian economy has not been accompanied by improvements in productivity (Salehi-Isfahani 2013). Figure 3 records trends associated with labor productivity and total factor productivity (TFP) in the country between 1997 and 2011. Labor productivity fell after 2008 while TFP was in decline throughout the period. Furthermore, reductions in TFP growth rates as measured at the aggregate level have been shown to account for one third of the significant decline in the performance of the Iranian economy in the postrevolutionary period (Mojaver 2009).

Needless to say, the impact of human capital—alongside productivity—has a great deal of nuance across different sectors and activities. After highlighting the importance of the manufacturing sector in the next section, we gauge its impact together with economies of scale and several other variables on manufacturing exports and employment.

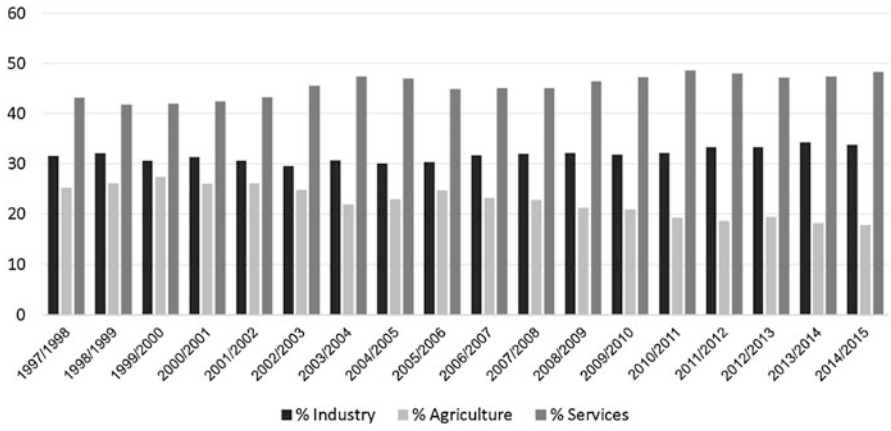

Fig. 4 Sector shares of employment (%) [Source: SCI (2016), Time series data]

Importance of Manufacturing Sector and Its Exports

As Fig. 4 shows, the sectoral share of employment in manufacturing in Iran has barely kept above one third, while the service sector has continued to grow in employment terms at the expense of agricultural activities. That is, whereas the largest number of college/university students major in technical/engineering or basic sciences, those who seek work have been more likely to end up in the service sector rather than manufacturing or agriculture. In fact, Iran's manufacturing sector mostly relies on unskilled labor. Literacy at manufacturing establishments employing 10 or more workers is becoming universal only now (SCI 1996–2013). Likewise, while the average level of educational attainment at these medium and large firms has improved over the years, it still remains below 12 years (Ibid.).

Yet, the manufacturing sector in Iran, as a developing economy with a relatively large population, has a significant potential for raising productivity and creating well-paying jobs (see Ocampo et al. 2009). Furthermore, manufacturing has been associated with learning a wide range of complex activities that are highly important to the larger context of national development (Lall 2000; Chang 2010). Even in high-income countries where most jobs are created in the service sector, manufacturing is instrumental in productivity growth. In developing economies, manufacturing can act as the leading sector, benefiting from backward and forward linkages, scale economies, and positive spillover effects related to technology and knowledge and resulting in productive transformation and significant employment generation (see Nübler 2014). In Iran, the manufacturing sector and its exports should arguably be viewed as an important means to generate productive employment for the skilled labor force as well as to grow the economy and escape the middle-income trap. As suggested in the introduction, increasing Iran's non-oil exports as a way to reduce the country's oil dependence has in fact been a major focus of the country's development plans. Figure 5 shows Iran's non-oil export record in practice. The

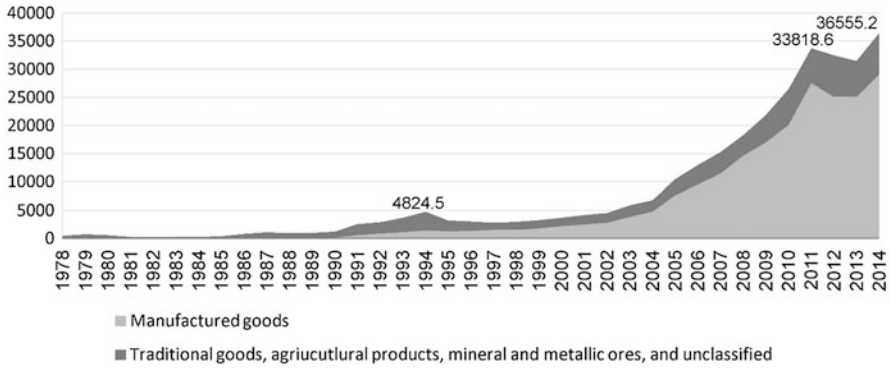

Fig. 5 Non-oil exports (current million US dollars) [Source: CBI (2016), Time series data]

exports of Iran's manufactured goods have been on a relatively steep upward slope following a period of stagnation. The export value of manufacturing products from Iran, which stood at only US$606 million right after the Iran-Iraq War in 1988/1989, reached its highest level in 2011/2012 at US$29.1 billion. It thus grew at an average rate of 18.2% during the period 1988/1989 through 2011/2012 (although it has experienced decline in the last 3 years most likely due to the impact of sanctions). Furthermore, Iran's exports of manufactured goods have had a relatively low level of technological intensity, high level of energy intensity, and low level of skill intensity (CBI 2009, 2013; see also MIMT 2015). It is no surprise then that they have not generated significant quality employment. Furthermore, given the current level, growth record, and content of manufacturing exports, it is unlikely that, in the absence of a much stronger policy regime, the goals set in the country's 2025 Vision Document (Majles 2003) and related expectations for the generation of significant quality employment will be realized.

Export-led industrialization has been promoted by a large number of development specialists as a successful late-industrialization strategy—especially based on the experience of the original East Asia tigers as well as China in the more recent period. Although the results of empirical studies on export-led growth are generally mixed (see Giles and Williams 2000), sustained productivity growth is recorded in countries that have succeeded in transforming their manufacturing activities to produce more sophisticated export products (Hausmann et al. 2007). For the case of Iran, exports have also been shown to exert a positive influence on growth (Ahmed et al. 2016; Atrkar Roshan 2007). Furthermore, falling manufacturing TFP growth rates in Iran have been observed in the postrevolutionary period in association with decreasing returns to scale, whereas exports have been positively linked to manufacturing TFP (Mojaver 2009).

A further argument in favor of exports is that the small size of the domestic economy in Iran has resulted in suboptimal production scales in many cases that reduce competitiveness. Scrutiny is likewise directed toward those industries whose capacity exceeds the domestic market size and/or export potentials. Suboptimal

production scales for a large number of manufacturing activities have certainly prevailed in the country (see, e.g., Ebadi and Mousavi Madani 2006). This is attributed to government's particular framework of protection and political economy of licensing that have generated a large number of firms across many industries, whose production is below minimum efficient scale. Such outcomes have in fact been underscored for developing countries in general (see Horstmann and Markusen 1986; Rodrik 1988: 115). The Iranian government has recently attempted to tackle this by issuing a directive addressed to its subordinate organizations across the provinces, which requires minimum production capacities for 86 listed manufacturing activities (MIMT 2016).

Beyond minimum production capacity, economies of scale are arguably crucial for sustained growth as they can lead to comparative advantage. Their role has been investigated in discussions on trade liberalization, competition, productivity, and efficiency. An older debate has concerned the number of firms in an industry in relation to competition and production efficiency (e.g., von Weiszacker 1980; Perry 1984; Mankiw and Whinston 1986; Amir 2003), while a more recent literature has probed the association between economies of scale and export status (e.g., Melitz 2003; Clark 2012; Armenter and Koren 2015). The significance of economies of scale has been especially highlighted in connection with trade, productivity, specializations, and economic geography (see Krugman 1998, 1995; Devarajan and Rodrik 1989).

Economies of scale may be considered in a number of ways (see Ethier 2009). In probing their significance—along with that of human capital—for Iran's manufacturing exports and employment in the second half the chapter, we inspect reduction of cost of output associated with increased production for four-digit ISIC subsectors. This is distinct from returns to scale, which refers to increasing production by the proportional increase in inputs.

Empirical Model and Estimation Results

Approach and Data

In this section, we investigate factors influencing manufacturing exports and employment in Iran. We estimate translog cost and production functions for the country's manufacturing subsectors to measure TFP and economies of scale. We also calculate efficiency—the ability to produce maximum output from a given set of inputs—using a stochastic frontier production function. Our aim is to assess the influence of these factors along with that of human capital on employment as well as exports. Controlled by firms and industry, TFP, efficiency, and economies of scale are hypothesized to positively impact exports. A fourth factor with potentially positive impacts on export performance, namely, the quality of products, is also associated with the activities of firms. Rapid improvements in quality have been emphasized as a major factor in sustaining development performance beyond

middle-income levels (Henn et al. 2013). Even in a highly industrialized country like Germany, low-productivity firms can produce exportable high-quality products (Wagner 2014). Despite its importance, we do not treat quality in this study due to measurement difficulties.

A major part of our calculations concerns TFP, efficiency, and economies of scale for four-digit ISIC subsectors in the Iranian economy. At the outset, a translog cost function is fitted to Iran's manufacturing subsectors for which a complete data set exists (see Coelli et al. 2005). This allows for the calculation of economies of scale associated with these subsectors for every year. A translog production function is then estimated and used to calculate annual TFP series. Time series for efficiency are further extracted by utilizing a stochastic frontier production function. A model is then estimated for the impact of economies of scale on manufacturing exports and employment. The effects of improvements in efficiency and productivity on exports and employment are also measured. Human capital measures are subsequently introduced into the model. Endogenous growth theory stresses the importance of increasing returns to human capital and technology that can sustain long-term economic growth. Yet, it should be borne in mind that such models are sensitive to the definition of human capital (see Brock and German-Soto 2013).

Our panel has been constructed for the period 1996–2013. Data on manufacturing sectors and subsectors are from the annual surveys conducted by the Statistical Center of Iran on manufacturing workshops with more than 10 workers (ISIC, version 3). While four-digit ISIC data for the period 1996 through 2013 are available, it is not possible to calculate capital stock for every subsector. Therefore, we use capital stock figures in the production function for the entire manufacturing sector published by the Central Bank of Iran. Furthermore, time series for total costs are unavailable from the Statistical Center of Iran. We use total input values instead of costs as well as production values in place of value-added figures (see Morrison Paul and Siegel 1999). Furthermore, we employ interest rate figures available from the Central Bank of Iran as representing price of capital. Other variables such as size of labor force and number of firms in each industry are also from the Statistical Center of Iran. Education expenditure figures in current US dollars from World Bank's World Development Indicators are used to represent human capital. Table 1 provides a list of our variables, variable definitions, and sources of data.

In the next subsections, we employ models for exports, employment, and combined effects of efficiency, productivity, and scale economies that allow for a thorough analysis of the subject. We first use cost and production functions to obtain sale economies, TFP, and efficiency. We then probe how these factors as well as human capital have affected employment and exports.

Obtaining Economies of Scale, TFP, and Efficiency

The translog cost function is specified below—where Y is output, TC is total cost, PK is the price of capital, WR is the real wage, and T is the time trend.

Table 1 Variable definitions and sources of data

Variable name	Definition	Data source
$\ln Y_{it}$	Logarithm of production value	SCI (1996–2013)
$\ln K_t$	Logarithm of capital stock	CBI (2016)
$\ln L_{it}$	Logarithm of the number of employees	SCI (1996–2013)
T	Time trend	–
$\ln TC_{it}$	Logarithm of total cost of industries	SCI (1996–2013)
$\ln PK_t$	Logarithm of 5-year interest rate as proxy for the share of capital in value added	CBI (2016)
$\ln WR_{it}$	Logarithm of real wage	Calculated using nominal wage from SCI (1996–2013)
RTC_{it}	Derivative of TC with respect to T, as rate of technical change	–
SE_{it}	Economies of scale	–
$EFFIC_{it}$	Efficiency of plants	–
$\ln TFP_{it}$	Logarithm of total factor productivity	–
$\ln EX_{it}$	Logarithm of exports in current US dollars	CAI (2015)
$\ln EXU_{it}$	Logarithm of export unit value in US dollars	Calculated based on CAI (2015)
$\ln ED_t$	Logarithm of human capital (education expenditures in current US dollars)	World Bank (2017)
$INTONE_t$	1-year interest rate	CBI (2016)
$INTFIVE_t$	5-year interest rate	CBI (2016)

$$\begin{aligned}\ln TC_{it} = {} & \alpha_0 + \alpha_1 \ln Y_{it} + \alpha_2(½)(\ln Y_{it})^2 + \alpha_3 \ln PK_t + \alpha_4 \ln WR_{it} \\ & + \alpha_5(½)(\ln PK_t)(\ln WR_{it}) + \alpha_6(\ln Y_{it})(\ln PK_t) \\ & + \alpha_7(\ln Y_{it})(\ln WR_{it}) + \alpha_8 T + \alpha_9(½)(T)^2 + \alpha_{10}(T)(\ln Y_{it}) \\ & + \alpha_{11}(T)(\ln PK_t) + \alpha_{12}(T)\ (\ln WR_{it}) \end{aligned} \quad (1)$$

With only two production factors, namely, capital (K) and labor (L), the following constraints are placed on the parameters of the model: $\alpha_3 + \alpha_4 = 1$ and $\alpha_6 + \alpha_7 = 0$. As there is only one interaction term—the product of real wage (WR) and the share of capital in value added (PK)—there are no other constraints. It is possible to differentiate natural log of TC with respect to natural log of PK or natural log of WR to calculate the input shares of capital and labor, but these are not required here. Economies of scale are derived by first obtaining elasticity of cost with respect to output ($\mathcal{E}_{CY}$) in the following way:

$$\mathcal{E}_{CY_{it}} = \frac{\partial \ln TC_{it}}{\partial \ln Y_{it}} = \alpha_1 + \alpha_2 \ln Y_{it} + \alpha_6 \ln PK_t + \alpha_7 \ln WR_{it} + \alpha_{10} T \quad (2)$$

Our emphasis here is on economies of scale at the industry level or reduction of cost of subsector output associated with increased subsector production. They are obtained by calculating $\left(\frac{1}{\mathcal{E}_{CY}} - 1\right)$ based on Greene (2000: 558, 1983). Estimation

Table 2 Estimation results for translog cost function

Var.	Coeff.	*t*-Stat.	Prob.
ln*Y*	1.183520	11.02260	0
(½)*(ln*Y*)^2	−0.010140	−1.409703	0.1588
lnPK	−2.073801	−3.626467	0.0003
lnWR	3.426597	19.69773	0
(½)*lnPK*lnWR	−1.891853	−15.12887	0
ln*Y**lnPK	−0.005445	−1.941014	0.0524
ln*Y**lnWR	−0.009172	−3.192567	0.0014
T	−0.325424	−11.43769	0
(½)*(*T*^2)	−0.001130	−1.971606	0.0488
*T**ln*Y*	0.011194	7.961505	0
*T**lnPK	0.006032	5.402008	0
*T**lnWR	0.040938	28.67717	0

$T = 18$, $N = 133$, $R^2 = 0.99$

results for the translog cost function are provided in Table 2. The model has been estimated using fixed-effects regression analysis and generalized least squares. All coefficients are significant at the 95% confidence level, except for that of the square of output. The fit is excellent with $R^2 = 0.99$. It is also possible to calculate technical change by differentiating the function with respect to $T\left(\mathrm{RTC_{it}} = \frac{\partial \ln \mathrm{TC_{it}}}{\partial T} = \alpha_8 + \alpha_9 T + \alpha_{10} \ln Y_{\mathrm{it}} + \alpha_{11} \ln \mathrm{PK_t} + \alpha_{12} \ln \mathrm{WR_{it}}\right)$. The coefficients of T and (½) * (T^2) suggest that with technical change realized through enhanced technology, foreign investment, appropriate infrastructure, or adequate financial support, industries can quickly achieve optimal scales and increased output, exports, and employment.

Trends associated with economies of scale for Iran's manufacturing subsectors are illustrated by Fig. 6. The figure shows that economies of scale for the examined subsectors have decreased through time. That is, costs have increased faster than output. Until around 2001, increasing production still made sense despite the rapid rise in costs, but not thereafter. This decline in economies of scale is observed despite some trade liberalization as well as initiatives to adjust the exchange rate during the period under investigation. It obviously poses significant threat to the country's manufacturing sector.

We find TFP by estimating the following translog production function in a manner similar to the case of the cost function (using panel data for each industrial subsector in the Iranian economy).

$$\ln Y_{\mathrm{it}} = \alpha_0 + \alpha_1 \ln K_{\mathrm{t}} + \alpha_2 (½)(\ln K_{\mathrm{t}})^2 + \alpha_3 \ln L_{\mathrm{it}} + \alpha_4 (½)(\ln L_{\mathrm{it}})^2 + \alpha_5 (½)(\ln L_{\mathrm{it}})(\ln K_{\mathrm{t}}) + \alpha_6 T + \alpha_7 (½)(T)^2 \quad (3)$$

We forego showing the estimation results and instead provide TFP graphs for the analyzed manufacturing subsectors in Fig. 7. The figure indicates that TFP has been either stagnant or decreasing in most manufacturing subsectors while the trend has

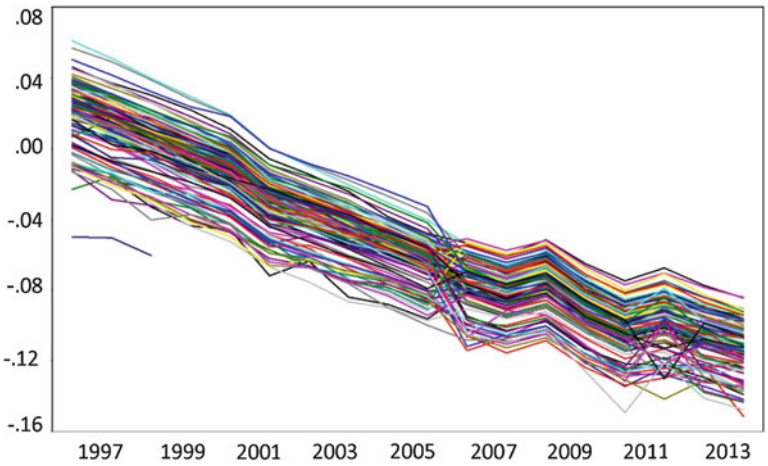

Fig. 6 Changes in economies of scale for Iran's manufacturing subsectors

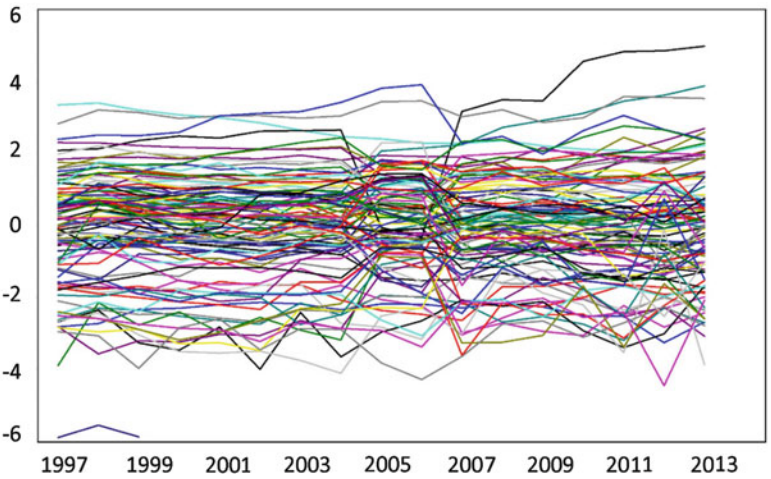

Fig. 7 TFP changes for 101 manufacturing subsectors

been aggravated after 2003. Furthermore, the decline in productivity is most pronounced for the Iranian fiscal years 2012/2013 and 2013/2014, that is, immediately after the removal of fuel subsidies. Using the stochastic frontier production function, we may also calculate efficiencies (EFFIC) for the examined manufacturing subsectors, which indicate little improvement over time.[2]

[2]Details available upon request.

Impact on Employment

We now turn to showing, in two models, how TFP, efficiency, and economies of scale as well as human capital and total exports have affected employment. Estimation results for the first model which probes the impact on total employment are provided in Table 3. Regressing the total employment variable on economies of scale, TFP, efficiency, human capital, and total exports yields an excellent fit. Each additional unit associated with economies of scale—found for every manufacturing subsector separately—raises employment by a factor greater than one. Furthermore, TFP and efficiency have negative effects on total manufacturing employment—as, with increased TFP and efficiency, attempts are made to reduce the workforce. Exports also have a modest positive impact on employment. Furthermore, the effect of human capital (ED) on exports is found to be positive and significant.

We include 1- and 5-year interest rates (INTONE and INTFIVE, invoking consumption and investment purposes, respectively) as well as real wage (WR) in a new model which estimates the effects on the employment of all subsectors. Table 4 provides the regression results for this model. The effects of human capital, total exports, and real wage are positive. Our results indicate that while 1-year interest rate increases employment, the 5-year interest rate has a negative impact on employment. Furthermore, improvements in efficiency have negative effects on employment as suggested by theory (firms reduce employment as they gain efficiency). Yet, productivity has a positive effect on employment (note the different finding for total employment). More importantly, the effects of economies of scale on employment are found to be positive and significant for almost all subsectors.

Impact on Exports

We further investigate factors influencing exports. Using the US dollar value of exports for 101 Iranian manufacturing subsectors in our panel data, the export variable is regressed on export unit value (EXU), human capital (ED), and scale economies (SE). Estimation results are provided in Table 5. Exports rise with increasing export unit value while human capital also has a positive effect on exports. The small coefficient found for EXU suggests low elasticity of demand for the Iranian manufacturing sector. More importantly, our results show that economies of scale have a large positive effect on exports (19.08%). That is, if economies of scale had increased, exports would have risen more than the actual record by 2013.

A similar regression analysis is performed on the 101 manufacturing subsectors to probe how exports react to economies of scale, human capital, technical change (TFP), and efficiency. Table 6 provides the results, which indicate that human capital has a significant and positive effect on exports (increasing it by 0.42% for every 1% increase in education expenditures). It further records the positive impacts of productivity and efficiency. Yet, the impacts of scale economies on exports are

Table 3 Effects of economies of scale, TFP, efficiency, and human capital on total employment of manufacturing sector

Var.	Coeff.	*t*-Stat.	Prob.	Var.	Coeff.	*t*-Stat.	Prob.
lnEX	0.00179	1.001871	0.3166	SE_I2695	5.429253	13.66575	0
lnED	0.62129	545.9684	0	SE_I2696	5.673573	12.3572	0
lnTFP	−0.05525	−14.6226	0	SE_I2699	5.619598	10.39351	0
EFFIC	−0.00281	−0.12464	0.9008	SE_I2710	4.261425	12.52208	0
SE_I1512	5.41103	16.27003	0	SE_I2811	4.573611	17.61583	0
SE_I1514	4.796055	13.0685	0	SE_I2812	5.485377	13.09538	0
SE_I1531	4.738894	13.45857	0	SE_I2893	6.012477	11.22956	0
SE_I1532	5.516107	17.84282	0	SE_I2899	6.785971	9.341932	0
SE_I1533	5.00067	15.58363	0	SE_I2911	4.819809	15.62146	0
SE_I1542	4.201075	10.29052	0	SE_I2912	5.117558	16.65115	0
SE_I1543	5.326562	15.1878	0	SE_I2913	5.78437	14.25925	0
SE_I1544	5.43747	16.72439	0	SE_I2914	5.674997	13.28193	0
SE_I1551	5.480642	17.65697	0	SE_I2915	5.853728	13.99727	0
SE_I1553	5.664168	23.3399	0	SE_I2919	5.12124	16.15111	0
SE_I1600	5.639954	15.91454	0	SE_I2921	4.79997	21.0536	0
SE_I1711	5.140584	11.52833	0	SE_I2922	5.34616	15.37011	0
SE_I1721	5.36522	16.37341	0	SE_I2923	5.689625	12.33672	0
SE_I1723	5.399051	19.47102	0	SE_I2924	5.208198	18.33714	0
SE_I1729	5.530936	18.16856	0	SE_I2925	5.631115	17.97487	0
SE_I1810	5.401615	15.16665	0	SE_I2926	5.919117	11.67269	0
SE_I1911	5.531061	17.25177	0	SE_I2929	5.90808	13.59299	0
SE_I1912	5.932795	12.44757	0	SE_I2930	5.157748	16.12033	0
SE_I1920	5.483992	18.89615	0	SE_I3000	5.493041	13.55121	0
SE_I2010	5.600877	14.85929	0	SE_I3110	5.098205	13.61844	0
SE_I2021	4.909936	21.91453	0	SE_I3120	5.290837	14.7224	0
SE_I2022	5.374714	19.14615	0	SE_I3130	4.956367	15.25897	0
SE_I2023	6.022754	10.1958	0	SE_I3140	5.195466	15.31839	0
SE_I2029	6.264897	11.1481	0	SE_I3150	5.438713	15.40897	0
SE_I2101	5.229726	16.70028	0	SE_I3190	4.896697	18.75578	0
SE_I2102	5.183774	13.80422	0	SE_I3210	5.535986	13.85479	0
SE_I2109	5.252448	15.01747	0	SE_I3220	5.394686	13.71475	0
SE_I2211	5.173488	18.10886	0	SE_I3230	5.306544	14.76418	0
SE_I2212	5.642881	17.71904	0	SE_I3311	4.838482	19.59102	0
SE_I2219	5.771892	13.39226	0	SE_I3312	4.906658	17.89602	0
SE_I2221	5.185177	21.29536	0	SE_I3313	5.452785	14.17082	0
SE_I2222	5.353204	20.51508	0	SE_I3320	5.440528	19.49411	0
SE_I2310	5.873163	8.171128	0	SE_I3330	6.155542	9.417051	0
SE_I2320	4.794975	9.359171	0	SE_I3410	4.324829	13.37528	0
SE_I2411	4.600647	10.81455	0	SE_I3420	5.554367	9.226154	0
SE_I2412	5.278494	10.80735	0	SE_I3430	4.601975	14.58018	0
SE_I2413	4.299887	15.08766	0	SE_I3511	5.12133	16.54832	0
SE_I2421	5.173573	8.697167	0	SE_I3512	5.400301	12.80352	0

(continued)

Table 3 (continued)

Var.	Coeff.	*t*-Stat.	Prob.	Var.	Coeff.	*t*-Stat.	Prob.
SE_I2422	5.185466	12.30026	0	SE_I3520	5.729082	17.15125	0
SE_I2423	4.883818	15.41579	0	SE_I3591	4.960121	21.53235	0
SE_I2424	5.033457	15.6612	0	SE_I3592	5.857946	11.32614	0
SE_I2429	5.205367	15.22651	0	SE_I3599	5.762068	10.54774	0
SE_I2430	5.509575	13.76333	0	SE_I3610	4.723908	20.78324	0
SE_I2511	5.433979	12.22118	0	SE_I3691	5.348806	15.28956	0
SE_I2519	5.751417	12.1372	0	SE_I3692	5.088774	15.07119	0
SE_I2520	5.090433	14.58364	0	SE_I3693	5.842709	14.24953	0
SE_I2691	5.897196	12.84883	0	SE_I3694	5.559137	19.21921	0
SE_I2692	5.541437	11.36444	0	SE_I3699	4.783207	18.93025	0
SE_I2694	5.004483	15.17408	0				

$T = 18$, $N = 101$, $R^2 = 0.55$

asymmetric—positive for some industries but negative for others. Furthermore, manufacturing subsectors with higher export performance in relation to scale economies are identified in Table 7, which can form a basis for government policy pursuing exports through enhanced economies of scale.

Conclusion and Policy Recommendations

We began this chapter by highlighting Iran's employment challenges against the backdrop of its rapidly expanding stock of nominal human capital. The stagnation of manufacturing employment in qualitative and quantitative terms is not a good sign for Iran as a developing economy. We further discussed Iran's manufacturing export performance and underscored concerns with regard to production scales. We then set out to probe factors influencing manufacturing employment and exports. Estimating a set of translog cost and production functions for Iran's manufacturing subsectors gave us TFP and economies of scale. We also extracted time series for efficiency by utilizing a stochastic frontier production function. These calculations allowed us to estimate a set of models measuring the impacts of TFP, economies of scale, efficiency, and human capital on manufacturing exports and employment.

Our estimation of the translog cost function suggests that realizing technical change through enhanced technology, foreign investment, appropriate infrastructure, or adequate financial support can result in optimal scale and increased output, exports, and employment for the investigated manufacturing industries. Yet, our investigation of scale economies underscores their continuous decline over the period 1997–2013, as costs have increased faster than outputs. The trend has rendered production especially nonviable after 2001 despite the adoption of certain measures by the government to liberalize trade and adjust the exchange rate. Our estimation results further indicate that TFP has either stagnated or decreased in a large number of

Table 4 Effects of scale, human capital, wage, TFP, efficiency, and 1- and 5-year interest rates on employment for manufacturing subsectors

Var.	Coeff.	*t*-Stat.	Prob.	Var.	Coeff.	*t*-Stat.	Prob.
C	−38.5163	−12.5166	0	SE_I2692	6.726863	1.616489	0.1062
lnEX	0.063857	5.245543	0	SE_I2694	21.6006	5.757451	0
lnED	2.51965	15.88811	0	SE_I2695	13.41053	3.292686	0.001
lnWR	0.630667	32.71268	0	SE_I2696	5.812488	1.4495	0.1474
INTONE	0.85046	10.29153	0	SE_I2699	8.785829	2.487645	0.013
INTFIVE	−0.93104	−10.0705	0	SE_I2710	38.25524	8.986915	0
EFFIC	−0.49102	−2.73417	0.0063	SE_I2811	37.97594	10.36663	0
lnTFP	0.749116	13.94132	0	SE_I2812	15.72651	4.430218	0
SE_I1512	15.13457	4.464797	0	SE_I2893	3.659994	0.891265	0.3729
SE_I1514	28.24645	8.800597	0	SE_I2899	−0.25415	−0.03317	0.9735
SE_I1531	22.09514	6.380104	0	SE_I2911	27.87963	8.277297	0
SE_I1532	4.885573	1.272358	0.2035	SE_I2912	21.63587	6.428146	0
SE_I1533	16.5371	4.806181	0	SE_I2913	5.458205	1.344245	0.1791
SE_I1542	20.47104	6.75295	0	SE_I2914	9.596479	2.810792	0.005
SE_I1543	24.14397	6.917748	0	SE_I2915	8.493833	1.974345	0.0485
SE_I1544	11.71336	3.405799	0.0007	SE_I2919	33.56357	6.729279	0
SE_I1551	10.89721	2.880482	0.004	SE_I2921	31.00093	9.778449	0
SE_I1553	14.58701	3.81978	0.0001	SE_I2922	24.37883	7.259179	0
SE_I1600	1.956772	0.545967	0.5852	SE_I2923	11.01462	2.362749	0.0183
SE_I1711	18.16665	5.419536	0	SE_I2924	18.65756	5.56896	0
SE_I1721	22.1767	6.459084	0	SE_I2925	9.384178	2.566467	0.0104
SE_I1723	28.56809	7.551952	0	SE_I2926	7.504842	1.888494	0.0592
SE_I1729	20.25661	5.22908	0	SE_I2929	11.0204	2.796555	0.0052
SE_I1810	26.27815	4.970185	0	SE_I2930	16.70668	5.288776	0
SE_I1911	20.14774	5.931703	0	SE_I3000	11.50955	3.436549	0.0006
SE_I1912	10.08031	2.197307	0.0282	SE_I3110	22.41114	6.939145	0
SE_I1920	17.73555	4.418237	0	SE_I3120	21.78341	6.272895	0
SE_I2010	21.89281	5.329184	0	SE_I3130	26.91327	8.172626	0
SE_I2021	21.49879	6.69706	0	SE_I3140	18.11349	5.654699	0
SE_I2022	12.43508	2.98293	0.0029	SE_I3150	21.69463	5.698453	0
SE_I2023	−1.77996	−0.3407	0.7334	SE_I3190	27.91133	8.69635	0
SE_I2029	−0.38179	−0.07501	0.9402	SE_I3210	14.78987	4.001841	0.0001
SE_I2101	20.64812	6.625625	0	SE_I3220	15.51512	4.527735	0
SE_I2102	23.08953	6.648081	0	SE_I3230	17.80613	5.364556	0
SE_I2109	19.30626	5.344464	0	SE_I3311	33.35435	9.912602	0
SE_I2211	23.21866	5.542003	0	SE_I3312	32.26632	9.600161	0
SE_I2212	17.7865	4.6961	0	SE_I3313	17.52586	4.202259	0
SE_I2219	15.84727	3.889044	0.0001	SE_I3320	10.05084	2.734104	0.0063
SE_I2221	16.97256	5.072756	0	SE_I3330	1.999522	0.347206	0.7285
SE_I2222	24.01795	6.201872	0	SE_I3410	28.33569	8.492129	0
SE_I2310	−0.25704	−0.03041	0.9757	SE_I3420	14.24323	3.606511	0.0003
SE_I2320	29.17145	3.601689	0.0003	SE_I3430	39.97375	9.386065	0
SE_I2411	40.49423	9.136478	0	SE_I3511	26.5619	8.546089	0

(continued)

Table 4 (continued)

Var.	Coeff.	*t*-Stat.	Prob.	Var.	Coeff.	*t*-Stat.	Prob.
SE_I2412	21.56877	6.058205	0	SE_I3512	11.9143	3.112634	0.0019
SE_I2413	32.8111	9.530388	0	SE_I3520	9.552181	2.436961	0.0149
SE_I2421	15.30528	4.440977	0	SE_I3591	24.09645	7.688779	0
SE_I2422	25.62484	7.447448	0	SE_I3592	3.819981	0.795525	0.4264
SE_I2423	30.4971	7.577359	0	SE_I3599	6.814657	1.439149	0.1503
SE_I2424	18.85395	5.931207	0	SE_I3610	38.4096	11.76617	0
SE_I2429	20.09293	5.847468	0	SE_I3691	21.21574	4.557085	0
SE_I2430	16.34692	4.653567	0	SE_I3692	20.36361	4.341423	0
SE_I2511	5.245437	1.557405	0.1196	SE_I3693	15.90093	3.756754	0.0002
SE_I2519	7.850826	2.276501	0.023	SE_I3694	23.40204	5.713556	0
SE_I2520	25.60131	6.103963	0	SE_I3699	33.78818	8.694912	0
SE_I2691	8.851354	2.457602	0.0141				

$T = 18$, $N = 101$, $R^2 = 0.87$

Table 5 Impact of export unit value, human capital, and scale on exports

Var.	Coeff.	*t*-Stat	Prob.
C	−68.63255	−18.82709	0
LnEXU	0.018108	0.876928	0.3807
LnED	2.912438	27.41668	0
SE	19.08477	13.81826	0

$T = 18$, $N = 101$, $R^2 = 0.95$

investigated manufacturing industries after 2003—the trend arguably aggravated in connection with the removal of fuel subsidies. Efficiency has similarly underperformed according to our results. Yet, we also showed that economies of scale for the probed manufacturing industries have a set of positive and significant employment effects. Increasing cost of capital has a negative impact on employment, as expected, while human capital, exports, and real wage also act to enhance employment. Human capital has a strong and positive impact on exports as well. Our empirical investigation further records the overall positive impact of economies of scale on exports, although this effect is negative for some individual subsectors. These results draw a troublesome picture of Iran's manufacturing sector and call for concerted action for a reversal of the unfortunate situation. The weak performance of productivity and efficiency together with the deteriorating situation of economies of scale through 1996–2013 has had serious negative effects on exports. On a positive note, we have identified a number of manufacturing subsectors with higher export performance in relation to scale economies that may be targeted by policy-makers.

A central finding of our study is that costs across the probed manufacturing subsectors have increased faster than value added. Thus a main initiative to be carried out by the Iranian government is to reverse this situation. Since human capital is found to have a positive impact on both scale economies and exports, a main government initiative should focus on enhancing human capital. It can be

Table 6 Estimation results for exports of 101 manufacturing subsectors

Var.	Coeff.	*t*-Stat.	Prob.	Var.	Coeff.	*t*-Stat.	Prob.
lnED	0.422514	13.66371	0	SE_I2695	−0.281658	−0.483279	0.6290
lnTFP	0.147484	2.428808	0.0153	SE_I2696	1.836199	2.898659	0.0038
EFFIC	8.828062	3.276954	0.0011	SE_I2699	0.281507	0.474562	0.6352
SE_I1512	2.483596	3.576525	0.0004	SE_I2710	−3.907416	−2.061586	0.0394
SE_I1514	−0.542686	−1.134150	0.2569	SE_I2811	−0.412944	−0.872843	0.3829
SE_I1531	0.089843	0.142750	0.8865	SE_I2812	−0.143444	−0.244216	0.8071
SE_I1532	−0.978206	−1.368277	0.1715	SE_I2893	−0.503465	−0.715248	0.4746
SE_I1533	−2.690208	−3.349701	0.0008	SE_I2899	1.391330	2.917813	0.0036
SE_I1542	−2.075947	−4.238539	0	SE_I2911	−1.755566	−2.530086	0.0115
SE_I1543	2.330207	3.499065	0.0005	SE_I2912	0.819751	1.338979	0.1808
SE_I1544	1.514011	1.883220	0.0599	SE_I2913	−0.656161	−0.901637	0.3674
SE_I1551	−1.519885	−1.762506	0.0782	SE_I2914	−1.447692	−2.014203	0.0442
SE_I1553	−7.263647	−3.715708	0.0002	SE_I2915	−1.111201	−1.579052	0.1146
SE_I1600	−1.937093	−2.409663	0.0161	SE_I2919	0.505878	0.867300	0.3859
SE_I1711	−0.171227	−0.347637	0.7282	SE_I2921	0.696421	1.134850	0.2566
SE_I1721	1.748709	2.594696	0.0096	SE_I2922	0.026305	0.040365	0.9678
SE_I1723	0.046749	0.063307	0.9495	SE_I2923	−2.540139	−2.815282	0.0049
SE_I1729	2.393790	3.276960	0.0011	SE_I2924	0.958202	1.386662	0.1658
SE_I1810	3.099065	4.480726	0	SE_I2925	0.096175	0.134366	0.8931
SE_I1911	2.718400	3.885264	0.0001	SE_I2926	−0.469485	−0.625793	0.5316
SE_I1912	0.223943	0.290450	0.7715	SE_I2929	0.985473	1.248260	0.2122
SE_I1920	3.037230	4.355506	0	SE_I2930	0.412875	0.816810	0.4142
SE_I2010	−1.952729	−2.498318	0.0126	SE_I3000	−2.314917	−2.713667	0.0067
SE_I2021	−0.687400	−1.024697	0.3057	SE_I3110	0.051553	0.097283	0.9225
SE_I2022	−2.090444	−2.800878	0.0052	SE_I3120	−0.073662	−0.109440	0.9129
SE_I2023	−4.693806	−6.093105	0	SE_I3130	0.102401	0.209771	0.8339
SE_I2029	0.547152	0.746714	0.4554	SE_I3140	−1.366937	−2.051425	0.0404
SE_I2101	−1.489006	−2.277705	0.0229	SE_I3150	0.419540	0.629005	0.5295
SE_I2102	−0.570445	−0.991312	0.3217	SE_I3190	−0.792743	−1.165370	0.2441
SE_I2109	−0.800228	−1.160522	0.2460	SE_I3210	−1.355162	−1.888186	0.0592
SE_I2211	−0.526137	−0.729138	0.4660	SE_I3220	−0.250416	−0.291372	0.7708
SE_I2212	−6.674330	−7.482153	0	SE_I3230	−1.966231	−2.925071	0.0035
SE_I2219	−1.667618	−1.845637	0.0652	SE_I3311	−0.464456	−0.722339	0.4702
SE_I2221	−2.261236	−3.062069	0.0022	SE_I3312	−1.527796	−2.258866	0.0240
SE_I2222	−5.864649	−6.951994	0	SE_I3313	−4.237646	−5.163756	0
SE_I2310	−4.262323	−3.355762	0.0008	SE_I3320	−2.008922	−2.150602	0.0317
SE_I2320	−0.969491	−0.756202	0.4497	SE_I3330	−0.452440	−0.593008	0.5533
SE_I2411	1.723525	2.944193	0.0033	SE_I3410	−5.662765	−2.980001	0.0029
SE_I2412	1.543424	3.161969	0.0016	SE_I3420	0.199953	0.304289	0.7610
SE_I2413	−2.112775	−1.681547	0.0929	SE_I3430	−1.091118	−2.274004	0.0231
SE_I2421	−1.196033	−1.676399	0.0939	SE_I3511	−1.109157	−0.976195	0.3291
SE_I2422	2.058600	3.913436	0.0001	SE_I3512	−5.480710	−5.921020	0
SE_I2423	0.169213	0.358518	0.7200	SE_I3520	−1.587290	−1.324027	0.1857
SE_I2424	1.778838	3.653119	0.0003	SE_I3591	−0.204327	−0.297005	0.7665
SE_I2429	2.001208	3.295857	0.0010	SE_I3592	−0.856758	−1.054155	0.2920
SE_I2430	−0.773074	−1.046835	0.2954	SE_I3599	−2.607290	−2.909289	0.0037

(continued)

Table 6 (continued)

Var.	Coeff.	*t*-Stat.	Prob.	Var.	Coeff.	*t*-Stat.	Prob.
SE_I2511	0.139791	0.258154	0.7963	SE_I3610	0.793130	1.194612	0.2324
SE_I2519	0.283748	0.411768	0.6806	SE_I3691	1.287603	1.367019	0.1718
SE_I2520	2.080958	4.449302	0	SE_I3692	−6.758575	−9.016804	0
SE_I2691	1.156178	1.719385	0.0858	SE_I3693	−1.709557	−2.169018	0.0303
SE_I2692	−1.605769	−2.412405	0.0160	SE_I3694	0.618800	0.794111	0.4273
SE_I2694	0.833525	1.818164	0.0693	SE_I3699	0.143702	0.204793	0.8378

$T = 18$, $N = 101$, $R^2 = 0.80$

targeted to affect economic growth via spillover effects and increasing returns to scale. Note that our results have captured the positive effects of primary education only. This is likely to indicate that we need intervention in the way human capital is accumulated. Furthermore, there is probably an under-allocation problem concerning knowledge production and technology acquisition compatible with industry, which must be addressed through careful policies. These entail significant public and/or private investment in (the quality of) education as well as research and development capabilities. Absorption of highly skilled labor as well as replacement and preventing brain drain also requires significant investment.

Another important policy initiative is investment in infrastructure. Inadequate infrastructure leads to segmentation of the markets, among other outcomes, and acts against economies of scale. Reducing the cost of technology transfer and focusing on technological upgrading should thus constitute another policy requirement. Collective action may also be facilitated through government initiatives among small firms so that they can benefit from economies of scale (Schmitz 1999). Focusing on quality is likely to enhance efficiency as well. Reaping economies of scale is not easy when the quality of input factors is also low. Apart from these, the government should support a framework for the integration of Iran's manufacturing subsectors in the global value chains. This may require a role to be played by multinationals and foreign direct investment. Yet, as foreign competition is already benefiting from economies of scale at home and internationally, exposure to foreign competition must be taken up within the framework of building capabilities in individual firms and industry. To this list, we should add the importance of the ease with which business transactions are conducted in general.

The overall policy aim should be to rapidly enhance the economy's export performance by invigorating the manufacturing sector that has the potential to create quality jobs for the country's increasing stock of human capital. The recent literature on successful late industrialization through the development of capabilities underscores the need to move the economy's structure of production and employment from low- to high-end activities that require continuous learning and technological upgrading, exhibit economies of scale and rapid growth of productivity and output, and foster high-wage employment (see especially Cimoli et al. 2009; Stiglitz and Lin 2013; Greenwald and Stiglitz 2014; Salazar-Xirinachs et al. 2014). These may be achievable through an effective industrial policy formulated and implemented in

Table 7 Four-digit ISIC subsectors with higher export performance in terms of scale economies

ISIC codes	Description
1810	Manufacture of wearing apparel, except fur apparel
1920	Manufacture of footwear
1911	Tanning and dressing of leather
1512	Processing and preserving of fish and fish products
1729	Manufacture of other textiles n.e.c.
1543	Manufacture of cocoa, chocolate, and sugar confectionery
2520	Manufacture of plastics products
2422	Manufacture of paints, varnishes and similar coatings, printing ink, and mastics
2429	Manufacture of other chemical products n.e.c.
2696	Cutting, shaping, and finishing of stone
2424	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes, and toilet preparations
1721	Manufacture of made-up textile articles, except apparel
2411	Manufacture of basic chemicals, except fertilizers and nitrogen compounds
2412	Manufacture of fertilizers and nitrogen compounds
1544	Manufacture of macaroni, noodles, couscous, and similar farinaceous products
2899	Manufacture of other fabricated metal products n.e.c.
3691	Manufacture of jewelry and related articles
2691	Manufacture of nonstructural non-refractory ceramic ware
2929	Manufacture of other special purpose machinery
2924	Manufacture of machinery for mining, quarrying, and construction
2694	Manufacture of cement, lime, and plaster
2912	Manufacture of pumps, compressors, taps, and valves
3610	Manufacture of furniture
2921	Manufacture of agricultural and forestry machinery
3694	Manufacture of games and toys
2029	Manufacture of other products of wood; manufacture of articles of cork, straw, and plaiting materials
2919	Manufacture of other general purpose machinery
3150	Manufacture of electric lamps and lighting equipment
2930	Manufacture of domestic appliances n.e.c.
2519	Manufacture of other rubber products
2699	Manufacture of other nonmetallic mineral products n.e.c.
1912	Manufacture of luggage, handbags and the like, saddlery, and harness
3420	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semitrailers
2423	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products
3699	Other manufacturing n.e.c.
2511	Manufacture of rubber tires and tubes; retreading and rebuilding of rubber tires
3130	Manufacture of insulated wire and cable
2925	Manufacture of machinery for food, beverage, and tobacco processing
1531	Manufacture of grain mill products
3110	Manufacture of electric motors, generators, and transformers
1723	Manufacture of cordage, rope, twine, and netting
2922	Manufacture of machine-tools

collaboration with the industry. Banks and capital markets must also participate in this government-industry symbiosis.

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The Role of State, Domestic Firms, and MNCs in the Iranian Auto Industry: Improved Competitiveness or Policy Capture?

Mohamad R. Razavi and Pooya Alaedini

Introduction

This chapter discusses the development of Iran's auto sector. The auto industry comprises both a large number of flexible and relatively knowledge-based component manufacturing activities and a small number of large-scale, capital-intensive assembly operations (Biggart and Guillen 1999). In developing countries, particularly, the growth models of the auto industry are likely to follow one of these paths: knockdown (KD) production by indigenous firms, KD production by foreign firms, or production of indigenous models by domestic firms (Korea Institute for Industrial Economics and Trade 2014). Iran's auto industry has experienced strong growth, primarily on the basis of the first model with minor contributions from the other two models. Iranian enterprises have been able to grow in both assembly and parts manufacturing by relying on a forceful import-substitution strategy and strong government support. Developing extensive new capacity and shifting the underutilized capacity in metal-mechanical firms to component manufacturing have been among the key factors contributing to this growth. Furthermore, whereas Iranian assemblers have remained quasi-state enterprises, domestic private firms have dominated the parts manufacturing sector. Their outputs however have been destined for the domestic rather than the global market (Alizadeh 2014).

The chapter examines the evolution of the Iranian auto industry as well as its features, ownership structure, and achievements in developing a domestic parts supplier network. It further looks at state policies in support of domestic assemblers and parts producers—showing how these may have discouraged the industry from

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moving into regional and global markets. It suggests that the latest domestic economic reforms together with opportunities offered by the recent removal of international sanctions have placed the country's auto industry at a crossroads. One path would lead the industry to becoming more competitive, having deeper cooperation with multinational corporations (MNCs), and getting integrated into regional markets and global production networks. In the other path, resulting in policy capture, the country's two main assemblers would deflect the implementation of overdue changes in key areas of ownership, management, technological capabilities, and organizational restructuring. They would thereby succeed in maintaining their near duopoly, which is solely focused on production for the domestic market. Having these possibilities in mind, the chapter explores government and enterprise responses to renewed interest by the MNCs in the Iranian market since the removal of sanctions and speculates about the industry's future prospects.

Brief Overview of the Industry's Evolution in Iran

With increasing urbanization and government investment in construction of urban and intercity roads during the 1950s and 1960s, the automobile emerged as an integral part of life in Iran. Relatively rapid population growth in the post-WWII period and an oil-induced economic expansion after the 1953 coup strengthened this trend. It further encouraged manufacture of cars to substitute imports. Production of passenger cars began in the late 1950s with the assembly of a few thousand Jeeps and Fiats. Additional population, economic, and urban growth led to the emergence of a sizable middle class, which attracted the private sector to the auto industry. The first major private-sector investment in the auto industry was initiated in 1962 when Iran National Company was established. The company began the assembly of UK's Talbot passenger cars in 1967 at an initial capacity of less than 10,000 units per year. Four periods are distinguishable in the evolution of Iran's auto industry since this modest beginning, which are shown in Fig. 1 and briefly described below.

1. Initial Growth Period (1969–1977): The rapid rise in Iran's oil income and a growing middle class during the 1960s increased demand and boosted both domestic auto assembly and car imports. With the help of foreign MNCs, an increasing share of domestic demand was satisfied by production in Iran—albeit with relatively limited local content. The industry rapidly increased its output, eventually reaching an annual production of 180,000 passenger cars by 1977. In this period, auto assembly and domestic production of parts were carried out by private-sector entrepreneurs. Government support through low-interest loans provided to domestic producers, as well as lower tariffs for complete knockdowns (CKDs) and parts imports compared to completely built-up (CBU) imports, was instrumental in initiating an import-substitution drive for the industry. However, since demand outpaced domestic production capacity, especially after the 1973

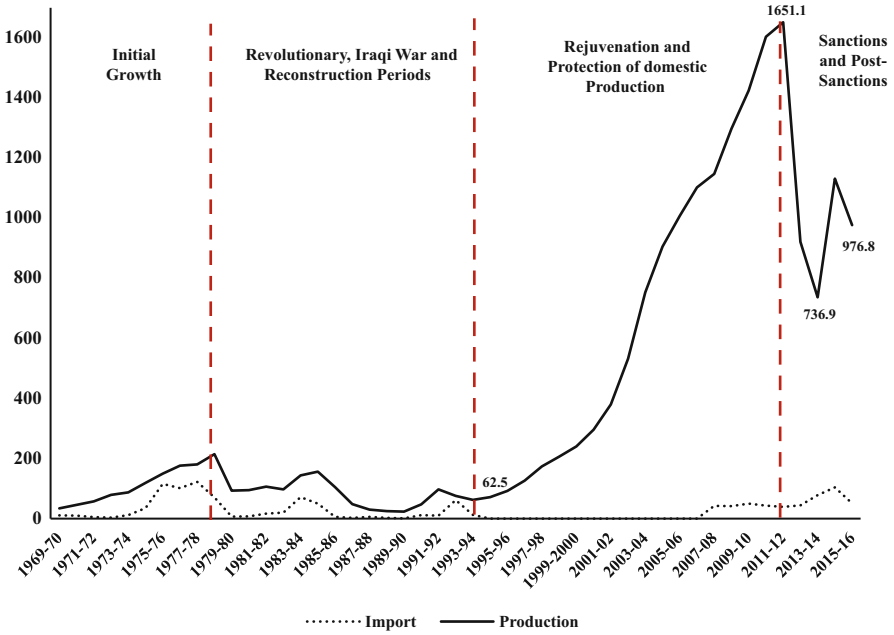

Fig. 1 Auto production and imports during Iranian fiscal years 1969/1970 through 2015/2016 (1000 units) [Source: Statistics on production based on MIMT (1969/1970 through 2015/2016); data on imports from CAI (1969/1970 through 2015/2016)]

oil boom, there was a continuous growth of imports—reaching a high of 123,000 cars in the Iranian fiscal year 1976/1977.

2. Period of Instability (1978–1994): The initial rapid growth of the industry slowed down with the onset of the 1979 Revolution when MNCs and key Iranian entrepreneurs left the country. All major facilities were nationalized. They were eventually placed under the control of the state agency Industrial Development and Renovation Organization (IDRO)—with Iran Khodro (IKCO) and Société anonyme iranienne de production automobile (SAIPA) standing as the country's two large auto firms/assemblers (the Big Two). Yet, the Iran-Iraq War further decreased auto-makers' access to foreign exchange needed to import parts. Production either stagnated or decreased, and there were no improvements in design or quality of the cars until the early 1990s. This lack of dynamism was due to a number of factors—including large share of imports, limited capacity and vertically integrated nature of existing auto companies (requiring huge investment to increase parts and assembly production), and an inability to attract major global assemblers. Figure 1 demonstrates that between 1978 and 1994, several ebbs and flows were experienced in the production and import of cars due to revolutionary turmoil, Iran-Iraq War, and shifting policies. With the end of the war, government policies were initially directed toward reconstructing the infrastructure. Later, in order to meet the pent-up demand and to utilize the newly

offered credit lines, auto imports increased (peaking in 1992/1993). The dependence of the auto industry on foreign exchange and imports of parts is evident between 1984 and 1993. In this period, the Iranian government was unable to meet its debt obligations, and the low price of oil led to a period of severe foreign exchange shortages. The production of cars, which depended heavily on foreign parts, suffered as a result.

3. Rejuvenation Period (1995–2011): While the government maintained controlling stakes in the two major assemblers through IDRO, the Iranian auto industry was rejuvenated and experienced a rapid growth after the mid-1990s. The Ministry of Industry and Mines (now Ministry of Industry, Mine, and Trade) initiated a strategic reorientation of the industry with the participation of the two major assemblers. A key initiative that contributed to the rapid growth of the industry required the assemblers to move away from vertical integration and outsource the production of parts by (1) utilizing the idle capacity in metal-mechanical industry especially among state-owned enterprises that had supplied the front during Iran-Iraq War and (2) encouraging the private sector to invest in and increase their capacity by receiving relatively sizable orders. With increasing levels of localization in popular, low-end models as well as through imports of CKDs and semi-knockdowns (SKDs) for newer and/or more expensive models, car production rapidly increased. The number of cars assembled was fewer than 100,000 in the early 1990s. By the Iranian fiscal year 2011/2012, the corresponding figure reached 1.6 million units. In addition to domestic production, IKCO installed factories outside the country in such nations as Syria, Venezuela, Senegal, and China. At this time, Iran was ranked 13th among major auto manufacturing nations, employing close to 170,000 workers directly or 12% of the country's total manufacturing jobs (MIMT 2015: 117). In the period 1995/1996 through 2006/2007, auto imports were negligible due to government protection. However, with exceptionally high oil revenues and reduced tariffs, car imports gradually increased after 2011 to reach a high of $2.5 billion in 2014 (Majles Research Center 2016: 137).
4. Sanctions Period (2012–2014): Total production during Iranian fiscal years 2012/2013 and 2013/2014 dropped significantly to 921,000 and as low as 737,000 units, respectively. Even though there was a 53% increase in the number of automobiles produced in the Iranian fiscal year 2014/2015, production shrank again the next year to 977,000 units. The main reasons for this volatility in auto assembly/production were the intensification of international sanctions imposed on the Iranian economy (including the country's auto industry) and a complete halt in the operation of most foreign brands in Iran. Both created major obstacles for Iranian assemblers to securing the needed auto parts. Specifically, the assemblers and many parts manufacturers were unable to conduct banking transactions to acquire parts and were thus unable to realize their production targets. For example, in the Iranian fiscal year 2013/2014, only 61% of production goals were realized (IKCO-Research and Strategic Planning Center 2015). Furthermore, with mounting pressure on one hand and runaway domestic inflation on the

other, the government had no choice but to resort to devaluating the rial in the Iranian fiscal year 2011/2012.[1] The devaluation of rial increased production costs for auto assemblers (due to dependency on imported parts), leading to price increases, reduced sales, and by extension production cuts (exports were quite negligible). Iran's auto industry came under international sanctions on June 2012, which forbade sales of all auto parts and key raw materials to Iranian producers. This further increased uncertainties and contributed to additional drops in production levels.

5. Post-sanctions Period (since 2014): It was only in January 2014 that sanctions on Iran's auto industry were lifted. Sanctions relief, together with the later declaration of the Joint Comprehensive Plan of Action (JCPOA), led to increased optimism and interest by European auto manufacturers as well as renewed ties with parts producers. With the lifting of nuclear-related sanctions in the Iranian fiscal year 2014/2015, production jumped again by more than 50%. Yet, in 2015/2016, although nuclear negotiations resulted in JCPOA, production decreased due to unrealized consumer expectations for lower prices (a social-media campaign not to purchase cars at the going prices was launched and became effective for the duration of a few months). During this difficult period, auto imports increased. Although imports never accounted for more than 10% of the market share, they commanded up to 35% of total market value in certain years. Yet, the two large Iranian auto assemblers have now concluded a number of joint venture agreements—in particular toward producing new models with the help of Peugeot–Citroen, Renault, and others—which emphasize, at least on paper, exports and transfer of technology. Cooperation of small private-sector assemblers with VW, Renault, Hyundai, and various Chinese firms are additional developments in the Iranian auto industry during the recent period.

Having provided a brief overview of the key trends associated with the Iranian auto industry, the chapter now focuses on the details of the developments in the sector over the past two decades—particularly, the initial period of rapid increase in production as well as the sanctions and post-sanctions periods.

Government's Auto Sector Policies and Their Outcomes

The Iranian government has supported the country's auto industry since the 1960s. Moreover, the rapid growth experienced by the auto industry after the mid-1990s can mostly be attributed to policies put in place by the Iranian government. These include the 1993 Auto Law, the tariff regime, foreign currency availability, and occasional interventions on the demand side. The main policies have aimed to boost localization, improve quality, increase competitiveness, and enhance exports—with

[1] According to the Central Bank of Iran (CBI 2016), during the period 2010/2011 to 2011/2012, the exchange rate increased from 13,568 rials per dollar to 26,059 rials per dollar—a rise of 92%.

mixed results. The most important among these has arguably been efforts to increase local content in production. Thus, before exploring the above policy initiatives and their outcomes over the past two decades, a brief discussion is provided on the merits and pitfalls of local content requirements to set the stage for a discussion of the effects of the 1993 Auto Law in Iran.

A number of developing countries have relied on local content requirements, based on specific laws or regulations, to increase the share of locally produced parts. Such regulations aim at inducing the foreign partner to gradually transfer production of parts to the host country. With this, the host country hopes to achieve higher degrees of technology transfer and quality standards as well as to reduce foreign exchange needs. Successful cases of enforcing such policies include Thailand and South Africa, where significant reductions in auto parts imports were achieved through local content initiatives (see Athukorala and Kohpaiboon 2008; Black and Bhanisi 2006). However, the approach is not without long-term challenges, despite its short-term benefits. As it does not encourage rapid technological learning, it may shape a perpetual mode of operation for domestic assemblers—which are prone to seeking short-term profit maximization at the expense of improving their long-term competitiveness. This is likely to happen, since improving local content of new models from 20–30% in the initial stages of production to 70–80% over the course of several years could become a perpetual process that would result in low levels of capability accumulation—in platform and body design, in research and development (R&D), in marketing, etc.—and of competitiveness. When such an approach is pursued within an import-substitution (IS) policy framework, production volumes are likely to be limited—leading to high average costs. Accumulation of technological capabilities are further disrupted as new models are introduced every few years by the original equipment manufacturers (OEMs) with a series of well-guarded new designs, standards, and performance characteristics.

Arguably, although a "KD strategy" with a focus on the domestic market is a necessary step in developing basic auto and parts production capabilities, in the long-term, it is a dead-end route for a nation aspiring to develop a competitive auto industry. This has been the case in Iran where, despite the declared goals, the trajectory of the pursued auto sector policies has promoted a KD strategy that has placed the industry on a sticky path—making the introduction of meaningful change very difficult. The two large domestic assemblers have used the opportunities provided by such a trajectory to maximize their profits by cooperating with various MNCs, introducing a variety of models with limited production volumes, and maintaining the production of certain popular models for a decade—and sometimes for more than two decades—with high local content, but with limited improvements in design, quality standards, or overall competitiveness that would result in exports.

Localization Drive: 1993 Auto Law

The Iranian auto industry began producing a small number of models in its early years, including the famous Paykan (Hillman Hunter) assembled by Iran National

Company (subsequently IKCO) as well as Citroen (Dyane) and Renault (Renault 5) manufactured by SAIPA. After the Iran-Iraq War, in the early 1990s, several licensing agreements with foreign firms were signed, increasing the range of products to include Peugeot 405, Daewoo (Cielo), KIA (Pride), and several Nissan, Iveco, and other models. The KD approach—buying parts in the form of CKD or SKD—was seen as a quick way to increase production and satisfy the pent-up consumer demand. Usually, such licensing agreements started with 30% local production, increasing to more than 70% in the course of 5 years.

Faced with foreign exchange shortages, the Ministry of Industry and Mines and the main assemblers realized the limits of relying on imported CKDs. The Auto Law was passed in 1993 to provide a supportive-competitive environment for the Iranian auto industry and particularly encourage local production of parts (Manteghi 2011: 106). It promoted the industry by setting a high tariff for auto imports (it was increased from 35 to 220%) and a lower rate for the importation of parts (Manteghi 2013: 225). According to the Law, the tariff differentials were to narrow each year, and tariffs for both CBU and parts would be gradually brought under 20% so that the domestic manufacturers would face competitive pressures to move up the price/quality ladder (Jahan-e eghtesad 2015).

One of the main provisions of the Auto Law was to support the formation of centralized parts procurement and management companies for the Big Two assemblers. In 1994, Supplying Automotive Parts Company (SAPCO, affiliated with IKCO) and later Sazeh Gostar (affiliated with SAIPA) were established in this vein. These umbrella companies fulfilled two major functions. First, they managed the outsourcing of parts manufacturing by locating either idle or underutilized capacities in the metal-mechanical industry or by encouraging investment by the private companies in the sector. The gradual integration of such production capacities into the supply chain of the Big Two—without requiring major investment by the assemblers—laid the foundation for the production takeoff of the subsequent years. Secondly, the two umbrella supplying companies developed engineering departments to assist domestic suppliers with adhering to various standards and systems that improved their production planning and quality control. The production takeoff after 1993/1994 was thus initiated (see Fig. 1). As the output of the assemblers increased severalfold, supplier companies also grew in size and number. Today, the number of companies which cooperate with SAPCO and Sazeh Gostar has reached 1200 parts manufacturers—which are ranked into several categories according to their capabilities. The secretary of Auto Parts Manufacturers Association has earlier reported the total employment in the parts industry as 190,000 (Iran Vehicle Manufacturers Association 2015b). The overall achievements of parts manufacturers are illustrated in Fig. 2—which shows that the share of locally produced parts in Iran's auto industry more than doubled within a decade to reach 42% of auto industry's production value by 2014/2015. Furthermore, the share of domestic parts in production expanded between 2010 and 2012—when international sanctions intensified and production of autos dropped significantly.

Although increasing localization in Iran can be seen as an achievement, three factors have raised doubts about its long-term viability. First, it has led to the

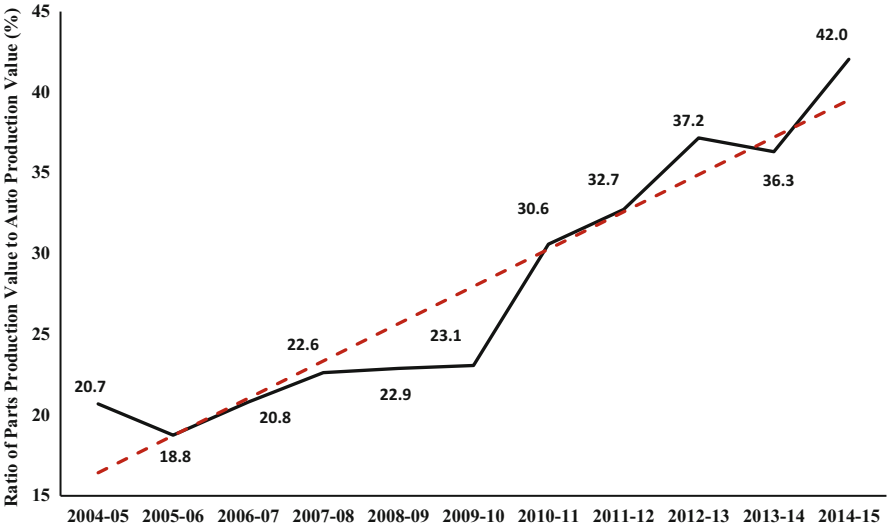

Fig. 2 Increasing share of locally produced parts in the total production value of Iranian auto industry during Iranian fiscal years 2004/2005 through 2014/2015 (percent) [Source: Calculated by the authors based on SCI (2004/2005 through 2014/2015), Census of large industrial establishments]

continued production of the same models for many years (in some cases for more than a decade) with little change in design or performance. Samand, Peugeot's 405 and 206 models, Kia's Pride, and Nissan's Patrol as well as some light trucks have been among those models that together accounted for more than two thirds of the industry's production in some years. Notwithstanding few facelifts, learning opportunities and improvements in domestic design, research, and, specially, development capabilities have thus been limited.

The second factor that constrained localization relates to the way the Big Two, as well as foreign OEMs and small local assemblers, took advantage of the Auto Law in ways that would maximize their profits. Since the Law treated parts imports uniformly, local and foreign assemblers were given a free hand to import CKDs and even SKDs. As a result, SKD and CKD imports experienced a sharp rise particularly in the high-end market segments with limited volumes. These cars were sold at relatively high prices, generating windfall profits for assemblers. While tiptoeing around the government's agenda, assemblers sought to maximize their profits by optimizing production, localization, and parts imports through focusing on two market segments. One segment was high-volume cars with high local contents, little change in design and performance features, and low profits under government pricing policies. The other segment was high-end/low-volume cars, produced with imported CKDs, which generated high profits. In this way, part of the competitive pressure intended by the Auto Law was eased—shaping an environment that provided scant incentives for enhancing learning, improving quality, and/or reducing costs.

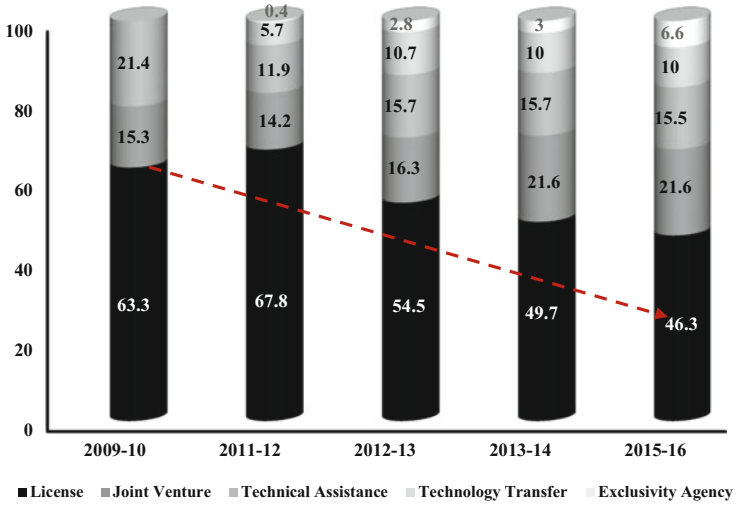

Fig. 3 Various types of international cooperation agreements in Iran's auto parts industry during Iranian fiscal years 2009/2010 through 2015/2016 (percent) [Source: Calculated by the authors based on foreign cooperation information in Auto Parts Manufacturers Association (2016)]

Yet, a third issue has to do with the reality behind official localization statistics provided by the assemblers. With all the claims about high levels of localization (more than 80–90% in some models), the onset of sanctions caused an almost 50% drop in the number of autos produced. The reason was that localization had been high in low-tech/high-volume parts, while both assemblers and parts producers imported many hi-tech or complex parts. This meant that even when assemblers reported that their systems or parts were of local origin, these incorporated foreign parts imported by component manufacturers (Majles 2014: Sect. 3).

Figure 3 captures developments in Iran's auto parts industry in terms of various international cooperation agreements—including licensing, joint venture, technology transfer, and exclusive agency. The total number of parts produced through international cooperation rose from 196 to 380 items between Iranian fiscal years 2009/2010 and 2015/2016. One of the effects of this trend was a decrease in the imports of parts, especially in CKD packages. In the period under consideration, the share of licensing agreements declined (from 63.3 to 46.3% of all agreements), while there was an increase in the shares of joint ventures (from 15.3 to 21.6%) and technology transfer agreements (from 0 to 10%). Such trends ensured improvements in the quality of parts produced by Iranian manufacturers. However, it is not clear whether sustained learning and accumulation of design and R&D capabilities have been achieved to enable Iranian parts manufacturers to eventually support the production of a locally designed and branded model for the export markets. The evidence for the accumulation of such capabilities pointed to two directions: First was the attempt to develop a domestic vehicle (Samand) with the assistance of

European engineering consultancy firms that cooperated in the design of the car and a new engine. In the process, both IKCO and part of its supply chain gained access to a range of design and development capabilities (Bozorg Mehri 2015). Second, regarding the other models, assemblers and parts manufacturers entered into successive rounds of agreements with international firms and technology holders in order to produce new models and parts introduced by foreign OEMs. It is clear that such new models, produced for the domestic market, require parts for at most 4–5 years with limited scale of production. This is a situation that has provided Iranian parts manufacturer with neither the plan nor the funds to upgrade their competitive capabilities (Iran Vehicle Manufacturers Association 2015b).

Overall, even though the Auto Law has boosted domestic parts industry and encouraged cooperation with global parts producers, the benefits have been limited because of the industry's focus on the domestic market. In addition, localization makes economic sense when minimum production scales are met. As such, those parts have been chosen for domestic production that would reach the required volume, have had relatively low technology, and would be made for car models not expected to change for several years. However, since the government has imposed price controls on the low-priced, popular models (of which more below), the Big Two and especially foreign or small assemblers have pursued other, more profitable paths available to them under the Auto Law. A significant path has been the importation of new models through CKDs. These are usually high-end products that are not subject to price controls, have production runs not exceeding several thousands, and generate high profits.

Quality Standards

The Iranian auto industry is partly regulated based on safety and environmental concerns. Given their crucial role, several rounds of standards have been formulated in Iran during the last two decades to upgrade domestic cars. The focus of such regulations has been on three areas: improving quality, addressing environmental concerns, and diffusing international safety standards. However, lack of enforcement on one hand and contradictory policy goals on the other have made it difficult to achieve the desired outcomes. The quality of a large share of domestically produced cars is far below international standards; light and heavy vehicles are responsible for a significant share of air pollution in major Iranian cities (especially Tehran); and high levels of road accidents (Mehrnews 2015) and casualties demonstrate that much more is to be desired in terms of safety standards and their implementation.

A recent study (Iran Quality and Standard Inspection Company 2016) on the quality of Iranian autos evaluated a relatively large sample of cars (more than 76,000) to report the following (based on a star-rating system with five stars being the highest quality ranking): 76% received only one star; 17% received two stars; and only 7% received three stars. These numbers reveal the relatively low quality of

Table 1 Implementation of international (European Union) fuel standards in Iran

Euro standards	Year of implementation in Iran	Year of implementation in Europe
83/351/EEC	2000	1983
88/76/EEC	2003	1988
EURO 1	2003	1992
EURO 2	2005	1996
EURO 3	–	2000
EURO 4	2014	2005
EURO 5	–	2009
EURO 6	–	2014

Source: Reproduced from Shahbazi et al. (2016: 50)

Iranian-produced cars—one of the key reasons the Big Two assemblers cannot make inroads into global or regional markets. This has led the National Standards Organization of Iran to expand its mandatory standards from the current 55 to 85 items, as of December 2017 (National Standard Organization of Iran 2018). However, Iran Vehicle Manufacturers Association claims that this will result in a crisis as close to 50% of the current auto output can no longer be produced without violating the additional, more stringent, standards (IRNA 2018).

Yet, high levels of air pollution have become a serious concern across large Iranian cities—especially in Tehran—with auto emissions being a main culprit. Table 1 indicates a lag of 10–15 years in adopting the European Union emission standards by the Iranian auto industry—ranging from 17 years (for early standards) to 9 years (for the more recent ones). Notwithstanding delays in the adoption of such regulations, their enforcement has been lackluster or delayed repeatedly. In a well-known case, the Ministry of Industry, Mine, and Trade refused to phase out the production of vehicles that did not meet Euro 4 standards on the grounds that doing so would require expensive imported parts, increasing the price of cars. Also, the Ministry claimed that stopping the production of autos not meeting the emission standards would cause unemployment (Sanatnews 2017).

A related issue is the age of the transport fleet in major Iranian cities and its role in aggravating air pollution. For example, while 43% of cars are less than 5 years old in Tehran, 36% are 5–10, and the rest are older than 10 years old. Meanwhile, 60% of minibuses are older than 20 years. Older vehicles use outdated technologies like carburetor-operated engines. A disproportionate share of emissions is generated by these types of vehicles. The share of carburetor-equipped vehicles in Tehran stands at 9.4%, 4.7 %, and 22.3 % for passenger cars, taxis, and pick-ups, respectively. Yet, the 9.4% share of carburetor-operated passenger cars is responsible for 51.3% of total emissions of passenger cars in Tehran (Shahbazi et al. 2016: 64).

In summary, the success of government interventions to enforce quality and safety standards has been rather limited, failing to push the local Big Two assemblers toward the expected outcomes.

Pricing

Another policy area in which the Iranian government has played a rather controversial role is pricing. Severe gaps between the demand and supply of autos in the Iranian market have led the government to intervene in the hope of restoring balance. However, such interventions, in particular price controls, have caused other types of distortions. By the end of the Iran-Iraq War in the late 1980s, there existed a large pent-up demand for various consumer durables, especially cars. This high level of demand could not be satisfied because the two major assemblers had limited production capacities, and the existing models were at least a decade old. Furthermore, new contracts with large foreign auto manufacturers required lengthy negotiations. These circumstances led to the emergence of long waiting lists, the formation of a black market, and large price differentials between the factory and black-market prices. At the same time, foreign exchange was in short supply and was thus rationed, making the importation of needed parts difficult. Along with the government's allocation of foreign exchange to the industry came regulations on how the currencies should be priced in rials and, by extension, how car prices would be calculated. One of the organizations affiliated with the Ministry of Industry, the Consumers and Producers Protection Organization (CPPO), was tasked with determining prices for a number of cars. Thus a pattern of bargaining between the Big Two assemblers (where the government had controlling shares) and CCPO (an arm of the government) began.

As shown in Table 2, prior to April 2012, most autos manufactured in Iran were priced by CPPO either directly or indirectly. As a result of international sanctions, the Iranian economy experienced unprecedented difficulties during 2011 and 2012—runaway inflation pushing beyond 30%, significant devaluation of the national currency, inability to access oil export revenues due to financial and banking sanctions, and a huge government budget deficit. These difficulties led the government to reimpose a number of draconian measures, including foreign exchange rationing and its allocation according to a ranking of needs.

Even though the Iranian auto industry claimed high levels of localization and foreign exchange was provided to parts manufacturers at a discounted rate after the intensification of the sanctions, the price of cars increased substantially with the devaluation of rial. The industry attributed this price jump to the higher cost of purchasing foreign parts. However, there was a consumer backlash against the price hikes and the industry.[2] Then-President Ahmadinejad intervened in the matter by issuing a directive appointing the Competition Council to set the price of a number of popular models (valued below 400 million rials or approximately $10,000 at the time). Since then, haggling over car prices has become more intense. The Big Two assemblers with the support of parts manufacturers and the Ministry of Industry,

[2]There was a campaign on the social media asking car buyers to postpone their purchases. It was meant to force the auto assemblers to reverse the price hikes. It gained momentum for a couple of months but eventually dissipated.

Table 2 Key characteristics of government's role in pricing of cars since 1980

Context	Pricing method	Pricing authority	Year
High demand and low production of cars, giving rise to sizable price differentials between factory and market prices, long waiting lists, lottery draws, and pre-sales	Cost plus, calculated based on official price of dollar	Min. of Industry: Consumers and Producers Protection Org. (CPPO)	1980s to mid-1990s
Declaration of price differential and paying the differential to CPPO	Set price according to market margin	CPPO's Auto Committee	Mid-1990s to late 2000s
The Big Two requested 20% price increase for the remaining products; 6% was approved	Stopped setting prices for commercial vehicles and for autos more than $26,000	Approved by Council on Auto Policy-Making and executed by CPPO	2011
Allocating foreign exchange based on *Mobadeleh* (discounted) rate, leading to both price hikes and windfall profits for the importers of CBUs and CKDs	More price liberalization based on the allocation of discounted foreign exchange	Presidential order appointing the Competition Council	2012
Liberalization leads to pressures for price controls again; pricing unsatisfactory to the Big Two; periodic controversy in media about the rationale for government pricing intervention	Based on a complex formula with a base price of 12% under market price while taking into account inflation, foreign exchange needs, and other factors	Competition Council (only for cars below $10,000)	2013 to present

Source: Iran Vehicle Manufacturers Association (2014a)

Mine, and Trade have argued for price liberalization. The Big Two claim that the Competition Council does not fully take into account the substantial rise in the price of foreign exchange and the resulting cost increases for imported raw material and parts. However, the Competition Council and some important circles within the government are skeptical about such claims. They believe that, left to their own devices, the Big Two would engage in unwarranted price increases. Those circles point to such forces that lead to price hikes as the duopolistic market structure, the Big Two's sole focus on the protected domestic market, the inability to move beyond the KD approach and its foreign exchange implications, the overstaffed operations, featherbedding, and large productivity gaps with the industry's international norms (Majles Research Center 2016; Renault 2016). Various critics raise such issues differently but in general call for a major shake-up and restructuring of the industry to address them. They argue that until these concerns are addressed, the government should act to check price increases in the interest of consumers and general welfare.

Tariff Regime

Tariffs have been an important instrument in the execution of import substitution and localization of parts policies and as such have contributed to the growth of the Iranian auto industry over the past two decades. Since the early 1980s, there have been heated debates about the extent of car imports. On one side are the supporters of the Big Two assemblers and local parts manufacturers who argue that large-scale imports would endanger the developed capabilities and the created employment by the auto industry (Iran Vehicle Manufacturers Association 2014b). They maintain that certain interest groups pursue large financial windfalls by importing new auto models at the cost of local capacities and jobs. On the other side, it is argued that lack of serious competition in the industry maintains the status quo: limited improvements in the quality and price of domestically produced/assembled cars and reluctance to alter the industry's ownership and management structure. It is further contended that with limited car imports, domestic manufacturers would be forced to reevaluate their entire price/quality offer to consumers (Majles Research Center 2000).

As shown in Fig. 1 above, CBU imports were negligible between 1993 and 2006. This reflected the success of the industry representatives in keeping the no-imports formula as the going policy. But by early 2000s, and as part of general economic reforms, the Ministry of Industry emphasized replacing all non-tariff import restrictions with tariffs. The auto industry came under severe pressure to agree to tariffs, something it had resisted until then. Finally, in 2002 the tariff rate for passenger car imports was set at 170%. This rate was so high that no one initiated imports. The following year the rate was reduced to 147% and in 2004 it was set at 120% (MIMT 2006). At the time, the Ministry declared that it planned to reduce the tariffs on an annual basis and such reductions were implemented for the next couple of years. But with the advent of Mr. Ahmadinejad's presidency and his populist agenda for employment generation, the reduction of tariffs for autos was stopped for several years. As shown in Table 3, the tariff rate was set at 90% in 2006 and did not change during the following 7 years. It was in the last few months of his administration that Mr. Ahmadinejad abruptly reduced the tariff rate of auto imports to 40%. This rate has remained in place—in addition to the prohibition placed since 2014 on the imports of cars with engine sizes exceeding 2500 cc.

Exports

As mentioned earlier, the rapid growth of auto production in Iran was fueled by domestic demand. Reliance on the domestic market is expected at early stages of import-substitution industrialization in developing countries. It is a common feature of the developmental trajectory of a number of industries, including the auto industry. Yet, the continued total dependence of Iran's auto assemblers on the domestic market is a sign of their inability to move up the price/quality ladder and

Table 3 Tariff rates for auto imports based on engine size during Iranian fiscal years 2004/2005 through 2016/2017 (percent)

Iranian fiscal year	Up to 2000 cc	2000–2500 cc	Above 2500 cc
2004/2005	120		
2005/2006	100		
2006/2007	90		
2007/2008	90		
2008/2009	90		
2009/2010	90		
2010/2011	90		
2011/2012	90		
2012/2013	90		
2013/2014	40	75	75
2014/2015	40	55	Prohibited
2015/2016	40	55	Prohibited
2016/2017	40	55	Prohibited

Source: Trade Development Organization (2004–2016)

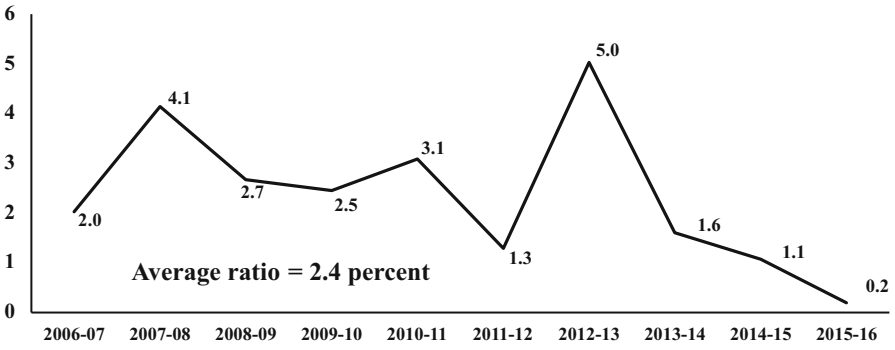

Fig. 4 Ratio of auto export value to sales value for the two main auto assemblers during Iranian fiscal years 2006/2007 through 2015/2016 (percent) [Source: Calculations based on financial statements for Iran Khodro Industrial Group and SAIPA Group provided in Codal (2006/2007 through 2015–2016)]

improve competitive performance. This section briefly reviews the export performance of the Iranian auto industry.

As shown in Fig. 4, the average share of CBU export value in the total sales value of the Big Two has been 2.4% for much of the past decade. In the Iranian fiscal year 2012/2013, when the auto industry's production experienced sizable contraction due to sanctions, the above ratio reached a high of 5%. More recently, a continuous decline has been experienced. Such shares demonstrate that the IS strategy still commands the auto industry in Iran after five decades. In other words, assemblers have not been able to develop exportable products to make any serious inroads into foreign markets. Instead of using the IS stage as a platform to accumulate learning,

Table 4 Exports of Iranian cars and shares of destination markets during Iranian fiscal years 2009/2010 to 2014/2015 (percent)[a]

Year/country	Iraq	Syria	Turkey	UAE	Turkmenistan	Azerbaijan	Egypt
2009/2010	76	3	13				
2010/2011	95						
2011/2012	86			3	6		
2012/2013	95			2			
2013/2014	51			10		19	13
2014/2015	79			5		6	

Source: Authors' calculations based on data from Customs Administration of Iran's Annual Report on Foreign Trade (CAI 2009/2010 through 2014/2015)

[a]Percentages are for the share of each country in a particular year; numbers in each row do not add up to 100 because there are other countries like Afghanistan and Pakistan that have very low shares and not shown in the table

acquire the necessary competitive capabilities, and gain a foothold in regional and global markets, Iranian auto assemblers have sought to maximize their profits irrespective of the costs to the national economy. The KD approach with high localization has become the main preoccupation of the Big Two, with an almost complete focus on the domestic market. This approach has shaped an industry that is unable to design and manufacture a competitive product under its control and to export to foreign markets. Even in the domestic market, the Big Two can continue production at the current scale only under high protective tariffs. The removal, or major reduction, of these tariffs poses a serious challenge to Iranian assemblers' survival as manufacturers.

One of the reasons for the low volume of car exports from Iran is the very limited number of countries where the Iranian auto assemblers and parts manufacturers have made a presence. The main export destinations for Iranian auto producers are given in Table 4. As shown in the table, these markets only consist of the neighboring countries. Furthermore, even in markets where Iranian assemblers have entered, their presence has not been sustained for long (except for the Iraqi market). This is a sign that such forays have been sporadic deals and not based on strategic decisions to target a specific market and stay the course. In fact, over the past decade, there has been no serious attempt to design and manufacture autos for export, to formulate a strategy for targeting export markets, or to develop the required infrastructure and capabilities in destination markets for a continued presence. The outcome has been limited and decreasing exports by the main assemblers in Iran.

The above findings are corroborated in a study by Abedini and Péridy (2009). After accounting for such factors as size of the Iranian GDP, car production level, and proximity to large emerging markets as well as trade liberalization by neighboring countries and other factors, they found that Iranian car exports were 97 times less than what they could potentially be (close to $10 billion in 2006). When hysteresis (lack of a history of exports) was added to their model, the potential exports became considerably less and only 3.2 times the existing level (Ibid.: 816).

Yet, a government document entitled "Automotive Industry in Horizon 2025: Goals and Policies" (IDRO 2015) has set the goal of exporting one million cars from Iran by 2025, with a total domestic production of three million vehicles. The document has also set a production goal of 120,000 units for the commercial vehicle sector, of which 25% would be exported. Yet, these export targets are hardly achievable under the current KD approach. To come anywhere near such targets, it is essential for the auto industry to undertake major investments in modern capacities, technological upgrading, and managerial transformation. The Big Two assemblers have so far not shown an appetite for upgrading their capacities and technologies, enhancing their design and development competencies, or creating marketing and sales channels to support their products and brands in regional markets. Cooperating with leading global firms is one approach to upgrade production platforms and management systems. However, it has been difficult to attract major foreign MNCs willing to make Iran a regional production and/or export platform. Iran has tried to include export performance clauses in contracts with those MNCs that have a presence in the country, but, so far, global players have not exported any noticeable number of cars or parts from Iran.

Market Structure and Ownership in the Iranian Auto Industry

The Iranian auto sector has acquired a duopolistic industry structure. This structure has emerged against the background of the nationalization of auto assembly companies in the aftermath of 1979 Revolution and the reorganization of a number of related firms during the war with Iraq. IKCO and SAIPA—both acting as groups of firms with prerevolutionary roots—have continued to dominate the industry. In 2015, these two companies assembled close to 90% of the industry's total vehicle production—in both passenger car and commercial segments (MIMT 2016). As discussed, the Big Two have predominantly pursued a KD approach along with increasing localization as they have boosted production. Their relationships, as well as those of others, with MNCs are thus worth probing.

IKCO has had long-term relationships with European firms—originally with Talbot of the UK (the first car rolled out in 1967) and then with Peugeot—assembling a number of models under licensing agreements. Its agreements with Peugeot started in 1990, in response to the pent-up demand that emerged during the war with Iraq that could not be satisfied with the existing capacities. Although IKCO has had a degree of success in manufacturing and branding its own products—Samand and Dena—its product range is heavily dependent on Peugeot models. The company has been able to tinker with some models through facelifts and minor design changes, in

order to adapt the vehicles to local market conditions.[3] SAIPA has cooperated with Renault since 1976. In the years after the Iran-Iraq War, SAIPA also entered into licensing agreements with the following companies: (1) Japanese Nissan after the mid-1980s, assembling a sports utility model (Patrol) and light trucks; and (2) Korean Kia Motors after 1993, producing the Pride (a subcompact) that became the company's cash cow for more than a decade, without any changes in design or performance.

In 2004, under an initiative launched by IDRO, IKCO and SAIPA partook in a three-way joint venture with Renault to produce that company's new low-end passenger model—L-90. The agreement for the joint investment project led to the establishment of the Renault Pars Company (49% Iranian, divided between the Big Two, and 51% owned by Renault) (MIMT 2006). Due to extensive interventions by the Iranian parliament, the production of L-90 was delayed for almost 10 years. The project was launched with 30% local content, which has now reached 59%—way below the original target of 80%.[4] The original agreement also called for exporting 20% of the auto output. This has not been realized either due to a number of issues, including lack of proper monitoring of adherence to local content requirements or export obligations, as well as failure to impose penalties in case of noncompliance or premature contract termination.

One target of the nuclear-related international sanctions imposed on the Iranian economy was the country's auto industry. Due to the sanctions, European, Japanese, and Korean companies that were active in Iran either terminated their operations or limited their activities. Working with both IKCO and Saipa, Renault became an exception as it tried to expand its footprint in the Iranian market. Even as it ran into difficulties with financial transactions, the company stayed the course hoping to come out of the sanctions situation in a dominant position. Yet, starting in 2013, Chinese companies significantly expanded their presence in the Iranian auto sector—benefiting from the nonreturnable Iranian revenues from oil sales to China as a source of finance (of which more later).

As for ownership, a complex situation has emerged in the Iranian auto industry. With the gradual divestment of government shares over the past decade, semi-state entities as well as subsidiaries of the Big Two have stepped forward to control the majority of the floated shares. Even though the 1993 Auto Law had required the government to gradually privatize the Big Two assemblers, it took another 12 years before any shares would be transferred. IDRO held the shares of both companies on behalf of the government. It gradually floated the shares in the stock market. Although nowadays IDRO directly controls only around 18% of each company's

[3]IKCO engineers started this process with the RD project, installing a domestic engine on the Peugeot 405 body and gradually moving to more design-intensive projects such as developing the Pars model by putting a facelift on Peugeot 405 or adding a trunk to the originally hatchback Peugeot 206 model.

[4]Authors' communications with Renault managers in Tehran during October 2016.

stocks, majority shares are held either by other semigovernmental funds and institutions or by subsidiary enterprises affiliated with the Big Two.[5] Given these circumstances, the boardrooms of both companies are still controlled by entities affiliated with the state—while their chief executive officers are appointed through agreements among the state and semi-state representatives on the boards. Many observers decry government's continued interference, which forces the companies to make decisions based on parameters not directly related to the economic rationale. They further argue that Iran's auto manufacturers can hardly become competitive or act as a private-sector industry with all the government interferences.

Post-sanctions Era: A New Thrust in International Cooperation

At their peak, the sanctions resulted in more than a 50% reduction in the number of cars assembled in Iran—from 1.65 million to 737,000 vehicles between Iranian fiscal years 2011/2012 and 2013/2014. With the partial removal of sanctions and, later, the adoption of JCPOA, the industry witnessed several new developments that together have provided a new impetus for its growth. These developments include: (1) an all-out effort by domestic assemblers to recover production and diversify their product portfolio through new licensing or joint venture arrangements; (2) attempts by European and Asian MNCs to either regain their pre-sanctions position in Iran or gain a new foothold in this largest Middle Eastern market; and (3) efforts of the Iranian government to formulate policies that would use this window of opportunity to capture lasting benefits for the industry. Their interplay is discussed below.

With the removal of part of the sanctions, there has been a rush to increase auto production. Assembly of cars has gradually recovered to reach 1.1 million units (in the Iranian fiscal year 2016/2017). It is expected to come close to the pre-sanctions peak of 1.6 million vehicles in 2017/2018. In search of producing/assembling higher quality and more up-to-date models, the Big Two have moved to diversify their product mix by signing contracts with several MNCs—optimizing their profits in the process. Therefore, unlike the approach during the period of sanctions, which resulted in the production of fewer models with high local contents and large production runs, the post-sanctions era is characterized by product diversification, lower local contents, and limited production runs (Iran Vehicle Manufacturers Association 2015a). The Big Two's lack of interest to pursue higher local contents has led to complaints by parts manufacturers. The latter see the assembly of new models that start with less than 20% local content and minor increases over the

[5]For example, IKCO has kept control of part of its stocks by maintaining cross shareholding through its subsidiaries such as Negar Nasr, Samand Investment, Sepehr Kish, etc. SAIPA has used similar mechanisms with its subsidiaries such as SAIPA Investment, Radin Investment Development Company, and others controlling significant shares of the parent company.

succeeding years as an evasion of the relevant laws and obligations—and a danger to the future of the parts industry.[6] Therefore, production recovery in the industry has been synonymous with more dependence on major OEMs, little progress in the accumulation of competitive capabilities, and unrealized exports to regional markets.

Aside from the main local firms, MNCs have also become major players in the Iranian auto sector. Global companies that already had a presence in the Iranian market have moved quickly to mend fences and restore/expand old ties. Peugeot, Fiat, Mazda, Isuzu, and others have negotiated for the resumption of production and shipment of CKDs. Others, such as VW, Citroen, and Hyundai, have shown interest in gaining a foothold in this attractive market. Peugeot has moved quickly to reestablish its ties with IKCO, its partner of two decades. During the sanctions peak, Peugeot cut all ties, even parts shipments—causing problems in production lines. Such actions damaged its reliability in Iran. However, as shown in Table 5, its offer of investing in a new joint venture, in lieu of payments to compensate for past unmet contractual obligations, was enough to negotiate its comeback with IKCO.

Firms that had continued their operations in Iran during the period of sanctions—including Renault and the Chinese companies Lifan, Dong Feng, Cherry, and FAW—have looked to improve their positions in this market. Renault has strategized to shape a third pole (in addition to the Big Two) in the Iranian auto industry. While continuing its cooperation with the Big Two, it has also entered into a joint venture with a key local importer of its vehicles in the private sector, Parto Negin Khodro, to assemble new models in Iran. Renault's more ambitious plans involve investing in a wholly owned independent manufacturing center in Iran and in the independent provision of sales and after-sales services (ISNA 2016). As for the growing Chinese presence in the Iranian auto industry, one can point to the following activities: SAIPA started a new joint venture with Brilliance Auto Group after the end of the sanctions period. It also began cooperation with Changan Company at its plant in the city of Kashan in 2014. Similarly, in the commercial vehicles segment, SAIPA Diesel started working with Dong Feng and Foton Motor Companies—producing vans, minibuses, and light trucks. Chinese companies have also cooperated with small private auto assemblers (in addition to the Big Two), whose foreign partners had cut ties due to the sanctions. Cooperation has commenced between Chinese Lifan and Kerman Khodro, as well as between Cherry and Modiran Khodro. More recently, Karmania Auto Company has begun operations as a joint venture, assembling the Chinese BYD products. Altogether, there has been a noticeable increase in the market share of Chinese car manufacturers, from 4% of the total number of vehicles assembled in 2010 to 11% in 2017 (MIMT 2017). There have been other initiatives by small assemblers as well: Kerman Motor Company started assembling two Hyundai models in 2016, while VW and Mammut (a private Iranian company) have reached an agreement to produce light commercial vehicles.

Alongside the Big Two and MNCs, the Iranian government has been an important player in the development of the auto sector. In anticipation of a new round of

[6]Authors' communication with the managers of the Auto Parts Association of Iran in May 2017.

Table 5 Post-sanctions foreign agreements with the two main assemblers and other firms in the Iranian auto industry

Partners	Key points in the agreement	Foreign partner's main commitments
Citroen and SAIPA Group	• Production of latest-generation vehicles • Presence of three Iranians and three French members on the board of directors • Increased investment in product design and development and establishing a new production line Cooperating with SAIPA's Research Center and parts producers to implement Citroen standards and achieve local content goals (SAIPA News 2016) • Producing Citroen models in place of existing products in SAIPA Kashan after 5 years	• Initial investment of 300 million Euros • Acquiring 50% of SAIPA Kashan's stock (joint venture—50:50) • Producing a new Euro 6 engine, upgradeable to Euro 7 by 2019 • Committing to 40% local content in the first year to be increased to 70% in 3 years • Transfer of technology and improving design and engineering capabilities
Peugeot and Iran Khodro Industrial Group	Payments to compensate for unmet past contractual obligations (Asriran 2016) • Establishing a joint company • Producing five new products (Peugeot 2008, 208, 301, 508, and 308). • Producing parts jointly by French parts manufacturers working with Peugeot and Iranian parts manufacturers	• Joint venture—50:50 (investment of $451 million for the production of new products and R&D). • To achieve local content of 40% in Peugeot 2008 within 1 year (Donya-e eqtesad 2016) • Commit to export 30% of vehicles produced in Iran (IKCO Press 2016)
Dong Feng and Iran Khodro	• Assembly of H30 Cross with 40% local content • Assembly of Hyma (SUV) with 20% local content	
Chinese companies with SAIPA and Pars Khodro	• Assembly of Brilliance with 20% local content • Assembly of Ario (S300) with 20% local content • Assembly of Changan with 20% local content	
Chinese companies with other Iranian companies	• Bahman Group to assemble several vehicles of the FAW Company (with 20% local content) • Kerman Khodro to assemble several models of Lifan and Jac (with 20% local content) • Modiran Khodro has assembled Chinese vehicles for a decade (including MVM, Tigo, and Arizo)	

Source: Compiled by the authors

interactions between domestic and global auto manufacturers, the Ministry of Industry, Mine, and Trade developed a series of guidelines for new contracts to be observed by domestic firms, financial institutions, and development authorities. They include the following four items:

1. Localization: Production of all new models should begin with at least 40% local content, to be increased to 70% within the next 3 years. This is in response to the lack of enthusiasm on the part of domestic assemblers and their foreign partners to start with the production of new models in Iran with more than 20% local content. It attempts to address concerns raised by parts manufacturers over the fact that the low local content of many new models—along with the reduction or halt in the production of popular old models that had reached a local content of more than 80%—would soon make much of their capacity idle and gradually force them out of business (Mihansanat 2018).
2. Foreign Direct Investment (FDI) and Joint Ventures: Iranian authorities and industry managers feel that one of the key reasons the French, Japanese, and Korean companies could easily cut ties with their Iranian partners and forego their contractual obligations has been their lack of direct investment in Iran. In addition, the experience of having Renault's presence in Iran has demonstrated the value of joint ventures in terms of upgrading the supply chain and improving management systems and product quality. The Ministry has thus emphasized that all new contracts pay special attention to establishing joint ventures—requiring investment by foreign companies in new projects. Although that has been the official line, only a limited number of foreign enterprises have agreed to make actual investments, whereas others have tried to buy time in order to evaluate the business climate and the risks involved.
3. Exports: The Iranian government and the ministry have emphasized auto exports. Given the lack of competitiveness associated with the Big Two Iranian firms in export markets, the Ministry has been pushing foreign firms to accept contractual clauses for exporting 30% of the local production. The Ministry has argued that in lieu of access to Iran's domestic market, MNCs should agree to export part of their production to other, mostly regional, markets. However, it would be difficult to hold MNCs accountable to such targets given the geopolitical developments in the region and the fact that resolving many issues about making Iran the regional platform of these global companies has not seen any progress. In addition, MNCs have business interests in various regional countries and are concerned that turning Iran into a regional platform will not serve their long-term interests well.
4. Technology Transfer: Iranian auto and parts manufacturers have remained relatively isolated from the industry's technological changes over the past 15 years. Even newer foreign models assembled in the country fall into the low-end classes that use basic and standard technologies. As the domestic firms have focused solely on production/assembly operations, they have not been able to keep up with the tremendous technological changes that are shaping the industry's future.

The decade-old efforts to develop electric and hybrid cars, or the impact of Industry4.0 and new technologies and applications such as the Internet of Things, smart cars, 3D printing, and others, are yet to be embraced in Iran. Iranian companies have mastered the knowledge of auto assembly and running production lines. IKCO has also cooperated with European engineering consulting firms to gain a degree of design and development capabilities toward performing facelifts on old models and gradually improving quality and functions. Thus minor capabilities have been accumulated in such areas as new platforms, chassis, and body design or subsystems technologies like engine, power train, suspension, brake system, and various types of auto electronics and electronics-based control (Bozorg Mehri 2015). However, the cooperation has not led to sustained capacities for new product development.

Against this background, the Ministry of Industry, Mine, and Trade has emphasized including relevant clauses in new international contracts in order to support domestic companies' access to new technologies—hoping to prepare them for a new era of radical technical change in the industry. However, one does not observe a new round of cooperation with foreign engineering firms that were instrumental in enhancing the technological capabilities of Iranian assemblers and parts manufacturers in the past.

Concluding Remarks: Whither the Iranian Auto Industry?

In concluding the chapter, key past and current developments are recaptured in order to leverage them for a rendition of future prospects and possible growth paths of the Iranian auto industry. Along the way, the roles of critical agents—the state, domestic assemblers and parts manufacturing firms, and foreign corporations—are examined.

After two decades of lackluster development, the Iranian auto industry experienced rapid growth between 1995 and 2010 during which time its production increased from 65,000 to more than 1.6 million vehicles. The drivers of this rapid growth were threefold: First, the government drafted and implemented the Auto Law of 1993, which imposed severe barriers on imports, and pushed the vertical disintegration of major assemblers and the formation of supply chains mostly through private-sector investment as well as participation by the Big Two in certain activities. Over the following decade, such initiatives resulted in high localization of parts for a limited number of basic models. These models did not see any meaningful changes in design, technologies, or performance criteria. The second important driver, favored by the Big Two as well as other assemblers, was the growth of a segment that relied heavily on the importation of CKDs for the assembly of new models. Middle-class consumers were more interested in such models due to their current design and technologies and their performance—willing to pay higher prices for them. In the segment that achieved high localization, production volumes increased

gradually to reach low hundreds of thousands, while imports were quite limited due to high tariffs and exports were insignificant. In addition, unit prices were high, and the quality of products was always cause for consumer complaints—forcing the government to intervene to address price and quality. The third driver that pushed the volumes up was improved household demand, as a result of increasing oil revenues during the decade of the 2000s.

With the onset of sanctions, serious bottlenecks emerged due to a number of factors: (1) a significant number of foreign partners severed their ties; (2) those that provided parts or continued their operations in Iran faced major difficulties with banking transactions; (3) even for models with very high local content, parts manufacturers faced major difficulties in supplying assemblers because they needed inputs from foreign suppliers. Together, such developments caused a nose-dive drop in the auto industry's production during 2012 to mid-2014—cutting the number of assembled cars by more than half. This led to significant layoffs at the time, particularly among parts manufacturers. While all industry segments were affected to some degree, the most hard-hit segment was the one that relied heavily on CKD imports and had not achieved high local contents.

After the removal of sanctions and the closing of new agreements with MNCs, industry production experienced a rather quick recovery. This recovery exhibits two different sides: On the positive side, assembly of a diversified range of up-to-date and high-quality models provides for more consumer options and satisfaction. On the negative side, more diversity has been tantamount to limited production runs, leading to lower localization and to lack of economies of scale and therefore higher prices. Overall, there has been insignificant progress in the accumulation of competitive capabilities. The volume of exports to regional markets remains low, while foreign currency is in short supply. Furthermore, in terms of employment generation, not only the outlook is not positive, it is relatively grim—especially among parts manufacturers.

Given the abovementioned dynamics, the auto industry in Iran faces a number of difficult issues: what are the prospects for the industry in the next few years? What roles can the domestic agents, the state, and key assemblers play to influence the outcomes? What is expected of MNCs? The following are some of the main factors influencing the prospects:

(a) The global auto industry is in the midst of rapid technological changes in several areas. Cars of the future will be quite different from what we own now, and the experience of driving a car will have little resemblance to our present-day experiences. Yet, the Iranian assemblers' and parts producers' interactions with auto MNCs and their supply chains have been limited over the past decade—restricting their access to new technologies. Domestically, there has not been any concerted effort to develop local R&D capabilities in terms of recent or emerging technologies. A continuation of the Big Two's and other auto producers' focus on the KD assembly path has led to the transfer of production and operational skills only, and not to design, R&D, or system-integration

capabilities. As such, the existing technical gap will only widen, and dependency on foreign sources of technology will increase unless there is a serious effort to accumulate technological capabilities. This requires the government, in close consultation with the key auto assemblers and parts manufacturers, to target specific emerging technologies and utilize all available policy instruments to line up the stakeholders. Mastery over such technologies can be achieved through a combination of channels—for example, via various forms of cooperation with foreign sources of targeted technologies (foreign OEMs, parts makers, research centers, and others) and simultaneous mobilization of local R&D centers, whether in related enterprises or in independent research centers and universities. It is through such concerted efforts that enterprises in the Iranian auto sector may be able to command some key emerging technologies and leverage them in their export-oriented production.

(b) Geopolitical and regional developments comprise another set of key external factors that influence the future prospects of the Iranian auto industry. Whether or not the JCPOA signed between Iran and the six world powers will move forward can have important implications for such issues as market access (unhindered access to regional markets), attracting FDI, and gaining access to new technologies. The Iranian government along with domestic assemblers and parts makers has no choice but to shape the required "auto space." It means that since the Iranian market is not large enough to support a viable competitive auto industry in the long run, all those concerned should work on preparing the grounds for a sustainable, long-term presence in the Middle Eastern and Central Asian markets. Several initiatives are in order: First, Iran needs to work on consolidating a regional block that will be open to deepening regional trade and investment. With the unmooring of traditional alliances such as Oman and Qatar's relations with other Arab states of the Persian Gulf region, Turkey's turn toward the region, and Afghanistan's and Iraq's multifaceted links to the Iranian economy and manufacturing, the formation of a regional block that would create, among other things, the "auto space" for Iran's auto industry becomes a realistic proposition. Its realization however requires reaching an agreement with one or two MNCs on making Iran their regional production platform as in the case of South Africa (see Barnes et al. 2017). Second, Iranian auto assemblers and parts manufacturers are to understand that the extent of long-term viability of such a proposition depends on their ability to shape a regional parts production network. It is only when various countries conclude that they have some share in such a regional enterprise will they be willing to accept and partake in it over the long-term. To propose such a regional enterprise and push it forward, Iran needs to put its house in order first, by seriously overhauling many of its trade and investment regulations that are not tuned to multilateral or even bilateral operational linkages.

(c) Notwithstanding technological changes and global-regional forces, national- and industry-level issues also loom large. The national ones include such issues as

providing safeguards concerning state and societal attitudes toward dealing with foreign direct investment and clarifying privatization norms that would allow transferring controlling shares in the Big Two to the private sector (whether to domestic investors or to foreign ones). Without the required changes in these areas, the impetus for structural change would not gain momentum. There also remains a key sectoral or industry-wide issue: drafting and implementing a strategic plan for the development of an export-oriented industry that would give first priority to long-term national interests (as opposed to firm interests). Also, in order to stop the proliferation of small-scale assembly operations, the government has to get behind a major rationalization and consolidation initiative that would raise the bar for new applicants and merge existing assemblers. The current policies do not have a strategic thrust away from the decades-old CKD assembly operations and toward reshaping the country's auto sector into a competitive, export-oriented industry. In addition, the passive attitude of the government toward the entry of an increasing number of assemblers that target the domestic market makes achieving scale economies and competitive capabilities more difficult. Such capabilities are essential if the industry wants to reduce average costs and generate the financial means to improve technologies, to penetrate and remain in export markets, and to enhance general competitiveness.

(d) There are also a number of firm-level issues that need to be resolved—especially, a strategic firm reorientation away from a culture of CKD assembly to one that is founded on progressively upgrading technological capabilities. That translates into different types of interactions with MNCs that would lead to the accumulation of design, research, development, and engineering capabilities. It would also mean undertaking purposeful and targeted R&D projects and developing networks that would help to lay the foundation for accessing targeted emerging technologies. Structural changes are further needed to transform the current inefficient and high-cost operational norms into efficient and competitive operational capabilities. This would in turn require an overhaul of the highly bloated organizational charts, replacement of managers who avoid undertaking transformative agendas while focusing on political survival, and deep changes in the structure and types of relations among enterprises within the supply chain.

To summarize, forces at work over the last two decades have shaped a fast-growing but uncompetitive auto industry in Iran that is dependent on a highly protected domestic market. Unless there is a coordinated series of initiatives to resolve technological, geopolitical, national, and enterprise-level challenges, the prospects for transforming the existing industry into a competitive one will not be bright. The industry should be reminded that undertaking such changes is no longer a choice but a dictum. Without the changes and in the face of aggressive strategies of MNCs, it would become more difficult for the industry to compete even on its own domestic turf.

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Trade Policy, Foreign Exchange Regime, and Industrial Development in Iran

Behrouz Hady Zonooz

Introduction

This chapter treats trade and exchange rate policies in Iran in connection with industrial development. It also touches upon taxes and subsidies, which as part of the system of financial incentives affect resource allocation across economic sectors as well as the market orientation of the domestic industry. It begins by underscoring the following observations: First, in the presence of externalities, scale economies, and/or learning, selective protection of the domestic industry can accelerate economic development and improve welfare. Second, the issue of potential benefits of an export orientation for industrial and economic development remains contested among economists. Third, in contrast to neoclassical economists, strategists of late industrial development deny any conflict between the protection of domestic products and the simultaneous development of manufacturing exports. The chapter then introduces Liang's (1992) classification of trade orientation as a simple framework for a subsequent discussion of periodic shifts in Iran between import substitution and de facto import promotion over the past few decades. The structure of financial incentives (including tax exemptions, energy subsidies, and banking credit subsidies) as well as sectoral strategies, especially in relation to trade, is also examined. Another section discusses Iran's manufacturing competitiveness and highlights its persistent negative trade balance in manufactured products as well as the dominance of energy-intensive production and low-tech exports in the country. Implications of the import substitution regime for Iran's economy in terms of monopoly structure, untapped scale economies, and sluggish technological progress are then underscored. Finally, the chapter is concluded with a set of general suggestions as minimum requirements to put Iran's economy back on the development and industrialization track.

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Trade Regimes and Industrial Policies: A Brief Review

By affecting the structure of imports and exports, trade policy has a significant bearing on the domestic economy. Furthermore, as the real exchange rate reflects the price of foreign products relative to domestic goods, it has important implications for economic competitiveness and an intimate connection with trade orientation. Protective measures affecting exports or imports are the main indicators of a country's trade policy. Imports are influenced by fixed tariffs, taxes, subsidies, deposit requirements for registration of orders, indirect discriminatory taxes, and quotas as well as other quantitative restrictions. Exports may likewise be subsidized or taxed. Maintaining multiple exchange rates shape the pattern of trade similar to import or export taxes and subsidies. Incentive measures have further implications for sectoral allocation of resources and orientation of economic activities toward exports or import substitution. Financial incentives—including preferential low-cost banking credit and tax exemptions offered to certain export industries, to certain regions, or to import substitution as well as subsidies provided to production inputs—affect allocation of resources across economic activities as well (see Balassa 1982: 3).

Trade strategies have traditionally been divided into import substitution (IS) and export promotion (EP) regimes, reflecting the levels of incentives provided to production for the domestic versus the foreign market. A policy regime is said to be neutral when it does not favor exports at the expense of supplying the domestic market and vice versa. According to most orthodox economists, this provides for an adequate export framework. Trade reforms are usually carried out with the aim either to facilitate growth and employment through enhanced resource allocation and economic efficiency or help to improve balance of payments by enhancing the competitiveness of the export sector or the efficiency of import substitution activities. Yet, neoclassical economists take trade reforms to mean moving toward a framework with fewer external trade incentives or a freer regime or a combination of both (see Corden 1992: 125).

The infant industry argument, based on dynamic internal or external economies, has been advanced as the reason for extending temporary protection to domestic firms (e.g., see Vestal 1995: 64). Yet, the argument has also been under heavy scrutiny by some neoclassical economists (e.g., Krueger and Tuncer 1982), who instead favor a neutral policy regime governing industry that does not differentiate between domestic and international prices or tradable and non-tradable goods. This, according to them, is achievable through a real exchange rate determined by the economy's fundamental variables as well as by ensuring free trade. Furthermore, while neoclassical economists permit government intervention to address market failures, they also think government's short-sighted decisions, often made with inadequate information, can themselves lead to failure. They prescribe uniform and temporary industry protection augmented with the provision of social services, whose delivery is beyond the capacity of the private sector, as well as support for human capital formation—all to be provided without favoring any industry over another. Neoclassical economists are thus against picking winners.

In contrast, industrial policy entails government intervention for allocating resources to specific manufacturing industries or certain divisions within them with the aim of accelerating economic growth and structural change in the national economy. As a policy regime under which provision of incentives among various sectors is intentionally non-neutral, it is considered by some to be indispensable or at least of crucial importance to the success of growth strategies and late industrialization (see Lin and Monga 2013: 20–21). It however remains a controversial policy perspective, owing to a number of failed attempts in the past as well as ambiguities with regard to its definition, scale, and tools that would be different from one country and level of development to another (Ibid.). Despite the controversy, there is a general consensus on its theoretical foundations as being associated with market failures. Neoclassical economists posit that, in contrast to government failures, market failures are limited. Nonorthodox economists, including neo-Keynesians, institutional economists, and new structuralists, however, point out the prevalence of market failures stemming from three sources: Positive external economies are associated with opportunities created for economic actors from investments made or risks taken by other economic agents as well as R&D spillovers. Marshallian externality is another source of market failure associated with geographic agglomeration economies stemming from local knowledge spillovers, input-output links, and costs of transport and integration of labor. Coordination problems can also give rise to market failures. Economic growth is a continuous process of industrial and technological progress that must be accompanied by social change and institutional development through an increasingly complex socioeconomic web with supporting nodes. Coordination among the nodes of this web for reaping the benefits of scale economies and achieving lowest production costs are beyond the capacity of any individual firm or even sector (Ibid.: 24–25).

Based on neoclassical economic perspectives, nonintervention in trade is the best policy in light of the differences between private and social costs or benefits. Taxing or subsidizing the exact sources of difference is instead proposed to address them, whereas instituting tariffs or taxing exports is rejected (Corden 1992: 99). Yet, new international trade theories, which came into prominence in the 1980s, while recognizing gains from trade in terms of access to a wider range of products as well as benefits of scale economies, also challenge orthodox conclusions on normative effects of interventions in the form of trade policy. New trade theorists, particularly those working within the framework of industrial organization, highlight a number of welfare-enhancing cases of trade policy under conditions of imperfect competition (see Brander 1995). Such cases, according to them, allow for the adoption of a strategic trade policy. In particular, under duopoly and in the absence of retaliatory measures by competitors, subsidizing exports becomes potentially superior in welfare terms to nonintervention. Furthermore, focusing on learning-by-doing, market structure, and industrial policy, Das Gupta and Stiglitz (1988) highlight the impetus for the dominance of monopolies when there are strong possibilities for learning (even when entry costs are small). They thus argue in favor of protecting infant industry through trade policy. They further posit that protection of domestic

industries associated with significant learning is warranted even when dominant foreign firms are also on learning curves (Ibid: 256).

Theorizing within a neoclassical framework, Krueger (1990: 157) claims that simultaneous protection of infant industries and provision of subsidies to exporters are not efficient. Yet, in practice, developing nations able to catch up in income and technology terms with advanced industrialized countries over the past few decades—including South Korea, Taiwan, Singapore, and most recently China—have relied on industrial policy and an export orientation. The same was true for postwar Japan and Western Europe. In these countries, there were also abundant cases of export promotion covering activities not coinciding with static comparative advantages. In fact, rather than exceptions to the rule, protective policies were an indispensable part of the export promotion strategies in these countries (Liang 1992: 447). Pack and Westphal (1986) believe that industrialization and export growth are about the development of technological capabilities rather than achieving static efficiency in resource allocation. According to them, the continuous process of technological change necessitates selective protection as certain technological elements are not tradable. Furthermore, Krugman (1986) argues that the assumption of perfect competition in relation to comparative advantages is not applicable to today's world, as externalities and dynamic economies are significantly more important than usually admitted. According to him, in the presence of oligopolies and scale economies, import substitution and export promotion are both compatible and necessary.

Liang (1992) has developed a model with three sectors—producing exportable goods, producing importable products, and producing non-tradables—to demonstrate that positive incentives for IS (EP) do not always result in increasing production of importable (exportable) goods. Liang classifies trade strategies based on incentive structures—rather than trade patterns—into five distinct categories as shown in Table 1. Point E at the center of the table, which shows a neutral strategy under free trade, and cells numbered 1 and 4 are typical of trade strategy classifications. Yet, in the cell numbered 2, incentives for both import substitutions and export promotion exist, which Liang calls protected export promotion (PEP). Under PEP, domestic firms are protected but are encouraged to export and compete internationally [akin to Pack and Westphal's (1986) analysis of South Korea]. Cell number 3 is associated with bias against EP and IS which increases pressure for imports and limits exports. The strategy, dubbed de facto import promotion (DIP), maximizes

Table 1 Relationships between incentives and trade strategies

		IS Activities	
		Disincentives (–)	Incentives (+)
EP activities	Incentives (+)	1-Export promotion (EP)	2-Protected export promotion (PEP)
	Disincentives (–)	3- De facto import promotion	4-Import substitution

E

Source: Reproduced from Liang (1992: 454)

imports and minimizes exports to deliver the needed resources for domestic absorption. Relying on foreign borrowing, this strategy can lead to growth in the short-term which is nonetheless unsustainable in the long term due to its negative balance of payments implications. Liang notes that this strategy is often adopted implicitly as an unwelcome side effect of other policies.

Invoking Balassa (1982: 3), who points out that the incentives regime can both orient economic activities to the domestic market or exports and affect resource allocation across economic activities, Liang's idea of bias is associated with two aspects of trade strategy—sectoral orientation and market orientation. The former is related to the choice of the leading sector or the growth engine, which determines the promoted sector irrespective of the destination of its products. The leading sector is of central importance. On the supply side, sectors are different in terms of cost of resources for development. Import substitution often means moving up the ladder to develop industries with no comparative advantage, which translates into higher resource costs. In contrast, export promotion is carried out for the production of those goods for which the country enjoys comparative advantage and hence relatively lower resource costs. On the demand side, each sector is also different in terms of its market and growth potentials. Sectors with low production costs are not necessarily those with high growth potentials. Developing countries usually possess comparative advantage in the production of traditional goods with low elasticity of demand and limited growth possibilities. They have little comparative advantage in products that can compete with imports from advanced industrialized countries. These more complex products often have high income and price elasticities of demand and entail fast-paced technological progress as well as rapid labor productivity increases. To minimize their domestic resource costs, developing countries can work to expand the efficient parts of their traditional sectors or enter into activities with high growth potential and high income and price elasticities of demand. Citing Findlay (1987: 97), Liang notes that momentary comparative advantages in any sector may or may not be sustained in the long term, while sectors competing with imports today may become exporters of tomorrow. Momentary comparative advantages are based on factor proportions at any given time while long-run comparative advantages are associated with changes in physical and human capital stocks as functions of economic variables and by extension the volume and pattern of trade. Thus, an export promotion strategy may not be optimal if its main focus is on momentary comparative advantages often associated with the production of traditional goods. As a main distinguishing factor between IS and EP, market orientation has to do with the choice of domestic versus international market as target for the products of the leading sector. In developing countries, under IS, the usual small market does not allow firms to produce at competitive scales. Export promotion in contrast is faced with the global market which dictates increasing specialization and full utilization of scale economies. Furthermore, it is usually assumed that competing against imports is inward-oriented while outward orientation is associated with production for the global market. This distinction is not entirely valid as in some cases a country's goal of competing with imports is to ultimately compete in the international market.

Table 2 Sectoral and market orientation of strategies

Market	Sector			
	Orientation toward importable sector	Orientation toward exportable sector	Orientation toward domestic products	Neutral
Domestic market (inward orientation)	(1) IS	(2) –	(3) DIP	(4) –
Export market (outward orientation)	(5) PEP	(6) EP	(7) –	(8) –
Neutral	(9) –	(10) –	(11) –	(12) FT

Source: Reproduced from Liang (1992: 454)

Table 2 is taken directly from Liang (1992). Its first cell indicates a strategy oriented toward the domestic market with the leading sector associated with import substitution. EP is identified with cell 6, that is, expansion of exportable products destined for the international market. DIP is placed in cell 3 which indicates preference for the domestic market and for non-tradable sectors (mainly services and physical infrastructure) over sectors producing exportable or importable goods. Free trade with sectoral and trade neutrality is shown by cell 12. Furthermore, cell 5 represents PEP, a strategy targeting the leading sector that is competing with imports with the goal to enhance its export capabilities. While PEP is an outward-oriented strategy, it also relies on import substitution. With an IS sectoral orientation and an EP market orientation, it creates a balance between the requirement of optimal resource allocation and the need for structural change and development of future strategic resources. The rest of this chapter extensively benefits from Liang's classification to discuss Iran's trade and foreign exchange rate policy trends and its industrialization trajectory.

Trade and Industrial Development in Iran Prior to the 1979 Revolution

Throughout the two and a half decades prior to Iran's 1979 Revolution, the country's foreign exchange earnings from the sales of petroleum filled the gap between savings and investments and acted strongly to reduce current account deficits. Receiving foreign direct investment and borrowing from abroad further helped Iran to overcome the main obstacles to rapid growth faced by most other developing countries. Yet, Iran's reliance on oil income also rendered unnecessary the adoption of any trade orientation aiming to promote non-oil exports. This situation was exacerbated during the last 2 years of prerevolutionary Fourth National Development Plan and throughout the 5-year period of the Fifth Plan, as despite the high rate of inflation, the exchange rate remained unchanged, thanks to the oil income. In effect, the strengthening of domestic currency favored imports as it discriminated against exports. Relying on oil exports and with prevailing IS regime during 1962–1973

and DIP during 1974–1977, the volume of imports grew much more rapidly than non-oil exports. The ratio of non-oil exports to imports declined from 16.5% in the prerevolutionary Third Development Plan (1962–1967) to 15.9% in the prerevolutionary Fourth Development Plan (1968–1973) and then to 4.5% in the prerevolutionary Fifth Development Plan (1974–1979) (CBI 2016a).

During the prerevolutionary Fourth and Fifth Plans, the government directly invested in the production of petrochemicals, basic metals (steel, copper, and aluminum), and machinery with the goal to advance the country beyond the first stage of industrialization that relied on inexpensive labor and technology. Although some of the large-scale industrial initiatives launched during the prerevolutionary Fifth Plan were not completed until after the 1979 Revolution or even the end of the Iran-Iraq War, plenty of important projects came into fruition in this period. Yet, among these, heavy industry initiatives often suffered from small size of the domestic market and lack of possibilities for full utilization of scale economies as well as outdated technology imported from the Eastern Bloc countries and lack of attention to the acquisition of technical and managerial know-how. Notwithstanding, with the full support of the government, durable goods produced by manufacturing firms in Iran enjoyed market monopoly. Firm owners, whether Iranian or foreign or the government itself, benefited from sizable economic rents and were thus not inclined to improve the quality of their products, reduce their costs, diversify their product portfolios, or ensure customer satisfaction. This situation created little incentive for technological upgrading or impulse for competitiveness.

Trade Policies Since the 1979 Revolution

It was suggested earlier that trade policy includes the management of exchange rate as well as the incentives regime influencing sectoral and market orientation of economic activities. In the previous section, it was pointed out that prior to the 1979 Revolution, Iran's trade policy was chiefly influenced by the availability of foreign exchange. Yet, this section and the next show that policies adopted by the government on trade and industry in the postrevolutionary period have also been highly affected by current account deficits or surpluses.

Developments in the Real Exchange Rate

Several exchange rate policy periods are discernable in Iran after the 1979 Revolution. In the first period running from 1979 through 1986, the price of US dollar was officially set at rates between 70 and 92 Iranian rials. This period coincided with postrevolutionary shifts and the onset of Iran-Iraq War as well as related capital flight and reduction of oil export earnings—which prompted the government to directly control foreign trade and establish foreign exchange quotas aiming to check the

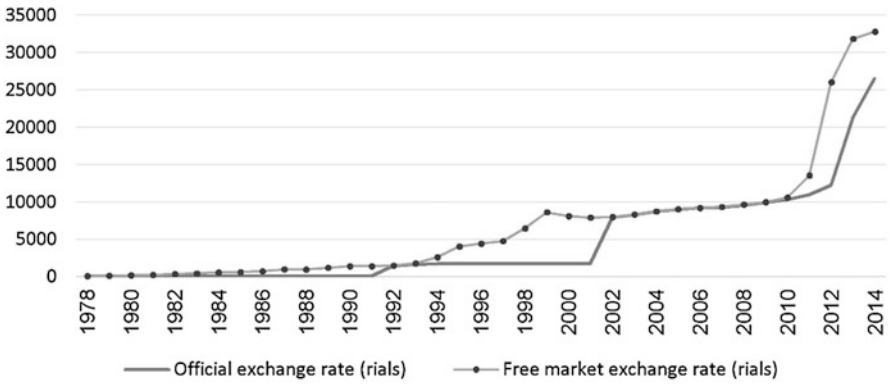

Fig. 1 Official and free market exchange rates (one US dollar), 1978–2014 [Source: CBI (2016a), Economic Time Series Database]

effects of foreign exchange rate on domestic prices. Yet, the high rate of domestic inflation and a drop in oil receipts created a parallel (free or black) foreign exchange market in the country. As illustrated by the two graphs of Fig. 1, which are drawn based on Economic Time Series Database of the Central Bank of Iran (CBI 2016a), the gap between the official and free market exchange rates continued to widen until 1992. Finally, in that year, the government took the decision to devaluate the Iranian rial with the aim to unify the exchange rate under a floating system. Yet, due to the persistence of high inflation rates (caused by the expansionary fiscal and monetary policies) as well as reduction of tariffs and nontariff barriers to imports, this situation would not be easily sustained. In fact, the government was again obliged to fix the nominal exchange rate. Lasting until 2001, this again created a gap between the official and the black market exchange rates that became widest in 1999—e.g., 1755 rials for one US dollar at the government rate and 8634 rials for one US dollar in the parallel market. At the start of the postrevolutionary Third National Development Plan in 2000, the government again resorted to official devaluation of the rial to adopt a managed floating exchange rate system. Due to the country's increasing foreign exchange earnings as well as better fiscal and monetary policies, this initiative proved durable. It lasted until 2010, when the intensification of international sanctions imposed on the Iranian economy resulted in a growing cleavage between the official and black market exchange rates. In 2014, the official and black market exchange rates between Iranian rial and US dollar were 26,509 and 32,801, respectively. At the time of this writing, in light of the Joint Comprehensive Plan of Action signed between Iran and the permanent members of the United Nations Security Council plus Germany, the Iranian government again intends to unify the multiple exchange rate system.

As indicated by Fig. 1, the gap between the official and black market exchange rates (shown for US dollar) has been wide except for the period 2002 through 2010. In most years between 1979 and 1999, importers with access to government-allocated foreign currency benefited from considerable economic rents, especially since

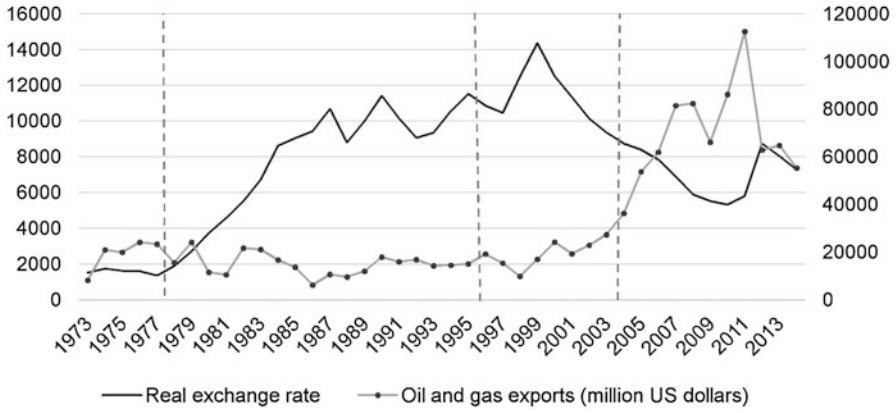

Fig. 2 Developments in real exchange rate and oil/gas exports [Source: CBI (2016a), Economic Time Series Database]

controlling the price of imports sold in the Iranian market was futile. Exporters able to convert their foreign exchange earnings into Iranian rials at black market rates also profited handsomely. Others were outcompeted and incurred losses. In the period 2002–2010, the competitiveness of Iran's industry was severely compromised. Figure 2 illustrates rapid changes in the real exchange rate in Iran over the past four decades. It is indicative of a lack of foreign exchange policy compatible with either export promotion or import substitution. Fluctuations experienced in the country's foreign exchange market have been chiefly influenced by oil shocks as well as expansionary fiscal and monetary policies adopted by the government in various periods. Under these circumstances, the private sector has not been able to formulate its export-related investment decisions with even a modicum of confidence.

Table 3 further shows developments in nominal and real exchange rates across various time periods in Iran. A number of factors have been cited in the literature as affecting the real exchange rate (see Bems and de Carvalho Filho 2009: 7–8) that are applicable to the case of oil-exporting countries. In the Iranian economy, positive oil shocks—most recently during 2000–2010—had the following effects on real exchange rate.

- Domestic consumption grew through real income or wealth effects, thus bidding up the relative price of non-tradables and causing real appreciation.
- Through the Balassa-Samuelson effect, productivity grew in the tradable sector, thus bidding up wages in the non-tradable sector and contributing to higher relative prices in the non-tradable sector—again a real appreciation.
- Net foreign assets, generally associated with higher wealth and investment income, rose to afford a more appreciated real exchange rate. Yet, the relationship between these assets and the real exchange rate is unclear for the case of oil-exporting countries. For one thing, increases in net foreign assets may only indicate the conversion of underground oil resources into assets abroad, which

Table 3 Developments in nominal and real exchange rates for different periods

Years	1961–1973	1974–1977	1978–1989	1990–1993	1994–1999	2000–2010	2011–2014
Length of period	13	4	12	4	6	11	4
Gap between official and free market rates	1.2	1.1	7.1	1.9	2.9	1.2	1.5
Range of nominal exchange rate in the free market (rials)	68–76	68–71	100–1207	1412–1806	2635–8634	8131–10601	11532–26500
Range of real exchange rate (rials)	1534–1778	1375–1753	1903–10005	9346–11421	10572–14359	5323–12497	4901–5891
Trade policy	IS	DIP	IS	DIP	IS	DIP	IS

Note: Gap between official and free market exchange rate is based on the ratio of average free market exchange rate to simple average of official rate
Source: First and second period from Hady Zonooz (2010: 307–308); third through sixth period from CBI (2016a), Economic Time Series Database.

does not increase total wealth. A better indicator would thus be the sum of net foreign assets plus underground oil wealth.

- Government spending increased, with strong implications for the real exchange rate, as it would orient domestic demand toward non-tradable goods.
- Trade constraints increased domestic prices and raised the value of domestic currency. Constraints were in place on trade in Iran during 1979–1991 through import quotas and outright import ban of a number of products. They were removed in the period 1992–1994 but reinstated during 1995–2001. Subsequent to the unification of the exchange rate starting in 2002, nontariff barriers were eliminated. This situation was sustained until the intensification of international sanctions against Iran in 2011–2012, after which the government again imposed quantitative restrictions on imports.
- Furthermore, price controls—which may reduce the consumer price index and decrease the value of domestic currency—were pursued vigorously in the period 1979–1991. They were somewhat relaxed between 1992 and 1994, resumed during 1995–1999, once more reduced through 2010, and strengthened again between 2011 and 2014.

Iran's real exchange rate fluctuations have been much more pronounced in comparison with both advanced industrialized countries and exporters of manufactured products (Ministry of Industry, Mines, and Trade 2015). The real exchange rate decreased throughout the periods of positive oil shocks—particularly 1974–1977 and 1999–2010—in the country, which reveals discrimination against exports (Ibid.). In both periods, Iran's open-door trade policy exposed domestic industry to strong competition by imports. It may thus be gathered that the Iranian government has tended to adopt a policy of DIP during oil booms, especially since the nominal exchange rate has been used as a nominal anchor to check inflation. Even in the period 1990–1993, although the government attempted to unify the exchange rate and eliminate nontariff barriers to trade, expansionary fiscal and monetary policies concurrently in effect made the realization of these aims impossible, and in practice the country's trade balance deficits resulted in mounting foreign debt.

Trade Policy and Nominal Rate of Protection for Domestic Production

In the period 1979–2001, the weighted average exchange rate for imported commodities was lower than that in the free market (see Fig. 3). For this reason, the government tried with various degrees of vigor to prevent, through price controls, the receipt of additional rent by importers. Yet, these efforts were in vain, as importers' capital continued to bloat through the initial postrevolutionary years, the Iran-Iraq War, and subsequently. From the time the government adopted a floating exchange rate system in 2002, the gap between official and free market

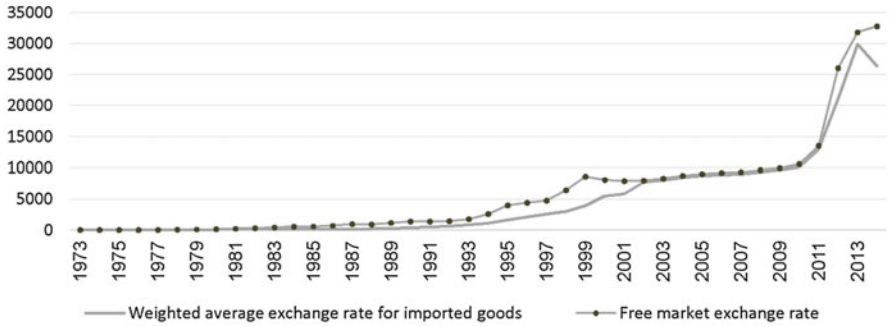

Fig. 3 Free market exchange rate and weighted average exchange rate for imported goods (rials) [Source: CBI (2016a), Economic Time Series Database; balanced averages calculated by author]

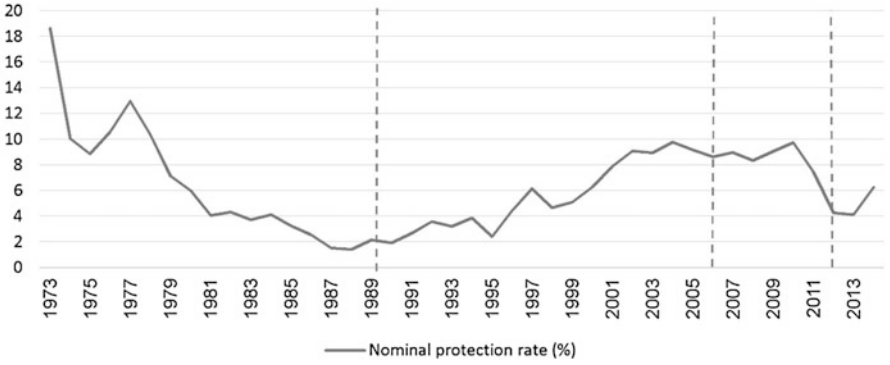

Fig. 4 Nominal rate of protection based on free market exchange rate (percent) [Source: CBI (2016a), Economic Time Series Database; CBI (2000 through 2013), Economic Trends. Nominal protection rate calculated by author based on nominal free market exchange rate]

rates was reduced, and price controls were relaxed at least until the end of the postrevolutionary Fourth Development Plan in 2010. Figure 4 illustrates the nominal rate of protection based on the free market exchange rate in Iran during a 40-year period. In the immediate aftermath of the 1979 Revolution through the end of the Iran-Iraq War in 1988, the nominal rate of protection experienced a decreasing trend. Between 1989 and 2004, the nominal rate of protection continued to increase, while it remained more or less stable in the period 2005–2010, and again experienced a decreasing trend thereafter. Table 4 further classifies Iran's exchange rate and trade regimes during the last half a century after Liang.

Table 4 Developments in Iran's trade policy

Years	1961–1973	1974–1977	1978–1989	1990–1993	1994–1999	2000–2010	2011–2014
Length of period	13	4	12	4	6	11	4
Degree of economic openness	18.3	29.1	18.5	25.5	14.9	23.0	18.9
Average nominal protection rate in terms of each dollar of imported goods (rials)	–	7.5	16.2	44.4	242.1	839.2	1352.3
Average nominal protection rate (percent)	–	10.6	4.2	2.8	4.4	8.7	5.5
Quantitative import restrictions	Existing	Existing	Existing	Reduced	Existing	Existing	Existing
Goods smuggling	Small	Small	Moderate	Moderate	Large	Large	Large
Trade policy	IS	DIP	IS	DIP	IS	DIP	IS

Source: Protection rates calculated by author based on CBI (2016a), Economic Time Series Database, and CBI (2000 through 2014), Economic Trends. Degree of openness estimated as the ratio of imports of goods and services to GDP at current prices based on data from World Bank (2016), World Development Indicators

Financial Incentives Regime

The exchange rate and protection provided to the domestic industry through tariffs and nontariff barriers are an important part of the financial incentives regime in any economy. In Iran, it is further important to take into consideration some other key indicators, namely, the real interest rate on bank credits, the real price of energy carriers, and corporate taxes. Concerning the latter, in Iran's tax laws, both before and after the 1979 Revolution, newly established industrial firms have always enjoyed tax exemptions for their first years of operation. During the postrevolutionary Third Plan, progressive rates were replaced by a flat 25% rate. The recent revisions made to the tax law in 2015 also contain a number of tax exemptions for businesses (National Taxation Affairs Organization 2015).

Furthermore, against the background of Iran's oil and gas wealth, provision of subsidies to reduce the consumer price of energy carriers has played a vital role in inter-sectoral resource allocation and manufacturing exports. For long periods of time, the price of energy carriers in Iran was lower than its opportunity cost. The low cost associated with energy consumption in Iran has naturally led to wasteful use and lower earnings from oil exports. Furthermore, richer households have tended to benefit more from the hidden subsidies due to their higher level and more diversified energy consumption. The real price of energy carriers (excepting auto fuel) remained constant during 1991–2009, while there was a considerable gap between domestic prices of energy and border prices (Majlis Research Center 2010). Eventually, with the adoption of the law on subsidy reform (to make them "targeted") and its implementation after 2010, this gap narrowed. Yet, the gap increased quickly again due to the runaway inflation and reduction in the value of Iranian rial. This experience showed that, without macroeconomic stability and reduced inflation to manage the value of the domestic currency, attempts at reforming the price of energy carriers are in vain. The share of natural gas in the total energy used by Iran's manufacturing establishments with ten or more employees is 77%, while another 13% is in the form of electricity and 7% comes from black oil (SCI 2012). As Fig. 5 indicates, energy use is most intense in the production categories "other nonmetallic minerals," "basic metals," and "petrochemicals." These are the same industries experiencing the fastest growth after the 1979 Revolution so that their combined share in total manufacturing value added at constant 2004 (Persian calendar year 1383) prices reached the figure of 60.8% in 2012. Their comparative advantages in the international arena have in fact been associated with the hidden energy subsidies they have received. This is revealed by examining Iran's manufacturing exports in the period 2000–2012 (see the section on the performance of manufacturing exports in this chapter).

Figure 6 provides information on the real interest rates associated with banking facilities provided to the industrial sector. In the period 1984–2014, due to controls exercised by the Currency and Credit Council as well as the Central Bank, the real interest rate for banking facilities was negative. This meant that public and private firms were able to benefit from sizable economic rents. Government controls were

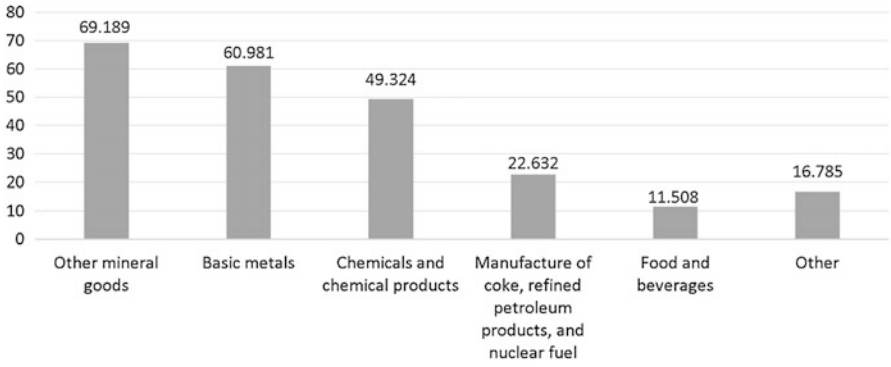

Fig. 5 Energy consumption by workshops employing ten or more workers in 2012 (million barrels of oil) [Source: SCI (2012), Survey Results for Consumption of Energy by Industrial Workshops Employing 10 or More Workers]

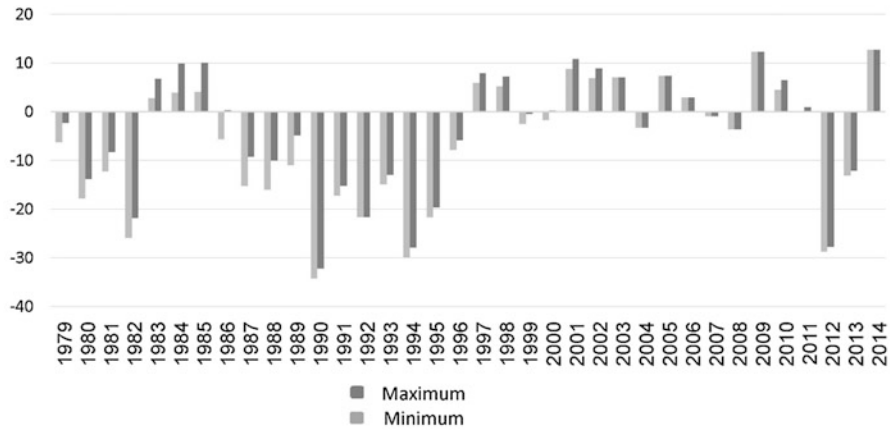

Fig. 6 Real interest rate of banking facilities provided to industrial sector, 1958–2014 [Source: Calculated by author, based on data from CBI's (1979 through 2010) Annual Review and CBI's (2012 through 2014) Economic Trends; conversion of nominal to real rate for banking facilities was made using the implicit price index of value added in the manufacturing sector]

particularly strong in the period 1986–1996. During the postrevolutionary Third Development Plan period (2000–2004), the government attempted to rationalize the rates on deposits and borrowing by privatizing public banks and allowing the establishment of new private banks. However, during the two-term presidency of Mahmoud Ahmadinejad, the government again pursued the provision of inexpensive banking facilities to the housing sector as well as a program to support the initiation of small ventures that were supposed to quickly generate employment. With the unleashing of inflationary forces during Iranian fiscal years 2012–2013 and 2013–2014, the country again witnessed negative discount rates for banking

facilities which was reversed in 2014–2015 with the reduction in the inflation rate. With little correspondence between the rates on deposits and lending, associated with the subsidies provided to the latter, the appearance of long queues and the need for credit rationing became inevitable. Under such circumstances, discrimination against small private manufacturing firms in favor of publicly owned companies as well as financial corruption became rampant while banks took to investing in companies they directly controlled. In the recent period, growth in the volume of bad loans, inadequacy of capital, expansion of illegal financial institutions, and the bank's turning to direct ownership of firms have jeopardized the sustainability of Iran's banking system, while shortage of banking facilities has become a major obstacle to increasing production and manufacturing investment.

Trade Deficit and Measures to Address It

It is argued in economic theory that the equilibrium exchange rate is that which provides for foreign trade balance in the long run. Obviously, an economy with an overvalued currency will be faced with not only reduced international and domestic competitiveness but also potential trade deficit and mounting foreign debt. When the government uses the nominal exchange rate as an anchor for controlling domestic prices, while oil export earnings are decreasing, implementation of foreign exchange quotas and quantitative restrictions on imports are unavoidable in order to prevent chronic foreign trade deficits. In Iran, whenever foreign exchange has been hard to come by (in particular during the periods coinciding with the Iran-Iraq War and the postrevolutionary Second Plan), the main concern of Iran's trade policy has been reduced to addressing the current account balance rather than protecting domestic production. If we exclude oil exports, since 1973, Iran's trade balance has remained negative (Fig. 7). However, the first and second oil booms created foreign trade surpluses for the country, while surplus growth through the latter period (1999–2011)

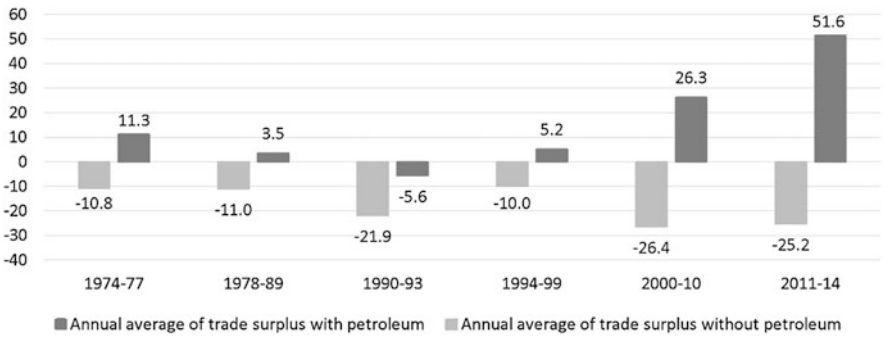

Fig. 7 Trade balance with and without oil exports [Source: CBI (2016a), Economic Time Series Database; CBI (2016b), Economic Trends, No. 82]

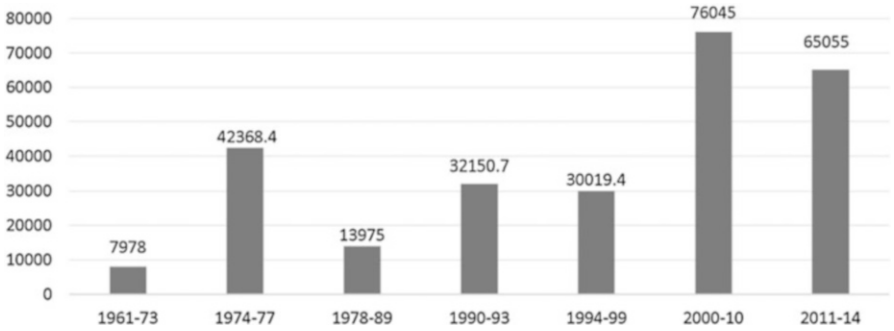

Fig. 8 Annual average investment in the manufacturing sector (billion rials, at constant 2004 prices) [Source: CBI (2016c), National Accounts—1959–2012; CBI (2016b), Economic Trends, No. 82]

had a long course. Furthermore, it was in this period that anchoring the exchange rate despite two-digit inflation resulted in significant economic impacts that appeared as "Dutch disease" and reduced growth with some delay.

During each period of oil boom, as the gap between domestic saving and investment as well as foreign exchange obstacles to imports has been addressed, access to imported capital goods and funds for manufacturing investment have improved, while adequate supply of spare parts, semifinished products, and raw materials has allowed higher rates of capacity utilization in the manufacturing sector. Figure 8 shows the jump in manufacturing investment during both the first (1974–1977) and the second (2000–2010) oil booms. In contrast, during the initial postrevolutionary years and through the Iran-Iraq War, foreign exchange shortages together with political and economic instability severely reduced capital accumulation in the manufacturing sector.

From IS to DIP and Back

Import Substitution for Self-sufficiency After the Revolution and Through the War

At the time of the 1979 Revolution, there existed a significant volume of outstanding loans taken by owners of manufacturing units who had fled the country with part of their capital. A large number of such units were nationalized after the Revolution along with all heavy industrial units which according to Article 44 of the Constitution of the Islamic Republic were supposed to be government-owned. The new leaders of the country were suspicious of the world market forces and saw a panacea in reducing the country's economic reliance on the West by decreasing oil exports as well as nationalizing large industrial units, banks, and foreign trade. Also, in practice, Iran's international tensions and the outbreak of Iran-Iraq War resulted in

Table 5 Regulations governing imports of industrial goods to Iran, 1984–1987

Description	Number of items
Number of items whose imports are banned	637
Number of items whose imports require special permit from a government ministry	1605
Total number of items subject to ban or control	*2242*
Total number of items not subject to ban or control	1189
All items covered by regulations on imports	*3431*

Source: Trade Promotion Organization of Iran (1984 through 1987), Import and Export Regulations

the imposition of economic sanctions on the country which disrupted its trade with the West. As foreign exchange shortfalls were further exacerbated during the first postrevolutionary decade, the government attempted to stabilize the foreign exchange rate through the imposition of quotas, quantitative restrictions on imports, high rates of tariff on imports, and widespread price controls. Hidden or overt subsidies on basic consumer goods and energy were provided in conjunction with such actions. These policies were meant to gain self-sufficiency through import substitution, overcome economic dependence, control inflation, and achieve social justice. Their results however did not amount to much more than increased reliance on oil income, growth of rentier networks, spread of corruption, and formation of a new capitalist class acting as clients of political power and bureaucracy. As Table 5 indicates, during the period 1984–1987, the list of products whose imports either were banned or required special permits became much longer than the rest. Furthermore, during the period under investigation, the law governing direct taxes continued to have serious negative impacts on investment in manufacturing. While the law's content changed quite often with ever more ambiguous articles, imposition of progressive corporate taxes and calculation of depreciation based on the book value of assets were major defects in its practices. Other public agencies, in particular the Social Security Organization and municipalities, exacted social security contributions and local taxes.

Iran's financial markets during this period saw little development or deepening. By nationalizing private banks and significantly strengthening its direct grip on economic activities, the government moved toward etatism, while the private sector faced discrimination. During the Iran-Iraq War, a significant part of the government's budget deficit was financed through the Central Bank. To curb inflation under such circumstances, the government took to controlling money multiplier through increasing reserve requirements of the banks and imposing ceilings on banking credits in addition to using the exchange rate anchor. At the same time, it issued a series of diktats to increase the share of government-owned companies and less-developed areas from banking credits. Yet, after the war, as banking credit restrictions were relaxed, the volume of debt associated with government and private companies to the banking system increased substantially. Furthermore, efficiency was seriously compromised due to the blurring of the line between commercial and

specialized banks, direct involvement of banks in managing production units, and lack of competition among banks. The Bank of Industry and Mine inherited a large number of problematic and indebted industrial units. With its capital and reserves remaining limited, it was no longer able to act as a specialized bank. Instead, it became focused on managing industrial units under its control as well as direct investment in new industrial initiatives, with its credit mainly directed toward financing these activities.

In most years during this period, rates on deposits and borrowing were lower than that of inflation, so that depositors provided significant subsidies to borrowers from the banking system. Yet, an unfavorable business climate together with foreign exchange shortfalls and economic sanctions resulted in a severe reduction in gross fixed capital formation in the manufacturing and mining sector, with only a temporary oil-induced respite during Iranian fiscal years 1983–1984 and 1984–1985. Furthermore, the rates of capacity utilization for most industries were low, as they had little success in addressing their foreign exchange needs for the upkeep and renovation of their machinery. Low on its finances, the government did not have the capacity to carry to completion large industrial initiatives inherited from before the Revolution. These problems reduced the rate of growth in the manufacturing sector to 1.5% per annum (CBI 2016c).

Experiences during the war revealed the fact that when the economy depends on oil exports while capital accumulation as well as utilization of the existing capacity in the manufacturing sector is contingent upon imports of capital and intermediate goods, it is impossible to achieve high rates of industrial growth through nationalizing trade and industry, halving oil output, and minimizing economic relations with the outside world.

Economic Liberalization and DIP During 1990–1993

With the reduction of Iran's international isolation after the end of the war with Iraq, the government initiated a number of economic reforms as part of its postwar reconstruction efforts. These especially included attempts at attracting foreign investment, liberalization, and structural adjustment to address domestic economic and particularly price distortions. As a result of government efforts, the gap between official and free market exchange rates was reduced. Bureaucratic hurdles facing exports were curtailed while export income as well as imported production inputs became tax and duty exempt. As shown in Table 6, there was no reduction in the number of items on which quantitative import restrictions were imposed. However, government agencies would be more likely to grant permits for items requiring them. Furthermore, customs tariff rates were reduced considerably so that the earlier nominal rate of protection of 5.6% was reduced to 4.2% in this period.

The government restricted price controls to a small number of commodities in the postwar period and increased the highly subsidized price of energy carriers. Furthermore, quantitative restrictions on banking facilities were relaxed while rates on bank

Table 6 Regulations governing imports of industrial goods to Iran, 1988–1992 and 1993–1997

Description	Number of items 1988–1992	Number of items 1993–1997
Number of items whose imports are banned	631	680
Number of items whose imports require special permit from a government ministry	1797	3642
Total number of items subject to ban or control	2428	*4322*
Total number of items not subject to ban or control	1012	229
All items covered *by regulations on imports*	3440	4551

Source: Trade Promotion Organization of Iran (1988 through 1997), Import and Export Regulations

deposits and lending were increased to reduce subsidies provided to the latter. These initiatives however fell short of making real interest rates positive. During the first 4 years of the First Plan (1989–1992), net fixed capital formation in the industry and mining sector grew (CBI 2016c). This was short-lived however against the backdrop of the unification of exchange rates as well as expansionary fiscal and monetary policies adopted by the government. The latter policies resulted in rising inflation which reduced any competitiveness gained as a result of devaluation. This combined with the effects of trade liberalization also created large trade deficits and foreign debts. The privatization initiative pursued by the government did not materialize in any effective way either due to the inadequacy of institutional and legal frameworks. Yet, economic reforms hurt vulnerable social groups. In the end, bureaucrats and the recently formed state class who were threatened by the possibility of instability reached an agreement with conservative politicians to halt the economic reforms.

Stabilization Policy and IS During the Second Plan (1994–1999)

By mid-1994, wide exchange rate fluctuations and mounting foreign debt had left the government no choice but to initiate new measures to control the foreign currency market and domestic prices. Under the rubric of economic stabilization, these measures included attempts at curbing domestic demand and imports. As their side effects, non-oil exports decreased and GDP growth that had gained momentum after the war stalled. Additional problems arose due to the legislative's reduced confidence in the executive branch which delayed the approval of the Second Plan. Once approved, its main thrust rested on instituting economic austerity with the aim to repay the country's foreign debts. An IS regime was imposed on the country as a result of the balance of payments deficits. The Second Plan also coincided with an oil slump as well as devastating droughts across Iran, which resulted in its underperformance as compared to the First Plan. Nonetheless, the manufacturing sector grew at an average annual rate of 7.2%, while net capital formation associated

Table 7 Effective protection rate in selected branches of manufacturing industry in Iran, 1996

Exchange rate per dollar against rial	Cotton and synthetic fibers textile (five plants)	Petrochemical products (one plant: Arak)	Cement (19 plants)	Steel sheet products (one plant: Mobarakeh)
2480	22.5	339.2	177.2	190.7
3108	−2.2	250.5	121.2	132.0
3750	−19	190.5	83.3	92.1

Source: Reproduced from Hady Zonooz (2004: 147); calculations based on Corden (1966) method

with manufacturing and mines increased during 1996–1998 (CBI 2016c). As shown in Table 7, the effective protection rate during the plan (given here for 1996) associated with energy-intensive industries including petrochemicals, steel, and cement were considerable—mainly resulting from the difference between the domestic prices of inputs and energy used by them and those of international prices.

DIP During 2000–2010

Starting in 2000, oil revenues began to recover—first slowly registering at an annual average of US$26.1 during the Third Development Plan (2000–2004) and then in unprecedented ways resulting in the annual average figure of US$77.8 million during 2005–2011 (CBI 2016a). Increased foreign currency earnings allowed the maintenance of a single exchange rate after 2002—that is, the ratio of the official and free market rates dropped from the earlier 2.9 to 1.2 (CBI 2016c). Due to the oil boom and expansionary fiscal and monetary policies, the real exchange rate continued to decrease and thus reduced the competitiveness of domestic products. While quantitative restrictions on imports were removed, the nominal rate of protection increased in comparison to the previous period. Yet, the latter did not prevent the loss of competitiveness experienced by the domestic industry. DIP may be associated with both periods of the Third and the Forth Plans. However, the two periods are different in terms of government's fiscal and monetary policies and their effects.

Policies During the Third Plan (2000–2004)

Several important trade-related initiatives were carried out during the Third Plan, including removal of nontariff barriers together with reduction of tariffs, unification of exchange rate and institution of a floating exchange rate regime, and structural reforms in the customs administration as well as approval of a new law for attraction of foreign investment by the parliament. Revised rates for imported items subject to tariffs were set as follows: 52% of items at a rate of 15% or lower, 20.6% at rate between 20 and 35%, and 27.4% at a rate between 40 and 200 percent (WTO 2009: 54). The

reforms allowed Iran to secure an observer status with the World Trade Organization in June 2005. During the Third Plan, net fixed capital formation in the manufacturing and mining sector grew sustainably. This growth in the first 4 years of the plan was larger than the previous 10 years, but it slowed down in the last year to register at 4%. Non-oil exports also grew but their absolute value remained rather small by the end of the period (CBI 2016c).

Policies During the Fourth Plan (2005–2010) and Preparation of the Fifth Plan

The Fourth Development Plan was in practice rejected by President Ahmadinejad's administration. Furthermore, the Fifth Development Plan was prepared by the government as a set of regulation, approaches, and goals without quantitative targets. The main policy followed by the government during the two-term Ahmadinejad presidency (2005–2013) comprised the injection of ever-increasing oil-boom money in the economy to gain popular support. Expansionary monetary and fiscal policies gave rise to severe inflationary pressures. Yet, to address inflation, the government turned to free trade and DIP as well as to anchoring the nominal exchange rate. Similar to the period of the Third Plan, no quantitative restrictions were placed on imports while the nominal protection rate, at about 9%, remained close to that of the Third Plan. During the Fourth Plan, the real exchange rate decreased substantially and domestic firms lost their competitiveness significantly. Furthermore, smuggling of goods to the country increased greatly. Yet, as high oil prices also meant a boom for energy-intensive products—including petrochemicals, basic metals, and minerals—Iranian firms specializing in them were able to expand their exports by leveraging low domestic prices of energy. The average export figure for Iran's manufactured products (excluding oil and gas) surpassed US$10 billion for the first time (CBI 2009, 2013). Annual investment in the manufacturing and mining sector during 2005–2011 also expanded and reached 80,000–100,000 billion rials (at constant 2004 prices). Despite these developments, the oil boom quickly gave rise to symptoms of the Dutch disease as the competitiveness of Iran's economy was reduced and industrial sector growth registered below 5% for 2007 and 2008 (CBI 2016c). In particular, imports of all types of products—from fruits and basic foodstuffs to consumer appliances and luxury items that were imported via both official customs and smuggling—increased in unprecedented ways. This hurt not only Iran's non-energy-intensive manufacturers but also farm producers, whose calls for a change of policy to restrict imports fell on government's deaf ears.

Table 8 shows that the net tax rate on imports in 2011 was below 10% for 17 manufacturing subsectors, while it was around 15% for 1 subsector, between 20 and 30% for 3 subsectors, and above 70% for 1 subsector. Smuggling in Iran is especially associated with subsectors having the highest rates in the table.

Table 8 Net taxes on manufacturing imports in 2011 (percent)

Subsector	%
Manufacture of radio, television, and communication equipment and apparatus	71.8
Manufacture of tobacco products	27.3
Manufacture of machinery and equipment n.e.c.	21.6
Manufacture of medical, precision, and optical instruments, watches and clocks	20.1
Manufacture of office, accounting, and computing machinery	15.2
Manufacture of paper and paper products	7.4
Manufacture of other transport equipment	6.3
Manufacture of rubber and plastics products	6.0
Publishing, printing, and reproduction of recorded media	5.5
Manufacture of textiles	5.1
Manufacture of fabricated metal products, except machinery and equipment	4.7
Manufacture of basic metals	3.2
Manufacture of motor vehicles, trailers, and semitrailers	2.8
Manufacture of wood and wood products, including furniture	2.1
Manufacture of electrical machinery and apparatus n.e.c.	1.4
Manufacture of other nonmetallic mineral products	1.4
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness, and footwear	1.1
Manufacture of chemicals and chemical products	0.6
Manufacture of furniture; manufacturing n.e.c.	0.4
Manufacture of food products and beverages	0.1
Manufacture of wearing apparel; dressing and dyeing of fur	0.1
Manufacture of coke, refined petroleum products, and nuclear fuel	−0.4

Source: Based on Statistical Center of Iran (2014), Input-output tables for 2011

It may be argued that reducing tariffs and nontariff barriers is the only way for Iran to join the WTO. This however requires a road map through which domestic industry would be exposed to international competition slowly. Yet, decreasing the real exchange rate by fixing the nominal rate against the backdrop of two-digit inflation rates amounts to a clear case of discrimination against domestic producers. Furthermore, using the nominal exchange rate as an anchor to combat inflation is justified only with the additional presence of anti-inflationary fiscal and monetary policies and better means to control factors responsible for the growth of money supply.

Intensification of International Sanctions and Return to IS During 2011–2014

Iran's dependence on oil revenues has made it highly vulnerable to negative oil shocks. The intensification of international sanctions imposed against Iran after 2011 in addition to an oil slump starting in 2014 gave rise to a serious case of stagflation in

the country. Furthermore, a sudden devaluation of the domestic currency became inevitable. The country suffered from foreign exchange shortages in 2012 and 2013, which disrupted its international transactions. Affected by these circumstances, fixed capital formation associated with manufacturing and mining decreased in 2012–2013, and the sector's value added shrank (CBI 2016c). The economy grew by 3% in 2014 due to the easing of sanctions on petrochemical and auto industries—which allowed for their growth through tapping underutilized capacity—as well as increased oil production. Yet, declining oil prices after mid-2014 reduced the industry and mining sector's growth. Furthermore, GDP growth dropped down to −1% in 2015.

Summing Up the Experiences

A close look at the financial incentive structure in postrevolutionary Iran (1979–2014) reveals a lack of long-term strategic approach to industrial development—which is similar to the prerevolutionary situation. Most government initiatives after the Revolution have been formulated and carried out in response to external shocks. As such, they have been subject to swift changes. All in all, the government has fanned the flames of inflation and has at the same time attempted to restrain it by fixing the nominal interest rate and controlling prices. Protection provided to domestic industry has been indiscriminate and fortuitous. It has been neither time-bound nor tied to any industry performance in terms of quality, cost, or export. With significant differences between domestic and competitive prices and against the background of complex regulations governing imports and exports, industry entry and exit, exchange and interest rates, and access to financial resources, it is almost impossible to gauge the impacts of trade policy or protective measures as a way of guiding policy. Needless to say, the nature and effectiveness of the formulated policies have also reflected the legal and institutional frameworks with which they are associated (of which more later).

Impact of Trade Strategy on Industrial Structure and Growth

Competitive Industrial Performance in the International Context

Lack of fiscal and monetary discipline and reactive foreign exchange policies on the part of the Iranian government is arguably related to the country's overreliance on oil export revenues, which makes it highly sensitive to negative or positive oil shocks. These effects have prevented Iran from playing any significant role in international

exports. Similar to some of the countries now counted as industrialized—e.g., South Korea—Iran started its industrialization drive with the promotion of large-scale manufacturing activities as well as private sector development in the 1960s and 1970s. Yet, the quality of institutions, structures, and policies in Iran has not resembled successful industrializers. For example, in South Korea, industrial investment targeted exports and relied on selective, conditional, and temporary protection of private sector producers to eventually capture global markets. In contrast, the Iranian government's earlier promotion of the private sector turned to animosity after the Revolution, which resulted in the flight of both capital and entrepreneurship. Despite the secession of animosity toward the private sector after the end of the Iran-Iraq War, attempts at privatization have in practice resulted in the emergence of large para-statal entities having the upper hand in competition with the true private sector. Furthermore, wide-ranging fluctuations in the real exchange rate and shifting rates of protection in response to the state of balance of payments have severely reduced macroeconomic confidence, thus preventing any significant investment targeting exports (see Hady Zonooz 2013).

On balance, Iran's manufacturing industries have had an inward orientation, as evidenced by their 0.2% share of the global export market in 2012 (Ministry of Industry, Mines, and Trade 2015). Although the value of Iranian manufacturing exports grew between 2001 and 2012, it barely reached US$20 billion by the end of the period (Ibid.). Yet, while a bulk of Iran's foreign exchange earnings have remained dependent on the exports of oil and gas, much of the country's non-energy exports—e.g., petrochemicals, basic metals, and nonmetallic minerals—have also continued to rely on subsidized, low-cost energy (CBI 2009, 2013). As shown in Fig. 9, the ratio of manufacturing exports to imports remained small between 2001 and 2012 (i.e., large negative trade balances for the sector). Reduction of manufacturing imports in 2012 was associated with the intensification of international sanctions against Iran. Furthermore, Iran's export value of high-tech products in the same year was negligible in comparison with its imports, which is an indicator of the country's industrial backwardness (Ministry of Industry, Mines, and Trade 2015).

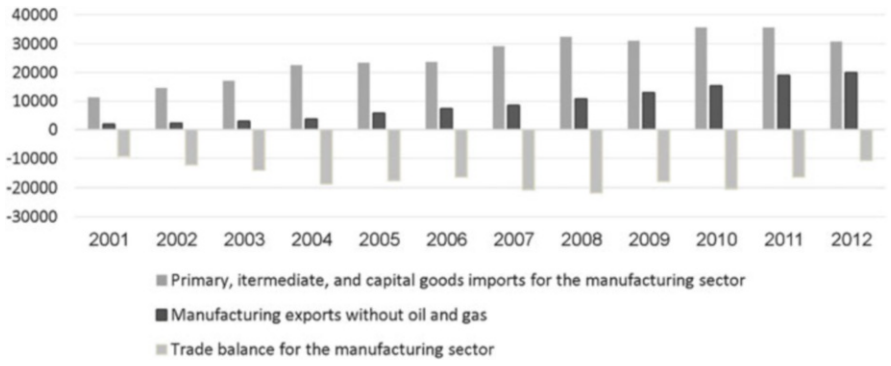

Fig. 9 Impact of the manufacturing sector on trade balance, 2001–2012 (US$ million) [Source: CBI (2009, 2013), Economic Report and Balance Sheet]

Trade Strategy and Manufacturing Growth

Figure 10 illustrates Iran's manufacturing growth rates since the 1960s. There were no negative rates of growth prior to 1977. However, since the Revolution, the manufacturing sector has witnessed 10 years of negative growth—albeit in the immediate postrevolutionary years and during the Iran-Iraq War—as well as 6 years of less than 5% growth. Furthermore, subsequent to each period of oil boom (and DIP), the country has experienced negative growth rates.

Yet, as no sustained export orientation has ever been adopted in Iran, trade policy has not been the main factor influencing the country's industrial development. As shown in the figure, three periods of rapid industrial growth may be discerned for the Iranian economy under distinct trade policy regimes. These are 1961–1973 associated with IS, 1974–1977 associated with DIP, and 2000–2010 associated with DIP. Their similarities include absence of foreign currency shortages, little gap between official and free market exchange rates (dominance of the free market), limited government intervention to set prices for manufacturing products, direct investment by the government and para-statal firms in the manufacturing sector, access to foreign investment and credit, government's strong will for economic and industrial development, and absence of or reduced international political tensions. Conversely, the historically weakest performance of Iran's industrial sector is associated with the revolutionary and postrevolutionary turmoil and Iran-Iraq War or 1978–1988—with 5 years of negative growth—as well as the intensification of international sanctions during 2012–2014, with 2 years of negative growth. In both periods, the country faced significantly reduced oil export revenues with serious negative implications for its international transactions. While import substitution was adopted as a response to the situation, manufacturing investment experienced significant reductions. As indicated in Fig. 11, per capita manufacturing output (in terms of value added at constant

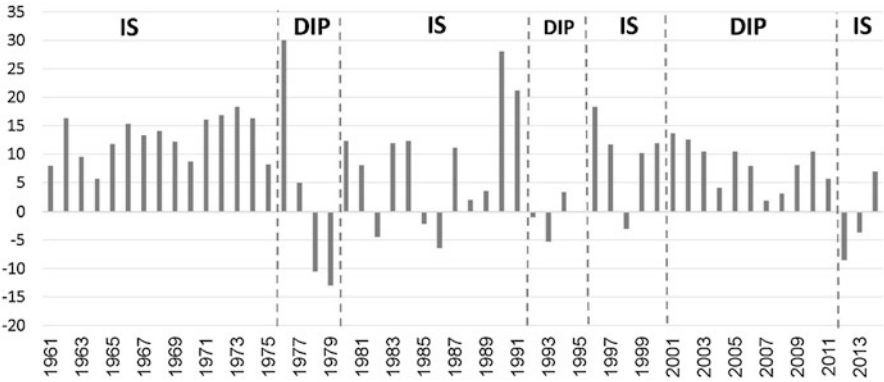

Fig. 10 Growth rates of manufacturing value added at constant 2004 prices (percent) [Source: CBI (2016c), National Accounts—1959–2012; CBI (2016b), Economic Trends, No. 82]

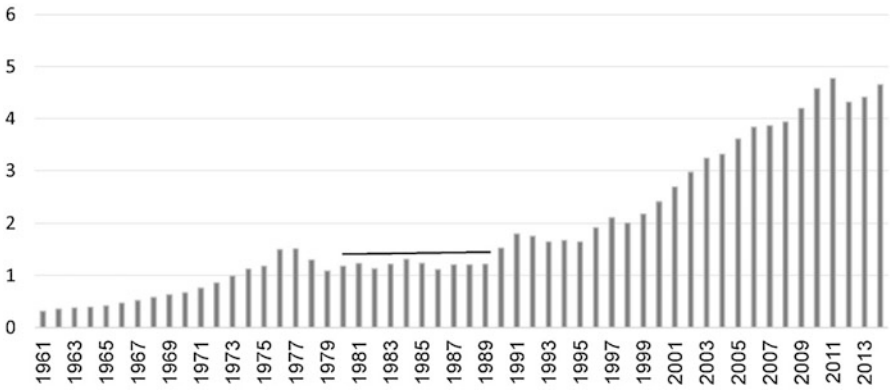

Fig. 11 Per capita manufacturing output at constant 2004 prices (million rials) [Source: CBI (2016c), National Accounts—1959–2012; CBI (2016b), Economic Trends, No. 82; CBI (2016a), Economic Time Series Database]

prices) declined between 1978 and the end of the war, but thereafter experienced a rising trend through 2011.

Several reasons may be cited for the relative success of IS and DIP during 1961–1973 and 1974–1977, respectively, and their relative failure in the postrevolutionary period. To begin with, there arose a contradiction after the Revolution between the government's trade policies as well as financial incentives system and its other economic policies. For example, the government has placed severe controls over the price of manufactured products while at the same time has provided the sector with hidden and overt subsidies. Similarly, the government has provided credit to the manufacturing sector at preferential rates while at the same time has directed banking facilities toward public sector firms and has additionally earmarked much of the oil export earnings for current government expenditures rather than developing physical infrastructure. Furthermore, there has been a serious conflict between the government's policies to protect domestic industry in the postrevolutionary period and its institutional arrangements associated with the economy (the performance of market forces being determined by their institutional framework in significant ways). Widespread confiscation of domestic and foreign-owned firms in the immediate aftermath of the Revolution seriously reduced the security of private property rights. Courts continued to create ambiguity with this regard in their rulings in subsequent periods, which increased transaction costs significantly. To these a host of other debilitating effects should be added, including conflicts in labor relations, overhaul of the financial system toward Islamic banking, problems associated with tax laws, increasing bureaucratic inefficiency and escalation of corruption, and political instability and increased international tensions. As mentioned, government's promotion of industry in subsequent periods has been mostly associated with the rise of a para-statal pseudo-private sector benefiting from substantial rents in direct competition with the less state-dependent private sector. In contrast, the prerevolutionary periods of industrial growth were marked by political

stability, excellent international relations, access to foreign assistance and investment, promotion of a new private sector industrial and entrepreneurial capitalist class, and government's investment in physical infrastructure and quality human capital as well as heavy, capital-intensive industries.

Yet, the additional impact of trade policies on industrial growth in the postrevolutionary period may be summarized as follows. Foreign currency abundance—which can result in the Dutch disease—and shortages that lead to the imposition of quantitative limits on imports both hurt manufacturing investment. The remedy is to restrict injection of additional oil revenues to the economy during oil booms by saving it to address shortfalls during the periods of oil slump in addition to benefiting from foreign financing. These require prudence and discipline on the part of the government as well as reducing international credit risks associated with the country. Neither has been seriously pursued by the postrevolutionary government.

A bulk of Iran's manufacturing imports comprise capital and intermediate goods obtained against the exports of oil. Thus the rates of capital accumulation, capacity utilization, and growth momentum in the country's industrial sector—against the background of the factors discussed above for the supply and demand sides—are highly dependent on oil revenues and mimic their fluctuations. Negative industrial growth rates in the postrevolutionary period are directly related to oil slumps but have been accentuated due to the country's lack of access to international financial markets.

Industrial Growth and Change

Despite the rapid growth of manufacturing in the 1970s, its share of GDP remained small at the time of the Revolution, while it became even smaller through the postrevolutionary upheavals and the war with Iraq. Yet, from the First through the Third Plans, industry's growth rate outpaced that of the economy as a whole and increased the sector's share of GDP (Fig. 12). The oil boom experienced during the Fourth Plan initially resulted in industrial and GDP growth. However, the declining real exchange rate and trade liberalization halted further growth. This situation was exacerbated due to the intensification of Western-imposed sanctions against Iran especially after 2012, which gripped the country with stagflation and reduced the manufacturing share of (non-oil) GDP.

In the period 1994–2011, Iran's manufacturing sector experienced a rapid growth. But the average annual growth rate of chemical industries, basic metals, nonmetallic minerals, and machinery industries has been faster than other manufacturing subsectors (CBI, National Accounts Statistic at 2004 constant prices). The performance of the former three is related to the country's comparative advantage in terms of oil and gas based on which hefty energy subsidies have been provided to these industries. Iran's construction industry, which was in a perpetual state of boom until recently, also provided a strong demand for metals and nonmetallic minerals subsectors. Furthermore, Iran's auto industry is an oligopoly

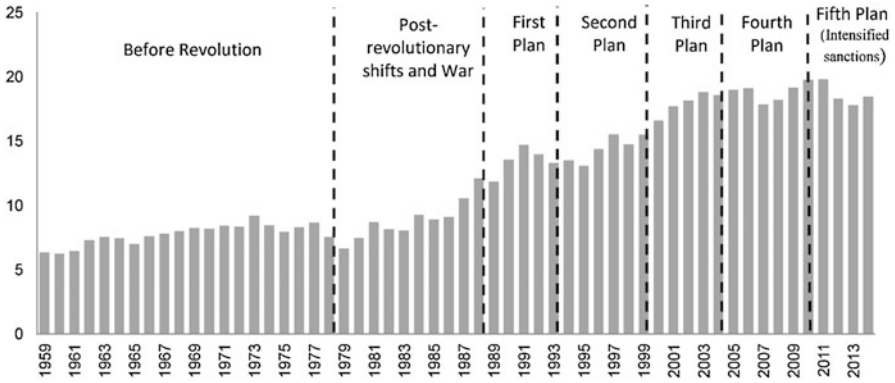

Fig. 12 Share of manufacturing value added in non-oil GDP, 1959–2014 (percent) [Source: CBI (2016c), National Accounts—1959–2012]

Table 9 Domestic resource costs for selected manufacturing industries, 1996 (rials)

	Domestic resource costs per US dollar of exports (rials)			
Exchange rate per US dollar against rials	Cotton and synthetic fibers textile products	Petrochemical products	Cement products	Steel products
2480	2971	3662	7715	7885
3153	3153	3562	8227	9113
3750	3338	3869	8750	10206

Note: Official and market exchange rates in 1996 were 1754 and 4446 rials, respectively
Source: Reproduced from Hady Zonooz (2004: 152)

supported by a fast-growing domestic market and strong protection provided by the government against its foreign competition. Food and beverages have also experienced rapid growth of demand due to the expansion of population and urbanization. In contrast, manufacture of wearing apparel has lost grounds due both to the growth of other sectors and to strong foreign competition.

Overall, IS together with a nonselective and unconditional protection regime adopted over long periods of time has restricted Iran's industrial development to the domestic market. Cost-competitive production at appropriate scales have also been hampered in the second round of IS associated with the production of intermediate goods, industrial machinery, and automobiles. It has further resulted in the emergence of monopolies, rent-seeking, and technological obsolescence. These effects have been exacerbated in the last three and a half decades due to Iran's problem-laden international relations. Furthermore, government's intervention in the market for commodities, capital, and foreign exchange has arguably hurt static efficiency in resource allocation in serious ways. Table 9 sheds light on this outcome by providing information on domestic resource costs as a measure of static efficiency. In 1996, at the shadow price of 3750 for one US dollar, the petrochemical industry (in Arak), steel industry (Mobarakeh mill in Esfahan), and 19 cement plants probed had serious problems with static efficiency among the four analyzed industries.

Conclusion

This chapter benefited from a simple classification of trade orientation to probe Iran's trade and foreign exchange policies over the past four decades in relation to its development and industrialization trajectory. It showed that de facto import promotion has been adopted in Iran during each period of oil boom and/or trouble-free access to external borrowing through easing imports and anchoring foreign exchange rate against inflation. Rather than being an intentional approach, this has followed from irresponsible fiscal and monetary policies, whereby the government has tried to check inflationary pressure by facilitating imports and strengthening the domestic currency. This policy was adopted in the period 1974–1977, possibly helping to unfold the 1979 Revolution. It was also embraced after the Revolution in the periods 1990–1993 and 2000–2010, with two conflicting effects. The first was easing imports of capital and intermediate goods. The second entailed easing imports of consumer goods and discriminating against exports, which negatively affected the market for domestic products. Yet, positive oil shocks are random and short-lived, as evidenced by the recent oil price meltdown after 2014. Import substitution policies were pursued in the period of 1961–1973 before the Revolution and three periods after the Revolution—1978–1989, 1994–1999, and 2011–2014. In the first and third periods as well as part of the second period, the country wrestled with falls in foreign exchange revenues due to oil shocks and embargos facing oil exports. During Iran's Third Development Plan (2000–2004), a short-lived, managed floating rate was adopted successfully, which was consistent with the long-run equilibrium of foreign trade. Furthermore, quantitative restrictions on imports were removed, while protection was provided to domestic industry via tariffs, credit (interest rate) subsidies, and tax exemptions. This minimally adequate framework was unfortunately set aside due to the political economic circumstances influenced by the subsequent oil boom.

Reshaping a framework that puts the Iranian economy back on track requires an array of carefully crafted initiatives. To begin with, maintaining the relative stability of the real exchange rate is crucial to preserving competitiveness. For this to happen, there is a need for fiscal regulations that gradually reduce the government's ability to use oil export revenues for its current expenditures. The money should instead be invested in an oil fund to neutralize later negative oil shocks. Furthermore, while inflation is steadily reduced, interest rates should further be brought into line with the country's development goals as to preclude rent-seeking and the operation of illegal credit institutions. It is also important to gradually rationalize the price of energy carriers. On the trade front, there is a need for strong policy and action to prevent smuggling, dumping, and imports of substandard goods as well as solid initiatives to eliminate nontariff barriers to imports and specially to join the World Trade Organization. In the realm of manufacturing, it is crucial to adopt selective and temporary measures that are further contingent upon performance to protect manufacturing activities with strong growth potentials. While banks specializing in the manufacturing sector and exports should be strengthened, their activities should be streamlined so that their facilities are directed toward high-performing and export-oriented

activities. Combining real exchange rate and industrial policies can especially provide an environment for industrial learning (Astorga et al. 2014).

Indeed, against the backdrop of globalization, technological progress and access to international markets and by extension high rates of growth are almost synonymous with a strong export orientation. A major part of adopting an export orientation has to do with learning to gain existing productive knowledge that is internationally available but not readily accessible. The success of late industrializers is associated with acquisition of knowledge by exposure to the global flows of goods, services, and capital. Important channels for industrial learning include foreign direct investment as well as active participation in the global economy via multinational supply chains (see Spence 2011: 58–69). To do so for an economy like Iran's requires the creation of quality institutions, both formal and informal, which encourage desirable social behaviors through economic means. These include institutions governing money and finance, property rights and contracts, and enforcement and supervision of the rules of the game as well as those addressing market failures, providing social security, and protecting democracy (see Rodrik et al. 2004). Markets must be governed through laws and regulations that are properly enforced so as to minimize market power, internalize externalities, address information asymmetry, set product standards, and ensure safety, among other things. Markets also require appropriate monetary and fiscal policies to address business cycles, unemployment, and inflation. Last, but certainly not least, market achievements must be legitimized under a democratic governance system with a strong social policy.

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Iran's Trade Policies: Connecting to the Markets

Mina Mashayekhi

Introduction

With the removal of at least part of the international sanctions imposed on Iran, the country can now start to increasingly seize economic opportunities linked to international trade and foreign markets. Iran's Sixth Economic, Social, and Cultural Development Plan, formulated for the period 2016–2021, highlights the role of trade, stressing the need to expand mutual economic and trade relations, to leverage economic diplomacy and benefit from the capacity of regional and international organizations, and to become a trade hub and establish special economic zones in strategic locations (Financial Tribune 2015). The strategies and roadmap to connect to foreign markets will naturally need to take into account current trends in international trade, the country's economic and geopolitical context, and its development objectives. In this regard, the formulation of a broad policy mix with a focus on structural transformation is required that must be pursued coherently and tailored to specific development needs to harvest pro-development benefits from international trade, including contributions associated with the 2030 Agenda for Sustainable Development (Agenda 2030) and to its Sustainable Development Goals (SDGs) which Iran has also endorsed.

This chapter begins by establishing the general linkages between international trade and development objectives. It then introduces the global context given by trends in international trade as well as some stylized facts on the Iranian-specific economic context. It continues with an analysis of the structure of the country's merchandise and services trade. This paves the way for several considerations on the multidimensional aspects of trade policy and on how it can support national

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development objectives, for example, through integration in the international trading system and accession to the World Trade Organization (WTO) with terms commensurate to the country's development. The chapter concludes by making reference to some concrete practices that can be part of Iran's trade strategies.

Trade and Development

Trade has had a significant role in the global economy, with exports of goods and services evolving from 11.2% of global gross domestic product (GDP) in 1970 to 30.5% in 2014, as reported by the United Nations Conference on Trade and Development (UNCTAD 2016c). This importance is acknowledged in the Sustainable Development Goals (SDGs), recognizing that trade can be instrumental for the Agenda 2030. In fact, international trade provides the means to connect suppliers and consumers of a country with foreign markets. Exports seize income-generating opportunities by, inter alia, expanding demand, benefiting from possible higher returns, and bringing production possibilities closer to full capacity. These can directly impact the achievement of goal 1 of SDGs on ending poverty. Such export-related mechanisms affect output and employment levels, which are of central importance to goal 8 on economic growth. Imports as well can increase the availability, variety, and affordability of goods and services, with important development effects, for example, in the case of medicines, vaccines, food, and environment-related goods and services (UNCTAD 2014). This matters for goal 2 on ending hunger, goal 3 on ensuring healthy lives, and goal 14 on the use of the oceans. International trade also allows for inflows of input factors as raw materials, intermediate inputs, equipment, technology, knowledge, and services—encompassing the infrastructure services sector (ISS). Therefore, supply capacity—including export capacity—in all economic sectors can become more efficient and more prepared to meet new and diversified markets and provide more value-added goods and services. This is central for goal 7 on energy, goal 8 on economic growth, and goal 9 on infrastructure (see Table 1).

Services and more particularly ISS are expected to play a significant role in SDGs. Several SDGs refer directly to ISS and basic services, while in others the role of the services sector is necessarily implied. More specifically, goal 1 on ending poverty aims at ensuring by 2030 "that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services." Services like education, health, energy, telecommunications, water, sanitation, and finance—including financial inclusion—are present. This comprises goal 1 on ending poverty; goal 3 on ensuring healthy lives; goal 7 on ensuring access to affordable, reliable, sustainable, and modern energy for all; and goal 9 on building resilient infrastructure, promoting inclusive and sustainable industrialization, and

Table 1 SDGs: selected trade-related goals and targets

Goal 1. End poverty in all its forms everywhere
1.1 By 2030, eradicate extreme poverty for all people everywhere
Goal 2. End hunger, achieve food security
2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect
Goal 3. Ensure healthy lives
3.b Provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and public health
Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all
7.1 By 2030, ensure universal access to affordable, reliable, and modern energy services
Goal 8. Promote sustained, inclusive, and sustainable economic growth
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading, and innovation
8.a Increase aid for trade support for developing countries including through the enhanced integrated framework for trade-related technical assistance to least-developed countries
Goal 9. Build resilient infrastructure
9.1 Develop quality, reliable, sustainable, and resilient infrastructure, including regional and transborder infrastructure
9.3 Increase the access of small-scale industrial and other enterprises to financial services
Goal 10. Reduce inequality within and among countries
10.a Implement the principle of special and differential treatment for developing countries
10.c By 2030, reduce to less than 3% the transaction costs of migrant remittances
Goal 14. Conserve and sustainably use the oceans
14.6 By 2020, prohibit certain forms of fisheries subsidies
Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development
17.10 Promote a universal, rules-based, open, nondiscriminatory, and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda
17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least-developed countries' share of global exports by 2020
17.12 Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least-developed countries, consistent with the World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least-developed countries are transparent and simple and contribute to facilitating market access

Source: Reproduced from the United Nations (UN 2015b)

fostering innovation. Access to financial services is mentioned frequently in SDGs[1] and is therefore a key element in implementing the Agenda 2030. Furthermore, goal 9 adds the requirement to "develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic

[1]References are found in the following goals: (1) no poverty, (2) zero hunger, (5) gender equality, (8) decent work and economic growth, and (9) industry, innovation, and infrastructure.

development and human well-being." The SDGs implicitly and explicitly rely on universal access for a set of ISS and basic services like health, water, energy, transport communication, and finance while encouraging the development of other services like research and development to eradicate totally extreme poverty (UNCTAD 2015).

Yet, the translation of international trade and economic growth into development benefits is not automatic. Income benefits can be diminished and not adequately distributed with market failures affecting efficient resource allocation, with income inequality arising between agents participating in trade-related activities and others who are not involved, and with trade-related structural changes bearing adjustment costs. In addition, international trade may create short-term incentives to specialize in activities that reflect already existing factor endowments, which can be nonaligned with structural transformation strategies toward diversification and upgrading aspirations of developing countries. Instead, it may lock and accentuate external and internal asymmetries and structural heterogeneity. In some cases, global value chains (GVCs) related to trade lead to "thin industrialization," whereby a country specializes in low-skill and low-productivity activities that are less than conducive to long-term development (UN 2015a). For example, labor-intensive, resource-intensive, and low-skill technology-intensive manufacturing exports represented more than 85% of total manufacturing exports from least-developed countries (LDCs) in 2014, an increase from 1995 (UNCTAD 2016c).

It is therefore necessary to put in place a comprehensive set of policies from different areas—including macroeconomic, monetary, fiscal, labor, industrial, technology, trade, investment, services, infrastructure, regulatory, institutional, education, social, and development policies—to harvest development benefits from international trade. This policy mix must be pursued, designed, and implemented in a coherent manner and tailored to specific development needs in a no one-size-fits-all approach, taking into consideration the global and national trade context. To achieve this, it is critical to seize the important momentum created by the adoption of the Agenda 2030 and of its SDGs and translate the aspirations conveyed in these decisions into actions.

Global Context of Trends in International Trade

Trade in Goods

International trade performance has been sluggish in recent years. After a very modest increase of 2.6% in 2015, the lowest since the global crisis of 2008–2009, global trade is forecasted to have grown only 1.7% in 2016 and to grow 2.8% in 2017 (EIU 2016b). This reflects the slow pace of global economy that reduced import demand, not only from developed economies but increasingly from emerging economies, particularly in China—where economic slowdown accounts for one-third of the deceleration in non-OECD import volume growth between 2014

and 2015 (OECD 2015)—but also in Brazil and in the Russian Federation. In addition, there is a decline in trade's responsiveness to output growth. While the ratio of global trade growth to global output growth was closer to 2:1 before the global crisis, it was closer to 1:1 in the period between 2012 and 2016.[2] On the one hand, this happens because major players increasingly source inputs domestically, reducing the role of GVCs in a so-called backlash to globalization. For instance, China's imports of intermediate goods, as a share of total imports, decreased from 34% in 2000 to 19% in 2015.[3] On the other hand, weak investment growth led to a reduction in exports of capital goods while consumer goods, with lower import content, increased. Again, China had a systemic role when trying to rebalance its economy from infrastructure investment and manufacturing to services and consumption.

Additional Context for Trade Downturn

This feeble performance is also linked to trade policy, in particular to insufficient tariff cuts—which are related to already liberalized markets and to the abundance of persistent exemptions—and an increasing number of behind-the-border measures which increasingly determine market access conditions, affecting developing countries more than tariffs. In 2015 there were more product groups contributing to the declining value of global trade. Resort to protectionism rose 50% in 2015, with G20 members being responsible of 81% of the measures implemented this year. While protectionist measures implemented in the first 4 months of each year since 2010 stood between 50 and 100, they have surpassed 150 in the similar period of 2016 (Evenett and Fritz 2016). This may derive from the backlash to globalization, compounded by unemployment rates in some markets, which has also materialized in the call for the separation of the United Kingdom from the European Union.

In addition to the deceleration in volume, the value of world trade in both goods and services contracted in 2015 for the first time since the global crisis. This derives from the depreciation of major currencies against the US dollar—which registered a nominal appreciation of around 20% between January 2013 and April 2016 (see Fig. 1), leading to the decrease in dollar-denominated trade value. The value contraction of world trade also results from the reduction of the value of commodity exports, a consequence of the significant fall in fuel prices since late 2014 and the downward trend of other primary commodities since late 2011 (see Fig. 2). Brent crude oil price reached a 5-year low of $28 per barrel in January 2016, a 40% drop from January 2015, which was already a 50% fall from June 2014 (Bloomberg 2016). Although with considerable uncertainty, this trend is likely to be resilient due to oversupply, with increased quantities among members of the Organization of Oil

[2]UNCTAD calculations based on United Nations (2017) and EIU (2016b).

[3]UNCTAD calculations based on WITS (2016).

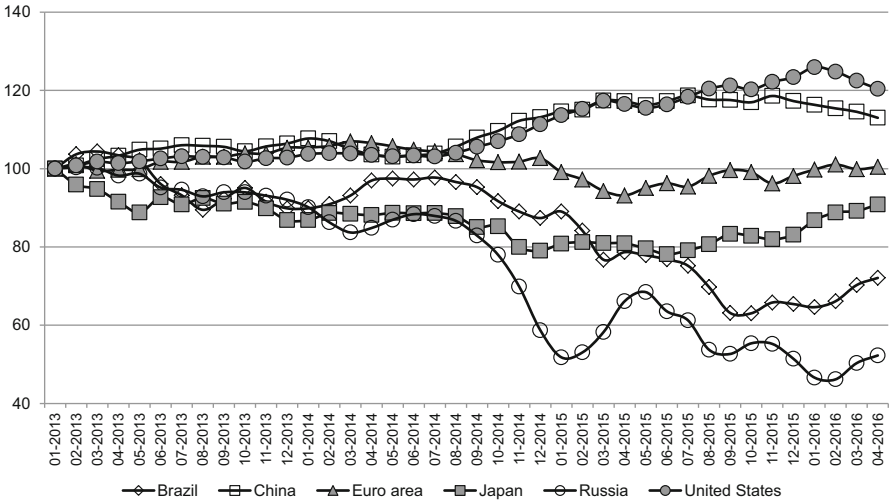

Fig. 1 Nominal effective exchange rates for selected countries (*index 2013/01 = 100*) [Source: BIS (2016), Effective exchange rate online data]

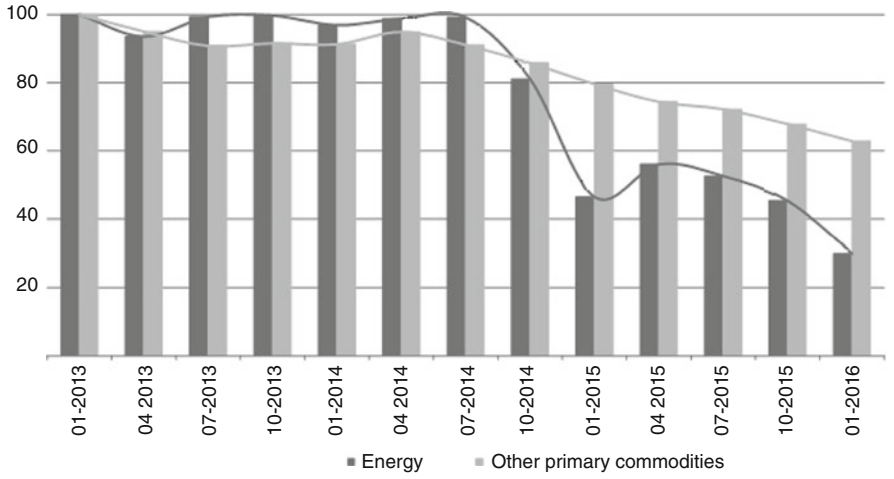

Fig. 2 Trade unit prices of energy and other commodities (*index 2013/01 = 100*) [Source: CPB (2016), World Trade Monitor]

Producing Countries (OPEC)—albeit somewhat slowed by recent agreements—as well as non-OPEC producers. This is augmented by some political stability in producing regions and by the market reentrance of Iran and to weak global demand, especially China. Against this backdrop, the nominal value of global merchandise exports dropped more than 13% from $19 trillion in 2014 to $16.5 trillion in 2015,

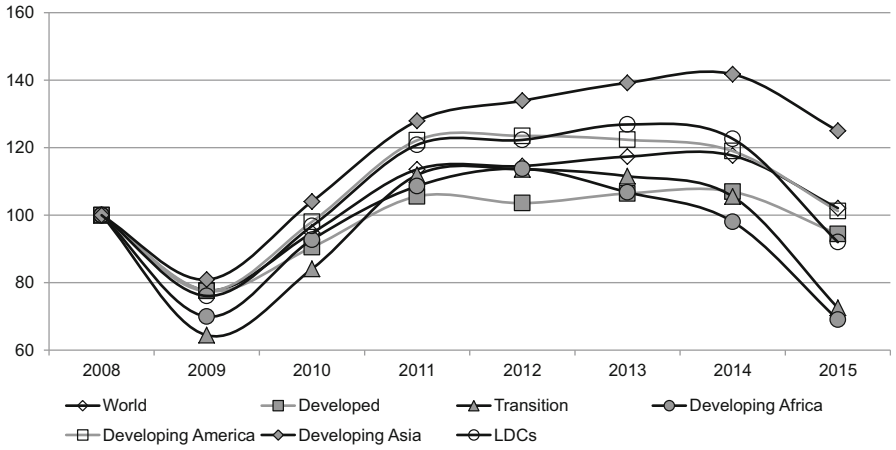

Fig. 3 Merchandise exports by region and development status (*index 2008 = 100*) [Source: UNCTAD (2016c), UNCTADstat]

with exports contracting for developed, transition, and developing economies (see Fig. 3).

Trade in Services

As in the global economic crisis, services have again been more resilient, although global services exports also experienced a decrease of around 6% from $5.1 trillion in 2014 to $4.8 trillion in 2015 (see Fig. 4). Exports contracted for developed, transition, and developing economies, with the notable exception of LDCs, which saw their services exports grow 1.3%. Some higher value-added services sectors have been more dynamic in developing than in developed economies—for example, telecommunications and computer and information services—due to growth in Asia and in Latin America and the Caribbean. This notwithstanding, developing countries still seem to be specialized in more traditional services such as transport and travel, particularly in Africa and LDCs, while developed economies retain the focus on higher value-added services such as financial and insurance services.

The Importance of Services Trade Is Underestimated

The share of services in total exports of goods and services was 27% in developed economies and 15% in developing economies in 2015. Be that as it may, these data underrepresent the importance of services trade as they focus on cross border trade, not capturing the very important contributions of services trade through commercial

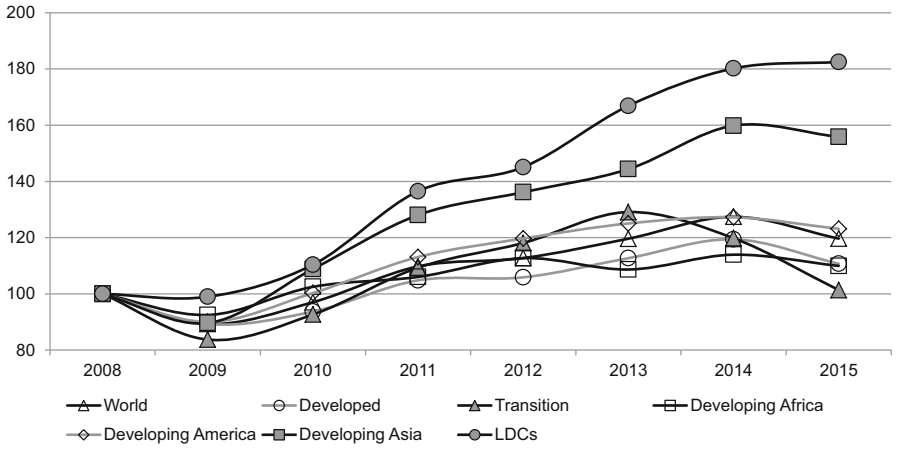

Fig. 4 Services exports by region and development status (*index 2008 = 100*) [Source: UNCTAD (2016c), UNCTADstat]

presence or temporary movement of natural persons. Services trade with commercial presence through foreign direct investment (FDI) is the major mode of supply as inferred by the increased sales by foreign affiliates, from $32 trillion in 2013 to $37 trillion in 2015 (UNCTAD 2016b) (assuming that this increase also derives from its services component). Services have in fact accounted for 53% of global announced greenfield FDI in 2015 or $408 billion (UN 2016). Services exports through mode 4 are also expected to be on a rising trend, based on the growth of migrants and remittances that reached $582 billion in 2015 (of which $432 billion to developing countries) (UN 2016). In 2014, Iran received $1.4 billion in remittances, representing a 3.9% growth over the previous year and a sizeable 14% of its total services exports in the same year (UNCTAD 2016c). In addition, cross border services trade data do not capture the significant value-added services embedded in goods exports. These comprised 59% of gross exports in developed economies and 43% in developing economies and economies in transition in 2011 (see Fig. 5), much above their shares of services exports in total exports. This is even more pronounced in sectors such as energy, chemicals, machinery, and transport equipment (UNCTAD 2016a). It confirms the importance of services as an enabler of all trade and makes services a major option for economic transformation, for export diversification, and for increased participation in GVCs. Indeed, the development potential of the services economy and trade is yet to be fully explored in many developing countries (Mashayekhi et al. 2011).

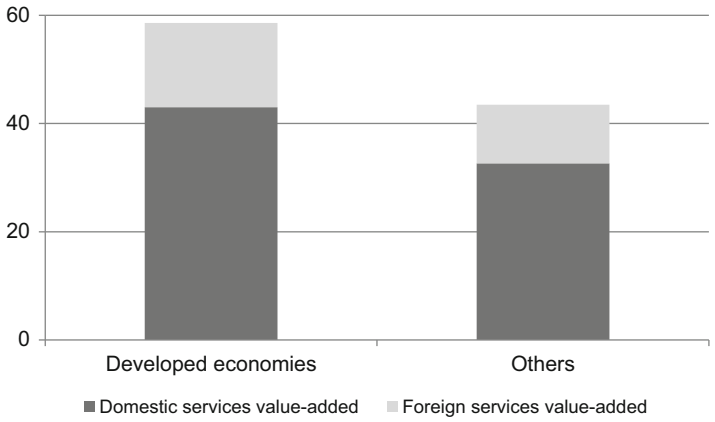

Fig. 5 Domestic and foreign services value-added share of gross exports, 2011 (*percentage*) [Source: UNCTAD calculations, based on OECD and WTO (2016), TiVA database]

New Paradigm of International Trade

Amidst the trade downturn, emerging economies have changed the paradigm of international trade and the international trading system, which are now operating in a multi-polarized world with important regionalization effects (UN 2014). Several developing economies have moved to central positions in global trading networks and have thus acquired a systemic importance. Moreover, regionalism and even GVCs have accentuated the geographic clustering of trade networks also in developing countries. Europe remains an intense trade cluster but now followed more closely by East Asia, in which 56% of the foreign value-added exports came in 2011 from within the region. To a smaller extent, there is also some trade clustering across countries within Latin America and the Caribbean regions. In this context, developing countries may contribute 55% to global GDP by 2025 and 64% to global exports by 2030 (World Bank 2015). China has a key role in this shift, also reflecting the asymmetry within developing countries regarding trade values and directions. Notwithstanding, developed economies retain an important influence on trade trends.

Iranian Economic Context

Output and Employment

The performance of the Iranian economy, measured by annual growth of GDP, was roughly similar between 2005 and 2010 to the performance of several groups where Iran is inserted, including the Economic Cooperation Organization (ECO) and the

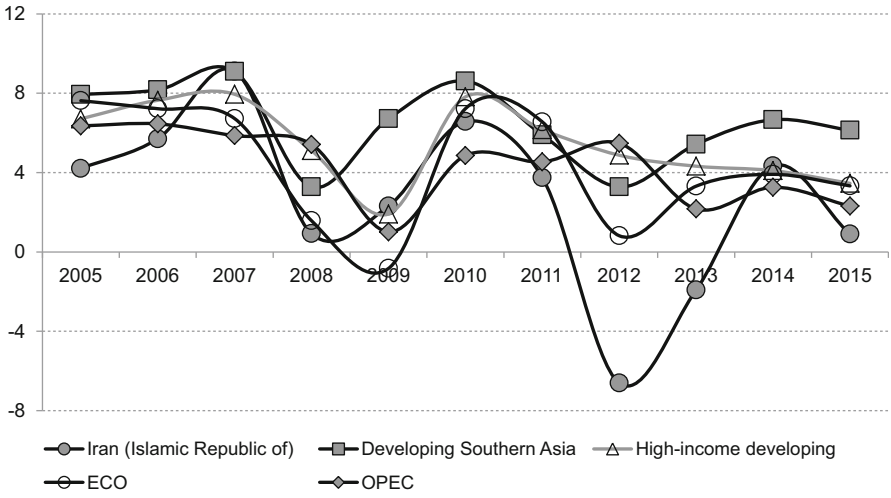

Fig. 6 Annual growth rate of GDP for selected economies, 2005–2015 (*percentage*) [Source: UNCTAD (2016c), UNCTADstat]

OPEC. It was also in line with the performance of its regional and income groups: high-income developing economies and developing economies of Southern Asia (see Fig. 6). This includes the reduction of GDP growth in the global crisis in 2008 and 2009 and the recovery in 2010. The important difference between GDP growth in Iran and in the related groupings occurred in 2012 and 2013, where international sanctions affected the Iranian economy and led to GDP growth of −7 and −2%, respectively (UNCTAD 2016c). Partial relief of sanctions was accompanied by positive growth in 2014. With the lifting of sanctions, GDP growth is estimated to be 4.6% in 2016 and forecasted to be 5.4% in 2017 (EIU 2016c), higher than in the period when sanctions were in force but still below the 8% target of Iran's Sixth Five-Year Development Plan (Financial Tribune 2015). This economic performance in recent years was explained mainly by the effects on international trade, which was the most responsive component of GDP. It also had negative growth during the global crisis and the period of sanctions and exhibited the highest growth before and after the global crisis and after the sanction period (see Fig. 7).

As indicated in Fig. 8, in 2014, output in Iran concentrated in services (with 60% of total GDP) and in mining and utilities (with 21% of GDP). Manufacturing represented only 11% of GDP and agriculture a mere 7%. This is approximately in line with the average OPEC profile. It is noteworthy that in Iran manufacturing contributes less to output than in other economies in the region (see Fig. 8). This servicification of the economy is also reflected on employment, with 48% of total jobs concentrated in the services sector in 2014—more than in 2005 (see Fig. 9). Industry accounted for 34% of employment and agriculture for 18%. The primary sector has the smaller number of jobs, is the only sector decreasing its contribution to employment from 2005 to 2014, and has the lowest productivity.

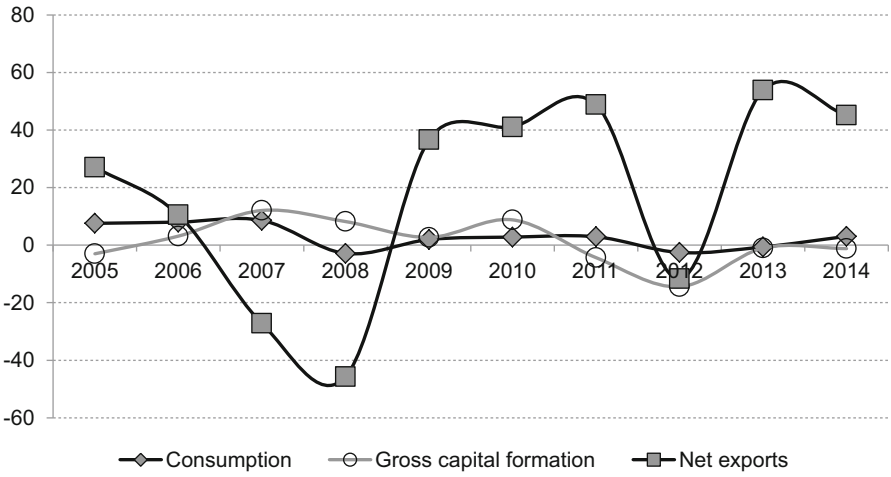

Fig. 7 Iran's annual GDP growth rate by type of expenditure, 2005–2014 (*percentage*) [Source: UNCTAD (2016c), UNCTADstat]

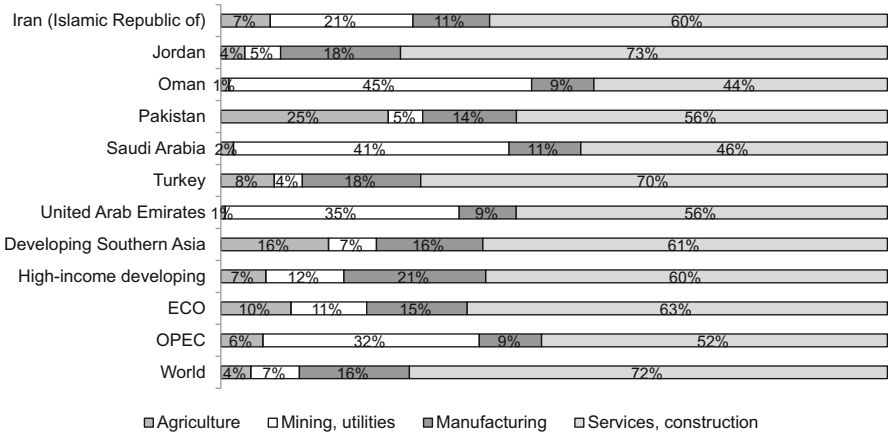

Fig. 8 GDP by type of economic activity for selected economies, 2014 (*percentage*) [Source: UNCTAD (2016c), UNCTADstat]

International Trade

As mentioned, the servicification of the economy is not fully translated into balance of payment-based statistics for international trade either in developed or in developing economies. Iran is no exception, with services exports amounting to $9 billion against $63 billion of merchandise exports in 2015 (UNCTAD 2016c). Still, this derives to some extent from the fact that these statistics for trade in services do not fully reflect the tradability of services, including the value-added services embedded

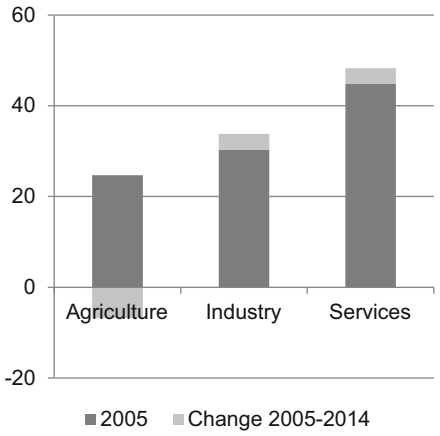

Fig. 9 Jobs by type of economic activity in Iran, 2005 and 2014 (*percentage*) [Source: World Bank (2016a), World Development Indicators]

in goods exports. Using value-added data computed for 2011, and comparing it to traditional statistics for the same year, it can be confirmed that there is an important difference. While services trade accounted for only 5% of gross exports according to standard statistics, the value-added analysis reveals that services are responsible for 22% of the value added in exports.[4]

In any case, these services exports based on balance of payment statistics correspond to the same contribution to GDP as the OPEC average. Merchandise exports in Iran represented a lower contribution to GDP than in the average OPEC profile in 2015 (UNCTAD 2016c). This may reflect the gradual recovery of exporting activities from the crisis period in Iran. The value of the country's merchandise exports, as well as the value of OPEC's merchandise exports, is also being affected by the abovementioned downward trend in energy commodity prices (see Fig. 2). These hypotheses are supported by the evolution of merchandise exports in Iran (see Fig. 10), which grew before the global crisis, decreased in 2009 during the crisis, returned to growth after the global crisis, decreased in 2012 and 2013 with international sanctions, recovered slightly in 2014 with partial removal of sanctions, and plunged in 2015 with the fall in commodity prices.

There is a persistent services trade deficit, and international trade in Iran is strongly dependent on goods, where surplus has been constant (see Fig. 10). Be that as it may, a somewhat positive performance of goods trade is strongly supported by increases in the value and not in the volume of exports (see Fig. 11). This divergence is linked to the strong focus of Iran's merchandise trade on fuel exports, representing 58% of total exports in 2015 (see Fig. 12), which are associated with volatility risks—as confirmed by the recent drop in commodity prices and in goods exports in 2015. This underpins the need to diversify the composition of exports. Services exports have proven to be more resilient to external shocks, without any significant fluctuations during the international crisis, in the period of sanctions and

[4]UNCTAD calculations based on World Bank (2016c).

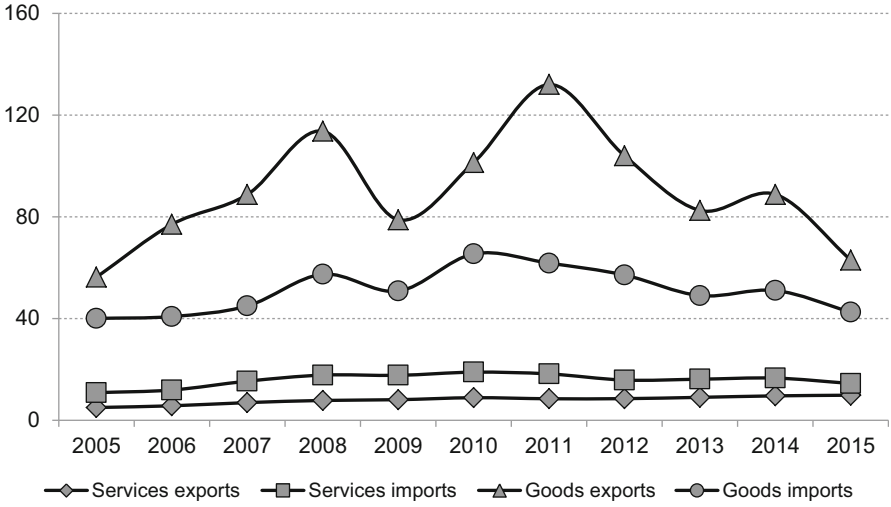

Fig. 10 Iran's exports and imports of goods and services, 2005–2015 (*$ billion*) [Source: UNCTAD (2016c), UNCTADstat]

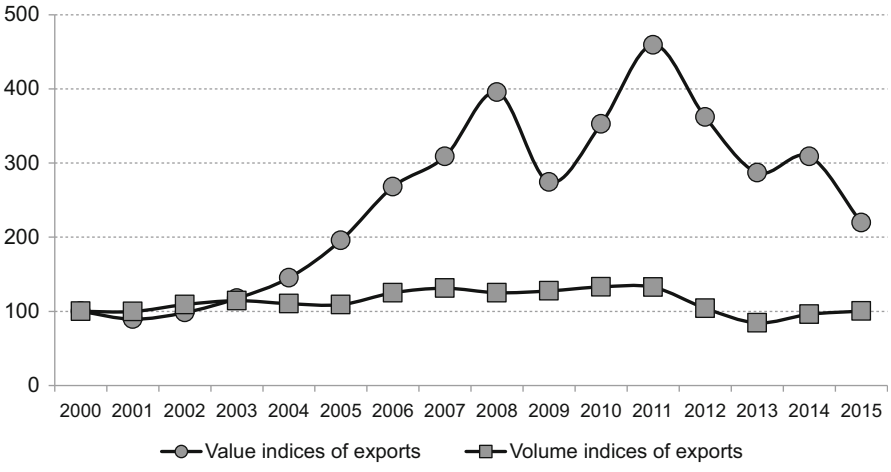

Fig. 11 Value and volume indices of exports for Iran, 2000–2015 (*index 2000 = 100*) [Source: UNCTAD (2016c), UNCTADstat]

in the current commodity price fall. In addition, services exports have displayed steady growth (see Fig. 10), standing as a valid option for diversification. Furthermore, the Sixth Five-Year Development Plan aims for a structural transformation by proposed investments in the agricultural, marine, and industrial sectors that can address volatility risks related to commodity dependence and favor economic and trade diversification.

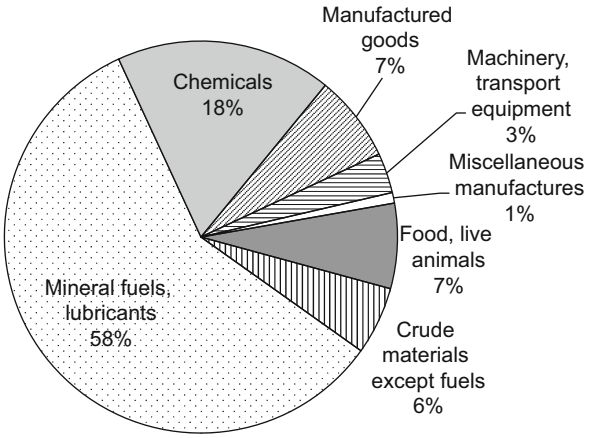

Fig. 12 Distribution of Iran's goods exports, 2015 (*percentage*) [Source: UNCTAD (2016c), UNCTADstat]

Destination Markets for Iranian Exports

In addition to diversify the product composition of exports, it is also important for Iran to diversify the array of export markets. Further to cause a decline in merchandise trade—and consequently in overall trade and output—sanctions caused trade to shift away from Europe toward Asia and the Middle East and to become more concentrated in terms of export markets (see Fig. 13). The ten main markets for Iranian goods exports received 76% of such exports in 2005, whereas in 2015 this number rose to 89%. The main goods export markets in 2015 were, in descending order, China, India, Turkey, Japan, the Republic of Korea, Pakistan, Syria, the United Arab Emirates, Saudi Arabia, and Oman. The focus on trade relations with countries in Southwest Asia, expressed in the Sixth Five-Year Development Plan, needs to be reconciled with diversification objectives.

Trade Perspectives

It is not yet fully clear if there will be developments in the US position toward the Joint Comprehensive Plan of Action, the agreement allowing the lift of sanctions, which may cast some uncertainty as to possible economic effects. As it stands, with the lifting of sanctions, oil exports are expected to increase in volume, with stocks partially compensating for the gradual recovery of recent underinvestments. Still, the positive effects of increased exports are being offset and outweighed by the negative effects of decreasing oil prices. In this context, the OPEC agreement from November 2016 is favorable for Iran as, on the one hand, it limits oil production and induces higher prices and, on the other hand, it recognizes the particular situation of the country—recovering from the period of sanctions—and grants Iran an increase in its quota. The post-sanction scenario has also facilitated the attraction of FDI, including

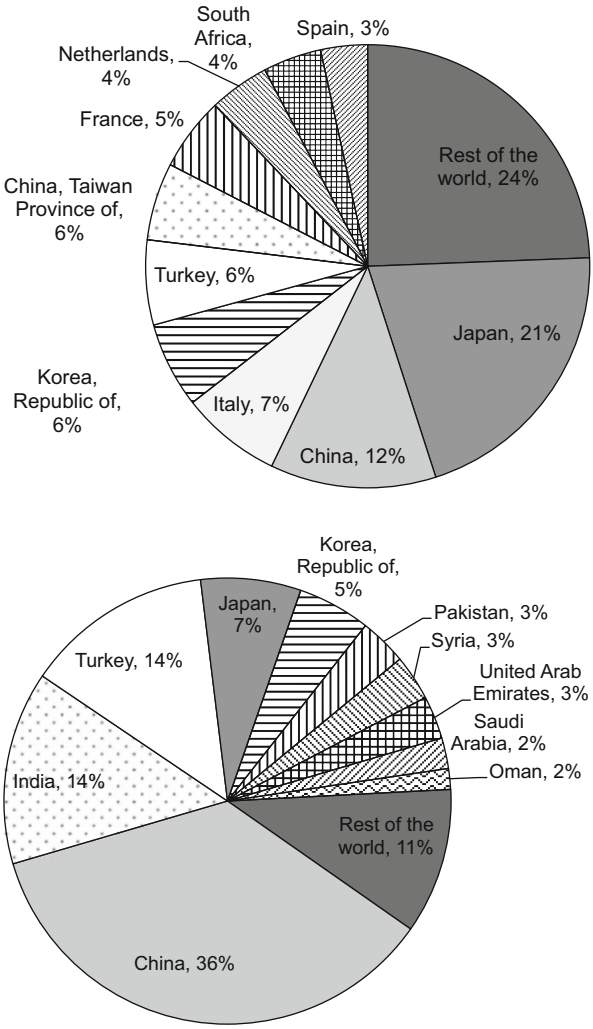

Fig. 13 Distribution of Iran's merchandise exports by partner, 2005 (above) and 2015 (below) (*percentage*) [Source: UNCTAD (2016c), UNCTADstat]

a contract with China to upgrade Iran's biggest refinery (EIU 2016c), improving its supply capacity in these products.

Non-oil trade, such as petrochemicals, automotive, and textiles, will also benefit from more open markets and by the reduction of foreign trade costs, supporting the goods trade surplus. In January 2016, Iran signed $55 billion in deals on hydrocarbons, metals, transport, and automotive sectors (EIU 2016a). A contract was signed with India to develop the important Chabahar port and several Asian and regional banks committed to set up representative offices in Iran. Moreover, Iran has also reached an agreement with France's Renault to open a car assembly plant in the country (EIU 2016c), confirming the country's potential as a market on its own and as a regional hub. Lower costs of imports, investments, and production can increase

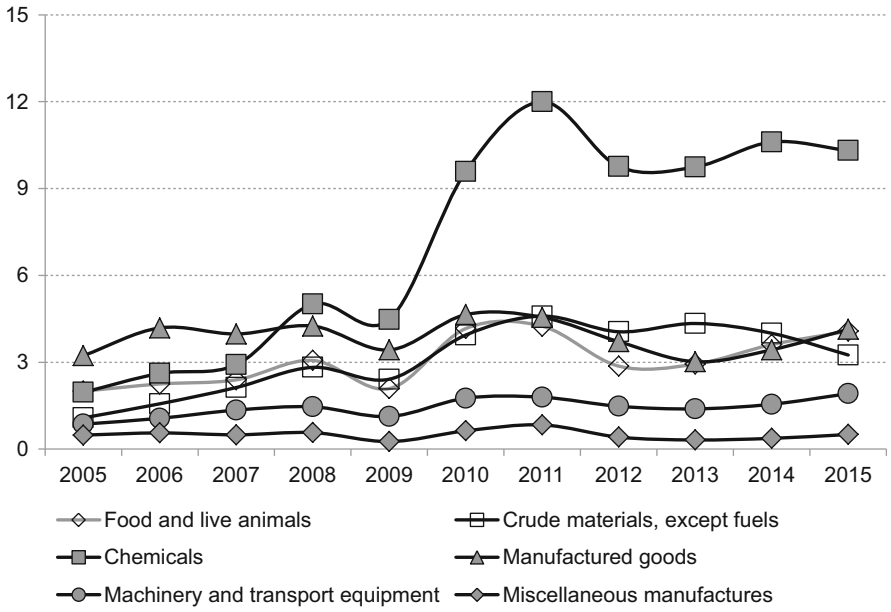

Fig. 14 Iran's non-oil goods exports, 2005–2015 (*$ billion*) [Source: UNCTAD (2016c), UNCTADstat]

supply and export capacity, but an assessment of the structure, performance, and potential of both merchandise and services exports is required so that trade, industrial, and other policies can seek to benefit from comparative advantages to support exports and market diversification, especially in activities with higher value added and productivity. To some extent, some diversification results have been achieved recently. Iran's fuel export share of total exports has decreased from 71% to 58% between 2014 and 2015. In the same period, the importance of the ten main destination markets for Iranian goods exports decreased from 93% to 89% (UNCTAD 2016c).

Structure of Merchandise and Services Trade in Iran

Trade in Goods

Regarding trade in non-oil goods, exports of "chemicals" and of "crude materials except fuels" registered the biggest annual growth between 2005 and 2015—18 and 12%, respectively (see Fig. 14). The higher shares in non-oil exports in 2015 were registered by exports of "chemicals" and of "manufactured goods"—43 and 17%, respectively. Between 2005 and 2015, there was also a relevant annual growth of

Table 2 Revealed comparative advantages associated with Iranian trade in goods, 2005 and 2014

Product group	2005	2015
Gaining comparative advantage		
Food and live animals		1.0
Coffee, tea, cocoa		1.4
Crude materials except fuel		1.5
Hides, skins, and furskins		1.5
Metalliferous ores and metal scrap		2.4
Chemicals		1.5
Organic chemicals		3.3
Inorganic chemicals		2.5
Fertilizers		3.5
Plastics in primary form		3.7
Mineral fuels and lubricants		
Gas, natural and manufactured		2.2
Manufactured goods		
Leather, leather manufactures		1.2
Iron and steel		1.0
Increasing comparative advantage		
Food and live animals		
Live animals	1.2	2.4
Vegetables and fruits	2.1	3.1
Crude materials except fuel		
Crude fertilizers	2.1	6.1
Decreasing comparative advantage		
Mineral fuels and lubricants	5.8	4.8
Petroleum and petroleum products	7.0	5.7

Source: UNCTAD (2016c), UNCTADstat

"machinery and transport equipment" and "food and live animals"—8 and 7%, respectively.

As indicated in Table 2, in 2015, Iran had revealed comparative advantage (RCA) in "food and live animals," including on the subgroup of "coffee, tea, and cocoa," in "crude materials except fuel," including on the subgroups of "hides, skins, and furskins" and "metalliferous ores and metal scrap." In the same year, RCA was also found in "chemicals," including on the subgroups of "organic chemicals," "inorganic chemicals," fertilizers," and "plastics in primary form." There was also a RCA in "leather, leather manufactures," and "iron and steel" within the "manufactured goods" group and on "gas, natural and manufactured," within the "mineral fuels and lubricants" group. These comparative advantages were not revealed in 2005. In "live animals" and "vegetable and fruits" within the product group of "food and live animals," and on "crude fertilizers" within the product group of "crude materials except fuel," RCAs were already found in 2005 but became more pronounced in 2015, most notably on "crude fertilizers." In "mineral fuels and lubricants," including in the subgroup of "petroleum and petroleum products," RCAs are found, although less distinct than in 2005. Nevertheless, the RCA of "petroleum and petroleum products" is still one of the most prominent within

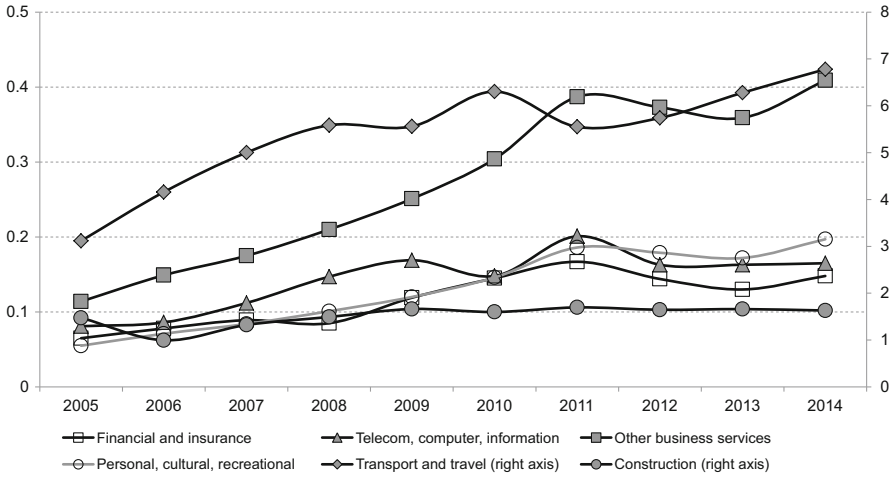

Fig. 15 Iran's commercial services exports, 2005–2014 (*$ billion*) [Source: UNCTAD (2016c), UNCTADstat]

merchandise trade, second only to "crude fertilizers." This evolution may also reveal some results in the diversification of the economy, with some specialization appearing or strengthening within food and live animals, crude materials except fuel, chemicals, gas, and manufactured goods, contrasting with a slight decrease in the specialization in petroleum.

Trade in Services

Between 2005 and 2014, the biggest growth in commercial services sectors was on "other business services" and on "personal, cultural, and recreational services"—15% annually in both sectors (see Fig. 15). In the same period, "financial services" and "telecommunication, computer, and information services" also had important annual growth—10 and 8%, respectively. Still, in 2014 all of these services sectors represented low shares of total services exports: 4% for "other business services" and 2% for the other mentioned sectors. In 2014, the biggest share in services exports is from transport and travel—with 73% of total services exports, which also had important growth between 2005 and 2014—9% annually. Deficit may remain due to rising imports, including from the growing presence of foreign oil firms. The impact should be partly offset by transport and tourism.

As shown by Table 3, in 2014, Iran had a RCA in "travel" which was not found in 2005. It also had a RCA in "personal, cultural, and recreational services," which already existed in 2005 but became more pronounced. RCAs are also found in "transport" and in "construction" in 2014 but less evident than in 2005. However,

Table 3 Revealed comparative advantages in Iranian trade in commercial services

Product group	2005	2014
Gaining comparative advantage		
Travel		1.4
Increasing comparative advantage		
Personal, cultural, and recreational services	1.2	2.4
Decreasing comparative advantage		
Transport	2.1	1.8
Construction	17.1	8.3

Source: UNCTAD (2016c), UNCTADstat

the RCA of "construction" is still the most important within trade in commercial services.

Connecting to Markets: Trade Policy for Development

Policy Mix and Multidimensional Trade Policy

Both the external and the domestic environment need to be taken into account in the set of policies that allow harvesting development benefits from international trade and facilitate its enabling role toward SDGs. It is important to mainstream such concerns into national policy agendas, including on macroeconomic, monetary, fiscal, labor, industrial development, technology, trade, investment, services, infrastructure, regulatory and institutional frameworks, education, and social policies, in a whole-of-government approach. These policies must be pursued, designed, and implemented proactively and tailored to specific needs in a no one-size-fits-all approach. This policy mix should consider national and local, bilateral, regional, and multilateral dimensions. That is particularly important to ensure policy, regulatory, and institutional coordination. Institutional aspects are in fact critical to a successful developmental outcome, as an integrated policy action requires adequately mandated, fully financed, and coordinated institutions. The multiplicity of policy areas requires a coherent and integrated approach, including by unified guiding documents. This coherence of trade policy, particularly in trade in services, is envisioned on SDGs.

Trade policy itself is multidimensional and it should rely on a coherent set of initiatives. Trade negotiations and the international trading system are key instruments to provide market access opportunities, to remove barriers and reduce trade costs. They can be instrumental to generate confidence in investors and trade partners, providing a context where trade benefits can be reaped. The network of agreements should also contribute to product and market diversification—as called for by the current national context of Iran (see Figs. 12 and 13)—and enable linkages with industrial, investment, and other policy areas. Iran has trade agreements with Belarus, Bosnia and Herzegovina, Cuba, Iraq, Kyrgyzstan, Pakistan, Syria, Tunisia,

Turkey, and Uzbekistan, and conversations are under way with the Eurasian Economic Union and Vietnam. Market intelligence and export promotion are important to translate market access into market penetration, materializing the opportunities created by trade agreements. Regional and international cooperative initiatives should also be pursued to seize inter alia economies of scale, infrastructure development, trade facilitation, mobility of natural persons, and mutual recognition.

Multilateral Trading System and Accession

The multilateral trading system (MTS) is a global public good that has the potential to contribute to development benefits from international trade. This is in line with Iran's strategy that envisages to considerably expand trade and economic relations with trade partners while reiterating the commitment to principles of nondiscrimination, transparency, greater trade openness, and the rule of law in the MTS. Accession, as part of the reform process, will assure most-favored nation (MFN) treatment and national treatment for goods in a universal, rules-based, and nondiscriminatory system, more market access, and the use of the dispute settlement mechanism (see Box 1). The simple arithmetic average of import duties in Iran's national tariff schedule is currently 18.71%, 17.12% for industrial goods and 26.43% for agricultural goods. Around 34% of tariff lines have the minimum tariff rate of 4%. The highest tariff rate is 75%, applied to 6.5% of tariff lines (WTO 2009). The accession to the WTO with the right terms, appropriate level of special and differential treatment (SDT), and transition period commensurate to the level of development of Iran is in line with the Sixth Five-Year Development Plan by promoting trade and economic growth and encouraging investments. Concerns revolve around low competitive domestic industries and to the long and demanding process of adapting the extensive regulatory framework. This needs to be addressed by a thorough and strategic preparation and definition of objectives and targets. The economic adaptation should be ensured by a gradual, timed, and sequenced process of liberalization that ensures coherence with national and sectoral development policy objectives and takes into account the development potential of international trade. The Doha round has not delivered to the full needs of developing countries, and therefore a comprehensive and multidimensional trade policy needs to be pursued to harvest development benefits, including the regional integration and cooperation component.

Box 1 WTO Accession Process
The WTO received Iran's membership application on July 1996. The General Council established a working party to examine the application in May 2005, when the country became an observer. Iran submitted its memorandum on the

(continued)

Box 1 (continued)
Foreign Trade Regime in November 2009 and replied to questions posed by the WTO members in regard to the memorandum in 2011. The memorandum was subsequently updated. The way forward will involve designation of the chair and meetings of the working party. This is facilitated by less external opposition but requires the country to take several actions to be prepared for the challenges of joining the WTO.

It also requires the development of institutional frameworks and human resources to ensure the adequate coordination of relevant public and private stakeholders, to negotiate and set appropriate commitments, and to fulfill obligations. This process further requires a long-term commitment, at the highest political level. Other than working on trade-related legislation, it is necessary to adapt economic and trade policies and ensure their implementation, including at sectoral level. Training and capacity building are necessary to promote effectiveness in the accession process, as well as ownership and continuity.

Twenty-First Century Trade and Services Policies

The linkages between trade, investment, technology, and industrial policy are particularly important because otherwise international trade may create short-term incentives to specialize in activities that reflect only the existing structure of factor endowments. Iran needs to use its comparative advantages (see Tables 2 and 3), but it also needs to defy them in support of long-term development benefits, in particular when it promotes higher value-added activities against external and internal asymmetries and structural heterogeneity. This upgrading requires a focus on the technology, innovation, and development of collaborative networks among public institutions and private entities, academia, and civil society. The Sixth Five-Year Development Plan underscores that the adoption of modern technologies is also a part of the development plan for agriculture, industry, services, and infrastructure services. Technology- and upgrading-driven efforts to build supply capacity and to compete through differentiation are particularly important for Iran as the educated labor force in the country will be more expensive and may not adequately compete through low costs as it is often the case in low-technology industries. Structural shifts in recent years seem to be in line with these objectives, with high-skill and technology-intensive manufactures representing 44% of non-oil exports in 2015 (see Fig. 16), but need to continue to be actively pursued. A facilitating and developmental state needs to address externalities and coordination issues to promote upgrading and diversification. This includes improving competitiveness—including of micro, small, and medium enterprises (MSMEs)—through clusters and integration into value chains.

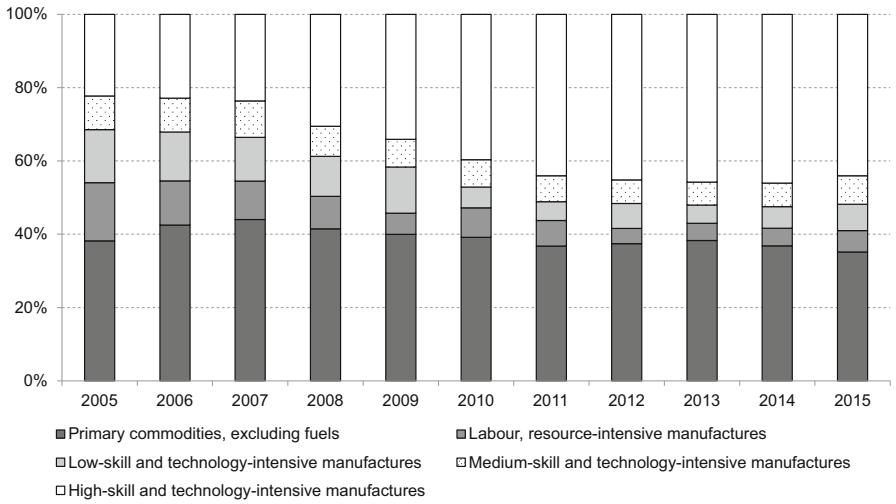

Fig. 16 Iran's non-oil goods exports by type of technology, 2005–2015 (*percentage*) [Source: UNCTAD (2016c), UNCTADstat]

The Sixth Five-Year Development Plan also underlined the importance of upgrading through the strengthening of value chains, impacting the country's export profile. This is envisioned for the oil and gas sector and also in upstream and downstream knowledge-based industries, including design, engineering, equipment manufacturing, and assembly. GVCs and regional value chains are by definition a connection to markets, providing opportunities for industrialization and diversification. An enabling policy mix and lead firm cooperation is required to avoid specialization in low-skill and low-technology activities. To foster participation in GVCs, it is necessary to reveal policy consistency and predictability, to have sound institutions, and to promote the ease of doing business. The elimination of labor market restrictions (including visa restrictions, openness to foreign labor, broader entry, and stay periods) and other restrictions (such as limits on foreign equity) facilitates the integration into GVCs. It is also important to develop adequate regulatory frameworks, intellectual property rights, and trade facilitation. Adequate data and statistics are also called for to have evidence-based policies and strategies. The policy approach should be best fit to development needs. Developed economies tend to promote sustainable business practices across value chains, while developing economies tend to aim for innovation and diversification to allow for upgrading within value chains.

Regional integration and cooperation can also promote the integration into regional and global value chains. It enlarges markets, creates economies of scale in investments, and enhances efficiencies in production, thus expanding capacity. Intraregional trade is important not only because of the important export shares it may achieve (see Fig. 17) but also because it tends to be more technological

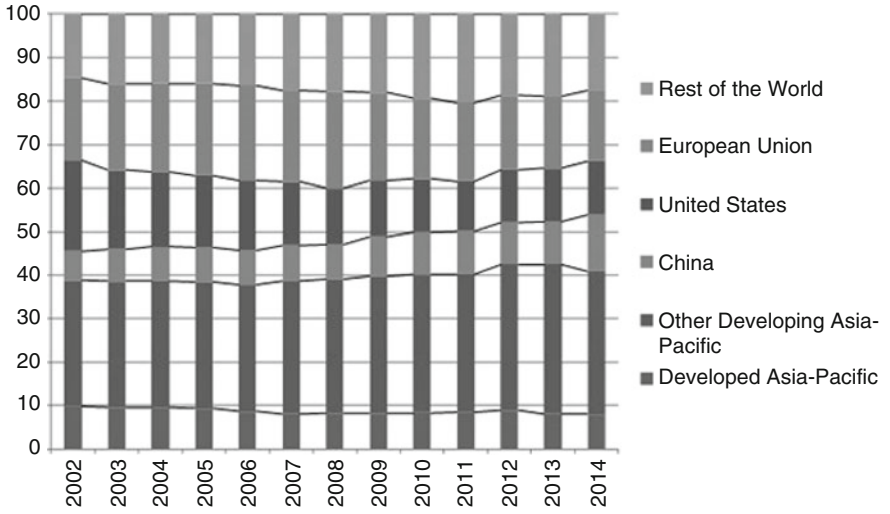

Fig. 17 Asia-Pacific's export destinations, 2002–2014 (*percent*) [Source: Reproduced from ESCAP (2015)]

intensive and also enable exploring complementarities, leading to export diversification and enhanced resilience against international shocks.

Services as Enablers of Trade and Development Strategies

The availability of services is particularly relevant to enter GVCs, as they provide the required inputs to enable such participation. Either as input providers or through outsourcing, services participate in all stages of GVCs (see Fig. 18). More broadly, services contribute to improve efficiency and competitiveness for all economic sectors. Research and development, product design, and marketing services can often add higher value added, underlining the importance of considering the potential of the services sector to diversify and improve supply and export capacity. Within the services sector, infrastructure services such as energy, transport, and telecommunications and financial services are essential to the efficient functioning of productive capabilities and overall economies and are as such a direct determinant of countries' competitiveness. Services accounted for 60% of GDP and for 48% of employment in 2014, and—as mentioned—for 43% of the value added in gross exports from developing economies and economies in transition in 2011 (see Fig. 5). Furthermore, services have an important potential to job creation, which is related to major concerns of policy-making in Iran, where unemployment has been identified to be around 10% and youth unemployment around 25% in 2014/2015 (see the chapters on scale economies and employment of highly educated labor in the present volume).

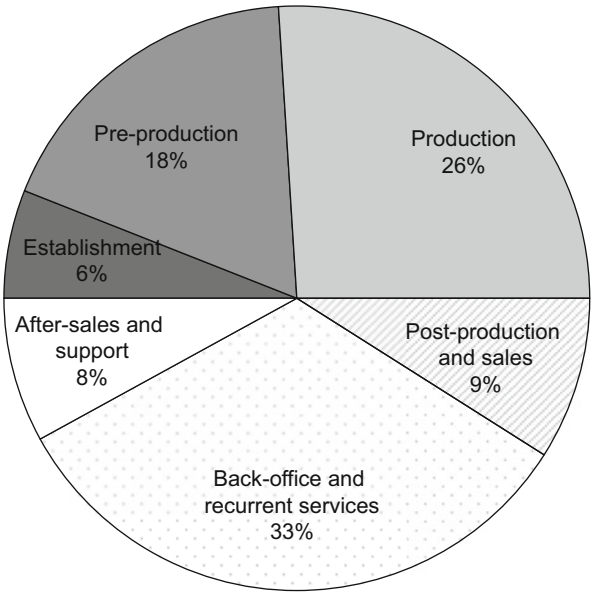

Fig. 18 Services in global value chains [Source: Reproduced from Asia Global Institute (2015)]

Box 2 Services and Structural Transformation

Services are providers of intermediate inputs enabling trade in all sectors and as direct determinants of productivity and competitiveness. The availability, quality, and affordability of services are therefore relevant to allow the participation, particularly of MSMEs, in GVCs. Services not only participate in all stages of GVCs but also have a coordinating function of production processes. Knowledge and technology-based services, in addition to adding higher value added, have an intermediation role that allows specialization. This contributes to a structural transformation consistent with the diversification and upgrading developmental objectives. This significant role of services is recognized in SDGs, which implicitly and explicitly rely on universal access for a set of basic and infrastructure services, while encouraging knowledge and technology services.

Notwithstanding, many developing countries are not fully benefiting from this potential. Policy, regulatory, and institutional frameworks are necessary to ensure efficient markets and to achieve development gains from services. These frameworks should address externalities and coordination issues, which are determinants of services' performance and need to be aligned to build complementarities between services sectors and the economy at large. The reduction of trade and investment barriers is also required as it promotes competition and allows for the inflows of knowledge, technology, financing, people, and other factors which can build supply capacity in services. This is

(continued)

Box 2 (continued)
particularly important for services which are still less tradable and benefit more from proximity. Furthermore, promoting international trade in services induces efficient services and may contribute to streamline regulatory requirements, thus enhancing positive effects in supply capacity. Favoring trade openness requires a multidimensional trade policy with negotiations, trade promotion, and market intelligence approaches.

A value-added analysis confirms the importance of certain services activities as providers of inputs and enablers of supply capacity, economic transformation (see Box 2), and participation in GVCs. The services value added incorporated in gross exports, which includes the contributions of services sectors to other economic activities such as agriculture and manufacturing, is much higher than the value of services direct exports. In Iran, this is found, for example, for the services sector as a whole and also for transport, financial services, and communications and information and communication technology (ICT) services (see Fig. 19), confirming these as key sectors for trade development strategies. Notwithstanding, Iran still lags behind several countries in terms of using the potential of services to improve economic competitiveness as its services sector accounts for a smaller share in its total forward linkages than in Brazil, India, South Africa, and Turkey (see Fig. 20). This is also found on certain services categories such as transport and financial services. Conversely, Iran has more ICT value added incorporated in exports than other countries, which is line with the abovementioned growth in technology-intensive manufactures.

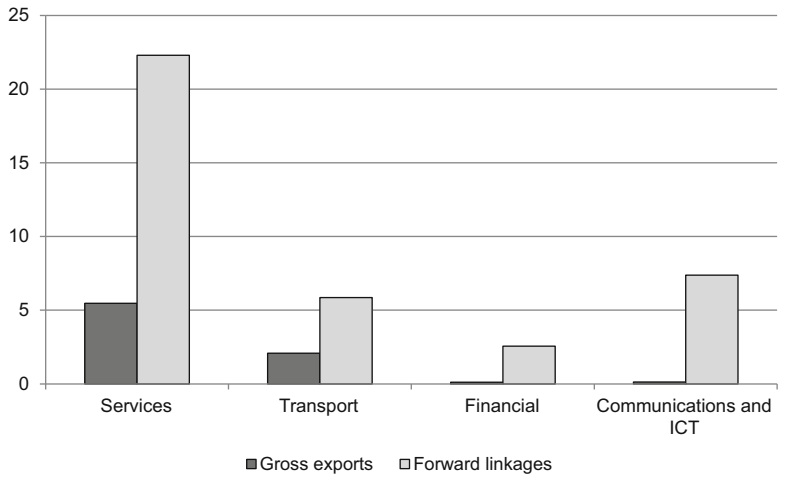

Fig. 19 Services share of Iran in gross exports and in total forward linkages value added, 2011 (*percentage*) [Source: UNCTAD calculations based on the World Bank (2016c), Export value added database]

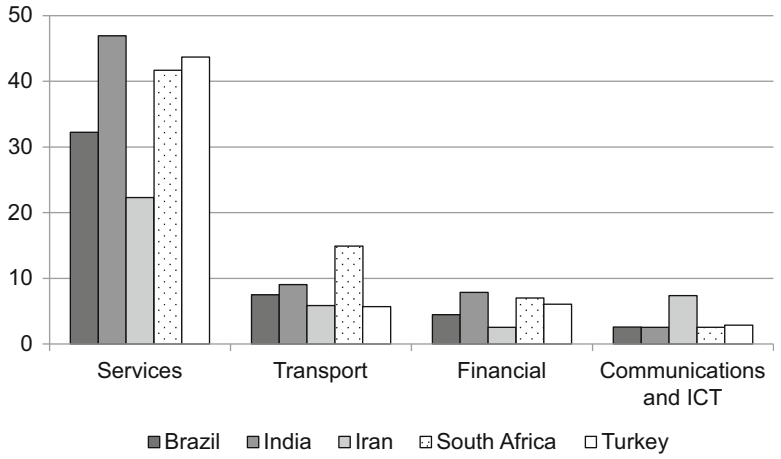

Fig. 20 Services share in total forward linkages value added for selected economies, 2011 (*percentage*) [Source: UNCTAD calculations based on the World Bank (2016c), Export value added database]

Iran has in fact made improvements in several of science and technology factors that support knowledge-based services. According to the UNCTAD Science, Technology and Innovation Policy Review of the Islamic Republic of Iran during the period 2005 and 2015, research activities have been emerging in areas such as nanotechnology, biotechnology, and renewable energy. The number of graduate engineering students has increased, and a law supporting knowledge-based start-ups, ratified in 2010, is benefiting—through financial and nonfinancial facilities—almost 3000 firms. The drive for diversification through knowledge-intensive activities has led to an eightfold increase in knowledge-intensive exports. ICT infrastructure has also improved with respect to mobile phone penetration from 12% in 2005 to 93% in 2015 and the Internet users from 8% in 2005 to 44% in 2015. Despite several policy actions, ICT infrastructure still requires higher investment to facilitate e-commerce and e-government and to improve ICT services and make them more efficient for businesses (UNCTAD 2016d).

The importance of developing infrastructure services, in addition to being acknowledged in SDGs, is recognized in Iran's Sixth Five-Year Development Plan in efforts to develop basic infrastructure, maritime trade, and rail transport. In particular, it aims to create comparative advantages on rail transport and developing rail freight transport through the upgrading of railroad and terminal facilities and connecting national railroads with regional and international transport corridors to boost export and transit sectors. The development of the financial and insurance services and markets and its instruments, and the use of development banks, is most relevant to facilitate investments, promote economic stability, and reduce the risks of business activities, strengthening the financial sector and trade financing. Financial inclusion is central to facilitate domestic and international transactions and to support the real economy, including households and MSMEs, toward poverty

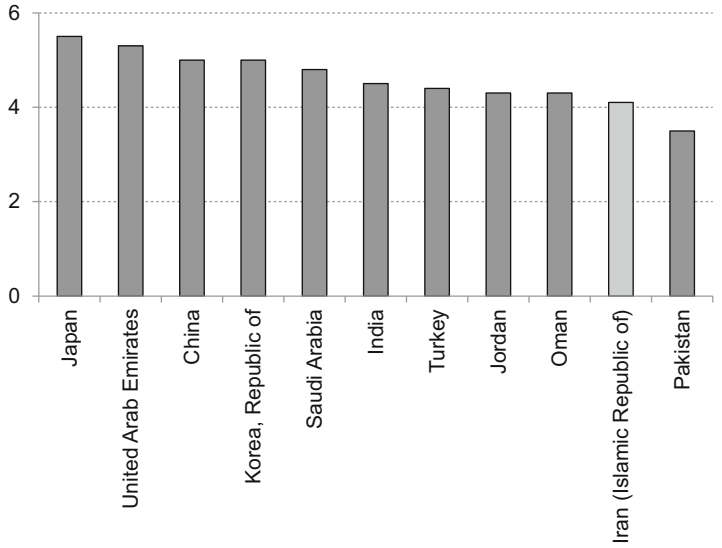

Fig. 21 Global Competitiveness Index 2016/2017 for Iran and selected economies [Source: UNCTAD calculations based on WEF (2016), Global Competitiveness Index]

reduction and economic and social development. The Sixth Five-Year Development Plan acknowledges the importance of developing the financial market and its instruments, including the money market, capital market, and insurance, toward facilitating investments, promoting economic stability, and reducing the risks of business activities. Iran's development plan also stresses the importance of favoring supply and export capacity by a continuous improvement in the business environment and in competitive market structures; by acknowledging the importance of the private sector and promoting its role in investment and development strategies; by encouraging domestic, diaspora, and foreign investments; by standardization and quality management systems; and by a comprehensive and efficient national statistic system.

Competitiveness

All these different dimensions of a trade-focused policy mix contribute to the improvement of the country's competitiveness. In the Global Competitiveness Index 2016/2017, Iran ranks 76 out of 138, below several countries in the region and several trade partners (see Fig. 21). This is a decrease from the previous year—where it ranked 74 out of 140 and improved from 2014 to 2015—where it ranked 83 out of 144, but it is still below the previous ranking of 66 out of 144 in 2012/2013. This places the country in a transition stage from a factor-driven economy to an efficiency-driven economy and still far from an innovation-driven economy. Detailing by pillar, Iran

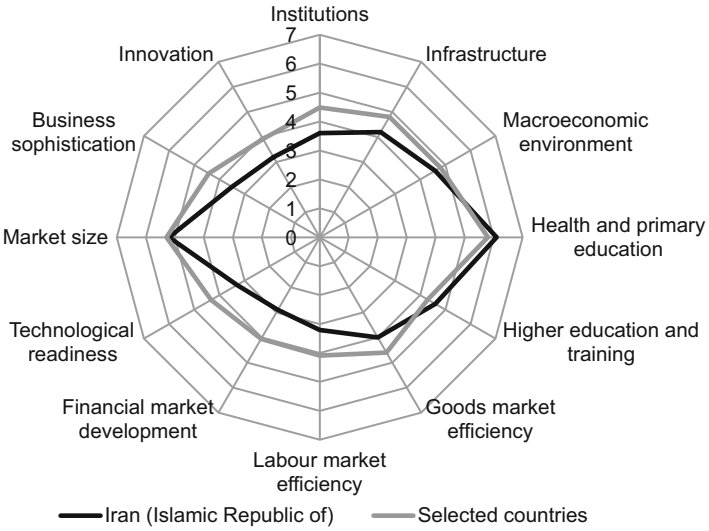

Fig. 22 Global Competitiveness Index 2016/2017 by pillar for Iran and selected economies [Source: UNCTAD calculations based on WEF (2016), Global Competitiveness Index]

ranks better in "health/primary education" and "market size" and worse on "financial market development," "innovation," "technological readiness," and "labor market efficiency."

In the comparison of Iran to the average of some other countries in the region and some trade partners, Iran performs somewhat better in "health/primary education" and in "higher education and training" and is almost equivalent in "market size." It lags behind mainly on "financial market development," "technological readiness," "business sophistication," "labor market efficiency," "institutions," and "innovation" (see Fig. 22). To a lesser extent, it also lags behind on "goods market efficiency" and "infrastructure." According to the World Bank, national infrastructure is extensive in many dimensions but lacking quality, namely, in roads, the Internet, and telecommunication services.

In the Doing Business Index of the World Bank, Iran ranked 120 out of 190 overall in 2017, slightly decreasing from 2016 when it ranked 117 out of 189. In the Middle East and North Africa (MENA) region, Iran ranked 11 out of 20, the same than in 2016 and an improvement from 2015 when it ranked 13 out of 20. In 2017, Iran is outranked by the United Arab Emirates, overall rank 26; Oman, rank 66; Turkey, rank 69; Qatar, rank 83; Saudi Arabia, rank 94; and Kuwait, rank 102. Iran outranks India, rank 130, and Pakistan, rank 144. Between 2016 and 2017, the country slightly improved its rank in protecting minority investors, from 166 to 165, and trading across borders, from 171 to 170. The rank worsened for Iran in starting a business, from 97 to 102; getting electricity, from 90 to 94; and getting credit, from 97 to 101. Slight decreases also occurred in registering property, from 85 to 86; paying taxes, 99–100; enforcing contracts, 69–70; and resolving

insolvency, 155–156. Between 2016 and 2017, Iran maintains the rank for dealing with construction permits—rank 27 (World Bank 2016b).

A coherent and integrated whole-of-government approach is required to mainstream trade into a best-fit policy mix that supports the achievement of SDGs. This requires setting deliberate and supportive policies, regulations, and institutions. These policies need to promote investment, technology, innovation, and entrepreneurship that drive a structural transformation that supports productive capacity and the move from a resource-based economy to a knowledge and innovation focus. It is necessary to strengthen supply capabilities and to meet quality requirements, thereby facilitating the integration into regional and global value chains. Services, which together with trade facilitation can lower trade costs, have a key role in this regard and in overall promotion of diversification and competitiveness. Levering all dimensions of trade policy involves an appropriate sequencing, pace and content of reform, liberalization, and integration. Connecting to markets also needs a strong focus on strengthening education and human capital.

Trade Policy and Services Policy Frameworks

To address several of the mentioned topics on supply and export competitiveness, there is a need for strategic trade and services policy frameworks. These envisage strengthening capacities for the formulation and implementation of trade policies toward SDGs and the Agenda 2030. These strategies should assist in the implementation of the Sixth Five-Year Development Plan of Iran by focusing on the analysis of the trade development nexus toward achieving development goals, sustainable economic development, and employment. Following a customized assessment that considers the specific needs of beneficiaries, trade strategies should provide recommendations for the development of trade policies and for improving supply and export capacity, strengthening selected sectors. Consultations should be promoted with local government, academia, and private sector stakeholders to strengthen local capacities, to ensure that the work builds on what already exists, and to ensure usefulness of validated recommendations. Capacity building should be promoted through experience sharing and information exchange on best-fit practices.

Trade analyses should consider the specific national context on trade performance, policy frameworks, trade-related regulations and institutions, and trade agreements at the multilateral, regional, and bilateral level. They should aim to diversify export products and markets, to promote a desired structural transformation, and to reduce incentives that do not lead to expected trade and investment results. In addition, trade strategies need to seek to take advantage of market opening and trade agreements, taking into account the persistence of non-tariff barriers to trade, quality concerns in destination markets, and constraints in supply capacity such as in human capital and access to infrastructure. It envisages the creation of forward and backward linkages domestically, regionally, and internationally, including by clustering and participating in GVCs, by addressing enclaves with no linkages

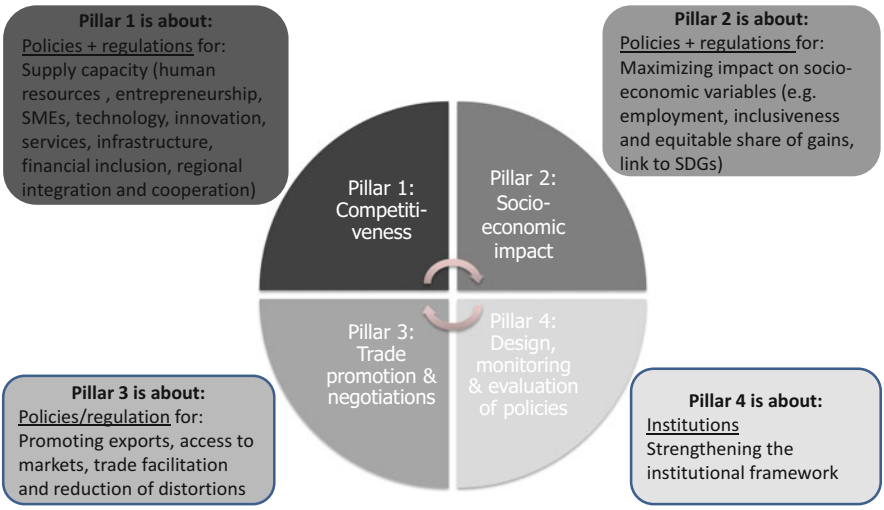

Fig. 23 Coherence between policy pillars as a driver for trade policy frameworks [Source: Mashayekhi (2015)]

with the rest of the economy, and by addressing the informal sector with low productivity. Trade frameworks should underline that an effective trade policy is based on the coherence among four pillars: policies and regulations to promote supply capacity, including the development of human resources, promotion of technology and innovation, infrastructure, and access to finance, pillar 1; policies and regulation to maximize the socioeconomic impact, including the promotion of employment and links between productive activities, and promotion of links to SDGs, pillar 2; promotion of exports and internationalization, trade facilitation, and reduction of trade distortions, pillar 3; and strengthening the institutional framework, pillar 4 (see Fig. 23).

Regarding the issues raised on services and infrastructure services, it is necessary to focus on regulatory and institutional frameworks as these are important to harness the potential benefits of services for economic diversification, structural transformation, and sustainable development. This is particularly important because, due to the intrinsically complex and multifaceted nature of services, harnessing their development potential remains a critical challenge. Services strategies should strive to improve human skills, aim to enhance productive and trade capacity in services, enhance economy-wide competitiveness, and meet development objectives, ensuring policy coherence and building institutional capacities.

Iran has RCA in several services sectors, which can be a basis for diversification in non-oil exports. In addition, services can help to develop comparative advantages in agriculture and manufacturing. A robust services strategy can help to materialize opportunities from these existent and potential comparative advantages, aiming to catalyze and institutionalize an endogenous process of services policy formulation, implementation, and review. Services strategies would benefit from an action plan

that provides clear steps, timelines, and funding for a reform process that is expected to lead to strengthened productive and export capacity and employment creation.

Changing Policy Direction and Establishing Linkages and Complementarities

There is need for changing national and international policy direction through deliberate, targeted, and interlinked actions to expand productivity growth, investment, and resource mobilization (public and private) and markets leading to development and employment creation. A national strategic agenda that promotes goods and services sector in general and identifies the individual priority sectors in particular is instrumental for optimizing the overall impact, interlinkages, and coherence of different policy measures including trade policy. Ensuring policy coherence horizontally and vertically requires an enabling institutional, regulatory, and human skills development framework. It would also require a cross ministerial and multi-stakeholder including public and private sector coordination to define strategic objectives and priorities, as well as to allocate resources—human, financial, and other—accordingly. For its effectiveness, such inter-institutional coordination mechanism would need to enjoy the endorsement at the highest political level and be institutionalized with requisite legal mandate, resources, and capabilities. This presumes effective institutional capabilities and requires capacity-building support. It is also important to experiment with different innovative policy approaches, learn lessons, and adapt them.

Particular attention needs to be given to the specificities of the services sector strategies and interlinkages. The horizontal and vertical coordination of sectoral policy initiatives is important in formulating a coherent overall national strategy for the services sector development. Services development strategies need to be consistent with other complementary policies. The overall services strategy should factor in different economic attributes of individual services sectors, as some sectors embody higher value added and more sophisticated skills, knowledge, and technology than others; they also make a greater contribution to economic development. Infrastructural services particularly financial services, energy, transport and logistics, telecommunications, etc. serve as backbone of the whole economy and have transformational impact on productivity growth and pace and pattern of structural change. Education, training, and research and development services are also key to building the right human skills including in the context of the fourth industrial revolution. In services activities, deploying a package of policy measures in a coherent manner and in the right sequence is particularly important. For instance, a combination of cooperation with the private sector to encourage investment and competition, as well as proactive public policy intervention to build ICT infrastructure and high-end technologies and to create effective demand and education, was instrumental for ICT sector development in the Republic of Korea.

The complex nature of services regulation is a key challenge, and appropriate regulatory frameworks need to be established for all services sectors to promote legitimate objectives including development of the sectors, universal access to key services, competition, and efficiency. Sectoral regulatory agencies, which are key to the regulation of specific sectors, particularly infrastructure services need to be strengthened. While different institutional models are possible, the presence of independent regulators is essential in ensuring a neutral, effective, and pro-competitive regulation. In telecommunications and ICT services in particular, adjusting the scope of regulatory mandates and enhancing cooperation with other regulatory agencies have been required. In Hong Kong, China, the Communications Authority was created from the merger of the broadcasting and telecommunications regulatory authorities. The development of mobile banking has called for a better coordination among telecommunications, financial, and competition regulators, as mobile banking entails various crosscutting regulatory issues, including consumer protection, interoperability, and roaming. International and regional cooperation is increasingly important for regulatory agencies, given the importance of standardization and harmonization under international standard-setting bodies. Regional regulatory cooperation can lead to the development of regional standards and stronger regulatory cooperation in addressing issues such as roaming fees.

The availability of reliable data is also a prerequisite for evidence-based policymaking. Measures to improve collection, treatment, and analysis of services data need to be placed high in the national regulatory agenda. In Brazil, the Integrated System of Foreign Trade in Services and Intangibles (SISCOSERV) provides an innovative approach to this matter and an opportunity for South–South cooperation. This system ensures an adequate classification of services activities based on the United Nations Central Product Classification. It also ensures the collection of statistics on the four modes of trade in services. SISCOSERV is fed by mandatory reporting from economic agents for all services transactions between residents and nonresidents. Its operation is facilitated by a strong institutional setting derived from a presidential decree and a country's experience in e-government and e-platforms (UNCTAD 2015).

Coordinated supply-side measures to build services' productive capabilities and potential stand out as the major national enabling factor on services. The development of productive clusters can promote intensive cooperation and coordination among firms and create economies of scale to reduce operational costs and enhance competitiveness, to help them better integrate higher value-added segments of regional and GVCs. Such policies are particularly supportive of small and medium enterprises (SMEs) and MSMEs. Enhancing a national innovation system is also an important factor enabling the integration of firms in higher value-added segments of global value chains. Formalizing the informal economy can help create an enabling environment, as informality affects many MSMEs, and formalized firms can create stronger linkages with the rest of the economy. Tax reforms reducing the tax burden on informal MSMEs and other incentives for formality, such as extending social protection coverage, can be pursued.

The shortage of qualified workforce remains a key impediment to the development of knowledge and technology-intensive services such as computer-related, business,

and professional services. Entrepreneurship needs to be strengthened and services firms supported through targeted measures. A strong education strategy to better match required skills particularly in science, technology, design, engineering and mathematics, and labor demand is critical for the development of these sectors and for upgrading of product activities. Policies to develop both technical and superior education are thus important. A strong link and dialogue between the academic, businesses, and policy-making bodies facilitates the identification of skills gaps and academic solutions, for example, postgraduate programs. Agreements with foreign universities to allow academic exchanges and the promotion of international accreditations for national universities would strengthen academic programs and their recognition. English language skills are of particular importance to reinforce labor supply, particularly in information technology-enabled services (UNCTAD 2015).

Deeper participation in international trade (both exports and imports) including through GVCs and pursuit of export-led growth needs to be given more focused attention. There is also a range of multilateral, regional, plurilateral, and bilateral approaches and mechanisms to be followed to diversify markets and negotiate better market access for goods and services exports. Accession to the WTO with terms commensurate to level of development of Iran is also an important approach to be pursued.

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Disclaimer The chapter reflects its author's personal views and is not to be taken as the official view of the UNCTAD Secretariat or its member states.

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Iran's Accession to the World Trade Organization: An Impediment or a Catalyst for Development?

Sadeq Z. Bigdeli

Introduction

As the largest, and perhaps the only significant, economy, still remaining outside of the rules-based world trading system, Iran continues to pursue joining the World Trade Organization (WTO). This is a peculiar point in the history of the WTO, as it is struggling to maintain its relevance in the twenty-first-century global trade dominated by unprecedented international fragmentation of production. While it officially governs around 98% of global trade, it is increasingly operating in the shadow of hundreds of emerging bilateral and mega-regional agreements each pushing different agendas and covering various global value chains. In fact, as of 2015, about half of world trade is governed by some form of a preferential trade agreement (PTA) (UNCTAD 2016: iv).

This means that Iran not only has to catch up with the process of economic globalization, the rules of which were mostly written in 1995, but it must also work concurrently on a PTA strategy to catch up with more recent waves of post-WTO developments to reap the benefits of its WTO membership. The WTO is the backbone of preferential trade arrangements, and its dispute settlement system is the most effective way for countries to ensure that those "basic rules of the game" are carefully observed. Iran would thus be misguided to pursue regionalism as an alternative, rather than a complementary, strategy for its constructive engagement with the global economy. At the same time, the relative decline of the WTO and its decision-making arm could well imply that an outsider country like Iran should use extra caution to avoid paying an unusually high price for an entry ticket to a club where the most-favored-nations principle is increasingly becoming an exception rather than the rule.

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In this context, the chapter examines the potential benefits and challenges of Iran's WTO accession mainly from a developmental perspective. This is done in the context of the heated and historical debates around whether the WTO in general and accession in particular have imposed undue restrictions on developing countries' "policy space" to pursue their developmental objectives. The overarching argument is that Iran's complex accession negotiations should not be viewed as a hard pill to swallow for getting admitted to the "international trading community" but rather to be used as a tool for fostering and embedding economic reform policies the country has unsuccessfully pursued for more than two decades. Another layer of complexity, which is perhaps unique to the case of Iran, is that Iran's long-standing bid for accession has been politicized in unprecedented ways. Barely emerging out of decades of unprecedented economic sanctions, the prospect of Iran's full integration into the global economy is not yet clear. The country is still involved in a complex web of geopolitical tensions. In the particular context of WTO accession, most of Iran's geopolitical rivals have leveraged, and are expected to continue to leverage, their veto power as members to extract political and economic concessions. Other members would simply view Iran as an untapped potential market in a sluggish world economy—a market with large middle-class consumers and huge resource windfalls. Any political, geopolitical, or simply economic reason alone would be sufficient to turn the case of Iran's accession into an overly complex negotiating process—perhaps even more complex, in some respects, than the cases of Russian and Chinese accessions.

The chapter starts by briefly reviewing the literature on the role of developing countries in the General Agreement on Tariffs and Trade (GATT) and the WTO and on whether the multilateral trading system contributes or restricts these nations from pursuing broader development goals. The third section carefully analyzes the process and substance of accessions with an emphasis on the "WTO-plus-minus phenomenon"—i.e., obligations of an acceding member to make commitments far beyond the original content of the WTO rulebook and the level of liberalization agreed upon by the original (founding) members. This aspect of accessions is highly important but not sufficiently explored in the literature on international trade and development. Had it not been for these super-WTO commitments, developing and less developed countries (LDCs) could more easily join the WTO with little concerns about the potential negative implication of the membership on their "policy space." While criticizing the unfairness of the WTO-plus-minus phenomenon, the chapter suggests that, if done properly, some of the extra obligations—particularly in the area of rules—can be used as effective tools for embedding sensible policy reforms. This, however, needs a level of knowledge and expertise often lacking in developing countries. With these issues in mind, the chapter's fourth section discusses the case of Iranian accession in detail. A few areas of caution are then underscored in the concluding section together with a set of policy recommendations.

Developing Countries and the Multilateral Trading System

From GATT to WTO

Dating back to 1947, the GATT remained a rich countries' club during the first five decades of its history. Eight years of the Uruguay Round negotiations (1986–1994) realized most of its ambitious goals and culminated in the creation of the WTO (Mavroidis 2015: 239)—while it was dominated by the North and especially the so-called "Quad," comprising a group of major trading nations that included the United States, Japan, and Canada as well as the European Communities (see Irwin et al. 2008). There is a rich literature on the low participation of developing countries during the GATT era. The most influential theory propagated by Hudec (1987) largely attributes the problem of the South's lack of engagement with the GATT to their passivity and defensive approach—their unwillingness to participate in the GATT Rounds' mutual exchange of commitments as well as their exemption-seeking attitudes, which were granted in the form of special and differential treatment (S&DT). LDCs in particular, including most African countries, were given wholesome exemptions from rules-related commitments (see Low 2007). Another set of reasons, on which there seems to be consensus among scholars, point to the developing countries' lack of expertise or political representation to fully participate in the system and make an effort to perhaps redress some of the biases embedded in it (see Bhagwati 2005). This can also explain the continued lack of engagement on the part of many developing countries in the WTO system (see Bown 2009).

Alternative reasons for developing countries' invisibility in the GATT system have also been offered. One is the heavy influence of former colonial authorities through which the GATT was de facto applied to a number of developing countries (Apecu Laker 2014: 8). Another has to do with the so-called "Principal Supplier Rule" that essentially excluded developing countries not among such suppliers from commodity-on-commodity basis tariff negotiations in the GATT era (Ibid.) One can point to additional factors associated with petroleum exporting countries' lack of engagement in the GATT. Having their particular concerns regarding the potential impact of the GATT rules on sovereignty over their resources, these countries either did not become GATT members or were latecomers to the system. Iran, for instance, participated in Havana Charter negotiations but made a strategic decision to limit its participation at the time to that of an observer. The situation was more or less the same with Saudi Arabia and most OPEC members. Venezuela, for instance, became a GATT member in 1990. It may be generally argued that the GATT's "classic agenda" mostly excluded issues that were central to the interests of developing countries—including those related to the agriculture, textile, and clothing sectors (Ibid.). With the inclusion of the Agreements on Agriculture, and the Agreement on Textile and Clothing in the WTO package, this systemic bias was partly addressed—mostly in terms of scope rather than content—during the Uruguay Round negotiations. Yet, the problem has persisted in a fundamental way, leading to the dead-end

reached in the WTO Doha negotiations as a result of the North-South conflict of agendas.

It is also important to note that during the 1970s, and in the spirit of the "New International Economic Order," the United Nations Conference on Trade and Development (UNCTAD) was most prominent as "the developing country institution." It was the main platform where developing country interests were promoted and pursued. This explains the much higher and more active participation of developing countries in UNCTAD as opposed to the GATT (Ibid.). The declining role of UNCTAD coincided with the emergence of the WTO in 1995 and its subsequent preeminence in the multilateral trading system. By the mid-1980s, some developing countries had already started to take a more proactive approach to the GATT while pursuing unilateral trade liberalization reform policies at home (Ibid.: 7). Yet, more than 20 years into the WTO's existence, the majority of developing countries, including almost all LDCs, have maintained their passive and exemption-seeking attitudes (Ibid.). Some analysts argue that such lack of willingness to engage with international trade rules might be the result of a "rational behavior," at least as far as smaller economies are concerned, to be able to focus their limited resources on internal issues (such as infrastructure and human development) rather than external issues such as foreign trade (see Dunoff 2007). At the same time, the situation has radically changed with respect to a number of developing countries, especially the emerging economies, which have been as active in the WTO negotiations and dispute settlement processes as the largest economies of the North. The critical issue for developing countries, including recently acceded members and acceding countries, is to learn lessons from the more proactive WTO members of the South in order to best utilize the system in their pursuit of development goals. This issue is highly relevant for countries outside the WTO, especially Iran, as the most, if not the only, significant economy outside the system.

"Policy Space" as a Balancing Act

Hudec's (1987) classic diagnosis with respect to the low level of participation in the GATT is plausible to the extent that providing wholesome exemptions would likely result in the lack of serious engagement on the part of developing countries. The argument would rarely hold in the context of the WTO where developing countries are subject to the same set of rules and obligations, except for a limited set of mostly procedural flexibilities and transitional periods known as S&DT. Yet, any invitation to phase out these randomly determined transition periods to encourage more serious engagement by developing countries might lead to imposing undue restrictions on the "policy space" necessary to pursue development objectives. To be sure, the fuzzy "policy space" is linked with the question whether global trade rules are unduly restrictive vis-à-vis development policies. According to the classic view, while the WTO is not and shall not be regarded as a "development organization," the trade liberalization agenda embedded in its objectives and rules should "naturally" lead to

economic development (see Finger 2002; Hoekman 2002). Under this mainstream view, the role of developing country governments in pursuing industrial development should be limited to the so-called horizontal policies such as the provision of macro stability, enhancing rule of law, and infrastructure development—all of which are considered to be consistent with the WTO rules. The S&DT, in this view, would mostly revolve around the provision of "aid for trade" and other options to assist resource-constrained developing countries to build sufficient capacity to move toward full implementation of what is considered as essentially development-friendly WTO rules (see Hoekman 2005: 22).

Yet, a strand of critical development scholarship regards some of the substantive WTO rules as constraining the ability of developing countries to pursue what they advocate as a more proactive industrial policy aiming to address prevalent market failures (Serra and Stiglitz 2008; Rodrik 2007). Beside criticizing the unequal market access side of the WTO bargain (in terms of goods such as tariff reductions and bindings as well as services liberalization), the main areas of concern cited in the critical scholarship include the prohibition of the use of export subsidies as well as certain domestic subsidies; the provisions of the Agreement on Trade-Related Investment Measures (TRIMS Agreement), banning the use of local content requirements; and the Agreement on Trade-Related Intellectual Property Rights (TRIPS Agreement) (see Khor 2008: 237–240). Also caution is advised in the area of financial services, if it results in the liberalization of capital flows without adequate prudential regulations in place. This strand of scholarship presents a robust criticism which is useful in the context of developing countries' collective goal to try to promote development in the WTO and more generally to redefine the trade policy jargon in global law discourse. There are, however, some important qualifications to be made to these lines of argument.

To begin with, critical approaches cannot and should not be used to justify and in fact revive what was perceived during the GATT era as a passive and defensive attitude on the part of developing countries in the multilateral trading system. In fact, the modest "rule of law" that has emerged as a result of WTO system should in principle be viewed as a global public good. As Stiglitz (2008: 312) suggests, despite being unfair, international institutions such as the WTO can and must be used by developing countries to advance their own interests. Various rulings of the WTO Dispute Settlement Body issued in favor of major developing countries are cases in point. Market access commitments, in the areas of both goods and services, are also relatively modest with respect to the so-called "original" (i.e., founding) developing country members. That is, tariff ceilings were not bound in 1995 for a number of tariff lines for most developing countries, and where they were, the bound rates usually stood much higher than their existing applied tariff rates. Services commitments were also modest and sporadic. The situation has remained the same as of today with respect to market access commitments made by original developing country members due to the failure of Doha Round negotiations to deliver any results in this area. Of course, the situation is largely different when it comes to North-South Free Trade Agreements, where excessive market access commitments can become an issue of real concern. Moreover, with respect to recently acceding

countries, as will be discussed in the next section of this chapter, concessions have been made at much higher levels than other similarly situated developing countries and therefore demand a much more careful consideration.

Furthermore, there is a general tendency in the critical scholarship to overexaggerate the constraining force of WTO "rules," in particular in the areas directly relating to industrial policy, such as subsidies and other incentive mechanisms, export measures, and localization policies as well as intellectual property (IP). On the question of subsidies, for instance, although the WTO does provide an outright ban on "export subsidies" (i.e., subsidies "contingent" upon exportation), the impact of the rules in the Agreement on Subsidies and Countervailing Measures on "domestic subsidies" is fairly limited—making it procedurally very burdensome for complainants to successfully challenge domestic subsidies in WTO dispute settlement process. In this vein, Amsden and Hikino (2000: 104–110) rightly argue that beyond export subsidies, "there is nothing in WTO law that prevents other countries from promoting their nascent industries and subjecting them to performance standards." Similarly, while the TRIMS Agreement provides for a flat ban on "local content requirements"," the WTO largely leaves regulations on foreign direct investment (FDI) in the hands of governments—especially in the goods sectors. Last but not least, the TRIPS Agreement provides for a number of flexibilities, which has enabled countries like India to fully implement its rules while maintaining a reasonable balance between their IP policies and an enabling technology policy. Here again, as will be touched upon later in the chapter, the so-called TRIPS-plus commitments (commitments going beyond the TRIPS Agreement), which are made in the process of accession, should be monitored more carefully for their anti-developmental implications. It is in this line of thought that Santos (2012) argues against the commonly held assumption that WTO legal obligations (but not necessarily accession commitments) overly restrict countries' regulatory autonomy. Alluding to the concept of "developmental legal capacity," he makes a contrast between the two cases of Mexico and Brazil. Whereas the Mexico relies on the WTO system to open up markets for its exporters and defend its domestic market from "unfair trade," Brazil goes beyond this by combining this strategy with domestic measures to promote economic sectors it considers valuable (Santos 2012: 631). In cases where such measures are challenged in the WTO, Brazil seeks to expand its policy space within the system by using "strategic lawyering" in their defense (Ibid.). What helps make these strategies work is that the WTO dispute settlement system, despite its effectiveness, does not provide for retrospective damages—leaving room for members to act inconsistently with WTO rules until the final verdict is issued by the Dispute Settlement Body.

It is therefore crucial to note in this context that while the sovereignty-oriented language of "policy space" might well reflect a kind of resistance against excessive demands by the North, the expression conceals the fact that what is at stake is not a binary question of "whether policy space is necessary" but rather a balancing act of a normative nature—i.e., what is the optimum regulatory space in each case and how to define the boundaries within which developing countries should be able to pursue their development policies. Seen from this perspective, the question should no

longer be revolving around the utility of S&DT per se but how to make it more sensible and effective (see Kessie and Apea 2006). In other words, the key issue is "which obligations should not be imposed on/accepted by developing countries; which obligations should be imposed on/accepted by developing countries, how and when should these latter obligations be contingently relaxed (Trachtman 2009: 113)." In this vein, Cottier (2006) argues how the existing S&DT should be replaced with a "graduation" approach, whereby WTO rules (say the ban on export subsidies) would be fully implemented after a country's export on the subsidized goods reaches a certain share of its export basket. These issues, like other items on the Doha agenda, have remained unaddressed and will likely remain so in the foreseeable future in multilateral negotiations. It is therefore up to developing countries themselves to carefully consider their development proprieties to be able to carve out an "optimum" policy space in their bilateral and regional trade negotiations. To the extent that trade agreements go too far, as they often do, in terms of limiting the ability of developing countries to effectively pursue pro-development industrial policies, they would be a source of real concern—even though they might provide short-term market access gains for some low value-added exports.

There is also a potential pro-development angle to trade agreements in general that deserves an equal attention. It has to do with the role of trade commitments in promoting stability and transparency and containing domestic rent-seeking behavior as well as providing other institutional benefits, which may be realized by preventing policymakers from undoing sensible reforms. To the extent that a reform, which is "locked in" constitutionally through trade arrangements or the process of accession to the WTO, can be considered as a sensible policy and as long as a reasonable room for maneuver exists, trade commitments can enhance and reinforce the country's own development objectives. In this way, trade can become a tool for sustainable development. This is a crucial point in a developing country context, where institutions are often not well placed to implement and sustain reforms that are desperately needed.

The Development Impacts of Accession-Specific Commitments

The Process of Accession: Unruly and Unfair

Thirty-six countries have so far joined the group of 128 original participants in the Uruguay Round. In addition, 21 countries are currently in the process of WTO accession, while only a handful of relatively isolated economies such as North Korea have remained completely outside the system. Among the main reasons cited in the literature explaining why countries join the WTO are acquiring an unconditional and permanent most favored nation (MFN) status, protecting themselves against arbitrary trade measures in export markets, participating in international rulemaking, and

having access to an impartial and binding dispute settlement system (see Cattaneo and Primo Braga 2009). More systemic reasons cited for accessions include anchoring domestic and regulatory reforms under the banner of international trade agreements, achieving trade growth while reducing trade volatility, ensuring greater predictability, and improving market access for exporters (Davis and Wilf 2011). The extent to which these objectives are achievable or have been fulfilled will be discussed in the next section.

While from a procedural perspective, WTO accession involves an overly complex and lengthy process of multilayer negotiations, its substance, in terms of what it actually entails, is not clear—making any estimations around the actual costs of accession quite uncertain at the outset (Evenett and Primo Braga 2006). This is because much of the substance depends on often one-sided "negotiations" to determine the content of the package of accession commitments. Osakwe (2011), who has been a longtime director of the WTO Accession Division overseeing important accession processes, believes that accessions are "naturally complex" because their associated commitments are interlocked with domestic reforms—hence they should not be seen as negative. Lacey (2007) in contrast refers to the "opportunistic approach" undertaken by incumbent members to leverage certain issues against the applicant. In the same vein, Neumayer (2013) clearly observes the "delaying techniques" utilized by Working Party members to extract more concessions from the applicant.

In terms of the law governing accession, Article XII and Article XIII of the WTO Agreement are the only relevant provisions in the whole WTO package of rules. Yet, Article XIII, as an ancillary provision on Non-Application of Multilateral Trade Agreements between Particular Members, refers to circumstances in which two members, due to the reasons of political and diplomatic nature, do not wish to have WTO rules apply to their trade relations, or lack thereof. Remaining as the only provision governing the main process of accession, Article XII stops short of laying out any detailed procedure on the required steps before an applicant country can become a full member. According to Article XII of the WTO Agreement:

1. "Any State or separate customs territory possessing full autonomy in the conduct of its external commercial relations and of the other matters provided for in this Agreement and the Multilateral Trade Agreements may accede to this Agreement, on terms to be agreed between it and the WTO. Such accession shall apply to this Agreement and the Multilateral Trade Agreements annexed thereto.
2. Decisions on accession shall be taken by the Ministerial Conference. The Ministerial Conference shall approve the agreement on the terms of accession by a two-thirds majority of the Members of the WTO.
3. Accession to a Plurilateral Trade Agreement shall be governed by the provisions of that Agreement."

Due to the lack of procedural details in Article XII regarding the process of accession, the Secretariat (especially the WTO Accession Division) has over time filled the legal vacuum by developing a complex and multilayered set of procedures

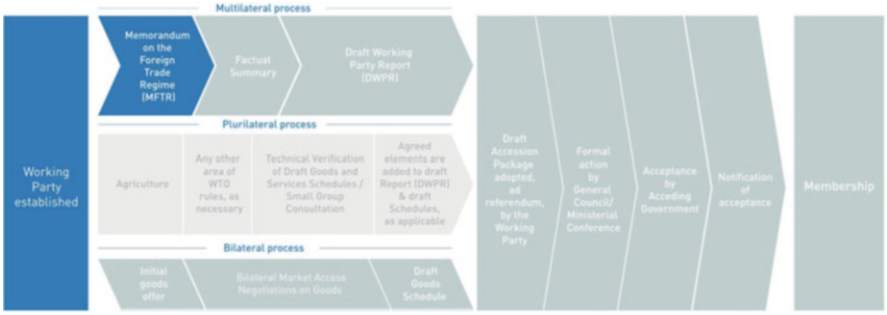

Fig. 1 Current status of Iran's accession [Source: WTO (2017)]

governing the accession process (WTO 1995). The following are the main steps that have more or less been taken so far in the previous accession processes:

- Submission of an application for accession
- Establishment of an accession Working Party (consisting of all interested WTO members) by the WTO General Council following which the applicant obtains an observer status and formally starts the accession process
- Submission of the so-called negotiating inputs, consisting of a Memorandum of Foreign Trade Regime (MFTR) as well as market access offers on both goods and services sectors
- A sort of a fact-finding process (through written questions and answers) regarding the acceding countries' MFTR, which is purported for Working Party members to prepare negotiating positions
- A complex and multilayered process of actual accession negotiations

The complex process of accession negotiations, which can last decades, mainly consisting of three layers:

- Multilateral negotiations on "rules" taking place at the Working Party upon appointment of a Chair
- Bilateral market access negotiations on goods (schedules of tariff commitment) and services (schedules of specific commitments)
- Plurilateral negotiations on matters relating to agriculture (largely subsidies but also recently Sanitary and Phytosanitary Measures (SPS) and other agriculture-related issues)

Figure 1 summarizes the latest status of Iran on the accession process. Once concluded and adopted by the Working Party in the form of the protocol of accession, the results of accession negotiations will be referred to the Ministerial Conference or the General Council for approval. Despite the text of Paragraph 2 of Article XII, which only requires two-thirds majority to be sufficient for the approval of membership, in practice not only the final approval decision but every single step,

enumerated above, have been subject to a consensus rule before the subsequent steps can be taken. This has led to the politicization of accession processes, whereby certain members (whether "original" or recently acceded members) can try, and in a few cases have tried, to block the accession process by refusing to join consensus. Prominent examples of members blocking the process of appointment of a chair for accession Working Parties include Sudan (for a period between 2009 and 2016) and Iran (persisting until today). The Russian accession was also blocked for a certain period of time by Georgia until a mediation process was launched by Switzerland between two sides (Osakwe 2015: 244).

The Substantive Aspect of Accessions: WTO-Plus-Minus Commitments

The real complexity in accessions lies in the substance of commitments, that is, the nature and scope of obligations made by acceding countries. This is because Article XII completely leaves the terms of accession to be agreed upon by all members on the one side and the acceding country on the other. This practiced consensus rule, which has been followed in almost all accession cases, has resulted in a very unequal bargaining positions in which every single WTO member (or any country acceding to the WTO before the applicant country) can leverage its veto power to demand concessions from the acceding country far beyond what was made by the original/founding WTO members. This leads to what is called WTO-plus-minus commitments. WTO-plus commitments are those obligations that are reflected in protocols of accession that go beyond the standard provisions contained in WTO Agreements (see Cattaneo and Primo Braga 2009). WTO-minus treatment refers to situations in which most acceded countries are partially deprived of S&DT granted to original developing country members. In a sense, acceding members receive a kind of an "inverse S&DT" (Bienen and Mihretu 2010). An important instance of WTO-minus treatment is that acceded countries were not allowed to use the so-called tariffication method for agricultural tariffs, and only a handful of them have been able to use "special safeguards" provided for in the Agreement on Agriculture (Butkeviciene et al. 2001: 156).

WTO-plus commitments may encompass both the areas of market access as well as rules. In the area of market access, acceding countries are treated like developed countries as they both have bound almost 100% of their tariff rates. This has not been the case for original developing country members. Turkey, for instance, which has only bound 50.3% of its tariff lines at the WTO can theoretically raise tariff rates applied to half of its tariff lines without any limits, gaining a huge policy space (although Turkey has given up this potential flexibility in the context of its agreement on forming a customs union with the European Union). Similarly, in terms of the level of protection, acceding members have had to bind their simple average tariff rates at 13.8%. This has been variable among acceding members, ranging from

a minimum of 5.1% in the case of Montenegro to the maximum rate of 39.7 in the case of Vanuatu. However, the final simple average bound rate for original members has stood as high as 45.5% (Osakwe 2015: 232). True, the level of applied tariff rate—the average tariff rate actually *applied* by original members—stands at much lower rates (around 9.5 in the year 2014) than the bound rate (the maximum level to which members can raise their tariff rates) (see WTO 2014). Yet, as mentioned previously, these countries do maintain their "policy space" to raise their tariffs within the bound rate, while acceded countries have little flexibility to do so due to the fact that their bound rate is usually at a level close, if not even identical, to their applied rate.

WTO-plus associated with market access is also commonly found in the area of services. Out of 161 service sub-sectors, the average number of sub-sectors committed by Article XII members reaches 103. The corresponding number for developed members stands at 94, while developing members and LDCs (excluding Article II members) have only made commitments for 33 service sub-sectors on average (Carzaniga et al. 2015: 643–644). In terms of sector coverage, out of 12 main service sectors, original members have mostly made market access commitments in tourism followed by infrastructure services (namely, financial, business, communications, and transport services), while the lowest levels of commitments are made in public services such as health and education (Ibid.) When it comes to Article XII members, however, exactly the same number of specific commitments is associated with all sectors—excepting environment, transport, education, health, and recreational services with lower levels of commitments on average (Ibid.).

In addition to these super commitments made by acceding countries in the area of market access, WTO-plus obligations have also been prevalent in the area of "rules"—commitments that go beyond the rules entailed in the WTO agreements. First and foremost, the trade legal regime of Article XII members (acceded countries) is screened carefully in the process of accession to detect rules that are deemed inconsistent with WTO requirements. Countries are usually not given a green light before they bring their laws and regulations in line with these requirements. This is why Article XII members such as China and Russia were required to introduce reform or make amendments in 2300 and 1166 pieces of their laws and regulations, respectively (Osakwe 2015: 229). Secondly, as the nature of WTO-plus-minus suggests, these countries have been asked to make specific obligations, which, in many cases, go far beyond the legal parameters of the existing agreements.

Acceding countries have always considered the WTO-plus-minus aspect of accessions to be unfair and have consistently objected to such practices. It not only seems to entail amendments to WTO agreements but also violates the nondiscrimination principle embedded in the so-called WTO constitution—as these commitments only apply to acceded countries. Regardless of the inherent unfairness of WTO-plus-minus as a matter of principle, however, these obligations can be evaluated and factored in as the potential "cost" of accession, which has been variable in every case and subject to particularities associated with each accession negotiation. From this rather realistic standpoint, accession-specific commitments can be divided into three loose categories as explained below. Depending on the

nature of these commitments and their (non-) suitability to each case, some of these commitments are not generally in line with developmental objectives, whereas others can be considered as being conducive to the kind of institutional reforms usually pursued in the context of development policy.

1. *WTO-plus obligations in the rules area that directly affect market access*. The main instances of this category include the following:

   - Specific obligation on the investment regime: Five members accepted obligations in this area (Osakwe 2015: 252). Estonia, for instance, accepted a national treatment obligation on direct taxation. None of the original WTO member has accepted such obligations due to the lack of a comprehensive investment agreement in the WTO.
   - Liberalizing trading rights: Thirty-nine commitments were made by acceding members on trading rights and registration requirements for import/export operation (Ibid.: 256). China, for instance, granted the right to trade to all enterprises in its protocol of accession (WTO 2001: para 83).
   - Joining zero-for-zero industry initiatives as a precondition for accession: These initiatives cover sectors such as pharmaceuticals and chemical intermediaries. Similarly, the plurilateral Agreement on Trade in Civil Aircraft requires signatories to eliminate tariffs on civil aircraft and related parts and components. The Information Technology Agreement (ITA) of 1996 and lately the so-called ITA Expansion of 2015 are voluntary agreements aiming at eliminating tariffs on a number of designated products in the area of information and communication technology.
   - Adopting import regulations other than customs formalities such as an elimination of tariff-rate quotas (TRQs) and tariff exemptions: Osakwe (2015: 258) enumerates 34 specific obligations on TRQs and tariff exemptions, although many countries maintained some flexibility in this area. For instance, Russia was allowed to keep a few TRQ measures with respect to agriculture products (WTO 2011: para 338–366).
   - Adopting export regulation especially with a view to liberalize exportation of raw materials, including restrictions on export taxes, export duties, and related fees and charges (Ibid.: 264–266).
   - Liberalizing public procurement markets by setting a precondition for acceding countries to join the plurilateral Agreement on Public Procurement (GPA). The GPA currently has 47 members. Seven acceded members (Armenia, Bulgaria, Chinese Taipei, Croatia, Estonia, Latvia, and Lithuania) joined the GPA upon accession. Nine acceded members are in the process of acceding to the GPA including China, Oman, and Ukraine. Five other Article XII members including Russia and Saudi Arabia have provisions regarding GPA accession in their respective Protocols of Accession (Ibid.: note 157). Ten acceded members, mostly small economies and LDCs, confirmed that they would join the Agreement on Civil Aircraft (Ibid.: note 179).
   - Eliminating the total agriculture measure of support (AMS) in agriculture sector: Eighteen out of 32 acceded members—notable among them China—

bound their AMS at zero. Yet, major Article XII members such as Russia and Saudi Arabia were allowed to maintain large amount of amber box (subsidies that distort production) subsidies (Ibid.: 272).

2. *Obligations that apply more restrictive rules on trade and IP regimes while having an indirect impact on market access*. These include:

   - State Trading Enterprises (STE): Thirty-three Article XII members accepted 72 specific obligations on state-owned or state-trading enterprises and privatization. Rather than forcing commitments regarding privatization per se, commitments in this regard have revolved mostly around transparency of the process and notification (Ibid.: 252–253).
   - Pricing policies: Most commitments in this regard include transparency requirements to publish information on state price controls, imposing certain explicit binding and enforceable requirements for nonuse of price controls to protect domestic industries, defining a list of nondiscrimination requirements, and specific constraints on pricing policies of natural monopolies regarding what constitutes "normal commercial considerations" (Ibid.: 254).
   - Marco policies, notably foreign exchange payments and balance of payment measures: Out of 33 Article XII members, 14 members "reconfirmed adherence to GATT Article XII and the Understanding on Balance of Payments requirements (Ibid.: 254)."
   - Precedence of WTO agreements over national law: Six out of 33 Article XII members (Estonia, Jordan, Croatia, Armenia, Vietnam, and Vanuatu) have accepted such commitments (Ibid.: note 23).
   - Customs formalities—customs valuation, rules of origin, pre-shipment inspection, trade remedies, technical barriers to trade (TBT) and SPS, etc.: This mostly includes confirmation and clarification of existing WTO commitments as well as improving existing provisions on rule-of-law type commitments, such as setting up appeal procedures and independent administrative tribunals (Ibid.: 257–264). Exceptions of odd commitments exist, such as precedence of WTO Customs Valuation Agreement over national law or elimination of consularization/notarization by consular officers in the country of export (Ibid.: notes 75 and 81). There are rather extensive WTO-plus commitments in the TBT and especially SPS areas, most of which are about strengthening transparency and rule of law. Important instances of substantive WTO-plus commitments in the TBT area include replacement of mandatory standards with voluntary standards or technical regulations (Ibid.: note 137). Significant substantive commitments were made by Article XII members such as Russia in the SPS area including the extension of existing requirements for harmonization of SPS measures with international standards, requirement of soliciting public comments on SPS proposals prior to adoption of SPS measures, and various other additions (plus) to basic requirements of the WTO SPS Agreement (Ibid.: 268–269).
   - Free zones and transit: Most obligations in free zones and special economic zones include clarification and confirmation of existing WTO rules and

principles as well as notification requirements (Ibid.: 270–271). The situation is mostly the same on accession obligations for issues relating to transit, but notable exceptions of WTO-plus exist, such as specific obligations of Ukraine, Russia, Montenegro, and Tajikistan on the inclusion of energy transit under Article V coverage (Ibid.: note 169).

- TRIPS: Apart from accession commitments regarding transparency and clarification, TRIPS-plus commitments mostly include the strengthening of IP enforcement for large Article XII members such as China and Russia (Ibid.: 274–275).
- Services regulation: Apart from accession commitments regarding transparency and clarification, WTO-plus obligations in the area of services mostly includes the strengthening of General Agreement on Trade in Services (GATS) Article VI on domestic regulation (Ibid.: 275).

3. *Transparency, rule of law and institution-building, and clarification of existing rules.* Apart from accession commitments that mostly cover clarification and confirmation of existing commitment rules as well as strengthening of enforcement mechanisms, there are a large number of separate commitments on transparency made by Article XII members. Overall, 22 Article XII members have undertaken 33 specific transparency commitments (Ibid.: 276). Some of the important commitments in this area include (Ibid.: 276–278):

   - Publication of all relevant laws, regulations, decrees, judicial decisions, and administrative rulings
   - Confirmation of existing transparency provisions in WTO agreements
   - Provision of prior notice before implementation of certain laws and regulations
   - Identification of modes of publication, i.e., an official website, journal/gazette, etc.
   - Establishment of enquiry points in certain issue areas
   - Specification of what information needs to be included in publications
   - Making available translations of relevant legislation and regulations
   - Provision of trade data to the WTO Integrated Data Base

Apart from excessive market access commitments which warrant a case-by-case evaluation, a more thorough analysis of the three loose categories discussed above demonstrates that the vast majority of accession commitments in the rules area concern clarification of existing rules, rules-of-law type commitments, and transparency requirements. Few exceptional cases of negotiated WTO-plus-minus commitments can be found to be putting an undue restriction on policy space. Two significant examples include obligations regarding elimination of certain production or infrastructure subsidies, especially in the agriculture sector (the so-called amber box subsidies, which are linked to production[1]) and the elimination of export taxes on raw materials.

[1]Not all acceded members have eliminated their AMS. While China has done so, for instance, Russia and Saudi Arabia have managed to reserve a large sum in the magnitude of billion dollars for

Needless to say, countries applying for accession have to exercise utmost caution in making liberalizing commitments as well as accepting WTO-plus-minus rules—taking account of their macroeconomic and development objectives and priorities as well as their sectoral specificities. Mistakes can be made. In a notable case of a miscalculation, China made a specific accession obligation in the area of export taxes for certain raw materials, without thoroughly envisaging the applicability of general policy exceptions (GATT Article XX) to such measurers. Years after accession and in pursuit of an industrial policy of developing its downstream sectors while trying to preserve the environment around the mining sector by using export restrictions and tax measures, China found itself in a fragrant breach of its accession commitments in a stream of WTO disputes brought by the United States, EU, and other members.[2] Regardless of sporadic mistakes or miscalculations, however, the Chinese accession overall is rightly considered as a model example of a successful exercise and a right policy direction, resulting in enhanced levels of growth and development for the country.[3]

Development Impacts of Accession Commitments

The development impacts of accession can be discussed from two angles: first the impact of market access commitments on both import as well as export levels of acceding countries and second the impact of accession commitments on rules and the acceding country's institutions. With respect to the rules aspect, Osakwe (2011) opines that the impact of higher-level commitments has been decidedly positive tightening loopholes and modernizing existing multilateral rules in areas that lack clarity. Seen from the perspective of developmental "policy space," however, clarity of rules by definition entails less flexibility for making interpretations in a favorable light. In this line, acceding countries ought to exercise utmost caution in making WTO-plus-minus commitments in the areas which had been identified before as imposing potential constraints in the first place. As discussed before, potential areas for concern include industrial policy and export strategy measures, local content requirements, government procurement, and TRIPS.

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their agriculture amber box. For those left with no tolerance for amber box support, they can still use green box subsidies as well as de minimis support. For definitions see the WTO Agreement on Agriculture and Annex 1 thereof.

[2]See China—Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum (DS—431, 432, 433); China—Duties and other Measures concerning the Exportation of Certain Raw Materials (DS—394, 395, 398); China—Export Duties on Certain Raw Materials (DS—508, 509).

[3]According to the *Economist* (2011), "The price of re-entry was as steep as the wait was long. China had to relax over 7000 tariffs, quotas and other trade barriers. Some feared that foreign competition would uproot farmers and upend rusty state-owned enterprises (SOEs), as to some extent it did. But China, overall, has enjoyed one of the best decades in global economic history."

A number of studies show that there are real gains to be made from the sort of institutional reforms, as associated with accession commitments, on enhancing the rule of law and transparency in trade policy. Tang and Wei (2009: 216) posit that institutional impacts have been more positive and significant for countries with a system of poor governance as well as those that undertook most rigorous accession-related (institutional) reforms. According to this study, countries, which undertook substantial reforms in the process of accession, achieved higher growth and investment on a faster pace than other countries. In the same vein, a recent comprehensive study (Haddad et al. 2015: 81) shows that for almost all developing countries acceding to the WTO, the country risk, measured by a composite indicator of political, financial, and economic risk called the International Country Risk Guide, as well as the policy and institutional indicator measured by the World Bank Country Policy and Institutional Assessment, significantly improves when a country achieves WTO membership as compared with the time the WTO accession process begins. Compiling trade performance data of 13 countries (including China) recently acceded to the WTO, the study finds that exports and imports of these countries grew faster than the years before their accessions (Ibid.: 88). What is interesting is that while Chinese exports outperformed the world average upon accession, the other 12 acceded countries were simply caught up and converged with the world average performance upon accession. It is also found that WTO accession is correlated with higher import growth rates not only above those experienced prior to accession but also above world averages. The import growth rate observed for these countries upon accession accelerates more significantly when taking account of Chinese imports, but it is still higher than the world average even without China (Ibid.: 90). The data for FDI inflows into acceded countries is even more dramatic than the one for imports and exports. In a sample of ten countries including China, one average net FDI inflows increases beginning in the year prior to WTO membership and continues to grow strongly thereafter. This trajectory is even more pronounced when excluding Chinese FDI data showing that the rate of net FDI inflows in nine selected acceded countries has been dramatic (Ibid.: 93–94).

Accessions can be expected to have a powerful and positive, albeit uneven, impact on trade (Subramanian and Wei 2007). A cost-benefit analysis of accessions is not an easy task and requires a different assessment for each case depending on the inherent characters of the pre-accession and the post-accession commitments especially in the areas of market access and WTO-plus-minus rules. Overall, one can safely assume that the less open an economy is (higher tariffs and non-tariff barriers [NTBs] or less open services sectors), the more likely that an import surge will pursue upon the implementation of accession commitments. The more export-ready an acceding country is in terms of supply-side conditions, the more likely that it will benefit from the market access it is provided mainly as a result of the removal of NTBs in export markets as well as potential attraction of export-oriented FDI. The macroeconomic implications of WTO accession can be broadly divided into the following categories:

- *Real effects*: On the positive side, WTO accession is expected to enhance predictability, security, and transparency. Exports can be expected to increase overall as part of aggregate demand and investment including private sector investment will possibly increase as a result of greater predictability in tax policies. At the same time, an increase in aggregate demand will likely result in a sharp increase in imports, while the supply side may experience serious constraints in uncompetitive industries. In these sectors, however, there will likely be long-term efficiency gains, but short-term adjustment costs must be seriously taken into account (Kireyev 2015: 122). This finding is in line with mainstream trade theory. The most vulnerable sectors in recent accessions include agriculture, food processing, auto industries, civil aircrafts, and pharmaceuticals (Ibid.: 144). Cattaneo and Primo Braga (2009) also highlight the reallocation of capital and labor to more competitive sectors, which would involve, like any trade liberalization reform program, social costs and pressure on the government's budget.
- *Fiscal effects*: The impact of accession on government budget is not clear as it can lead to revenue increases or shortfalls depending on the pre-accession circumstances (see Ebrill et al. 1999; Kireyev 2015: 145). According to Kireyev (2015: 145), the effects of accession on customs revenue have been negligible on balance. On the one hand, accessions may lead to a drop in customs revenue if pre-accession tariff rates were already at the optimal place on the Laffer curve maximizing revenue and also if there were no quotas in place to be transformed into tariffs as a result of accession. On the other hand, customs revenue may increase upon accession as it expands the tax base especially due to the "tariffication" of NTBs. Streamlining customs procedures may also lead to more imports and hence more revenue if properly taxed. On the export side, accession may well be expected to result in a decline in export taxes. This can be considered as a positive thing since, according to Kireyev (2015: 147), export taxes in principle should only be used temporarily to absorb windfall profits from exceptionally favorable shifts in terms of trade. Accessions have had a negative but small impact on internal tax revenues because acceding countries, facing limitations to impose higher taxes on imported products, may be forced to lower their direct tax rates (e.g., VAT) for their domestic producers as a result of the implementation of the national treatment obligation. In terms of the impact of accession on the expenditure side, there may be, on the one hand, direct budgetary savings due to the elimination of (some) subsidies, most notably export subsidies and import substitution subsidies. On the other hand, there may be an increase in budgetary costs associated with accession requirements such as training of personnel, procurement of new equipment and technology, redrafting of domestic regulation, strengthening enforcement capacity, and generally rebuilding trade infrastructure. Reduction of subsidies will most probably not be enough to offset these costs, because export subsidies are rare in acceding countries, while the reduction of agriculture subsidies is usually phased in over time (Kireyev 2015: 149). This is why a cost-benefit analysis of accessions has always been viewed as being very complex (see Kavass 2007; Drabek and Woo 2010; Laird 2009).

- *Monetary effects*: If WTO accession liberalizes capital flows in a country with a fixed exchange rate regime, this can well limit the authorities' ability to conduct monetary policy. Yet, if the acceded country maintains a flexible rate regime, the liberalization of capital flows will not have a meaningful impact on monetary policy (Kireyev 2015: 152–153). It is also critical for acceding countries to maintain a robust framework for applying prudential regulations in the financial sector as permitted in GATS.
- *Balance of payments effects*: In the area of goods trade, as mentioned above, exports may increase as a result of better market access but may also decline if the export base is eroded by reduced protection from more efficient imports, elimination of export subsidies, reduced domestic support, etc. Imports, however, will most probably increase unless they face constraints by collapsing domestic demand if the overall impact of accession turns out to be negative. Exports of services will most probably not be affected, while imports of services may substantially increase. However, in service sectors with a strong export potential (such as transport, travel, financial services, and information technology), a substantial increase in exports can be expected in the medium term (Kireyev 2015: 152–155).

Viewed from an institutional perspective, WTO accession can help improve trade governance (Tang and Wei 2009: 216) by allowing governments to distance themselves from domestic lobbies likely to push against structural reform policy or attempting to reverse them (Maggi and Rodriguez-Clare 1998: 601). Apart from technical details that complicate an accurate assessment of the costs and benefits associated with any accession, one important part of the equation—which has always been on the radar screen of acceding countries—has to do with the unobservable but huge costs of "exclusion." With close to 98% of world trade covered by WTO rules, nonmember countries increasingly fear to be left behind. This forces them to consider accession as the lesser of two evils, despite the costly and asymmetrical admission process.

Drawing Lessons for Iran

Iran's Accession Bid in Historical Context

For the entire lifespan of the WTO, Iran's accession "non-process" has been subject to two opposing forces: the country's lukewarm efforts to increase its interactions with the multilateral system and the US political efforts to isolate it from the global economy through blocking its accession. Iran became an observer to the GATT at the time of its inception in 1947 but never decided to become a full member in the institution's five decades of existence. In the late 1970s and 1980s, many developing countries, disappointed in UNCTAD to deliver as a substitute pro-development organization, turned to the GATT to catch up with the world trading system. Iran

was however distracted during this period with huge internal and external political storms in the form of a historical revolution, the hostage crisis, and the 1980–1988 war with Iraq which was the longest conventional warfare of the twentieth century (see Hiro 1989).

In the first half of the 1990s, the government of the late President Hashemi Rafsanjani was either too preoccupied with internal economic challenges associated with postwar reconstruction programs, or else did not gain a wide consensus among different factions in time not to miss a historic opportunity for Iran to accede to the GATT before the conclusion of the Uruguay Round negotiations. By the time the significance of the ongoing GATT negotiations caught the full attention of Iranian policymakers, the Round had been concluded. After an unsuccessful bid to simply renew its observer status, Iran first applied for membership in 1996. This was the same year the US Congress passed the Iran and Libya Sanctions Act of 1996 (ILSA)—the first round in a stream of unilateral sanctions, which has only piled up over time.

From 1996 until 2001, Iran's application did not find its way to the agenda of the WTO General Assembly even for consideration due to the direct opposition of the United States. Upon concerted diplomatic efforts and with the help of a few allies, Iran's application was put on the agenda but consistently rejected in a number of General Council sessions by the United States. Finally, in June 2005, and as a result of successful diplomatic negotiations on Iran's nuclear program at the time, the US government was convinced by its European allies to join consensus in the WTO General Council and allow the Working Party for Iran's accession to be officially established.

This however coincided with the rise of new tensions between Iran and the West on its nuclear program, leading to a series of sanctions imposed on Iran by the United Nations Security Council. The new Iranian government at the time was also ambivalent in its initial years to actively participate in the accession process, and hence the prepared negotiating inputs were waiting to be officially signed off for submission for almost 4 years. Eventually, in an uncertain environment, the Iranian government submitted its MFTR in 2009 following which it moved to respond to about 900 written questions in 2011, posed anonymously by a number of members. The rumor at the WTO was that a significant number of those questions came from the United States. This, once again, coincided with the height of sanctions imposed on Iran by the United States and EU on the backdrop of a series of United Nations Security Council Resolutions. At one level, therefore, Iran was ready for a Working Party Chair to be appointed for the first meeting of a series of its accession process. At another level, it was clear that the United States had adopted the policy of informally blocking the appointment of a chair and hence putting the whole process, once again, on hold. Lately, however, and with the successful conclusion of the groundbreaking Iran Nuclear Deal in July 2015, hopes were renewed once again for the accession negotiations to resume—a process that will no doubt continue to be subject to geopolitical ups and downs in the years to come. The chronology of Iran's relations with the world trading system is provided in Table 1.

Table 1 Chronology of Iran's relations with the world trading system

Period	Iran—GATT/WTO relations	Iran's relations with the West	The world trading system (Accessions)
1947–1960s	Iran participates in Havana negotiations but intends not to join the GATT and remains as an observer	-The United Kingdom and the United Sates orchestrate a coup to overthrow the democratically elected Prime Minister Mohammad Mosaddeq in favor of strengthening the monarchical rule of Mohammad Reza Pahlavi (1953) -The 1955 Treaty on Amity, Economic Relations, and Consular Rights between Iran and the United States	-GATT signed as a protocol of provisional application (1947) -Brazil, Pakistan, Cuba, Syria, and Lebanon among GATT founding members (Syria and Lebanon later withdrew membership) -Five rounds of GATT negotiations
1970s–1980s	Iran remains an inactive observer to the GATT	Iranian revolution (1979)	GATT Tokyo Round: 1973–1979
		Iran-US hostage crisis (1980)	GATT accessions include: Egypt (1970); Singapore (1973); Philippines (1979)
		Iran-Iraq war (1980–1988)	GATT Uruguay Round negotiating the WTO (1986–1994): Many developing countries join the GATT: Thailand (1982), Mexico (1986), Venezuela (1990), Tunisia (1990), Bahrain (1993) Qatar (1994), and the United Arab Emirates (1994)
1990s	-Iran unsuccessfully tries to renew its GATT observer status at the WTO (1995) -Iran's application for accession (1996)	Iran and Libya Sanctions Act of 1996 (ILSA) imposed by the United States	WTO inception (1995) Three WTO Ministerial Conferences including one in Seattle leading up to the WTO legitimacy crisis WTO memberships: Ecuador and Bulgaria (1996); Mongolia and Panama (1997); Kyrgyz Republic (1998); Latvia and Estonia (1999)
2000s	-Iran's application first reviewed by the WTO General Council (2001) -Iran's application	-The Paris Agreement between Iran and the E3-EU (2003) (Iran's agreeing to temporarily	Four WTO Ministerial Conferences and the inception of the so-called Doha

(continued)

Table 1 (continued)

Period	Iran—GATT/WTO relations	Iran's relations with the West	The world trading system (Accessions)
	rejected more than 20 times at the General Council due to the US objection (2001–2005) -Iran becomes an observer to the WTO and a Working Party established by the General Council (2005) -Iran submits its MFTR (2009) -Members pose 698 written questions on Iran's MFTR (2009)	suspend uranium enrichment) -Iran-EU negotiations on a Trade Cooperation Agreement (2002–2005) -Iran resumes uranium enrichment (2004/5) -A number of UN Security Council Resolutions against Iran (Resolutions #1969 and 1737 (2006); #1747 (2007); #1803 and 1835 (2008) -A number of US sanctions including the Iran Freedom Support Act (2006) passed by the US Congress	Development Round (2001) Accessions: Jordan, Georgia, Albania, Oman, and Croatia (2000); Lithuania, Moldova, and China (2001); Chinese Taipei (2002); Armenia and the former Yugoslav Republic of Macedonia (2003); Nepal and Cambodia (2004); Saudi Arabia (2005); Vietnam and Tonga (2007); Ukraine and Cabo Verde (2008)
2010–2012	-Iran submits a written response to 698 questions (2011) -The United States blocks designation of a chair to the Working Party for the accession of I.R. Iran (2011)	-UN SC Resolution # 1929 (2010); # 1948 (2011); #2049 (2012) -A number of US sanctions including the Comprehensive Iran Sanctions, Accountability, and Divestment Act of 2010 (CISADA); Section 1245 of the 2012 National Defense Authorization Act (NDAA) and Iran Threat Reduction and Syria Human Rights Act of 2012 (ITRSHRA) -A number of EU sanctions including the Council Regulation (EU) No 267/2012 Concerning Restrictive Measures Against Iran and Repealing Regulations (EU) No 961/2010	Three WTO Ministerial Conferences and the demise of the Doha Round The proliferation of met-regional trade agreements Russia joins the WTO in 2012 along with Montenegro, Samoa, and Vanuatu
2013–2016	-Around 60 members (including the EU) issue statements at the WTO General Council in support of the resumption of Iran's accession process (May 2016) -Iran-EU reach an	-Joint Plan of Action (2013) -Joint Comprehensive Plan of Action (2015) -United Nations Security Council Resolution 2231 endorsing the JCPOA and removing the six former	WTO membership reaches 164 Accessions: Lao People's Democratic Republic and Tajikistan (2013); Yemen (2014); Seychelles and Kazakhstan

(continued)

Table 1 (continued)

Period	Iran—GATT/WTO relations	Iran's relations with the West	The world trading system (Accessions)
	understanding on a bilateral process to create a dialogue on Iran's accession and a number of members show a similar interest (2016)	UN SC Resolutions (2015) -Removal of EU sanctions and suspension of US nuclear-related sanctions (2015)	(2015); Liberia and Afghanistan (2016)
2017	EU renews its expression of support for Iran's WTO membership (2017) Iran's accession process in limbo	The US threatens to withdraw from the JCPOA (2017)	A major shift in the US trade policy agenda (withdrawing from the Trans-Pacific Partnership, renegotiating the North American Free Trade Agreement, Aggressive policies toward the multilateral trading system and China) The Eleventh WTO Ministerial Conference Buenos Aires, 10–-13 December 2017

Source: Compiled by the author

Iran's Accession: An Institutional Perspective

Many of Iran's neighbors in the region are among the original/founding WTO members—including Pakistan (1948), Turkey (1951), Qatar (1994), and the United Arab Emirates (1994). Others have completed their accession processes in the last decade—Saudi Arabia (2005), Tajikistan (2013), Yemen (2014), and Afghanistan (2016). Few exceptional cases still behind in the accession process are Iraq, Uzbekistan, and Azerbaijan, which, in contrast with Iran, Syria, and Libya, have had several Working Party meetings. Turkmenistan is the only country in the wider Western and Central Asia region, which has not yet applied for WTO membership (WTO 2016: 16).

Compared to most of its neighbors, Iran's trade and economic policy is governed relatively poorly. Trading across borders is very expensive leading to higher costs of intermediary and consumer products. The lack of adequate infrastructure services and low level of FDI attracted in these sectors have exacerbated the economy's trade competitiveness. Currently the Iranian economy ranks 120 out of 190 countries in the "ease of doing business," its weakest performance (ranking 170 out of 190) being in the relevant subindex of "trading across border" (World Bank 2017). Although international sanctions have taken a heavy toll on Iran's economy, the weak performance of economic indices is also due to macro-mismanagement including the presence of red tape and administrative inefficiencies. Efforts in recent years,

especially by Iran's customs authorities, to create a single window system, boost e-governance, and bring Customs Laws more into consistency with the World Customs Organization, have not been reflected in its overall performance in the world rankings due to existing systemic deficiencies.

Decades of relative isolation from the multilateral trading system seem to have contributed to an outdated institutional setting and a policy environment suffering from lack of coordination among various policymaking institutions as well as lack of transparency and predictability. Market barriers—both in the form of tariffs or NTBs—may be created overnight in the name of "market regulation" or simply "balancing supply and demand"—especially in the agriculture sector—with little process in place for stakeholder consultation and without any fear of repercussions or violations of international commitments. This is all despite the fact that nontechnical/non-tariff measures (including quantitative restrictions and import prohibitions) have, at least on paper, been ruled out in literally all of the country's 5-year economic, social, and cultural development plans since the Third Plan (2000–2005).

In fact, it was during the Third Plan—which coincided with Iran's early hopes to join the WTO—that the most radical structural reforms were implemented to pave the way for Iran's journey toward WTO membership. These reform plans not only included the elimination or tariffication of NTBs but also elimination of arbitrary import licenses and import monopolies alongside introduction of tax reforms, new laws on investment and e-commerce, and privatization programs—including the establishment of the first generation of private banks and insurance companies. Macroeconomic policy reforms such as adopting a unitary exchange rate were also successfully implemented during this time. Figure 2 demonstrates that Iran

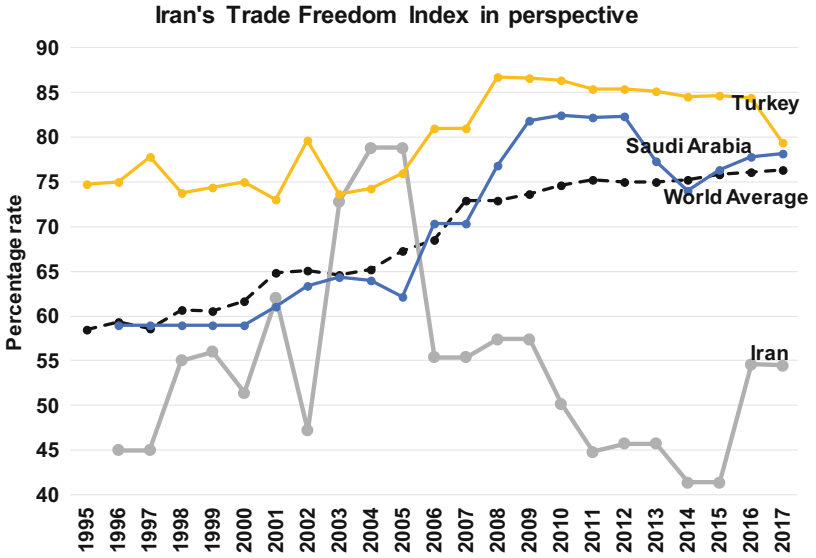

Fig. 2 Iran's Trade Freedom Index in comparison with neighboring countries and World Average [Source: Heritage Foundation (2017)]

performed miraculously during this period in terms of its Trade Freedom Index, not only outperforming the world average but also its major neighboring economies.

Notwithstanding the achievements under the Third Plan, all subsequent 5-year plans have been less than successful in realizing their similarly ambitious policy reform goals. The increasingly dimming prospects of WTO membership and the lack of institutional capacity, along with the mounting pressures of sanctions, can be viewed as major contributors to such underachievement. Yet, given the general picture presented above, WTO accession can help sustain Iran's own intended policy goals in the areas of TBT and SPS as well as more generally trade facilitation and the recognition of the right to trade. Most importantly, installing transparency mechanisms (whether under existing WTO agreements or accession-specific commitments) can contribute to enhancing Iran's institutional performance in the broader economic as well as trade policy settings. Another area in which reform would enhance overall economic efficiency is the elimination of some of the existing distortive pricing policies. Although much of these policies have been eliminated over the years, there still remains a complex and nontransparent mechanism in certain areas. At the same time, the continued supply of gas at lower than market prices to domestic industry would likely remain as a key element of Iran's policy toward developing its downstream chemical/petrochemical sector. This will surely become an important part of Iran's accession negotiations as was the case for Saudi Arabia and the Russian Federation—which managed to maintain their pricing policies within a negotiated framework of a specific pricing formula (see WTO 2005: para 33; WTO 2011: para 132).

These are some of the important policy areas recognized to be key for improving trade competitiveness whereas they are difficult to sustain within the framework of unilateral reform plans. In this sense, the costs of implementing the necessary institutional reforms, including the training of the personnel or obtaining laboratory and customs equipment, although costly, should be considered in the long term as being outweighed by the benefits of a revamped trade infrastructure. At the same time, there are other areas concerning "rules" in which Iran may face significant challenges. Some of the important challenges in Iran's future accession negotiations can be summarized as follows:

- *Elimination of export subsidies*: There has always been a general mandate in Iran's development plans for the past two decades for the government to provide financial and fiscal support for all export activities. In practice, however, and given the governments' budgetary constraints, this has been limited to the case of granting full income tax exemption, the elimination of which could negatively impact the nascent Iranian non-oil export industry (Shiravi and Nazarnejad 2012). Seen from a historical perspective of providing these export subsidies, however, they have been usually deemed as a partial remedy for an ineffective exchange rate regime with the tendency to overvalue the Iranian rial against the US dollar. Replacing such an anti-export bias with the reintroduction of a managed floating exchange rate regime could compensate for the lack of limited export subsidies provided in Iran in the form of tax exemptions. Furthermore, government support

for trade promotion activities as well as other non-specific support for export activities (notably in the area of infrastructure and export logistics) can be upgraded and enhanced to address major supply-side constraints. Such initiatives are mostly deemed legal under the WTO Agreement on Subsidies and Countervailing Measures.

- *Industrial property*: Iran is already a member of major World Intellectual Property Organization Conventions—most notably the Paris Convention for the Protection of Industrial Property, which is implemented through the domestic law. There is of course room for improvement in the overall legal environment by streamlining and strengthening institutions in charge of IP protection and enforcement. WTO membership can and will no doubt play a key role in achieving this. Moreover, in light of the experience of recently acceded countries, it is likely for Iran to be asked by major industrial countries to enhance its IP enforcement mechanism in certain sensitive areas such as pharmaceuticals. To the extent that an enhanced IP enforcement mechanism improves the legal and investment environment in the country, it would be advisable for Iran to negotiate a balanced package of accession commitments—one which would boost, rather than hinder, the development of the country's vibrant biotechnology and nanotechnology industry with its promising export potential. Resisting any substantive TRIPS-plus commitments—of the kind existing in the US PTAs—or maintaining full TRIPS flexibilities is highly advisable as they could seriously hamper Iran's path toward becoming a knowledge-based economy and also negatively affect its social and health policies.
- *Copyrights*: Challenges also exist in the area of copyrights. Iran has a relatively robust copyright system in place for protecting domestic authors. However, it is not a member to the Berne Convention, which means that it can legally discriminate against works published outside of the country. The WTO requirement to pay royalties to non-national authors (which is a TRIPS/WTO commitment) would likely lead to an increase in the prices of books and other protected literary and artistic works following Iran's accession. Caution is further warranted in other TRIPS-plus areas—especially since a handful of acceded members have accepted TRIPS-plus commitments including acceding to extra World Intellectual Property Organization's (WIPO) conventions such as WIPO Copyright Treaty (WCT) and WIPO Performances and Phonograms Treaty (WPPT) (Bhattacharya and Laker Apecu 2015: 808). More importantly, the impact of accepting universal copyrights on the Iranian nascent software industry should be carefully evaluated.
- *Agriculture (amber box) support*: Iran will likely be asked to bind, if not substantially reduce, its existing amber box subsidies—i.e., agriculture subsidies directly linked to production levels. These are seldom provided in Iran in the form of direct subsidies. They are rather provided in the form of price support mechanisms or guaranteed purchase prices. Given the sensitivity of the agriculture sector, especially in the area of strategic commodities, any successful accession process should result in a balanced package that includes a reasonable allowance for amber box support. This is the model pursued in the accession of Saudi Arabia

and the Russian Federation as opposed to China. At the same time, given Iran's water crisis and other environmental challenges, green box subsidies, which face no limitations in the WTO, should be more frequently used in order to meet those challenges (Bakhshi et al. 2011: 21).

- *Other challenges*: Other potential challenges include the requirement to remove TRIMS, especially local content requirement (Shiravi and Pouresmaeili 2011). Although these measures (for instance, "Made in America" measures) are on the rise in the global economy, they have not been widely used in Iran in the past, except in public sector procurement and infrastructure projects. Firstly, an argument can be made for a measured use of TRIMs, especially local content requirements, until and before it will be phased out as a result of the final act of accession. Secondly, Iran will be asked by the Working Party members to join the plurilateral Agreement on Government Procurement. This agreement to which the majority of founding WTO members have opted not to accede may well have repercussions from a market access perspective, given the significant size of Iran's public procurement market. Yet, many recently acceded members have agreed to join the agreement upon accession or in a future date, for the reasons of expediency or its potential advantages from an institutional perspective—in light of its transparency and nondiscrimination principles governing public tenders. Another area of potential challenge is export duties or taxes. Any possible WTO-plus requests from members to bind or eliminate certain export duties, although not widely used in Iran, would have to be viewed with caution. This is because, from the perspective of industrial policies, these measures might be needed to help the economy diversity through encouraging the production of sophisticated or downstream products as opposed to the export of raw materials.

Despite the above complications, if Iran manages to agree with its Working Party on a balanced package of rights and obligations, the benefits of accession in terms of an institutional enhancement can be taken to outweigh the potential costs of implementing necessary legal and regulatory reforms.

Iran's Accession: Market Access Implications

Being among the top 20 economies in the world in terms of market size (WEF 2016), Iran is naturally viewed by other trading nations as a huge untapped market for their exports. At the same time, the Iranian economy is more diversified in comparison with the petroleum-based economies of its region. The share of oil and gas in Iran's gross value added was about 23% in 2014—less than that of the United Arab Emirates (30%) and Kuwait (50%) (McKinsey Global Institute 2016: 12). This level of relative diversification has been achieved partly as a result of shielding many sectors from international competition. Whether due to the market's relative isolation or various trade protective measures in place or a combination of both, many sectors are dominated by domestically manufactured products. For instance,

more than 90% of automobiles and pharmaceuticals are produced domestically, and imports of the Fast Moving Consumer Products (FMCP) only account for 8% of the domestic market (Ibid.). Many agricultural products including in the dairy, fruit, and vegetables sub-sectors have been subject to either high tariffs or import bans. This has negatively impacted factor productivity in these highly protected and/or isolated sectors (Ibid.).

Therefore, one of the most challenging aspects of accession for Iran lies in bilateral market access negotiations that would lead to reduced tariffs and non-tariff measures (NTMs) for goods as well as opening up service sectors through relaxing existing regulatory restrictions. In the goods sector, despite efforts in the last few years to substantially drop average level of tariffs, Iran still maintains one of the highest average rates in the world. The simple average of import tariffs in Iran in the year 2015 was 18.71%. The figure stood at 17.12% for industrial goods and 26.43% for agricultural products (Bigdeli 2017). The situation becomes more complex in the agriculture sector where average tariffs are lower than a few countries including WTO members in the region such as Turkey and Egypt, but effective protection is still significant due to various NTMs in certain "sensitive" sectors. Wheat is a notable example in point where a low 10% tariff is rendered meaningless in face of the import ban that has been in place since the inception of self-sufficiency programs in recent years.

A few studies have used economic models to evaluate the overall and sectoral impact of the liberalization of Iran's economy through WTO membership on overall welfare, imports and exports, employment, equality, etc. Aziznejad et al. (2012) find that a gradual liberalization of intermediary and capital products in Iran will lead to higher growth and overall performance of the economy. Farajzadeh et al. (2017: 75) employ a computable general equilibrium model, in line with standard theories of international trade, to show that under a scenario of full liberalization, Iran would experience an 8.9% increase in GDP and a welfare gain of 13.2% and 9.3%, respectively, for urban and rural households. The study further predicts that removing trade barriers would increase inequality among households in favor of urban and high-income groups (Ibid.).

One important limitation in these economic models is that, apart from certain data deficiencies, they seem to maintain a general bias in favor of liberalization embedded in their static methodologies, by ignoring the adjustment costs associated with the period of transition in the process of sectoral liberalization. Given Iran's highly protected market in the agricultural sector as well as certain industrial sectors (including the auto sector, textile and clothing, leather and apparel, and pharmaceuticals, among others) and having had relatively isolated service sectors, the cost of transition toward a more open, competitive, and efficient market structure could be very high, if not prohibitive, in the short to medium term. It would, therefore, be necessary for Iran to conduct the process of liberalization gradually in a phased manner as it normalizes its trade and financial relations with the world. The first phase should involve a tariffication of protective NTMs (especially where they are prevalent in the agriculture sector) followed by reducing overall tariff rates concurrently with the reform of macroeconomic policies (especially monetary policy). As it

is usually the case for oil-exporting countries suffering from the so-called Dutch disease, Iran has often maintained the misguided policy of a fixed exchange rate regime with an overvalued currency that tends to make imports cheaper than they would otherwise have been under a liberal (flexible) exchange rate regime. This has largely neutralized the protective impact of high tariffs (see Lotfalipour et al. 2013) and should therefore be seen as part of the same reform package. Interestingly enough, Iran once succeeded to implement a managed floating exchange rate policy during its Third Plan (2000–2005). It has however failed to sustain that policy for various reasons, including economic sanctions. Currently, Article 20 of the Law on the Permanent Rules Governing the Country's Development Plans (Majles 2017) makes a new permanent mandate to implement a managed floating exchange rate policy.

Furthermore, the policy of a gradual tariff reduction should preferably not be implemented unilaterally (see Trebilcock 2011: 5). Tariff and other liberalization policies should rather be envisaged in a 5–10-year periods in bilateral or regional settings in the form of preferential trade agreements with select trading partners. This would allow Iranian producers to gradually prepare for an increased level of competition while simultaneously "going international" in particular with respect to highly potent resource-based industries (in particular in the downstream sectors) and export-ready businesses in other sectors (by removing trade barriers in export markets). It should also be noted that trade liberalization or WTO accession does not necessarily lead to the sophistication or diversification of exports. Industrial and other complementary policies addressing supply-side constraints should be pursued in tandem with negotiations for concluding trade agreements.

Overall, given that most challenges Iran will face in its accession lie particularly in the area of market access, an accession policy that would not envision a complete removal of all political and economic sanctions (whether or not one considers them legally consistent with the WTO rules) would likely not be worth the heavy adjustment costs involved. One should therefore see Iran's accession policy within a broader geopolitical context, including the country's foreign policy and particularly the development of Iran-US relations.

Concluding Remarks and Recommendations

As a country involved in complex geopolitical rivalries, Iran has for years been kept behind the closed doors of the most significant organization governing the world trading system. If the gateway to the WTO opens as the venue for its closer integration into the global economy, Iran will face a particular situation of late-comers' disadvantage. It will have to pay a higher than normal price for entering a system, which is not as significant as its heydays, if it is not in decline. This has been increasingly the experience of recently acceded members as any accession entails major institutional reforms and trade and investment liberalization well beyond the level accepted by original developing members.

Regardless of the debates concerning the impact of the world trading system on developing countries' "policy space," evidence shows that a handful of these economies have been able to take advantage of the rules of the game to pursue their development objectives. The case of accession is not an exception. However unruly and unfair, accessions can either contribute to or hamper development depending on the details of accession commitments as well as the level of serious engagement on the part of the applicant county. Those acceding countries that were able to locate accession in their predetermined development strategy, rather than an aim in itself, utilized this opportunity as a driver of sensible reforms. Rather than being captured by rent-seeking globalizing/neoliberal forces, the accession policy should be used as an instrument to enforce and embed a well-designed industrial development policy in a world of globalized production. In the case of Iran, accession negotiations shall be taken as a chance to implement most of what was contained, but never implemented, in its overarching laws and mandates, including the country's 5-year development plans. Viewed from this perspective, Iran could arguably take advantage of accession to substantially enhance transparency, rule of law, and overall institutional quality of its trade and economic policies. Needless to say, there are a set of prerequisites for this strategy to be successful, including the availability of quality information and expertise as a basis for devising a sensible trade policy in order to draw appropriate "red lines" regarding where to apply real rigidities and where to allow for flexibilities. This would also require a political economy environment permitting policymakers to distance themselves from domestic powerful lobbies as they involve the stakeholders in devising "sensible" trade policies and building them into negotiating mandates (see Evans 1995).

Notwithstanding the potential benefits of accessions in the area of "rules," extra caution needs to be applied in negotiations for market access liberalization. This is because, due to its relative economic isolation or trade protective measures or a combination of both, Iran's relatively diversified economy has long suffered from the lack of competitiveness and low productivity and hence could potentially be very vulnerable to unmanaged liberalization. This process of "managed liberalization" should ideally pursue the following broad guidelines. First, the overall impact of all protective measures, such as tariffs and NTBs, should be evaluated in light of the neutralizing effect of other policies potentially countering domestic protection, such as an overvalued exchange rate policy that has been biased against exports as well as misguided policies leading to a high level of existing informal trade.[4] Second, protective NTBs such as import bans need to be addressed though a tariffication process before implementing any tariff reduction policies.

The third guideline is that tariff reduction and other liberalization policies in the areas of both goods and services should be made in the context of bilateral and regional preferential trade arrangements, rather than being implemented unilaterally.

[4]Sanctions have no doubt contributed heavily to what constitutes record levels of illegal and informal trade. Due to some accounts, at the height of sanctions, more than half of Iran's imports can be entering through informal channels with little to no supervision or taxation.

This, along with the geopolitical complexities that has been and is expected to continue to complicate Iran's accession process in the future, should lead Iran to adopt a unique two-pronged trade strategy: The first prong should involve a serious multilateral engagement at the WTO on the area of rules and institutional reforms, while the second prong should entail a regional/bilateral element containing a mutually enforced market access liberalization. The first prong should involve a serious engagement in WTO accession negotiations in the area of rules, preferably through an official Working Party, and, if not politically possible, through a regulatory dialogue on Iran's trade policy regime in a plurilateral WTO grouping. This could also function as an effective Iranian commercial diplomacy, with a view to resisting isolationism and exclusionism unilaterally forced onto its economy, despite the promises of the landmark nuclear deal in 2015. The second prong would then pursue market access liberalization though a PTA policy in which Iran would carefully select partners constituting the country's potential export destinations. It is therefore advisable that Iran clearly distinguishes the "process" of accession from the final "act" of accession. Until there is a positive shift in the dynamics of the country's accession process, Iran should use its engagement with the WTO as a venue for institutional reform while pursuing its market opening trade negotiations at bilateral and regional settings. This two-pronged strategy would offer several benefits:

1. It could allow Iranian producers to gradually prepare for an increased level of competition, while simultaneously "going international" in particular with respect to resource-based industries as well as export-ready businesses in other sectors.
2. It could enhance Iran's leverage in its accession negotiations. This is because any delay in the process of Iran's accession would lead to a widening gap between the applied MFN and preferential tariff rates negotiated with PTA partners leave out non-PTA-partner countries.
3. Upon accession and its entailed (unilateral) reduction of market barriers for WTO members, Iranian exporters would not be left with pre-existing MFN rates, in a situation where most competitors are enjoying duty-free access due to preferential trade arrangements. The same logic would apply in the area of services liberalization.

The fourth guideline has to do with the need to form policies complementing any trade liberalization policy on at least two levels: firstly, a robust industrial policy to boost domestic supply capacity through removing market failures that create supply side constraints and secondly a comprehensive social policy, including social safety nets, to carefully manage the process of the transition of the economy into a more efficient and open one while taking utmost care of the most vulnerable segments of the society employed in the uncompetitive sectors of the economy. This implies that a level of protection might be needed to remain in place in certain highly sensitive sectors despite economic inefficiencies. Although this is likely to be difficult from a negotiating standpoint, it should be noted that all countries are used to maintain these second-best policies if it becomes clear that gains from trade would not outweigh the social costs of transition. As the final guideline, when it comes to the most serious

stages of negotiations, the ultimate "act" of accession could not be divorced from its broader geopolitical context and relevant foreign policy developments, particularly the development of Iran-US relations. An accession policy that would not envision a complete removal of all unilateral and multilateral economic sanctions (whether or not one considers them legally consistent with WTO rules) would likely nullify much of the potential benefits of accession. Similarly, from an internal perspective, Iran's final phase of accession should accompany, and in fact should be the result of, a strong political will at all levels and an emerging national consensus on the part of all stakeholders. It is only under such circumstances that Iran could reap developmental benefits from its reinsertion into the global economy.

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Gender and Industrial Policy: Considerations for Iran

Nadereh Chamlou

Introduction

Iran's Sixth Five-Year Economic, Social, and Cultural Plan (Majles 2017), covering the period 2017–2021, is centered on an ambitious 8% average annual growth rate that is also to reduce the Gini coefficient from its current 0.37 to 0.34 by 2021 and generate around one million jobs (Farsnews 2016). Given the uncertain oil markets, much of the weight to achieve these targets is placed on the non-oil economy, which must grow and diversify considerably. If the plan is realized, by way of compounding, Iran's gross domestic product (GDP) should increase by around 45%. Yet, the latest Article IV Consultation Report of the International Monetary Fund (IMF 2017: 45) states that removing gender-based biases in the labor force "could boost the GDP in Iran by around 40 percent."[1] Given the size of Iran's economy, the loss due to gender-based barriers, in absolute terms (i.e., current dollars), is among the highest losses globally and is only surpassed by Saudi Arabia (Cuberes and Teignier 2015).[2] Iranian decision-makers could therefore augment the effectiveness of their policies to realize the goals of the Sixth Plan by tackling the impediments to women's economic participation. A recent law passed by the Iranian parliament (Majles 2016), however, aims to reduce women's economic participation rate even further.

Among the main causes of the low female labor force participation (FLFP) in Iran are legal and extralegal barriers women face in the economic domain

[1]The analysis is mostly based on the work of Cuberes and Teignier (2015). Karshenas et al. (2016) assume a female labor force participation (FLFP) rate that is closer to the world average to arrive at a slightly lower number.

[2]Yet, largely due to a host of restrictive institutions, the 17% female labor force participation rate in Iran is even lower than Saudi Arabia's 20%.

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(Salehi Esfahani and Shajari 2012; Rostami-Povey 2016; Rezai-Rashti 2015; Majbouri 2015; Azimi 2015; Rezai-Rashti and Moghadam 2011). As a result, Iran has been ranked 122nd among 127 countries in terms of gender disparities in economic legal rights (Fraser Institute 2016: 203). Furthermore, based on International Finance Corporation's (IFC 2016: 4) *Women, Business, and the Law*, which identifies 23 areas in the economic domain where women face differential treatment than male counterparts, Iran has the highest number of barriers after Saudi Arabia and Jordan among the 173 countries in the sample—considerably more than other Muslim-majority countries worldwide (World Bank 2016a).

The common belief is that when women gain more rights or opportunities, it is at the expense of men. Considerable literature exists, and will be discussed in this chapter, that provides empirical evidence to the contrary. Equality of opportunity that engages and benefits from the capabilities of all citizens is good for all. In the aggregate, it reduces misallocation and wastage of resources and leads to greater welfare for all. Recent research shows that gender equality leads to enhanced economic diversification, innovation, growth, and lower income inequality.

Over past decades, advanced economies have come to integrate policies, which increase FLFP and break the glass ceiling, as effective elements of their economic policies, be they improving the investment climate, trade, or sustainable development.[3] Even international bodies have embraced the integration of gender issues into all spheres of their work. Twelve of the 17 Sustainable Development Goals of the international community for 2030 include gender-specific coverage to ensure that the targets of the goal are achieved. The World Bank's flagship report *Doing Business* will henceforth incorporate the treatment of women in a country's business environment into the calculation of the index, which will impact the ranking of the countries covered. It sends an important message. Countries that want to improve their ranking can now do so by removing gender-based barriers.

The purpose of this chapter is to contribute to the debate about the policy choices that are necessary to generate a high growth in Iran's non-oil sectors. It proposes to decision-makers to consider the oft-neglected area of women's empowerment as an important policy lever for achieving Iran's development goals. The chapter draws its conclusion from the synthesis of the emerging literature about the linkages between gender equality and macroeconomic outcomes and highlights their relevance to the Iranian case. It concludes that Iran cannot neglect half of its talent pool and expect to become a competitive industrial power or a regional economic leader at a time when many of its competitors make every effort to draw in the capabilities of all their citizens by removing gender-based hurdles. The chapter begins with a broad overview of the evolution of and recent rethinking about industrial policy. The next segment covers selected research that links gender equality to increased industrial diversification, higher growth rates, improved income distribution, and firm

[3] "[US] Federal Reserve Chair Janet L. Yellen has prescribed an unusual remedy for the United States' aging, low-growth economy: harness the under-tapped pool of female talent" (Washington Post 2017).

productivity. The final section includes some specificities about FLFP in Iran and the opportunities and challenges around women's economic participation. The chapter concludes that addressing gender equality and women's empowerment as part and parcel of the broader portfolio of policies and reforms could substantially improve the ability of Iran to achieve its ambitious Five-year Plan.

Evolution of Industrial Policy

Global labor market data show that the world's workforce is better educated. An increasing share has tertiary education, and over half of them are women. Better education is typically associated with higher labor productivity, higher value-added outputs, higher growth, and faster development. Normally, job seekers with tertiary education are less likely to be or remain unemployed as compared to those with less education or skills, and many see higher levels of education as an insurance against unemployment.

However, over the last few decades, a new phenomenon has emerged globally, but more acutely in middle and low-income economies. Their rates of economic growth notwithstanding, they have failed to create an adequate number of jobs even for the higher educated. In these countries, the educated find themselves more and more among the unemployed. Particularly the youth is hit hard by this new phenomenon (see ILO 2016). There has been the general talk of jobless growth and/or skills mismatch despite high levels of investment in education. In parallel, though poverty (as measured by international benchmarks) has drastically declined since 2000, there is a widespread perception that inequality has increased. These developments have given rise to new political dynamics with unexpected electoral outcomes. Since the 2008 financial crisis, there has been a search for new solutions, among them through rethinking industrial policy, since despite expansive fiscal policies and aggressive monetary policies, most economies have been stuck in neutral, and growth has been anemic.

The question about what generates growth has occupied economists for centuries. The answers have frequently swung from one extreme that the market is the engine of growth and the most efficient allocator of resources to the other end where the government is the fixer and the guiding hand. The laissez-faire school of thought and the notion of the invisible hand of the market were dominant from the times of Adam Smith up to the early twentieth century. The Great Depression revealed the weaknesses of the pure market approach and swung the pendulum in the opposite direction, which ushered in the Keynesian school and the belief in the decisive role of government in spurring economic growth.

To understand the dynamics of growth and identify the mechanics of its determinants, economists began to develop growth accounting and other techniques to forecast and explain changes associated with a specific public policy measure. In the first generation of growth models, capital was central to growth and technology was exogenous though still a critical determinant (Lin and Monga 2010). A key missing

element in this approach was the role of technology, which had led to significant structural and economic transformations and which was the distinguishing factor between premodern and modern economic growth theories (Lin 2011: 195, citing Kuznets 1966). The new growth models, the endogenous growth theories as they came to be known, treated technology differently from other factors such as capital and labor, with two important distinctions. First, technology could be used indefinitely at zero marginal cost (Romer 1987). Second, it was a public good with social outcomes, yet could be under private ownership and control, thus providing incentives for its production and optimal use. These properties led to removing some methodological constraints and in identifying new policy levers for growth.[4] "While neoclassical models of growth took technology and factor accumulation as exogenous, endogenous growth models explain why technology grows over time through new ideas and provide the microeconomic underpinnings for models of the technological frontier" (Lin 2011: 196).

The wave of post-WWII decolonization and the establishment of the Bretton Woods organizations (The World Bank and the International Monetary Fund) ushered in a new field—development economics. Development, rather than merely growth, posed new challenges though there were clear overlaps in such areas as competition, physical and human capital, technological progress, equilibrium, and diminishing returns (Ibid.). Two theories are noteworthy. The first was explained in a paper by Rosenstein-Rodan (1943) that highlighted the linkages between economies of scale at the level of firms and the size of the market. Large markets could lead businesses to take advantage of technological productivity edge; and market size depended on the kind of technology adopted. Hence, a virtuous cycle. Modernization and development seemed to necessitate large firms, for which there was little private capital in developing countries, to jumpstart the process of economic development and make it self-reinforcing and self-sustaining. Otherwise, countries could find themselves in a poverty trap. Rosenstein-Rodan's framework inspired other economists and led to the "structuralist" approach to economic development. The essence of these theories was that the markets in developing countries had defects and that only the state could play the important role in stimulating economic development.

The second theory was suggested by Prebish (1950) and Singer (1950), which put the spotlight onto the deterioration of terms of trade between the exporters of raw materials—mainly developing countries—and exporters of finished products, which were largely industrial countries. The deteriorating terms of trade, they argued, translated in income transfers from the poor to rich countries. They suggested that developing countries create manufacturing capacity themselves, which could be done through import substitution and protection of domestic (infant) industry to help these firms take off and become viable over time. These two theories coincided

[4]More recent research has focused on how countries diffuse technology and how these differences produce different growth paths.

with strong nationalist movements and became the general development strategy in the 1960s and 1970s that swept Latin America, Asia, African, and the Middle East.

But the outcomes of this development approach were disappointing for several reasons. First, import substitution and protection shielded the enterprises from competition and made them inefficient over time. To keep these firms from collapsing, governments were forced to provide them with subsidies that imposed costs on the economy and distorted prices (Lin 2009). Another reason for the failure of the firms was that they often defied the country's factor endowment. For instance, in countries which were heavily labor intensive, these enterprises were highly capital intensive. Thus, they could neither scale up, since it required capital, nor create sufficient number of jobs, which the economy needed. Third, since it was left to the governments to pick winners or losers, they often missed selecting the "correct" industries. The established firms enjoyed monopoly status, which opened the door to rent-seeking, corruption (Krueger 1974), and what came to be known as crony capitalism. The combination of the stagflation of the late 1970s, the Latin American debt crisis, and the collapse of the socialist planning systems generated the momentum against the role of government in the driver's seat and thus put an end to Keynesianism and the structuralist (industrial policy) development model (Lin 2011: 198).

The post-Latin American debt crises in the early 1980s saw the emergence of an era of neoliberal free-market policies that came to be called the "the Washington Consensus" since the ten-point program was espoused by the IMF and the World Bank (Williamson 1990). They entailed structural adjustments and stabilization programs on the one hand and economic liberalization and privatization on the other. Over time, they, too, failed to generate the needed employment, and because of their heavy social costs, they became controversial. Policy-makers and politicians were less inclined to implement them fully or consistently (Williamson 2002).

As both structuralism and free-market approaches were widely dismissed, the economic research community began its search on what made some countries grow faster than others. Cross-country regressions and complex theoretical models that attempted to find the determinants of growth could not produce tangible results. At best, they could indicate that growth factors interacted with each other and no one reform parameter could be sufficient on its own. Reforms had to be implemented in conjunction with other changes, but the menu of reforms differed from country to country. Governments, however, had limited implementation capacity and could not do everything—hence, the need to prioritize structural change and sequence the agenda correctly. Hausmann et al. (2005) developed the "growth diagnostic" or "decision tree" whereby they argued that economies faced "binding constraints" on growth and structural change that varied over time within a country and differed across countries. Though it was a useful approach, it still could not solve the puzzle about the divergence in growth performance between emerging economies.

In 2006, the World Bank convened the Growth Commission under the guidance of two Nobel Laureates, Mike Spence and Robert Solow. Their mission was to review

policies across a broad spectrum of strategies in 13 countries[5] that had an average growth rate of 7% over at least a 25-year period since 1950. The Commission wrestled with the complexity of all elements of growth strategies—budget allocations, taxes, exchange rates, trade and industrial policies, regulations, privatizations, and monetary policies, to name a few. After several years of review, the Growth Commission's most important conclusion was that previous growth research had paid limited attention to heterogeneity, i.e., the characteristics of each country and that each country had followed its distinct path that could not be replicated in other countries. While no prescription could be given, high-growth countries had two commonalities:

> One, they imported ideas, technology, and know-how from the rest of the world. Two, they exploited global demand, which provided a deep, elastic market for their goods. The inflow of knowledge dramatically increased the economy's productive potential; the global market provided the demand necessary to fulfill it. To put it very simply, they imported what the rest of the world knew, and exported what it wanted. (Commission on Growth and Development 2008: 22)

It became apparent that what separated the high-growth batch from others, or the developed from developing, was a knowledge gap, which free markets were unlikely to bridge on their own. In the search to find new alternative theories, industrial policy reemerged as one of the tools for consideration. With the failure of the Washington Consensus, which believed that free and unfettered markets served development best and that the government played no intervening role in the structure of the economy—no "difference whether we produce potato chips or computer chips" (quoted in Stiglitz and Greenwald 2015: 218)—the attention now began to shift toward the role of "knowledge" vs. technology in development and what governments could do in terms of facilitation.

The timing was also fortuitous. The 2008 financial crisis breathed new life into the debate, and that the governments should play an activist role to stimulate economic growth and development. The United States, which had been adamantly against industrial policy, began to implement industrial policy without calling it as such. The Obama stimulus package was essentially industrial policy in that it propped up specific strategic sectors such as the banking, the auto, the energy, the infrastructure, and the health sectors. Since the United States did it, it opened the door to a rethinking of industrial policy as one of the tools in the toolkit that countries could use to shape their economies.

The "new structural economics," sometimes dubbed "industrial policy 2.0," combines the activist role of the government with market-friendly economic systems and institution to promote a country's comparative advantage. Justin Lin, the Chief Economist of the World Bank (2008–2012), was a key proponent at a time when the global crisis had a severe impact on emerging countries, which were searching for a new framework for growth. Building on previous theories and the findings of the Growth Commission, the starting point of the new structural economics is a

[5]The 13 economies were Botswana; Brazil; China; Hong Kong, China; Indonesia; Japan; the Republic of Korea; Malaysia; Malta; Oman; Singapore; Taiwan, China; and Thailand. Two other countries, India and Vietnam, were also considered.

country's endowment and the active role of the state to promote development. But unlike the early structuralist who viewed endowments as somewhat static (i.e., labor, natural resources, etc.), for the new structural economists, endowments are changeable over time.

The new approach has differences with previous structuralist/industrial policy thinking. The old structuralist economics (Rostow 1960) categorized societies into five stages of development: (1) traditional stage, (2) preconditions to growth, (3) takeoff mode, (4) process of wealth generation, and (5) mature stage for mass consumption. Questions were raised early on whether all developing countries had to transition through a similar trajectory and how countries moved from one stage to the next (Gerschenkron 1962). The new structural economics assumes a continuous rather than discrete-step process, whereby the changes in industrial structure adjusts and transforms an economy's endowment structure. Globalization and rapid product development offer countries new opportunities in which a country can specialize in at any stage of development. "The differences between the two frameworks derive from their dissimilar views on the sources of structural rigidities: old structural economics assumes that the market failures that make the development of advanced capital-intensive industries difficult in developing countries are exogenously determined by structural rigidities due to the existence of monopolies, labor's perverse response to price signals, and/or the immobility of factors" (Lin 2011: 205).

The similarity between the "old" and the "new" structural economics is that both acknowledge the role of the state to move an economy from a lower level of development to a higher one. They differ on the approaches and the modalities for intervention. Still, critics see the main shortcoming of the new approach to be that it still relies on state officials, bureaucrats rather than businesspeople or innovators, to determine which sectors to promote, and thus still determine winners and losers.

Proponents of the new school concur that it rejects dependency theories and that a developing country can over time change its hard and soft factor endowments through active policy direction and thus counter any negative historical trends and diversify the economy by building industries that are consistent with its new factor endowments made possible by globalization.[6] The following differences are further highlighted by Lin (2011: 206–207):

> The new structural economics concludes that the role of the state in industrial diversification and upgrading should be limited to the provision of information about the new industries, the coordination of related investments across different firms in the same industries, the compensation of information externalities for pioneer firms, and the nurturing of new industries through incubation and encouragement of foreign direct investment (Lin 2009; Lin and Chang 2009; Lin et al. 2011). The state also needs to assume its leadership role effectively in the improvement of hard and soft infrastructure to reduce transaction costs of individual firms and so facilitate the economy's industrial development process.

[6]Perhaps a good way to visualize the difference between the old and the new structural economics is the distinction between Saudi Arabia, which has an economy built on the old structuralist concept of "endowments," and Dubai, which has little of any old-style resources, but has been able to promote a modern and diverse industry through a combination of "hard and soft" infrastructure.

Impact of Gender Equality on Economic Policies

Since industrial policy, or new structural economics, is back on the agenda, some governments are proactively looking for ways to diversify, improve competitiveness, or direct the private sector to meet new global challenges such as climate change, water, energy, etc. The merits and shortcomings of the new structuralist approach will emerge over time. But for now, it is considered a useful tool in the arsenal of policy-making.

Structural transformation, however, entails not only channeling resources into new activities but also allowing the creative destruction of old sectors and institutions that waste resources that could be freed up to invent new products and employ a changing workforce (see Ianchovichina and Lundstrom 2009). Fiscal policy, monetary policy, financial sector development, foreign direct investment, and trade policy, which are the standard tools of economic policy, can only do so much. They cannot dictate the firm's unique niche and the productivity of its employees. More is needed.

Some governments have experimented with industrial parks, export processing zones, incubators, etc. Regardless of whether the right sector or location is chosen, the success of an industry depends on its ability to absorb technical know-how, improve productivity, and expand its market. Failure of firms to have access to a wide talent pool and adjust their production and business models to changing circumstances unravels even the best of government's ability to pinpoint the "correct" industry.

The "old" structural economics said almost nothing about human capital despite the substantial evidence that the steady growth in per capita incomes in advanced countries was primarily due to increases in productivity that resulted from higher knowledge and improved human capital. The "new" structural economics pays great emphasis to the quality and quantity of human capital, not just "labor," as an essential component of a country's endowment. Human capital and its utilization have become recognized drivers of economic growth because as firms move up the technological value chain, they face higher levels of risk. Better and higher quality human capital enables businesses to adopt new technology and mitigate uncertainties.

The rest of this section builds on the above observations and covers the nexus between gender equality and economic growth. There is an emerging body of empirical literature that underscores the importance of gender equality for positive economic outcomes. The literature discussed below highlights the impact of reducing gender inequality on export and product diversification, growth, income distribution, macroeconomic outcomes, and micro/firm-level performance. They provide insights for decision-makers in search of potentially overlooked policy levers.

The first paper by Kazandjian et al. (2016) deals with the relationship between gender inequality and export diversification as well as gender inequality and output

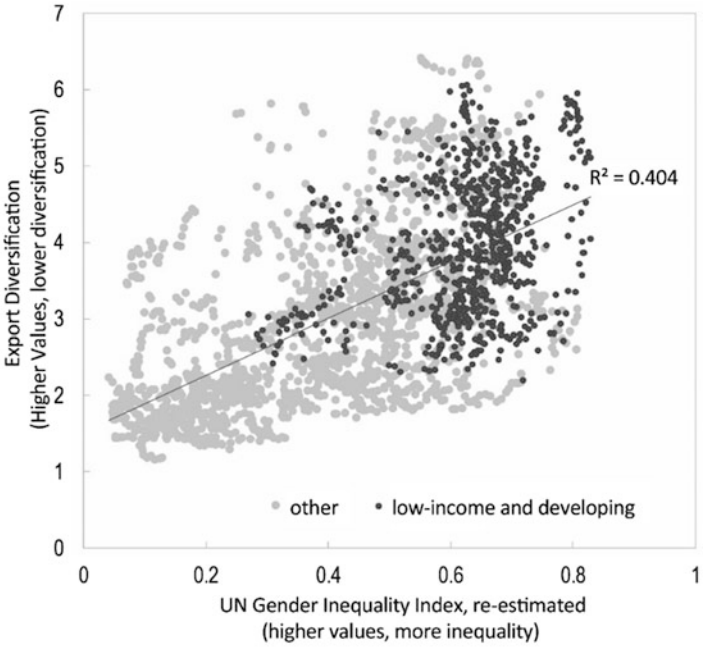

Fig. 1 Export diversification and gender inequality, 1990–2010 [Reproduced from Kazandjian et al. (2016: 6), based on World Bank (2016a), UN (2015), IMF (2014), and estimations made by the staff of International Monetary Fund]

diversification.[7] As shown in Fig. 1, countries with high levels of gender inequality (measured by the United Nations' Gender Inequality Index or GII) display lower levels of export diversification (defined as the combined measure of export product variety and equality in export shares). Figure 2 presents a similar relationship between output diversification (defined as the equality in the contribution of sectors to real output, including services) and gender inequality.

Kazandjian et al. (2016) analyze the effects of gender inequality on export and output diversification together with various determinants identified in earlier literature, such as structural characteristics, institutional environment, cyclical factors, and diversification policies. They first run baseline regressions using the aggregate GII for each dependent variable, i.e., export diversification and output diversification. The second set of regressions have the same dependent variables, but use the subcomponents of GII (i.e., female labor force participation, secondary enrolment ratio, women in parliament, maternal mortality, and adolescent fertility). The authors then test for causality between the GII and the diversification variables and the direction of that causality. In the first baseline regressions (i.e., using the overall GII), they find strong and negative associ-

[7] Introducing new product lines and creating a more balanced mix of existing products.

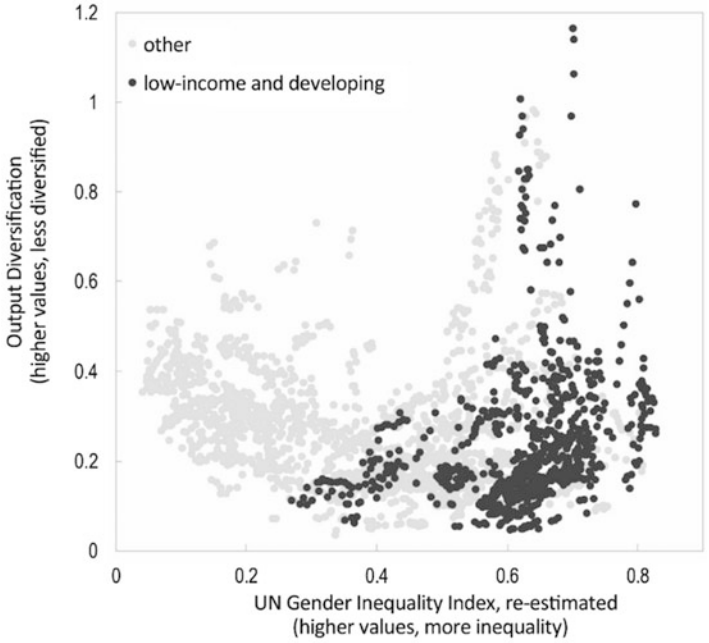

Fig. 2 Output diversification and gender inequality, 1990–2010 [Reproduced from Kazandjian et al. (2016: 6), based on World Bank (2016a), UN (2015), IMF (2014), and estimations made by the staff of International Monetary Fund]

ation of GII with export diversification in low-income and developing countries.[8] As shown in Table 1 in the Appendix, the results are similar when using the entire panel of emerging and advanced economies. Higher gender equality is significantly associated with higher export diversification. "The effect of gender inequality comes on top of structural characteristics [and its] impact remains when controlling for policies associated with export diversification" (Kazandjian et al. 2016: 14).

As demonstrated by Table 2, the results of their baseline regression against output diversification are comparable for low-income and developing countries. Kazandjian et al. (2016) also run the model using the disaggregated indicators of GII. Table 3 shows that the "human capital channel"—i.e., higher female-male enrollment ratio—has a significant and positive relation with export diversification, with a stronger effect in low-income and developing countries. A higher female-male ratio means lower gender disparities in education and a more evenly distributed talent pool in the workforce. The results support the earlier statement made above that better human capital across the board enables firms to adopt newer and more complex processes to

[8] "[M]oving from a situation of absolute gender inequality to perfect gender equality measured by the index could decrease the Theil index of export diversification, i.e. increase export diversification in low-income and developing countries, by 0.6–2 units. The magnitude of this effect is equivalent to up to about two standard deviations of the index across low-income and developing countries" (Kazandjian et al. 2016: 13).

move up the technological value chain. Using the "resource allocation channel"—i.e., higher female labor force participation—yields comparable results for low-income and developing countries. Interestingly, better health outcomes such as lower maternal mortality and lower adolescent fertility (indicating later marriages), which may first appear to be unrelated to production, have a positive impact on export diversification. This suggests that lower adolescent fertility or later marriages are associated with girls staying in school longer and acquiring more marketable skills. Likewise, lower maternal mortality indicates that the female human capital is not lost during prime working stage. The effect of the disaggregated GII on output diversification is comparable to the results on export diversification (Table 4).

Finally, they test for evidence of causality between gender equality and diversification and the direction of such causality (Table 5). The authors use legal rights as an instrument to check for causality. Women's legal rights are a valid instrument as they do not directly impact export diversification per se, but are correlated with components of gender-based inequality. Statistical tests confirm the validity of the properties of this instrument. "The results suggest that gender inequality may indeed be a cause of lower economic diversification" (Kazandjian et al. 2016: 17). Legal restrictions constrain human capital and "lead to suboptimal creation of ideas and development" that impede diversification (Kazandjian et al. 2016: 21). Thus, the authors demonstrate the link between gender equality and economic diversification, which is widely considered a source of sustainable growth. They go on to prove the reverse direction of causality with legal gender equality, i.e. reducing legal disparities between men and women is likely to lead to greater diversification because of better utilization of human capital.[9]

Earlier literature had established that structural transformation improved gender equality since it expanded the demand for women's economic participation (Akbulut 2011; Olivetti and Petrongolo 2014; Ngai and Petrongolo 2014; Rendall 2013) because it created jobs requiring less physical strength for which women could compete (Rendall 2013). Kazandjian et al.'s findings go further and confirm the research by Demirgüç-Kunt et al. (2013) that gender-based legal restrictions negatively affect women's access to finance and impede their full economic potential. Others have found similar results with respect to female labor force participation and employment, asset ownership and wealth, and on property rights (World Bank 2008; Deere et al. 2013). Quisumbing and Pandolfelli (2010) also find that legal restrictions impede the adoption of new technologies.

[9]"[T]he analysis highlights significant determinant of export and output diversification, even after including legal rights for women, such the right to be the head of a household or marital property rights, as instruments for gender inequality in GMM regressions. The instruments [used] pass standard econometric and rule-of-thumb tests. Each of the instruments is individually significant in the first-stage regressions, and the F-statistics of the IV regressions are well above the rule-of-thumb threshold value of 10. In addition, in specifications with two or more instruments, the *p*-values of the Hansen J-statistic do not allow us to reject the joint null hypothesis that the instruments are uncorrelated with the error term, supporting our hypothesis that the excluded instruments are indeed correctly excluded from the estimated equation. These results suggest that gender inequality may be indeed a cause of lower economic diversification" (Kazandjian et al. 2016: 17).

While women's economic activity matters on its own merits, the second important paper discussed here, which is by Gonzales et al. (2015b), finds a correlation between gender equality under the law and per capita GDP growth. The World Economic Forum's *Global Gender Gap Report* (WEF 2014) as well as the *World Development Report* (World Bank 2012) suggests a similar association. Lowering fertility, increasing education, and providing child care are identified in the earlier gender literature as key determinants of female labor force participation. It is also shown that the extent of government expenditure policies, including maternity leave and child benefits as well as tax policies, has important implications for women's economic participation. The impact of gender-based legal restrictions on women's labor force participation, however, has received less systematic attention. Gonzales et al. (2015b) examine the legal effects on women's labor force participation for a large set of countries over an extended period. They include indicators based on the World Bank's Women, Business and the Law Database (IFC 2016) that relate to women's work and entrepreneurship and find that fewer discriminatory laws are strongly associated with higher female labor force participation. Furthermore, legal equality in economic rights explains variations in male-female labor force participation gaps across countries and time.[10]

The third noteworthy paper is by Gonzales et al. (2015a), which shows a strong association between gender-based economic inequalities and income inequality. Earlier research suggests that moderate income redistribution policies could have a modestly positive impact on growth, while growth is likely to be dampened when countries implement strong redistributive policies (see Ostry et al. 2014). Hence, redistributive policies can reduce the income dimension of inequality and, if not excessive, promote modest growth. But the non-income dimensions of inequality, such as health, education, and access to work, may not easily be tackled by income redistribution alone and need to be targeted separately. Gonzales et al. (2015a) argue that leveling the economic playing field between men and women can alleviate overall economic inequality. Similarly, Elborgh-Woytek et al. (2013) demonstrate that bridging gender gaps in employment and economic opportunity have significant and positive impact for nearly every economy, even in advanced countries.

On the microeconomic side, a series of studies over the last decade have demonstrated that gender diversity matters for firm performance. Christiansen et al. (2016) examine the link between gender inclusion and the financial performance of two million companies in 34 European countries. The correlation is positive in sectors with a high share of female participation. The explanation may be that these industries make a better use of the overall talent pool as well as the male-female complementarities in skills and problem-

[10]In particular, the following factors are all related to a statistically significant decrease in the gender gap in labor force participation: legally guaranteed equality between men and women; equal property rights equal inheritance rights for sons and daughters; joint titling for married couples; women's liberty to pursue a profession, obtain a job, or open a bank account; a woman's right to initiate legal proceedings without her husband's permission; right to sign a contract; and a woman's right to be the head of a household. These effects come in addition to other factors, such as demographics, education, and family policies that have the expected sign and are statistically significant in the regression analysis.

solving. They also find that higher female representation in senior positions is positively correlated with better company performance, which ultimately has macroeconomic implications in the aggregate. Leveling the playing field through policies that facilitate women's full-time attachment to the labor force and professional upward mobility could help build a viable pipeline of women qualified for senior corporate positions.

Country-specific studies carried out over the last 15 years by Catalyst (2017), leading management firms, and business schools reconfirm the impact of diversity in general, and gender diversity specifically, on the performance of publicly traded companies. The underlying reason is that firms that manage their human capital effectively are likely to manage their overall assets more efficiently and gain better insights into their markets. The consistent evidence across countries and sectors has induced companies to review internal talent management and staffing policies. It has also led many governments to remove discriminatory laws that impede greater diversity. In most European countries that want a sustained pace of growth, quotas have been introduced—either by the companies themselves or through government's inducement targets—to ensure a strong pipeline of viable candidates is tap into the female talent pool.

In summary, as a complement to a rethinking of industrial policy to better guide the resources within an economy and ensure that there is a smooth transition toward sectors that yield higher returns and phase out activities that drain the economy, there have been robust studies about the linkages of gender equality and economic growth. Women's economic participation positively impacts a range of macroeconomic outcomes and firm-level performance (see Galor and Weil 1996; Alesina et al. 2013). Moreover, going beyond earlier studies that suggest that economic development will over time reduce gender inequality, the emerging evidence presented in these studies points to a reverse causality, i.e., reducing gender discrimination positively affects growth, industrial and export diversification, and development (see Dollar and Gatti 1999; Stotsky et al. 2016; Cuberes and Teignier 2015; Duflo 2012). Legal discrimination undermines the allocation of a country's most precious economic resource—its human capital—and prevents firms and households from optimizing their opportunities in accessing income and accumulating wealth.

The Case of Iran

The question of whether women should work or be homemakers is a hotly debated topic in Iran despite the global evidence that two-income families are financially better off, accumulate more wealth, invest more in the education and health of their children, and are able to weather economic shocks and downturns. Opponents justify their objection to women's work on two grounds. First, men have had the traditional role as the family's breadwinners, and there is no need for women's income. In almost all societies, men were traditionally the providers, and Iran is no exception. Thus over time, the social structure came to establish institutions, rights, and privileges that corresponded to men's responsibility in this regard. However, as families increasingly were unable to make ends meet on one income alone, women entered the workforce and contributed to the household's sustenance. At times, they are even the main/sole breadwinner, Hence, norms, laws, and

institutions changed or adapted gradually in recognition that discrimination against a woman was essentially discrimination against her family. In Iran, this transition was present but was interrupted with the 1979 Revolution and in certain areas reversed. A second and related argument oft-heard from opponents is that jobs are scarce and that women will take away opportunities from men, who are the rightful breadwinners of their families. They argue, therefore, that men be preferred in hiring and receiving benefits, which effectively promote sex-/gender-based discrimination in the labor market.

At 17% per ILO estimates, and 12% per national estimates, Iran has one of the lowest female labor force participation (FLFP) rates[11] in the world (Fig. 3a), even lower than its neighbors Saudi Arabia (20%) and Turkey (29%). But unlike the latter two countries where the female unemployment rates hover around or below the male rate (6% and 11%, respectively), female unemployment rate in Iran is quite high at 20% despite the low FLFP, and nearly double that of the male unemployment rate (Fig. 3b). The high female unemployment rate is not caused by skills mismatch, which will be

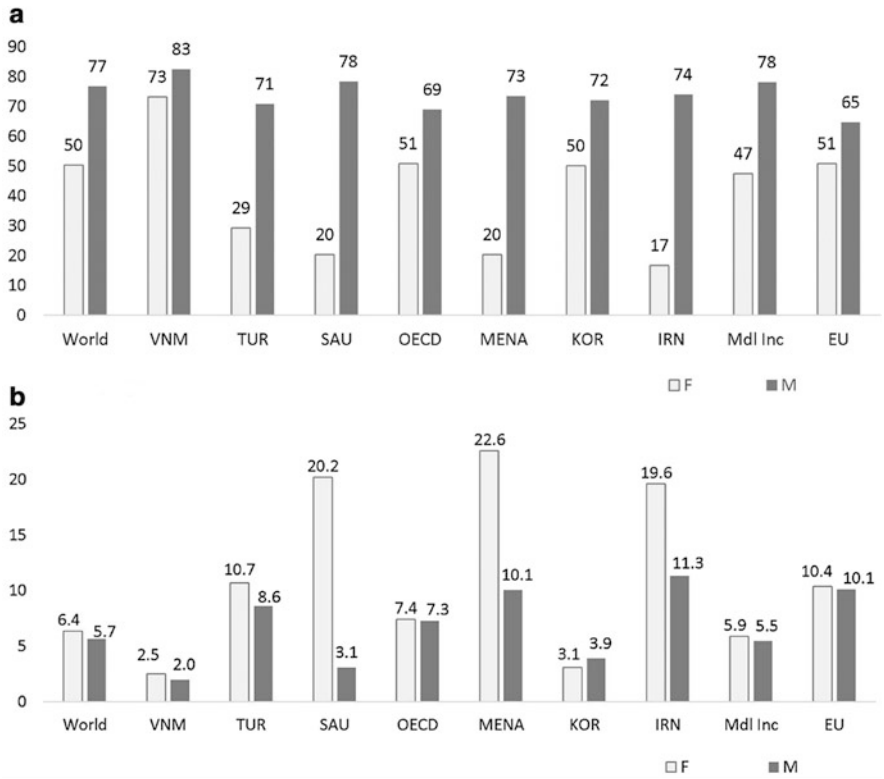

Fig. 3 (**a**) Male-female labor force participation rates, (**b**) Male-female unemployment rate (percent) [Source: World Bank (2016b), World Development Indicators]

[11]It is often argued that women work informally. ILO estimates include informal workers, women who work without remuneration in family work, and part-time workers.

discussed later in this chapter. The low participation and the high unemployment rates constitute one of the most glaring dysfunctions of Iran's labor market (IMF 2017).

For policy-makers, whose success is measured by a decline in the metric of unemployment, fewer women entering the labor force could be a blessing since the unemployment rate is based on those who work and are in search of work. "Participation" includes everyone who is employed, works part-time/full-time, informally or formally with or without remuneration, and actively looks for work. It does not include those who are of working age but never participated or left the market. Thus, reducing the number of female would-be job seekers improves the unemployment rate.

A host of policies either discourage women from joining the workforce or encourage them to exit. Since the 1979 Revolution, there have been continuous and frequent spurts of policies with a view of reserving jobs for men. For instance, while most countries that face low female labor force participation introduce affirmative action or implement quotas to increase the number of women, in Iran the affirmative action has been for men, i.e., there is a ceiling (and usually a low one) for female intakes. The male-female allocations were so glaring that in the summer of 2016, President Rouhani had to finally address the issue (Guardian 2016). He instructed his cabinet to review the sex-based quotas, after complaints mounted that a public sector hiring drive for 3500 openings had set an explicit ceiling of lower than 20% for women, regardless of the candidate's educational qualification or performance on job-specific entrance exams. The quotas were more stringent in urban areas, possibly because there were more men looking for jobs. In the countryside and perhaps because of less competition, the allocations for women were slightly more generous. Thirty percent of jobs were strictly for men. Men had access to 961 job classifications and women to only 16. Moreover, men could apply for managerial positions, which women did not. Hence, there was an explicit horizontal and vertical job segregation. In the end, activism proved successful, job categories were reclassified for the delayed exam, and in fact more woman passed its first stage as compared to men (ISNA 2017a). The actual hiring structure remains to be seen.

Beyond hiring allocations, there have been public media campaigns to downplay the role of women in the workforce and promote their traditional caregiving role. Concurrently, implicit or explicit policies and regulations impose a range of disincentives to employers to hire women. During the Ahmadinejad administration (2005–2013), a set of family policies were introduced to presumably "support" working wives. Instead, they resulted in an actual drop of working women from 3.96 to 3.1 million. For any country, a drop of close to one million women workers is a sharp decline, even more so for a country with an already low base (Fig. 4). This precipitous decline is also due to the dearth of jobs for women. During the said period, 871,000 male jobs were created, while 568,000 female jobs were eliminated (Salehi Esfahani 2015). More recently, as part of the Sixth Five-Year Plan, a controversial legislation was sent to the Guardian Council to provide incentives to women to retire after 20 years of service (ISNA 2017b). It would have pushed thousands of women out of the workforce, had it been approved. Another draft legislation was to mandate that the working hours of women with children, especially with children under six years and/or disabled husbands, be reduced from 44 to 36 hours per week, but with full payment (Majles 2016). Women's advocacy groups protested that these regulations would result in fewer employment opportunities for women.

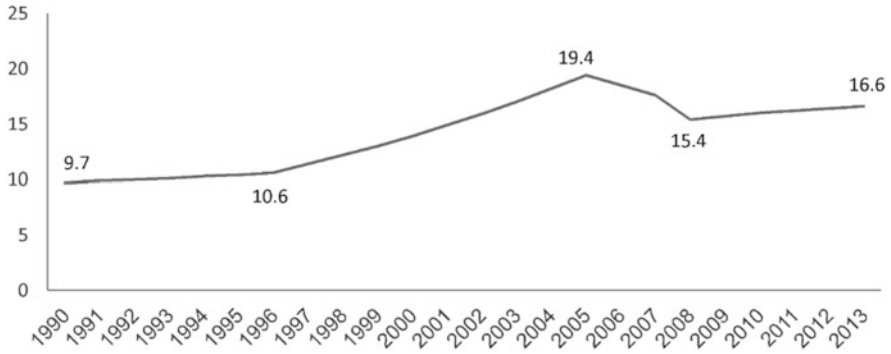

Fig. 4 Female labor force participation trends in Iran [Source: ILO (2014), Key Indicators of the Labor Market]

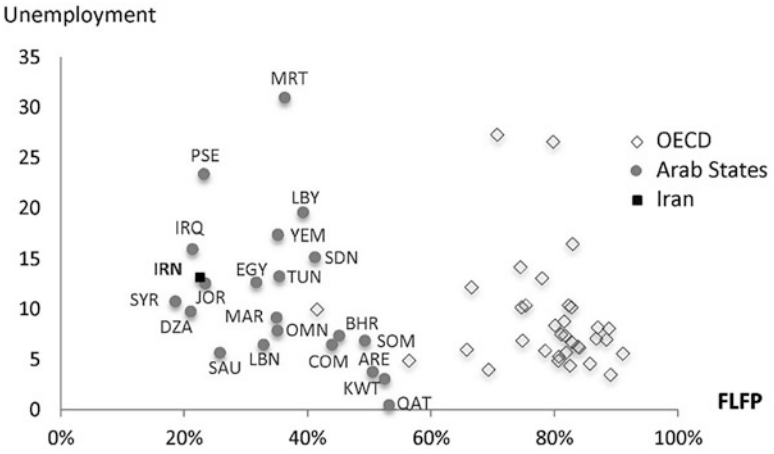

Fig. 5 Female labor force participation and unemployment rates [Reproduced from World Bank (2004: 8), data for latest available years]

If pushing women out of the workforce is a mechanism to engineer a lower aggregate unemployment rate and more jobs for men, global evidence points to an opposite outcome. As Fig. 5 demonstrates, using cross-country data, there is a negative correlation between female labor force participation and aggregate unemployment. For OECD countries, the correlation is slightly negative, while for MENA countries a stronger negative correlation exists between the two indicators. It suggests that in the long run, disregarding short-run fluctuations in the unemployment rate, an economy that is more inclusive is likely to experience lower unemployment for several reasons. For one thing, income earned by women, often as second earner, expands a family's purchasing power, thus, spurring demand for goods and services, which results in job creation. A second income can also act as a stabilizer in times of economic volatility or shocks. More stability at the household level provides also greater freedom for policy-makers to take the difficult decisions of structural reforms, which invariably

result in temporary layoffs in one industry in anticipation of takeoff of a new one. The high cost of such structural transitions necessitates normally state handouts to dampen the shock at a time when the fiscal burden may be the highest (Karamesini and Koutentakis 2014; Daouli et al. 2014).[12] But, if a higher share of families can fall back on a second income, the burden on the state can be lighter and policy shifts that would benefit the economy in the long-run can be taken with steadier hand. Hence, policy-makers should target an overall expansion of opportunities for men and women and benefit from all skills and talents, rather than focus solely on lowering the unemployment rate—as has been targeted in Iran (Farsnews 2016).

Gender discrimination exerts a substantial cost on the Iranian society which have been quantified in several instances. In principle, as explained by Becker (1992) when the population of the discriminated is relatively small in comparison to the privileged group (as was the case in the United States where the white population was nine times bigger than the black), discrimination hurts the marginalized minority financially and benefits the preferentially treated majority. However, when the discriminated group accounts for a sizable fraction of the total population, discrimination negatively impacts both groups, the discriminated and the discriminators. This was the case in South Africa where the black population was four to five times as large as whites. Despite some benefits for the whites, the Apartheid system eventually broke down under its own weight. With women constituting half the population, discrimination against women hurts every single family, and Iran is closer to the South African case.

The impact of weak FLFP in Iran, at a time when over 60% of university graduates are female, indicates poor utilization of human capital and manifests itself in low productivity growth. Figure 6 plots the growth rate of total factor productivity (TFP) in Iran since 1990 (IMF 2015). TFP has had a sharp decline since roughly 2000, and its recovery will take years. The output per worker is falling and suggests structural impediments to allocation of resources.

It is therefore no surprise that gender disparities in economic activities result in loss of GDP output. Figure 7 uses Cuberes and Teignier's (2015) estimation results for the top ten countries with the largest percentage GDP loss. For Iran, it is a loss of 41%—that is, if women were to work at the same rate as men, the GDP of Iran could be that much higher. They attribute the prevalence of legal barriers as the primary reason for these losses. As shown in Fig. 8, Iran indeed has one of the highest numbers of gender-based legal barriers—23 specific instances. Karshenas et al. (2016: 3) use different assumptions and arrive at a 21% loss assuming women work part-time or a 35% loss assuming they work at the same rate as men.[13] The actual number is less critical than the overall indication that the Iranian economy and families suffer from a considerable loss due to low economic participation that is due to legal obstacles—which is highlighted in Rezai-Rashti and Moghadam (2011),

[12]Karamesini and Koutentakis discuss the labor market flows and unemployment dynamics by sex in Greece during the crisis, while Daouli et al. highlight the added worker effect of married women in Greece during the crisis.

[13]They estimate gross impact as a percentage increase in per capita GDP assuming women have the same hours of work and productivity as men. Net impact adjusts for productivity drag and part-time work.

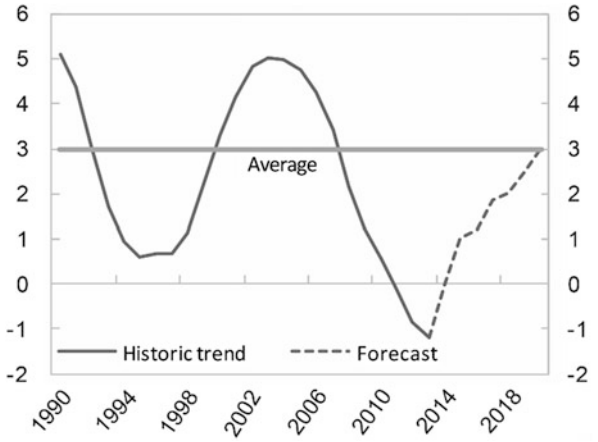

Fig. 6 TFP trend growth in non-oil sector [Reproduced from IMF (2015: 9), based on information from Iranian authorities and IMF estimates]

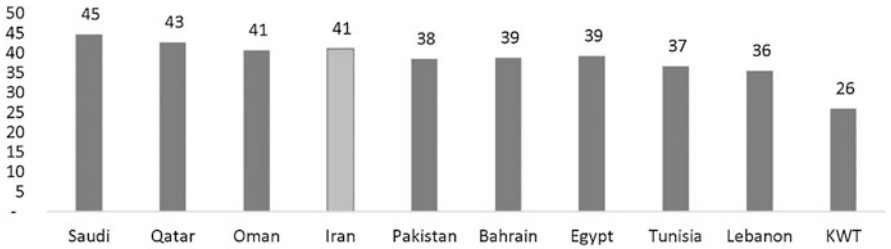

Fig. 7 Long-run GDP loss due to occupational gender gap (percent) [Source: Based on the results of Cuberes and Teignier (2015)]

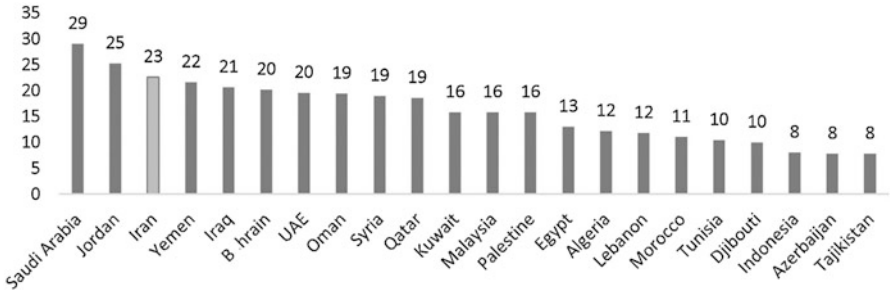

Fig. 8 Number of legal gender barriers [Reproduced from IFC (2016: 4), based on Women, Business, and the Law Database]

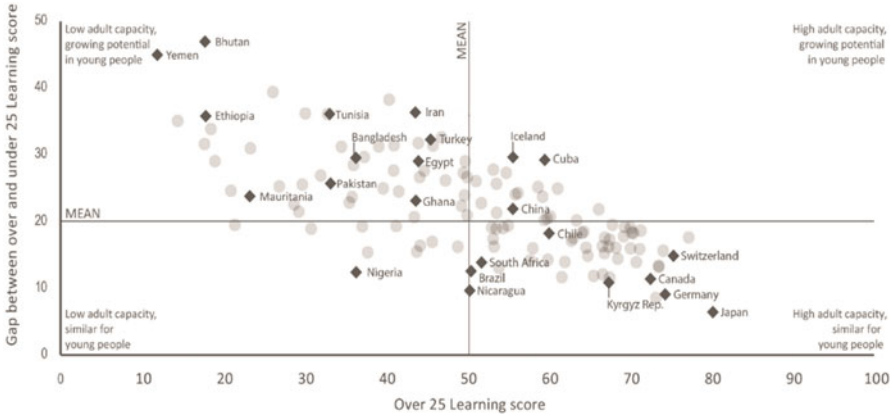

Fig. 9 Intergenerational progress in learning theme score average [Reproduced from World Economic Forum (2016: 17), based on Human Capital Index 2016]

Salehi Esfahani and Shajari (2012), Rostami-Povey (2016), Majbouri (2015), and Chamlou and Karshenas (2016).

To counter this trend, policies that remove these legal obstacles are as important as any other policies and reforms that are intended to unleash Iran's economic potential, be they consistent with" industrial policy" or any another economic framework. Countries with far higher per capita incomes, such as Norway, or global economic powers, like Japan, have implemented policies to promote a meaningful integration of women into the economy, politics, decision-making, and leadership.

Iran could benefit from a more inclusive economy if it has ambitions of becoming a regional economic power. It has ample natural resources, a large domestic market, and a geographic location that can easily access a market of 300–400 million people in neighboring countries. To do so, Iran's most important resource is its human capital. Figure 9, taken from the *Human Capital Report 2016*, ranks countries into four quadrants based on the Human Capital Index. The top right quadrant includes countries with solid learning capacities developed earlier that have achieved further improvements for their next-generation workforce. In contrast, countries falling in the bottom left quadrant have failed to upgrade the human capital potential of their younger generation. Countries in the bottom right quadrant are mostly mature economies, which had an educated older cohort and largely maintained their levels with minor improvements in the younger group. Yet, countries in the top left quadrant made the most significant expansion in the capacity of their young generation in comparison to the previous generations—among them Iran. As the report puts it, "successful leveraging of the full human capital potential of the young generation will be especially crucial to reaping the opportunities of the Fourth Industrial Revolution" (WEF 2016: 17).

Women account for more than half of the Iranian talent pool. They make up about 60% of university/college entrants. Their share in engineering is 26%, science 69%, and business and law 69%—fields that are essential for firms (Guttman 2015). At a time when most countries struggle to attract women into science, technology,

engineering, and math (STEM) fields, Iran has a considerably underutilized female talent pool at its disposal that could contribute effectively to the export and product diversification, which were discussed in this chapter. Indeed, according to the United Nations *Statistical Yearbook* (UN 2016: 39–54), Iran has the world's fifth largest enrollment in tertiary education (given for 2014)—of which more than half are women. It also has one of the three biggest populations (actual numbers rather than just percentages) of women engineering students in the world.

Iran's window of opportunity is now and will not be open for very long. The increase in birth rates of the 1980s combined with the rapid decline since the 1990s has yielded Iran a uniquely low age-dependency ratio (Fig. 10a), as defined by the

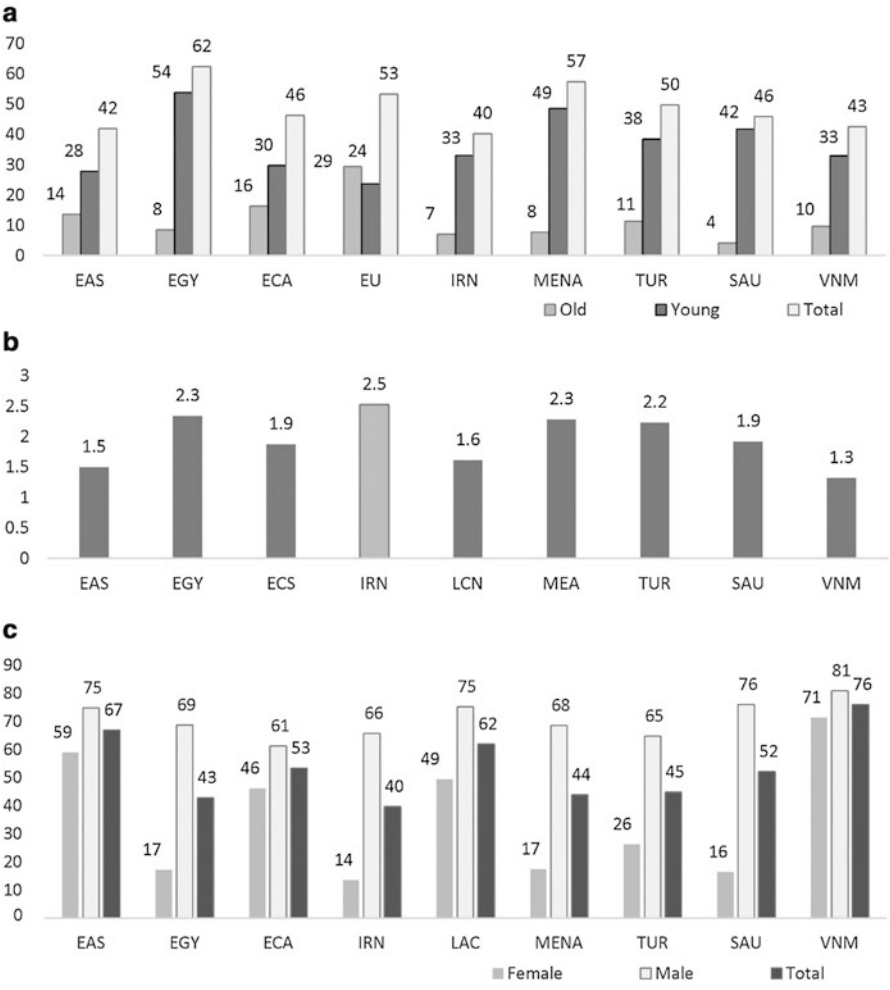

Fig. 10 (**a**) Age-dependency ratio [Source: World Bank (2016b), World Development Indicators], (**b**) Economic dependency—number of persons supported by each worker [Source: World Bank (2016b), World Development Indicators], (**c**) Employment-to-population ratio (percent) [Source: World Bank (2016b), World Development Indicators, and ILO (2014), Key Indicators of the Labor Market]

share of youth (less than 15) and elderly (65+) population over the 15–64 age population. "Iran benefits from relatively small age-dependency ratios through 2045, which could help boost productivity and economic growth" (IMF 2017: 38). By contrast, Iran has one of the highest economic dependency ratios. Every worker supports 2.5 nonworkers (Fig. 10b). This is the result of having one of the lowest overall employment-to-population ratios (40%). While male participation rates are also low compared to other developing countries (for instance, Vietnam has about the same population but a male participation rate of 81% compared to Iran's 66%), the female ratio is among the lowest (Fig. 10c).

Conclusions

Iran faces challenges in stimulating inclusive growth, industrial diversification, job creation, and the development of its non-oil economy. Under the Sixth Five-Year Economic, Social, and Cultural Plan (2016–2021), it hopes to achieve an ambitious 8% yearly growth. For this to happen, Iran would need to enact many structural and institutional reforms to unleash the capacity of all Iranians in the economy. To put the plan into operation, Iran is exploring various frameworks, among them an approach in line with the "new structural economics," since it believes that there is a role for the state to play in industrial diversification and upgrading. But, unlike earlier forms of industrial policy, which picked winners and losers, the role of the state must now be limited to the provision of information, coordination, and upgrading of institutions that improve the country's *hard and soft infrastructure*. These can in turn reduce the transaction risks and costs that individual firms face and support industrial innovation and diversification (Lin 2011).

Above all, the "new structural economics" places an emphasis on human capital as a country's most deciding endowment. This chapter has argued that all respective policy reforms, which Iran must consider, pay serious attention to removing sex-specific and gender-based legal and social barriers that currently result in the underutilization of Iran's impressive and large female talent pool. Women constitute more than half of Iran's human capital, in quantitative and qualitative terms. Contrary to some prevailing thinking that women's increased participation can only be at the expense of men's, and thus justify the status quo, expanding women's economic opportunities will bring to the market ideas and skills from which the whole economy can benefit. According to recent analyses, Iran's GDP could gain as much as 35–41% with women's full participation. A growing body of recent cross-country empirical studies has found strong positive association, causation and direction of causation, between reducing gender inequality and improved macroeconomic outcomes such as growth and improved income distribution, export diversification, and firm-level profitability and performance. For these reasons, reducing gender inequality should be an integral element in defining the reform agenda during the implementation of Iran's Sixth Five-Year Plan.

Appendix

Table 1 Explaining export diversification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gender inequality									
Gender Inequality Index	0.703**	0.752***	0.776***	1.156***	1.141***	1.381***	1.078***	0.983***	0.665**
	(0.273)	(0.278)	(0.277)	(0.319)	(0.284)	(0.282)	(0.294)	(0.298)	(0.264)
	1.014**	0.983**	1.113**	0.338	0.880**	0.120	0.274	0.538	0.630
	(0.431)	(0.438)	(0.435)	(0.457)	(0.432)	(0.440)	(0.405)	(0.417)	(0.426)
Structural factor									
Log (population)	−0.707***	−0.560***	−0.568***	−1.059***	−0.434***	−0.222	−0.682***	−0.450***	−0.101
	(0.133)	(0.135)	(0.136)	(0.156)	(0.146)	(0.145)	(0.138)	(0.148)	(0.147)
Lag Human Capital Index	0.0460	0.0406	0.0743	−0.112	−0.0729	0.0309	−0.286	−0.285	0.0887
	(0.109)	(0.110)	(0.110)	(0.127)	(0.111)	(0.111)	(0.116)	(0.118)	(0.103)
Log (real GDP per capita)	−1.838***	−2.371***	−1.712***	−2.215	−1.736***	−0.970***	−1.166***	−1.750***	−0.971***
	(0.294)	(0.289)	(0.308)	(0.310)	(0.297)	(0.311)	(0.296)	(0.301)	(0.328)
Squared	0.114***	0.140***	0.103***	0.0245	0.108***	0.0605***	0.0704***	0.112***	0.0516***
	(0.0174)	(0.0172)	(0.0182)	(0.0190)	(0.0179)	(0.0188)	(0.0178)	(0.0182)	(0.0191)
Mining as share of GDP	0.00937**	0.00694*	0.0119***	0.0253***	0.00694*	0.0119***	0.0221***	0.0266***	0.0236***
	(0.00396)	(0.00398)	(0.00416)	(0.00377)	(0.00407)	(0.00407)	(0.00392)	(0.00407)	(0.00472)
Policies									
1. Institutions									
Fraser Institute sum. index	−0.116***								−0.0700***
	(0.0137)								(0.0178)
Legal syst. and property rights		−0.0358***							
		(0.0102)							

2. Openness									
Freedom to trade			−0.0646***						−0.0219*
			(0.00858)						(0.0114)
Globalization index				−0.0123***					
				(0.00268)					
3. Infrastructure									
Length of road network					−0.0300**				
					(0.0144)				
Log (landlines/ 1000 workers)						−0.129***			−0.110***
						(0.0177)			(0.0180)
Macro/cyclical factors									
Terms of trade							0.00313***		0.00427***
							(0.000347)		(0.000440)
Log (REER)								0.186***	0.305***
								(0.0519)	(0.0490)
Constant	11.90***	13.69***	10.78***	5.434***	10.21***	6.928***	8.737***	9.483***	5.712***
	(1.201)	(1.209)	(1.273)	(1.209)	(1.232)	(1.284)	(1.223)	(1.263)	(1.436)
Observation	1.841	1.835	1.836	1.789	1.726	1.726	1.903	1.909	1.583
Countries	100	100	100	105	89	89	100	102	84
R-squared	0.181	0.141	0.174	0.108	0.110	0.136	0.127	0.118	0.271

Standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Note: All specification include country and time fixed effects
Source: Reproduced from Kazandjian et al. (2016: 15)

Table 2 Explaining output diversification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gender inequality									
Gender Inequality Index	−0.0552*	−0.0344	−0.0867**	−0.1000***	0.0283	0.0397	−0.0103	−0.0932**	0.0404
	(0.0310)	(0.0315)	(0.0425)	(0.0369)	(0.0305)	(0.0307)	(0.0398)	(0.0369)	(0.0393)
In LIDC	0.188***	0.203***	0.212***	0.310***	0.194***	0.158***	0.302***	0.190**	0.268**
	(−0.0488)	(0.0495)	(0.0709)	(0.0527)	(0.0462)	(0.0476)	(0.0629)	(0.0794)	(0.119)
Structural factor									
Log (population)	−0.0376**	−0.0318**	−0.0352	−0.0524***	−0.0309**	−0.0269*	−0.0568***	−0.0466**	−0.0424*
	(0.0150)	(0.0154)	(0.0224)	(0.0179)	(0.0157)	(0.0158)	(0.0196)	(0.0221)	(0.0240)
Lag Human Capital Index	0.0350***	0.0346***	0.0271	0.0376***	0.0219*	0.0281**	0.0254*	0.0509***	0.0320**
	(0.0121)	(0.0122)	(0.0171)	(0.0145)	(0.0120)	(0.0121)	(0.0154)	(0.0153)	(0.0152)
Log (real GDP per capita)	−0.215***	−0.238***	−0.225***	−0.233***	−0.221***	−0.192***	−0.340***	−0.132**	−0.208***
	(0.0336)	(0.0353)	(0.0431)	(0.0360)	(0.0319)	(0.0339)	(0.0407)	(0.0543)	(0.0707)
Squared	0.0103***	0.0112***	0.0108***	0.0107***	0.00985***	0.00809***	0.0179***	0.00578*	0.0121***
	(0.00199)	(0.00209)	(0.00262)	(0.00220)	(0.00192)	(0.00205)	(0.00254)	(0.00302)	(0.00398)
Mining as share of GDP	0.000214	0.000283	−0.00216***	−0.000943**	0.00355***	0.00381***	−0.000152	−0.00367***	−0.00519***
	(0.000449)	(0.000474)	(0.000583)	(0.000430)	(0.000427)	(0.000434)	(0.000461)	(0.000638)	(0.000741)
Policies									
1. Institutions									
Fraser Institute sum. index	−0.00961***								−0.00816***
	(0.00155)								(0.00191)
2. Openness									
Freedom to trade		−0.00224**							
		(0.000976)							

Average tariff rates			−0.0290***						0.0647***
			(0.0108)						(0.0111)
Globalization index				−0.00105***					
				(0.000307)					
3. Infrastructure/investment									
Length of road network					−0.00464***				
					(0.00153)				
Log (land-lines/1000 workers)						−0.00716***			−0.00452*
						(0.00193)			(0.00234)
							−3.79e-06***		−5.94e-06***
							(7.98e-07)		(7.84e-07)
4. Financial development									
Financial reform index								−0.0760***	−0.0293**
								(0.0126)	(0.0128)
Constant	1.386***	1.440***	1.435***	1.550***	1.325***	1.221***	1.895***	1.101***	1.322***
	(0.137)	(0.146)	(0.174)	(0.141)	(0.132)	(0.140)	(0.170)	(0.232)	(0.307)
Observation	1.880	1.875	1.410	1.839	1.752	1.752	1.783	1.128	1.027
Countries	102	102	100	107	90	90	108	75	67
R-squared	0.165	0.146	0.108	0.209	0.221	0.223	0.190	0.167	0.220

Standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Note: All specification include country and time fixed effects
Source: Reproduced from Kazandjian et al. (2016: 16)

Table 3 Explaining export diversification—dimension of gender inequality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gender inequality									
Female labor force participation rate	0.473	0.970**	0.758	1.762***	0.995**	0.859*	1.562***	1.478***	−0.0324
	(0.472)	(0.466)	(0.468)	(0.532)	(0.457)	(0.462)	(0.478)	(0.467)	(0.423)
In LIDC	2.748***	−3.458***	−2.935***	−3.146***	−3.400***	−3.111***	−2.609***	−2.185***	−2.092***
	(0.844)	(0.867)	(0.851)	(0.888)	(0.980)	(1.004)	(0.833)	(0.811)	(1.066)
Secondary enrollment ratio	−0.00603	0.0555	0.0444	−0.580*	−0.374	−0.328	−0.333	−0.279	0.316
	(0.281)	(0.284)	(0.283)	(0.315)	(0.270)	(0.270)	(0.291)	(0.282)	(0.247)
In LIDC	−0.986**	−0.987**	−1.034**	0.119	−0.195	−0.167	−0.0318	−1.012**	−1.590***
	(0.480)	(0.490)	(0.484)	(0.446)	(0.456)	(0.456)	(0.461)	(0.424)	(0.590)
Women in parliament	−0.00265	−0.00212	−0.00271	−0.00525*	−0.00520	−0.00292	−0.00337	−0.000692	0.00444
	(0.00278)	(0.00282)	(0.00292)	(0.00315)	(0.00283)	(0.00283)	(0.00293)	(0.00315)	(0.00277)
In LIDC	0.00691	0.00482	0.00606	0.00452	0.00752	0.00800*	0.00418	0.00650	0.00578
	(0.00482)	(0.00487)	(0.00493)	(0.00517)	(0.00461)	(0.00459)	(0.00487)	(0.00484)	(0.00471)
Maternal mortality ratio	0.00142**	0.00156**	0.00151**	0.00154*	0.00130*	0.00104	0.00145**	0.00152**	0.00169***
	(0.000695)	(0.000700)	(0.000700)	(0.000800)	(0.000676)	(0.000692)	(0.000719)	(0.000699)	(0.000629)
In LIDC	−0.000415	−0.000884	−0.000411	−0.00141*	−0.000186	−1.73e-05	−0.00129*	−0.000668	−0.00111
	(0.000735)	(0.000755)	(0.000741)	(0.000830)	(0.000727)	(0.000733)	(0.000750)	(0.000733)	(0.000672)
Adolescent fertility rate	0.000586	0.000761	−0.000966	0.00377	0.00172	0.00231	0.00318	0.00267	0.00341
	(0.00271)	(0.00274)	(0.00277)	(0.00309)	(0.00266)	(0.00265)	(0.00284)	(0.00288)	(0.00254)
In LIDC	−0.00143	0.00138	−0.00821	0.00640	0.00476	0.00393	0.00702	0.00436	0.0122**
	(0.00409)	(0.00419)	(0.00411)	(0.00403)	(0.00457)	(0.00461)	(0.00396)	(0.00375)	(0.00535)

Structural factors									
Log (population)	−0.0711	0.171	0.181	−0.742***	0.329	0.340	−0.305	0.239	0.667***
	(0.234)	(0.237)	(0.236)	(0.271)	(0.239)	(0.238)	(0.240)	(0.247)	(0.238)
Lag Human Capital Index	−0.358**	−0.310**	−0.392**	−0.244	−0.313**	−0.288*	−0.483***	−0.419***	−0.387***
	(0.155)	(0.158)	(0.157)	(0.185)	(0.152)	(0.152)	(0.162)	(0.158)	(0.139)
Log (real GDP per capita)	−2.059***	−2.261***	−2.051***	1.137*	−1.698***	−1.626***	0.248	−0.766	−0.848
	(0.609)	(0.624)	(0.622)	(0.595)	(0.608)	(0.610)	(0.586)	(0.563)	(0.617)
Squared	0.125***	0.131***	0.120***	–0.0578	0.106***	0.101***	−0.0136	0.0550	0.0495
	(0.0356)	(0.0365)	(0.0363)	(0.0354)	(0.0357)	(0.0358)	(0.0348)	(0.0335)	(0.0362)
Mining as share of GDP	0.0114**	0.00874	0.0151**	0.0122**	0.0142**	0.0151***	0.0143***	0.0191***	0.0390***
	(0.00566)	(0.00573)	(0.00607)	(0.00557)	(0.00562)	(0.00565)	(0.00549)	(0.00587)	(0.00629)
Policies									
1. Institutions									
Fraser Institute sum. index	−0.115***								−0.124***
	(0.0221)								(0.0254)
Legal syst. and property rights		−0.0437***							
		(0.0169)							
2. Openness									
Freedom to trade			−0.0516***						−0.00345
			(0.0149)						(0.0168)
Globalization index				−0.0114***					
				(0.00368)					
3. Infrastructure									
Length of road network					−0.0276				
					(0.0188)				
Log (landlines) per 1000 workers						−0.0499*			−0.0532**
						(0.0271)			(0.0261)

(continued)

Table 3 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4. Macro/cyclical factors									
Terms of trade							0.00287***		0.00458***
							(0.000536)		(0.000607)
Log (REER)								−0.00341	0.236***
								(0.0798)	(0.0759)
Constant	12.64***	12.50***	11.78***	–0.198	8.799***	8.703***	2.426	4.838*	3.450
	(2.540)	(2.640)	(2.583)	(2.488)	(2.590)	(2.588)	(2.484)	(2.498)	(2.704)
Observation	1.033	1.034	1.032	954	989	989	1.083	1.084	927
Countries	96	97	96	101	86	86	96	98	81
R-squared	0.203	0.162	0.194	0.133	0.174	0.175	0.149	0.168	0.354

Standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Note: All specification include country and time fixed effects
Source: Reproduced from Kazandjian et al. (2016: 18)

Table 4 Explaining output diversification—dimensions of gender inequality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gender inequality									
Female labor force participation rate	0.0160	0.0562	0.0665	−0.0181	0.0776*	0.0624	0.0613	0.0580	0.0127
	(0.0449)	(0.0446)	(0.0642)	(0.0505)	(0.0469)	(0.0474)	(0.0543)	(0.0681)	(0.0704)
In LIDC	0.0695	0.0358	−0.292**	−0.00734	0.0568	0.0749	0.0384	−0.421***	−0.342**
	(0.0810)	(0.0821)	(0.123)	(0.0843)	(0.0924)	(0.0939)	(0.0978)	(0.156)	(0.174)
Secondary enrollment ratio	0.124***	0.133***	0.0947***	0.119***	0.110***	0.117***	0.0922***	0.0751***	0.0313
	(0.0263)	(0.0265)	(0.0359)	(0.0293)	(0.0271)	(0.0271)	(0.0315)	(0.0371)	(0.0384)
In LIDC	−0.0407	−0.0502	−0.107*	−0.0965**	−0.0696	−0.0695	−0.0760*	−0.0776	−0.282***
	(0.0453)	(0.0458)	(0.0595)	(0.0417)	(0.0439)	(0.0439)	(0.0452)	(0.0740)	(0.105)
Women in parliament	−0.000203	−0.000462*	−0.000449	−0.000178	−0.000573**	−0.000619**	−0.000456	−0.000386	−0.000523
	(0.000260)	(0.000277)	(0.000352)	(0.000295)	(0.000283)	(0.000284)	(0.000324)	(0.000360)	(0.000379)
In LIDC	−0.000136	3.47 e-05	0.000539	7.31 e-05	6.11 e-05	0.000167	0.000372	0.000137	−0.000579
	(0.000458)	(0.000470)	(0.000696)	(0.000473)	(0.000439)	(0.000440)	(0.000531)	(0.00102)	(0.00128)
Maternal mortality ratio	0.000162**	0.000171***	6.44 e-05	6.27 e-05	0.000203***	0.000174**	0.000117	5.40 e-05	1.97 e-07
	(6.51 e-05)	(6.58 e-05)	(9.43 e-05)	(7.45 e-05)	(6.89 e-05)	(7.02 e-05)	(7.95 e-05)	(9.70 e-05)	(6.69 e-05)
In LIDC	−8.27 e-05	−7.99 e-05	4.73 e-05	7.38 e-05	−0.000136*	−0.000115	3.04 e-05	−1.43 e-05	7.79 e-06
	(6.94 e-05)	(7.02 e-05)	(1.00 e-04)	(7.79 e-05)	(7.44 e-05)	(7.52 e-05)	(8.34 e-05)	(0.000105)	(0.000122)
Adolescent fertility rate	0.000925***	0.00101***	0.000931**	0.000769***	0.000327	0.000428	0.000535*	0.000401	0.000758
	(0.000258)	(0.000264)	(0.000373)	(0.000290)	(0.000270)	(0.000270)	(0.000305)	(0.000474)	(0.000488)
In LIDC	0.000974**	0.000993**	0.00119**	0.00110***	0.00163***	0.00153***	0.00132***	0.00181***	0.000633
	(0.000387)	(0.000391)	(0.000523)	(0.000378)	(0.000443)	(0.000450)	(0.000421)	(0.000655)	(0.00104)

(continued)

Table 4 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Structural factor									
Log (population)	−0.0116	−0.00569	−0.0546	0.0336	−0.00484	−0.00776	−0.0438	−0.0281	−0.00629
	(0.0224)	(0.0227)	(0.0334)	(0.0259)	(0.0244)	(0.0243)	(0.0286)	(0.0396)	(0.0422)
Lag Human Capital Index	0.0183	0.0191	0.0146	0.234	0.0199	0.0230	0.0158	0.0479**	0.0459*
	(0.0148)	(0.0150)	(0.0221)	(0.0176)	(0.0157)	(0.0157)	(0.0188)	(0.0239)	(0.0239)
Log (real GDP per capita)	−0.0755	−0.619	−0.196**	−0.217***	−0.124**	−0.115*	−0.240***	0.0433	−0.243
	(0.0585)	(0.0602)	(0.0801)	(0.0566)	(0.0607)	(0.0613)	(0.0691)	(0.129)	(0.152)
Squared	0.00239	0.000941	0.00921*	0.00980***	0.00422	0.00368	0.0112***	−0.00306	0.0141
	(0.00342)	(0.00352)	(0.00476)	(0.00337)	(0.00356)	(0.00360)	(0.00416)	(0.00718)	(0.00859)
Mining as share of GDP	0.000103	−0.000482	−0.00373***	−9.53 e-05	0.00241***	0.00252***	0.000476	−0.00552***	−0.00855***
	(0.000544)	(0.000587)	(0.000827)	(0.000510)	(0.000554)	(0.000562)	(0.000556)	(0.000123)	(0.000131)
Policies									
1. Institutions									
Fraser Institute sum. index	−0.0107***								−0.00724**
	(0.00212)								(0.00341)
2. Openness									
Freedom to trade		−0.00251**							
		(0.00144)							
Average tariff rates			0.0636***						0.143***
			(0.0183)						(0.0251)
Globalization index				–0.0021***					
				(0.000351)					

3. Infrastructure/investment									
Length of road network					−0.00474***				
					(0.00190)				
Log (landlines/ 1000 workers)						−0.00573**			−0.00403
						(0.00267)			(0.00390)
Investment per worker							−1.67 e-06*		−5.39e-06***
							(9.59 e-07)		(1.41e-06)
4. Financial development									
Financial reform index								−0.0115***	−0.0630***
								(0.0201)	(0.0226)
Constant	0.541**	0.451*	0.933***	1.109***	0.719***	0.717***	1.124***	0.138	1.389**
	(0.245)	(0.251)	(0.330)	(0.236)	(0.257)	(0.258)	(0.291)	(0.554)	(0.656)
Observation	1.063	1.062	681	987	1.014	1.014	942	552	485
Countries	98	98	95	103	87	87	104	73	65
R-squared	0.245	0.229	0.231	0.330	0.259	0.258	0.294	0.276	0.341

Standard errors in parentheses
***$p < 0.01$, **$p < 0.05$,*$p < 0.1$
Note: All specification include country and time fixed effects
Source: Reproduced from Kazandjian et al. (2016: 19)

Table 5 Explaining diversification—instrumental variable GMM

Export diversification			Output diversification		
	(1)	(2)		(1)	(2)
GII	5.785***	3.534**	GII	1.778***	0.153***
	(1.942)	(1.739)		(0.361)	(0.0387)
Log (population)	−0.976***	−0.252	Log (population)	−0.0830**	−0.134***
	(0.214	(0.271)		(0.0396)	(0.0230)
Lag Human Capital Index	0.0251	0.420***	Lag Human Capital Index	0.131***	−0.00844
	(0.196)	(0.162)		(0.0321)	(0.0116)
Log (GDP per capita)	−1.307***	−0.666*	Log (GDP per capita)	−0.390***	−0.222***
	(0.337)	(0.343)		(0.0726)	(0.0809)
Squared	0.0931***	0.0360*	Squared	0.0230***	0.0141***
	(0.0201)	(0.0196)		(0.00446)	(0.00473)
Mining as share of GDP	0.0318***	0.0105	Mining as share of GDP	0.00129	−8.56 e-05
	(0.00710)	(0.00659)		(0.00126)	(0.000944)
Fraser Institute sum. index		−0.0498	Fraser Institute sum. index		−0.0114***
		(0.0363)			(0.00169)
Freedom to trade		−0.0405***	Average tariff rates		0.0361***
		(0.0141)			(0.0105)
Log (landlines) per 1000 workers		−0.0919***	Log (landlines) per 1000 workers		−0.00201
		(0.0281)			(0.00190)
Terms of trade		0.00427***	Investment per worker		−5.89 e-06***
		(0.000609)			(1.02 e-060
Log (REER)		0.301***	Financial reform index		−0.00467
		(0.0588)			(0.0124)
Constant	5.515***	3.438	Constant	0.923***	1.578***
	(2.046)	(2.466)		(0.329)	(0.354)
Observation	1552	1204	Observation	1554	833
P-value of Hansen J-statistic	0.296	0.248	*P*-value of Hansen J-statistic	0.548	0.276
Instrument *F*-test	13.27	12.85	Instrument *F*-test	16.28	33.44

Standard errors in parentheses

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Note: All specification include country and time fixed effects. Lesotho and Mauritania are dropped from the estimation due to insufficient observation

Source: Reproduced from Kazandjian et al. (2016: 20)

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Employment of Highly Educated Labor Force in Iran: Challenges and Prospects Through the Sixth Development Plan and Beyond

Gholamali Farjadi, Alireza Amini, and Pooya Alaedini

Introduction

A dominant feature of Iran's industrial development framework over the past four decades has been an emphasis on import substitution to meet the domestic demand. Government protection has been provided to firms unconditionally through import tariffs and non-tariff barriers, while the incentive structure has paid little attention to the development of capabilities. The policy framework has either resulted in suboptimal production scales or has promoted resource-based, capital-intensive, and energy-intensive production—such as petroleum derivatives, petrochemicals, basic metals, and non-metallic minerals. Similarly, Iran's exports have been realized through products relying on cheap natural resources rather than human capital or technological progress (CAI 2015). Yet, a bulk of Iran's industrial sector has been dominated by governmental or para-governmental entities unable to upgrade their inefficient management practices (Financial Tribune 2017; Al-monitor 2016).

A related concern is that the Iranian economy has experienced "jobless growth" in recent years. This is while the country's manufacturing sector suffers from low labor productivity—likely to suggest veiled unemployment and overstaffed operations. Based on information from the Central Bank (CBI 2014), during 2006–2011, Iran's gross domestic product (GDP) grew by an average of 4% per annum, while its average annual growth rate of manufacturing value added was 5.8%. In the same

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period, the annual growth rates of employment for the whole economy and the manufacturing sector were 0.07 and −2.3%, respectively (ibid.). Furthermore, as college/university enrolments and graduations have grown rapidly over the past two decades (SCI 2016d), especially in the technical and engineering fields, unemployment has permeated higher levels of education—graduate as well as postgraduate. Curiously, it has stood at twice the rate of unemployment for the illiterate population in the recent period, which has been shrinking due to improving literary rates.

Thus, the Iranian government now faces the major task of generating significantly more employment for the country's college/university graduates through appropriate economic development strategies. In fact, Iran's 2025 Vision Document (Majles 2003) calls for full employment, equal employment opportunities, and increases in the share of human capital in generating national product. Furthermore, the recently initiated Sixth Economic, Social, and Cultural Development Plan of the Islamic Republic (Majles 2017), covering the period 2016–2021, provides certain exemptions for employers hiring college/university graduates in its Article 14—as it strives to reduce the unemployment rate from the recent level of 12.6 to 8.6% by the end of the period. Notwithstanding exemptions or other hiring incentives and given the large and expanding pool of technical/engineering graduates, it is advantageous to achieve the latter by increasing the contribution of highly educated workforce to production—which in fact constitutes a target of the Sixth Development Plan. This would likely lead to the enhancement of manufacturing competitiveness, exports, and productivity with potentially longer-term positive effects on employment opportunities as well as capabilities in a broader sense.

In this chapter, we examine the employment prospects of those with tertiary-level education in Iran together with government policy challenges in checking their rising unemployment. We first discuss developments in the labor market—including the role of manufacturing in it—for college/university graduates. We then describe the Sixth Development Plan's employment policies and targets and answer two related questions—will there be an adequate supply of labor force with tertiary-level education to meet the needs of the manufacturing sector during the Plan? And will the manufacturing sector be able to absorb the bulk of the labor supply with tertiary-level education? As the answers to these questions are yes and no, respectively, we subsequently make an attempt to identify skill-intensive manufacturing subsectors with competitive advantages in Iran whose development might be facilitated by the government. The aim would be to generate employment for the growing ranks of the highly educated labor force to meet or surpass the Sixth Development Plan's targets. Yet, we suggest that generating significantly more employment in the manufacturing sector for those with tertiary-level education can only be achieved in the longer-term and a broader sense by shaping a new development and industrialization framework in Iran through a carefully crafted package of capability-oriented government policies. To begin with, promoting skill intensity across all manufacturing activities can act to increase employment opportunities for the country's highly educated labor force. Improving the quality of education and matching its curricula with labor market needs is another important means. Yet, a shift is ultimately needed in the country from activities relying heavily on natural resources and simple labor input to skill-intensive

activities under a capability-oriented, knowledge-based development framework. These and other potential initiatives are proposed in the last section before our conclusion, which subsequently sums up the chapter and its policy recommendations.

Developments in Iran's Labor Market for College/University Graduates

Muted contributions of education to the economy alongside inequality of educational opportunities have been observed for most countries in the Middle East and North Africa (see Pritchett 1999; Makdisi et al. 2007; World Bank 2007; Salehi-Isfahani et al. 2014). Using the results of Trends in Mathematics and Science Study (TIMSS) test administered to eighth-graders, Salehi-Isfahani et al. (2014) report significant inequality in learning achievements in Iran as a result of inequality of opportunities related to students' social circumstances (e.g., the availability of resources for additional tutoring). Furthermore, the focus of the educational system in Iran, similar to many other countries of the region, is on secondary and especially tertiary education. The country's public sector-dominated labor market is relatively inflexible and offers lower returns to vocational training in comparison to secondary and tertiary education (Salehi-Isfahani et al. 2009). This said, Iran's vocational training system has also grown rapidly, but its quality as well as its relationship with the job market is at best uncertain (see ILO 2005: 23–29). Overall, labor market signals are most likely distorted in favor of higher-level degrees by the government's direct hiring as well as regulations governing the labor market (Salehi-Isfahani 2002: 155).

As shown in Figs. 1 and 2, enrolments at and graduations from Iran's institutions of higher education have expanded rapidly over the past two decades. This has been especially the case for the technical and engineering fields. Figure 3 highlights the ensuing rapid pace of growth in labor supply associated with college/university graduates, while Fig. 4 indicates that these developments have been accompanied by a rise in the unemployment of this group from 4% in 1996 to around 20% in 2016. Even those with postgraduate degrees have been facing a 16% unemployment rate in the recent period, as suggested by Fig. 5.

Yet, Table 1 on the recent employment structure in Iran indicates that between 2005 and 2015 the manufacturing sector employed less than 12% of college/university graduates, while the service sector accounted for more than three quarters of such employment (with the decline in the share of service sector employment from 80.4% to 76.3% mostly attributable to government's recent attempts at checking the earlier bloating of public sector employment). As of 2016, the share of college/university graduates in total manufacturing employment remains relatively low at 16.7%, although it has exhibited an average annual growth rate of 32.9% between 2006 and 2016—increasing from 307,700 to 636,600 (SCI 2006b, 2016b).

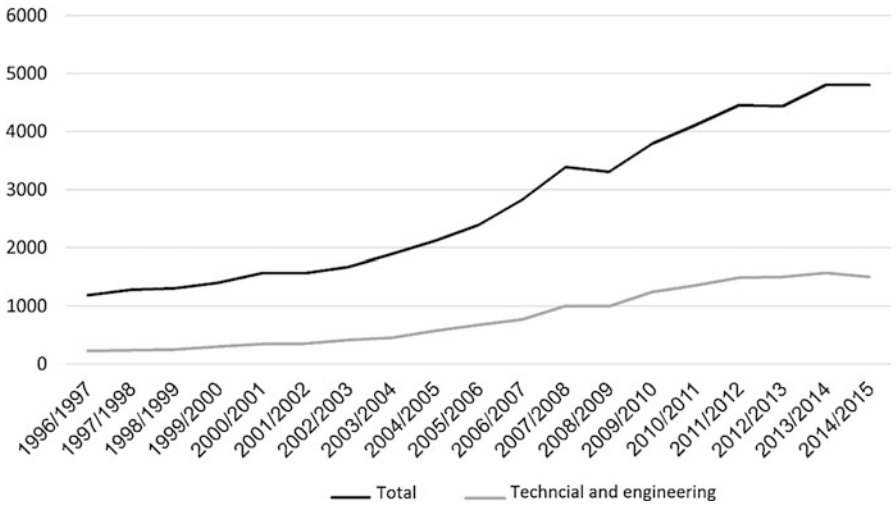

Fig. 1 Number of students in higher education, 1996–2015 (thousand persons) [Source: SCI (2016d), excel tables on higher education]

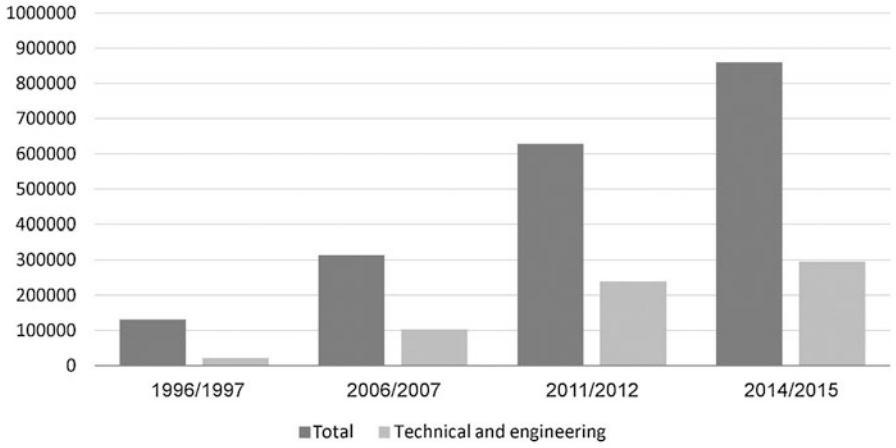

Fig. 2 Graduates from higher education institutions by field of study, 1996–2015 [Source: SCI (2016), excel tables on higher education in Iran]

Prospects for Employment of College/University Graduates in the Manufacturing Sector During the Sixth Development Plan

The labor market in Iran has undergone a curious development over the recent decades. On one hand, the high rate of unemployment has also been associated with low rates of labor force participation—especially for the youth who have opted

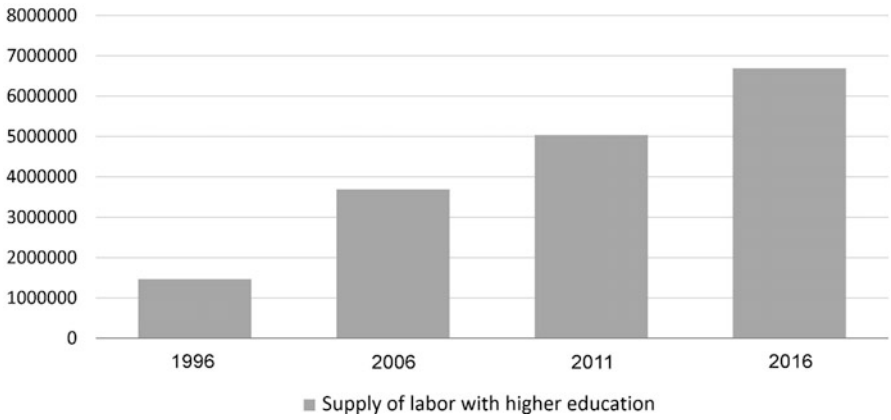

Fig. 3 Supply of labor with higher education (persons) [Source: SCI (1996a, 2006a, 2011a), Census results; SCI (2016d), Results of labor force survey]

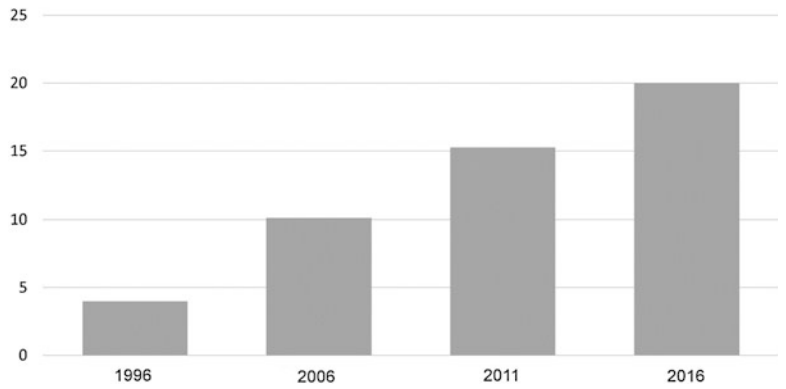

Fig. 4 Unemployment rate of labor force with tertiary education (percent) [Source: SCI (1996a, 2006a, 2011a), Census results; SCI (2016b), Results of labor force survey]

to leave the labor market temporarily to seek higher levels of education. On the other hand, higher education has expanded rapidly to accommodate this trend. This has checked the pressure on the labor market, as the rapid growth in unemployment has been delayed until the recent period. Labor force participation rate and unemployment rate grew by 1.2 and 1.4 percentage points, respectively, between 2015 and 2016. The rising pressure on the labor market as a result of the entry of college/university graduates has coincided with the Sixth Development Plan's preparation period and has attracted the attention of its policymakers. Against this background, the Plan (Majles 2017) calls for "rapid, sustainable, and employment-generating growth" in its overarching policy framework and further treats employment as priority in its Article 2. It is targeting an annual growth of 975,000 jobs in total employment in order to reduce the unemployment rate to 8.6% by 2021. This further requires an 8% GDP growth per annum.

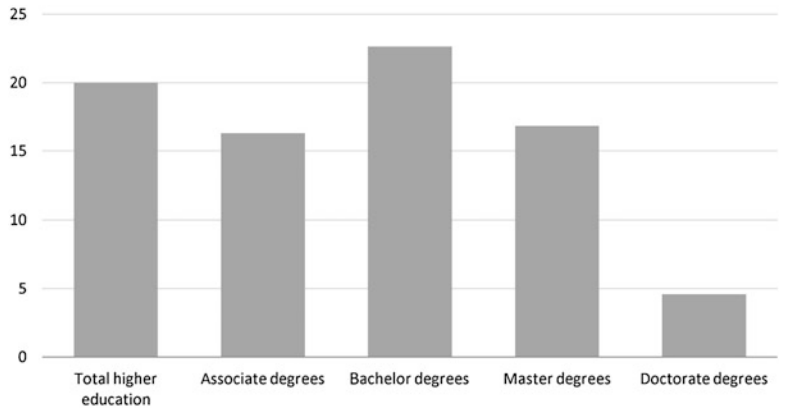

Fig. 5 Unemployment rate of college/university graduates by educational attainment, 2016 (percent) [Source: SCI (2016b), Results of labor force survey]

Table 1 Sectoral distribution of employees with tertiary education, 2005 and 2015

	Sectoral distribution (number of persons)		Sectoral distribution (percent)	
	2005	2015	2005	2015
Total	2,842,446	5,007,961	100	100
Agriculture, hunting, forestry, and fishing	77,887	145,441	2.7	2.9
Mining and quarrying	24,602	54,011	0.9	1.1
Manufacturing	288,976	598,311	10.2	11.9
Electricity, gas, and water supply[a]	52,767	112,682	1.9	2.3
Construction	112,120	276,058	3.9	5.5
Services	2,286,094	3,821,458	80.4	76.3

Source: SCI (2005b, 2015b), Results of labor force survey
[a]Includes electricity, gas, steam, air-conditioning supply and water supply, as well as sewerage, waste management, and remediation activities in 2015

Apart from the above targeting, which translates into specific allocations of resources, the Plan also calls for the preparation of guidelines on decent work that should pay attention to employment generation, skills and knowledge development, upgrading technical know-how, and protecting small-scale and home-based employment as well as preparing a plan for rural economic development and employment generation. It also stresses the use of funds released from the reduction of energy subsidies to promote production and employment, among other initiatives. The manufacturing sector is seen as a key sector in providing employment, especially for college/university graduates. Its value added and employment are supposed to grow at annual average rates of 9.3 and 3.4%, respectively, during the Sixth Development Plan. Likewise, productivity is to be raised by an average of

5.9% per annum during the Plan with implications for manufacturing firms' competitiveness and skill intensity. The Sixth Development Plan's projections for manufacturing translate into the generation of 139,000 jobs on an average annual basis so that the sector's total employment can rise from around 3,817,000 in 2016 to about 4,512,000 by 2021. Provided that average growth trends experienced during the period 2006–2016 persist through the Sixth Development Plan (based on SCI 2006b, 2016b), the share of college/university graduates in total manufacturing employment should increase from 16.7 in 2016 to 24.3% by 2021—which is the addition of 91,676 jobs annually for college/university graduates to the manufacturing sector employment.

Yet, the annual average supply of highly educated labor during the Sixth Plan will be 615,000 persons (MPO 2016). This means that the manufacturing sector will be able to accommodate only a small part of the highly educated labor. According to the statistics provided by the Ministry of Science, Research, and Technology (MSRT 2016), in the 2013/2014 academic year, 31.3% of college/university students studied in technical and engineering fields. Using the figure of 893,000 persons projected by the Management and Planning Organization to annually graduate from Iranian institutions of higher education during the Sixth Development Plan and extrapolating based on the 31.3% figure, we get 280,000 graduates per annum in technical and engineering fields—which will be well above the needs of the manufacturing sector. This means that the rest of the technical and engineering graduates must be absorbed into other economic activities, especially the service sector.

Given the above observations, the manufacturing sector should not be expected to absorb the bulk of the highly educated labor supply in the near future. Such a situation necessitates a carefully crafted plan effecting major changes in the country's economic structure and requiring a longer time period. In the short term and during the Sixth Development Plan, however, more modest steps can be taken to at least meet or surpass the Plan's targets. Indeed, to meet the goal of the Sixth Development Plan for the average generation of 91,676 manufacturing jobs per annum, additional policies are likely to be required. With this in mind, in the next section, we probe skill-intensive manufacturing activities in Iran together with factors potentially influencing skill intensity.

Increasing Skill Intensity in the Manufacturing Sector Through the Sixth Development Plan

In this section, we investigate skill intensity in Iran's manufacturing sector and its relationship with a number of important factors. The latter include those specific to each industry rather than macro-factors that are also touched upon later in the chapter. The aim here is to draw policy recommendations, especially for the Sixth Development Plan, concerning the development of skill-intensive manufacturing activities exhibiting advantage in generating employment for college/university

Table 2 Human capital in Iran's manufacturing sector

	1996	2001	2006	2011	2013	1996–2013 average
Average years of education	7.5	8.6	9.9	10.6	10.9	9.2
Share of highly educated workforce in manufacturing (%)	8	12.9	17.9	23.8	26.3	16.2

Source: Based on SCI (1996c–2013c), Survey of manufacturing establishments with ten or more workers

graduates. We use two-digit ISIC (International Standard Industrial Classification—REV. 3) data for the period 1996–2013 based on the Survey of Manufacturing Establishments with Ten or More Workers (SCI 1996c–2013c).

Table 2 provides basic information on human capital in Iran's manufacturing sector. It indicates that the average number of years of education for the workforce engaged in manufacturing establishments with 10 or more workers increased from 7.5 years in 1996 to 10.9 years in 2013. The share of employees with higher education in this category of manufacturing establishments grew from 8% in 1996 to 26.3% in 2013. These improvements notwithstanding, both figures are still indicative of low levels of human capital associated with Iran's manufacturing activities. Enhancing human capital in manufacturing and especially increasing the contribution of highly educated workforce to the sector would arguably have important implications for its international competitiveness in terms of both cost and quality. Expanding well-paying jobs for the country's growing numbers of educated youth would likely have a number of positive social consequences as well.

Table 3 sheds light on skill intensity—measured as the share of highly educated employees in the total workforce—in Iran's skill-intensive manufacturing activities for the period 1996–2013. Skill-intensive activities are defined here as those whose skill intensity is above the average for all manufacturing activities. Among the 12 skill-intensive manufacturing activities presented in the table, which employ 63% of all workers with high levels of education, the following have the highest rates of skill intensity: "manufacturing office, accounting, and computing machinery"; "manufacturing radio, television, and communication equipment"; and "manufacturing chemicals and chemical products". Developing these activities is thus expected to create the most employment opportunities for the college/university-educated labor force.

Capital versus labor intensity in a given industry is to a large extent indicative of the degree of skill intensity, as capital-intensive activities are also likely to be skill-intensive. Capital versus labor intensity of an activity may be determined by examining its share of total employee compensation in value added, that is, the share of labor in the factors of production. Activities for which this measure is below manufacturing sector averages may be considered capital-intensive. Table 4 provides information on the share of employee compensation in value added for Iran's skill-intensive manufacturing subsectors (using data on manufacturing establishments with ten or more workers). The most capital-intensive manufacturing

Table 3 Skill intensity in the most skill-intensive manufacturing activities (percent)

Subsector (ISIC two-digit categories, REV. 3)		1996	2001	2006	2011	2013	1996–2013 average
1	Manufacture of office, accounting, and computing machinery	30	41.3	41	50	56.8	44.8
2	Manufacture of radio, television, and communication equipment and apparatus	12.5	20.5	26.8	44.5	44.5	26.3
3	Manufacture of chemicals and chemical products	15.6	20.4	28.6	37.5	39.1	26.2
4	Manufacture of coke, refined petroleum products, and nuclear fuel	10	17.1	29.7	37.8	35.6	23.7
5	Manufacture of medical equipment, precision and optical instruments, and watches and clocks	15.6	15	25	27.7	31.1	21.6
6	Manufacture of motor vehicles, trailers, and semitrailers	14	21.2	22.5	25.1	28.4	21
7	Manufacture of electrical equipment and machinery (n.e.c.)	10.8	16.5	23	30.2	31.1	20.2
8	Manufacture of basic metals	13.7	20.2	23.9	23.6	26.8	20
9	Manufacture of tobacco products	1.4	8.6	33.8	31.1	46.6	19.8
10	Manufacture of machinery and equipment (n.e.c.)	11.1	16.3	22.1	27.2	30.3	19.7
11	Manufacture of other transport equipment	6.9	15.1	6.5	30.5	33.1	19.3
12	Manufacture of fabricated metal products, except machinery and equipment	12.2	15.5	18.6	23.3	26.4	17.7
Total manufacturing		8	12.9	17.9	23.8	26.3	16.2

Source: Based on SCI (1996c–2013c), Survey of manufacturing establishments with ten or more workers

activities among the skill-intensive industries are: "manufacture of chemicals and chemical products"; "manufacture of coke, refined petroleum products, and nuclear fuel"; and "manufacture of basic metals".

Knowledge intensity in a manufacturing activity is also likely to have a positive bearing on its skill intensity, as high-tech industries are expected to employ workers with higher levels of education. To probe knowledge intensity, we can examine the ratio of research and development (R&D) expenditure to value added across manufacturing activities—the higher the value, the more knowledge-intensive the activity. Table 5 compares this value for Iran's skill-intensive manufacturing sectors. The ratio of R&D expenditures to value added for 7 out of 12 skill-intensive manufacturing subsectors is higher than the average figure for the entire manufacturing sector. These are thus considered to be both skill-intensive and knowledge-intensive.

Export orientation can be considered as another factor influencing skill intensity in manufacturing. To assess export orientation, we may examine export-to-output ratios for the skill-intensive manufacturing subsectors. Activities with export-to-

Table 4 Share of employee compensation in value added for skill-intensive manufacturing activities

Subsector (ISIC two-digit numerical codes, REV. 3)		1996	2011	2012	2013	1996–2013 average
1	Manufacture of tobacco products	0.337	0.734	0.506	0.399	0.465
2	Manufacture of medical equipment, precision and optical instruments, and watches and clocks	0.304	0.32	0.249	0.318	0.347
3	Manufacture of other transport equipment	0.362	0.484	0.321	0.48	0.345
4	Manufacture of machinery and equipment (n.e.c.)	0.321	0.355	0.318	0.276	0.34
5	Manufacture of fabricated metal products, except machinery and equipment	0.216	0.389	0.29	0.298	0.335
6	Manufacture of electrical machinery and apparatus (n.e.c.)	0.271	0.285	0.28	0.275	0.287
7	Manufacture of office, accounting, and computing machinery	0.185	0.369	0.411	0.365	0.282
8	Manufacture of radio, television, and communication equipment and apparatus	0.2	0.28	0.239	0.139	0.267
9	Manufacture of motor vehicles, trailers, and semitrailers	0.228	0.284	0.51	0.391	0.24
10	Manufacture of basic metals	0.157	0.198	0.133	0.172	0.189
11	Manufacture of chemicals and chemical products	0.13	0.136	0.083	0.086	0.135
12	Manufacture of coke, refined petroleum products, and nuclear fuel	0.384	0.089	0.081	0.073	0.102
Total manufacturing		0.259	0.23	0.186	0.184	0.233

Source: Based on SCI (1996c–2013c), Survey of manufacturing establishments with ten or more workers

output ratios above the average for the entire manufacturing sector are considered export-intensive. This however is not a sufficient indicator for our purpose, which is identifying manufacturing activities that have the potential to generate jobs for the growing pool of college/university graduates. In this vein, an export-intensive activity is useful if its comparative advantage in producing the export item stems from human capital. That is, skill intensity would be low for an export product relying on cheap natural resources and/or unskilled workers. Table 6 compares export-to-output ratios across the 12 skill-intensive manufacturing activities in Iran. It shows that only two categories, namely, "manufacture of chemicals and chemical products" and "manufacture of basic metals" are export-intensive in addition to being skill-intensive. Yet, although some level of skill intensity is associated with these activities, both subsectors rely heavily on natural resources—raw materials and cheap energy. Furthermore, Iran's third most important non-oil export category, consisting of tannery products and leather converting, is not included in the table as it is not skill-intensive.

An additional factor potentially affecting skill intensity in a manufacturing activity has to do with scale. Larger firms are expected to employ skilled workers

Table 5 Share of R&D in value added in skill-intensive manufacturing activities (percent)

Subsector (ISIC two-digit numerical codes, REV. 3)		1996	2011	2012	2013	1996–2013 average
1	Manufacture of medical equipment, precision and optical instruments, and watches and clocks	0.51	0.33	0.21	2.99	0.84
2	Manufacture of office, accounting, and computing machinery	0.9	0.08	0.88	0.41	0.56
3	Manufacture of motor vehicles, trailers, and semitrailers	0.45	0.54	1.05	1.22	0.52
4	Manufacture of radio, television, and communication equipment and apparatus	0.31	0.07	0.16	0.13	0.36
5	Manufacture of electrical machinery and apparatus (n.e.c.)	0.14	0.25	0.49	0.25	0.31
6	Manufacture of chemicals and chemical products	0.29	0.17	0.15	0.17	0.29
7	Manufacture of machinery and equipment (n.e.c.)	0.35	0.16	0.2	0.12	0.29
8	Manufacture of other transport equipment	0.3	0.14	0.07	0.07	0.22
9	Manufacture of basic metals	0.15	0.27	0.11	0.09	0.18
10	Manufacture of fabricated metal products, except machinery and equipment	0.08	0.14	0.11	0.1	0.17
11	Manufacture of coke, refined petroleum products, and nuclear fuel	0.08	0.09	0.05	0.05	0.08
12	Manufacture of tobacco products	0	0	0.99	0	0.07
Total manufacturing		0.2	0.22	0.19	0.21	0.24

Source: Based on SCI (1996c–2013c), Survey of manufacturing establishments with ten or more workers

at a higher rate. Scale may be measured by examining mean value added of manufacturing establishments in each subsector (dividing total value added of an activity by its number of establishments), as shown in Table 7. Subsectors for which this measure is above the average of the entire manufacturing sector may be categorized as large-scale. Seven of the 12 subsectors presented as skill-intensive in the table are large-scale as well.

It is also possible to think of scale in terms of the number of workers in an operation. As indicated by Table 8, the larger the operation in terms of the number of workers, the more likely it is to employ workers with college/university education. For example, in 2009, an average of 12.2% of workers of microenterprises (employing two or fewer employees and considered a part of industrial guilds in Iran) had tertiary-level education. The corresponding figures for medium (10–49 workers) and large (50 or more workers) establishments were 20.9 and 27.5, respectively. Although these figures are slightly smaller in 2011 and 2013, they still show a positive association between skill intensity and size of the enterprise in terms of the number of workers.

Table 6 Export-to-output ratios in skill-intensive manufacturing activities (percent)

Subsector (ISIC two-digit numerical codes, REV. 3)		1996	2011	2012	2013	1996–2013 average
1	Manufacture of chemicals and chemical products	15.62	40.37	31.95	31.54	28.6
2	Manufacture of basic metals	5.18	8.44	8.21	8.3	10.77
3	Manufacture of other transport equipment	8.37	1.46	0.43	0.49	5.22
4	Manufacture of coke, refined petroleum products, and nuclear fuel	2.94	11.89	5.71	8.92	4.68
5	Manufacture of electrical machinery and equipment (n.e.c.)	0.76	3.49	3.45	4.41	3.35
6	Manufacture of machinery and equipment (n.e.c.)	1.27	5.74	5.94	4.34	3.01
7	Manufacture of tobacco products	6.85	1.38	0.32	0.52	2.84
8	Manufacture of fabricated metal products, except machinery and equipment	1.48	2.5	3.28	3.39	2.61
9	Manufacture of motor vehicles, trailers, and semitrailers	0.6	0.91	2.75	1.25	1.25
10	Manufacture of medical equipment, precision and optical instruments, and watches and clocks	2.21	0.64	0.63	2.2	1.23
11	Manufacture of radio, television, and communication equipment and apparatus	0.48	0.24	0.06	0.06	0.56
12	Manufacture of office, accounting, and computing machinery	0.54	0.96	0.96	0.21	0.34
Total manufacturing		4.89	12.63	10.77	11.53	8.41

Source: Based on SCI (1996c–2013c), Survey of manufacturing establishments with ten or more workers

One obvious recommendation based on the above observations would be to target skill-intensive manufacturing subsectors that exhibit competitive advantage in Iran. A policy package is required that can positively influence this subset of skill-intensive manufacturing activities. For example, supporting R&D activities can help develop the seven skill-intensive manufacturing activities in Table 5. In general, the package may include policies that promote R&D, increase production scales, grow exports, and/or enhance capital intensity for certain skill-intensive industries. Table 9 provides a summary of the characteristics of skill-intensive manufacturing subsectors in Iran, based on which a policy package for the development of skill-intensive manufacturing activities may be formulated. Except for "manufacture of fabricated metal products," all skill-intensive manufacturing subsectors have at least one of these characteristics discussed above—capital intensity, knowledge intensity, large scale of production, or export intensity.

Table 7 Average value added per establishment in skill-intensive manufacturing activities (billion rials, constant Iranian fiscal year 2011–2012 prices)

Subsector (ISIC two-digit numerical codes, REV. 3)		1996	2011	2012	2013	1996–2013 average
1	Manufacture of tobacco products	1100	1107	1006	938	1038
2	Manufacture of coke, refined petroleum products, and nuclear fuel	285	507	444	409	411
3	Manufacture of basic metals	120	157	143	153	143
4	Manufacture of chemicals and chemical products	36	152	154	154	124
5	Manufacture of motor vehicles, trailers, and semitrailers	15	120	64	51	62
6	Manufacture of radio, television, and communication equipment and apparatus	6	26	86	93	53
7	Manufacture of office, accounting, and computing machinery	3	49	46	62	40
8	Manufacture of electrical machinery and apparatus (n.e.c.)	13	39	28	25	26
9	Manufacture of medical equipment, precision and optical instruments, and watches and clocks	7	22	20	20	17
10	Manufacture of other transport equipment	3	29	19	13	16
11	Manufacture of machinery and equipment (n.e.c.)	7	21	19	19	16
12	Manufacture of fabricated metal products, except machinery and equipment	10	16	16	19	15
Total manufacturing		15	42	40	40	34

Source: Based on SCI (1996c–2013c), Survey of manufacturing establishments with ten or more workers

Table 8 Manufacturing workforce with tertiary education by firm size (percent)

Enterprise type by number of workers	2009	2011	2013
With 2 workers	12.2	N/A	N/A
With 10–49 workers	20.9	18.8	16.4
With 50 or more workers	27.5	25	22.6

Source: Based on SCI (1996c–2013c), Survey of manufacturing establishments with ten or more workers; ITSR (2012), summary results of the first specialized survey for measuring productivity at guild and trade units

Longer-Term Policy Initiatives to Increase Skill Intensity and Job Opportunities in the Manufacturing Sector

Over the past two decades, Iran's manufacturing sector has continued to rely on natural resources (oil and gas, minerals, and land) and use of unskilled or low-skilled labor, whereas the country's higher education system has expanded rapidly to produce ever larger numbers of graduates each successive year. As discussed

Table 9 Summary characteristics of skill-intensive manufacturing subsectors in Iran

	Skill-intensive manufacturing subsector (ISIC two-digit numerical codes, REV. 3)	Characteristics
1	Manufacture of office, accounting, and computing machinery	Knowledge-intensive and large-scale
2	Manufacture of radio, television, and communication equipment	Knowledge-intensive and large-scale
3	Manufacture of chemicals and chemical products	Knowledge-intensive, large-scale, capital-intensive, and export-intensive
4	Manufacture of coke, refined petroleum products, and nuclear fuel	Capital-intensive
5	Manufacture of medical equipment, precision and optical instruments, and watches and clocks	Knowledge-intensive and large-scale
6	Manufacture of motor vehicles, trailers, and semitrailers	Large-scale
7	Manufacture of electrical machinery and equipment (n.e.c.)	Knowledge-intensive
8	Manufacture of basic metals	Capital-intensive
9	Manufacture of tobacco products	Large-scale
10	Manufacture of machinery and equipment (n.e.c.)	Knowledge-intensive and large-scale
11	Manufacture of other transport equipment	Large-scale
12	Manufacture of fabricated metal products, except machinery and equipment	

above, the average years of schooling for Iran's manufacturing-sector workforce is barely 11 years, which is indicative of activities with low levels of technology and value added. It also reflects a mismatch between industrial and educational policies, which has resulted in a fivefold growth of unemployment for college/university graduates, as discussed. The government can opt to provide incentives to firms for employing college/university graduates. More importantly, it should change the country's industrial development framework relying on natural resources and unskilled or low-skilled labor. Inward-oriented policies and shielding domestic firms from exposure to international competition have provided little incentive to firms for enhancing their skill intensities or upgrading their technologies. A reformed structure that aims at enhancing domestic firms' competitiveness through technological upgrading and increasing use of scientific knowledge will raise their demand for hiring college/university graduates.

Table 10 compares Iran's labor productivity, export-to-output ratio, and share of R&D in manufacturing value added with those of selected OECD countries and China. Labor productivity in Iran's manufacturing sector is lower than all the countries in the table, although its smaller gap with Turkey and China hints at its potentials to catch up. Iran's situation is comparatively grave however in terms of export-to-output ratio, which is a stark indicator of the inward orientation of the country's manufacturing sector. Figures given in the table for Iran's ratio of R&D expenditures to manufacturing value added, when compared to those of the rest of the economies, are further revealing of the challenges the country's manufacturing

Table 10 Iran's labor productivity, export-to-output ratio, and share of R&D in manufacturing value added in comparison with selected economies

	Labor productivity in establishments with ten or more workers (thousand US dollars per person, PPP at constant 2011 prices)			Export-to-output ratio (%)		Share of R&D in manufacturing value added (%)	
Country	2005	2008	2010	2005	2010	2005	2010
Germany	97.3	103	104.8	67.1	65.6	8.35	9.4
UK	83.1	86.4	92.2	47.9	55.3	7.75	10.67
USA	146.7	147.4	167.2	19.3	18.7	10.26	12.87
Canada	67.5	81.1	77.9	57.8	49.1	7.32	7.05
South Korea	96.5	115.2	141	44.3	62.9	7.7	13.74
Turkey	50	49.9	N/A	42.9	45.5	0.35	0.63
China	37.6	N/A	47.8	42.5	40.9	6.59	8.71
Iran	35	40.9	45.8	12.3	13.5	0.22	0.27

Source: Labor productivity based on employment figures from ILO (2016), share of manufacturing value added in GDP from UNIDO's (2016) Statistical Country Briefs, and GDP (in constant 2011 dollars, PPP terms) from World Bank's (2016a) World Development Indicators; export-to-output ratio based on World Bank's (2016b) World Integrated Trade Solution and UNIDO's (2016) Statistical Country Briefs; share of R&D in manufacturing value added based on OECD (2013) and SCI (2005c, 2010c)

sector is facing in terms of its capacity for innovation and international competitiveness. According to the *Global Competitiveness Report* (WEF 2016), Iran is now in transition from factor- to efficiency-driven development—a stage before innovation-driven development in the three-stage model. Furthermore, based on the same report, Iran's rank among 138 countries in terms of labor market efficiency is 134, while its respective ranks for wage flexibility and productivity are 123 and 113. A related issue is the existence of a competitive environment between domestic and foreign firms, that is, an economy's degree of openness. Iran's rank in 2013 was 155 out of 157 countries covered by the *Economic Freedom of the World Annual Report* (Fraser Institute 2015) in terms of freedom to trade internationally.

Indeed, a major factor affecting skill intensity in Iran's manufacturing sector is the existence of a competitive environment fostering creativity and innovation—for which highly skilled workers would be increasingly required. Yet, although other measures focusing on the domestic market may be less gloomy for Iran, the overall situation of competition in the country is quite grim with stifling consequences for skill intensity in the manufacturing sector. Adopting an export orientation and gradually exposing domestic firms to international competition are expected to have significant positive impacts. More generally, diversifying away from oil and producing output at a much higher rate require carefully crafted macroeconomic, industrial, and accompanying social policies. Generating significant employment for those with high levels of education as well as the rest of the labor force also necessitates a well-functioning labor market as part of a dynamic economy. For this, labor market institutions must be strengthened, which needs a decentralized and at the same time a more participatory decision-making process. As an example,

flexibility of working hours associated with skilled workers in the labor market may have important implications for skill intensity in the manufacturing sector. It is often the case that small and medium enterprises need skilled workers only on a part-time basis. Flexible regulations governing the labor market for highly educated labor force may thus positively influence their employment, benefiting both skilled workers in terms of employment rate and skill intensity in manufacturing activities. Furthermore, job creation in the private sector has been stifled due to the scarcity of resources, which have moved toward the public sector and para-governmental entities. Measures can be taken to ensure adequate provision of banking credit to skill-intensive enterprises. These are likely to include innovative startups that may be micro or small enterprises (which we have not dealt with in our analysis in this chapter). Exchange rate policies have likely dampened the need for skills as well in Iran by affecting the sectoral composition of employment. There is thus a need for better exchange rate policies, efficient financial intermediation and loan selection, and more transparent public finances (see ILO 2005).

These measures will remain inadequate if the labor force does not possess skills required by the market. Despite the spectacular expansion of tertiary education in Iran, the country is ranked 85 among 130 economies evaluated in terms of Human Capital Index (World Economic Forum 2016). The index assesses both learning and employment outcomes, that is, the ability to maximize and leverage human capital endowment. Major shortfalls associated with Iran's human capital score are related to labor force participation and unemployment rates, especially for women, as well as quality of education, skill diversity, and staff training. According to figures from the Statistical Center of Iran (SCI 2016d), of the more than 11 million persons with some tertiary-level education in the country in 2013/2014, around 40% were college/university students. The likely economic inactivity of this group together with very low levels of economic participation among women brought the total number of economically inactive persons to 5.7 million in 2013/2014, while another 1.03 million persons were unemployed. Iran is also afflicted with a serious case of brain drain (Carrington and Detragiache 1999; Torbat 2002; Alaedini 2009). Furthermore, the rapid expansion of college/university enrolment—at public universities as well as proliferating private institutions—has lowered the quality of received education. Student-to-faculty ratio at Iran's public universities increased from 23.8 in 1995 (MPO 2004: 252) to 71 in 2013 (MPO 2013: 404). Per capita public expenditure on education also decreased drastically during this period (Majles Research Center 2015). Notwithstanding, Iranian higher education system has been criticized for its lack of attention to the requirements of the job market and non-practical curricula (see Hamdhaidari et al. 2008; Bazargan 2000). The nominally abundant human capital is said to lack the types of work culture required for export-led growth or working with foreign direct investment (see Odgers Berndtson 2016). There is thus a mismatch between the received education and the human capital needs of jobs that are actually or may potentially be created in various sectors of the economy. The average credentials for students have also likely declined as their total numbers have increased. It may be further speculated that high rates of unemployment for university graduates has reduced incentives for studiousness, thus lowering the average

skill profile of the graduates. The underdevelopment of university-industry relations has been highlighted as another shortcoming of Iran's higher education system by the small number of case studies available on the subject (e.g., BagheriMoghadam et al. 2012). Some related issues include the ideological content (Mehran 1990) and political screening of applicants for both higher education and employment (Habibi 1989). Thus, increasing the employment of labor force with tertiary education will further require an overhaul of the higher education system as well as developing a close university-industry relationship—including internship and apprenticeship programs.

Conclusion

We started this chapter with a discussion of labor market developments for college/university graduates in Iran and the prospects for their increased employment through the country's Sixth Economic, Social, and Cultural Development Plan. Based on estimates provided by the Management and Planning Organization, around 80% of new labor supply during the Sixth Development Plan will be associated with college/university graduates. This means that the manufacturing sector should not face any problem in finding suitable candidates for recruitment—taking into account especially the large pool of technical and engineering students and graduates in the country. Availability of labor force with quality education is likely to have a positive impact on skill intensity in the manufacturing sector, as firms will have better access to high-quality human capital. Yet, the sector will be able to accommodate only a portion of the highly educated labor supply during the Plan. Furthermore, a set of strong initiatives are needed to make sure the Plan's targets are met or surpassed. We were thus prompted to use two-digit ISIC data for the period 1996–2013 to identify skill-intensive manufacturing activities whose further development could be targeted to generate employment for the country's highly educated labor force.

Our analysis which probed various factors associated with skill intensity—including share of R&D and employee compensation in value added, export-to-output ratio, and scale—highlighted 12 manufacturing activities that together employ 63% of Iran's highly educated manufacturing workforce. Among them, "manufacture of office, accounting, and computing machinery," "manufacture of radio, television, and communication equipment," and "manufacture of chemicals and chemical products" are the most skill-intensive. Creating a supportive environment for their growth should be considered by the government. Needless to say, a more thorough analysis of various manufacturing activities within these identified subsectors—as well as other subsectors—in terms of skill intensity would allow for better targeting. In a more general sense, we suggested that firms with higher shares of R&D in value added are more skill-intensive and likely to require a highly educated workforce. Another policy target should thus comprise support for the expansion of firms' R&D activities. We further indicated that larger firms are likely to be more skill-intensive—this being true when comparing small to micro and medium to small enterprises. Incentive structures that encourage

growth of firms and mergers are thus likely to enhance skill intensity and by extension the demand for a highly educated workforce. Yet, some skill-intensive manufacturing activities are also capital-intensive and/or have higher export performance records. The government should refrain from policies that increase such firms' relative costs of capital or at least continue with its subsidized banking facilities to firms that are at the same time skill-intensive and capital-intensive. As some of the country's export industries are skill-intensive, policy initiatives to increase their exports—for example, through subsidies provided to exporters or trade facilitation—can also lead to a higher demand for college/university graduates.

Increasing employment opportunities for the labor force with tertiary-level education will additionally require enhancing skills through higher quality and market-oriented training accompanied by internship and apprenticeship programs. Yet, increasing the capacity of Iran's manufacturing sector to absorb a significantly larger part of the highly educated labor force necessitates major shifts of industrial and trade policies to move the economy from resource-based production toward export-oriented and knowledge-based activities relying on continual capability and technological upgrading. A well-functioning labor market with strong decentralized institutions must also be fostered to generate significant employment for those with high levels of education as well as the rest of the labor force. Accompanying macroeconomic measures are required as well to ensure the maintenance of an environment conducive to creation of skill-intensive employment.

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