

Industrial Policy and Trade Competitiveness in North America

Industrial policy and trade development are interrelated indicators that affect the economic growth of a country. In North America, the USA and Canada have a well-established symbiotic relationship in driving the national economic development. Mexico, being a country following the protectionism for a substantial period in the past and having several economic setbacks, has yet to overcome the black holes in low financial integration, industrial growth, and international trade competitiveness. This chapter critically examines the approach of Mexico and the USA on industrial policy, financial integration, and spending on research and development (R&D) as an impetus for augmenting the industrial production and trade competitiveness. However, the growing threat of disruptive innovation on the international business has also been discussed in this chapter.

Industrial policy of a country is considered to be the critical gateway to the internationalization of the trade and economy. The liberal trade policies attract substantial foreign investment in production and business operations of the country that contributes enormously to its GDP to drive the economic growth and international competitiveness. Most developing countries are reforming their industrial policies to overcome the conservative ideology laid with the protectionism maxims. In view of the globalization and industrial policy reforms, most developing countries are leaning toward outsourcing their requirements and purchasing goods that were originally manufactured internally. In another move, many countries are also intending to engage in offshoring activities

to globally relocating manufacturing process and maintaining ownership control. Such policies helped companies to reduce their manufacturing costs and offer competitive prices in the international markets to stay in the global marketplace. Policy makers and business strategists alike are searching for theoretical frameworks to understand the underlying dynamics in industrial reforms in emerging countries that has driven global reshuffling of production activities innovations and market competitiveness (Andersen 2006).

SHIFTS IN INDUSTRIAL POLICY IN MEXICO

The political and economic ideology of Mexican leaders tends to shift from protectionism to liberalism with the change in the political leadership and international moves on globalization since the mid-twentieth century. However, it is yet difficult to establish the clear inclination of the ideology growing in the country that supports globalization. Though NAFTA has influenced some drifts in the trade and economy liberalization, the country needs to reform its industrial policy to stay at par with the emerging nations across the world in the twenty-first century. The Mexican economy has experienced slow economic growth per annum for nearly three decades prior to 2015. The economy of the country grew by only 2.1% during the period 1982–2010, which revealed much lower growth than the rate obtained during stabilizing the development period or the shared growth stage within the region. The economic situation of the country was on the brink when the GDP per capita fell down steep registering 0.46% of annual growth during the above referred period causing a high rate of unemployment. The precariousness of employment was associated with meager economic growth between 1982 and 2008, which could generate only 354,306 jobs annually on an average in the formal sector of the economy. However, the unemployment persisted in the economy at an annual increasing pace until the end of the economic recession in 2011.

Soon after the devaluation of currency in Mexico 1994, a short-term macroeconomic policy succeeded in maintaining inflation at levels less than a single digit (the inflation rose to 52% as hyperinflation during mid-1990s), at the expense of maintaining the peso-dollar exchange rate appreciated, with poor results in terms of driving exports and employment. The critical examination economic model of Mexico exhibits the structural incapacity to generate economic growth mainly in the industrial

manufacturing sector causing inability to generate employment and raise productivity. This is also explained by the trade and industrial policies applied during 1981–1999 period which was based exclusively on market efficiency criteria and on cost-benefit calculations to minimize the financial market distortions. The trade and industrial policies implemented by several governments till 2012 have been passive as they aimed at removing barriers that prevent the resources assigned to the so-called “free market” economy. Counting on the positive side of industrial policies introduced during the period 1981–2012, it is observed that the governments tended to make the state regulations flexible, curb state and private monopolies, and gradually minimize tariffs (also eliminate cross-border tariffs in some sectors delineated under NAFTA) to encourage global competition. However, the neoliberal ideologists in Mexico have not laid their foundation of trade and economic growth on industrial reforms to drive globalization of factors of production on a real-time basis and stay competitive in the global marketplace. All adopted a passive trade and industrial policy that simply left the development of manufacturing industry in the hands of market forces to ride a “free play.” The market forces in the context of globalization and regional economic integration controlled the industrial scenario in Mexico and determined the entry and exit of companies. Accordingly, the country will be incapable of implementing active trade and industrial policies that promote economic development. The slow economic growth that the Mexican economy has been facing for the last 24 years (1981–2015) is the result of insufficient growth in the manufacturing industry as a priority sector.

The post-economic recession period in the country is being managed by the recently elected government, which took over the economic challenges since 2013. The National Development Plan 2013–2018, unveiled in June 2013, explicitly considers the industrial policy as a tool for development. This new economic development plan envisages active policies that tend to promote the industrial production index and augment exports avoiding unnecessary distortions in competitive markets. The new plan emphasizes non-subsidized industrial growth and minimizes interventions by the state in production or investment to draw a true portrait of the country on industrialization and sustain the market competitiveness. It advocates the economic and industrial efforts to be laid on correcting market failures, re-orienting production to key sectors and markets, deregulating economic restrictions in the sectors of international market development, and coordinating actions between the private and

the public sector players. This economic development plan stresses the urgent need to create stronger forward and backward linkages between exports and the rest of productive activities to boost Mexico's economic growth and internal markets (Bird-Moreno 2013). The main objective of the new industrial policy is to achieve efficient operation of the markets and promote competition, given that this is believed to be the best route to enable private initiative to make decisions concerning investment, production, and employment. As a result of the structural reforms to exploit NAFTA satisfactorily, the focus has been laid on improving privatization in industrial sectors, intellectual property rights, and human and physical infrastructure. The new industrial policy proposes essentially to resolve the points of distortions in the market, monopolies, oligopolies, incomplete markets, and asymmetric information.

However, these liberal economic principles are based on a series of programs promoting industry, both horizontal and vertical in character, seeking to strengthen foreign direct investment (FDI), industrial production, and market competitiveness. There are four distinct policies laid toward attracting FDI as discussed below:

1. The policy combines intellectual and physical property rights protection, and financial and fiscal incentives to promote transnational companies¹ in new strategic sectors. The diverse industrial growth brings manifold economic development as witnessed in the Mexican economy over the twenty-first century in the automotive and the emerging aerospace industry. More than 260 aerospace companies now operate in Mexico, exporting some \$4.3 billion in aircraft and parts last year. The Mexican government has set a target of \$12 billion in such exports by 2020.
2. Another factor in the policy envisages the support for locating multinational companies in the electronic, software, and computing industry. The requirements and regulations for importing are still evolving under NAFTA. It is the responsibility of the importer to define what certificates are required and from whom to obtain them. The Mexican government strictly enforces all customs regulations, particularly when it comes to potentially under-valued Asian-origin goods. The liberalization combined with NAFTA trade movement has led to lower prices and more rapid diffusion of business in computer and software industry throughout the economy. However, such economies of scale penetration of foreign

firms have paralyzed the domestic computer firms as they became non-competitive in the market. Both countries saw an increase in computer production, but Mexico's production was contract-based mainly for export to the USA (e.g., Dedrick et al. 2001).

3. Another policy perspective is raised toward the highly concentrated activities of large-scale and network economies, such as electricity, telecommunications, and oil and natural gas. In the case of Mexico, most of these sectors are state-controlled except telecommunications. In these sectors, government support basically consists of developing flexible regulatory frameworks that promote and strengthen competition between agencies.
4. Finally, the territorial policy has been designed to measure the so-called clusters, particularly of small- and medium-sized companies and activities in which a large number of small firms operate to develop the leadership under the guidance of large transnational companies. Such perspective in the industrial policy is to encourage the small and medium enterprises of Mexico to gain market competitiveness and grow global through potential exports and exploring the contract manufacturing opportunities.

Despite dynamics of new industrial policy, two challenges appear to drive the manufacturing sector in Mexico internationally competitive. The first challenge is to improve the capability and competency to form an endogenous nucleus of technological momentum in the manufacturing sector to drive the industrialization movement in the country in all sectors, and the second challenge is to construct enterprise taxonomy from small and medium level to national and transnational. These reforms represented a turn toward a market economy and passive trade and industrial policy whose only objective was to remove the distortions to the market that have seriously damaged the country's potential for growth. To drive growth in the Mexican economy, not only is an active, strategic trade, and industrial policy required but also this policy must exist within the frame of a broader economic policy that promotes economic development in Mexico. In order to develop an internationally competitive and active industrial policy, the government should reduce the income inequality, provide financial subsidies to the small and medium enterprises, and encourage exports to overcome the huge differences between regions and sectors inside the country, and consequently eradicate industrial differentiation. The challenge that lies in building a new economic

development model is to drive the industrial sector strategically with key manufacturing responsibilities. A new economic model for economic development is required that enables the country to repair the damage of the current model and envisage active trade and industrial policy as a lever for economic development.

THE LOOSE ENDS OF INDUSTRIAL POLICY

The industrial policy comprises the strategies for the growth of the secondary sector of the economy by improving the design of manufacturing industries as well as the services and primary activities. Thus, the industrial policy of the country is also analogous to the production development policy. The public policy makers need to integrate the industrial policy from the perspectives of innovations, technology, design, and market competitiveness to be achieved by the country and attain the proposed objective (Peres and Primi 2009). In developing countries, the industrial policies are complex as they are multi-focused arguing for protections to native and infant industries, on the one hand, and catering to the various trade agreements, on the other hand. The various industrial policy instruments can be grouped into the following categories:

- Science, technology, and innovation policies: The objective of these policies is to increase national capacities to use, absorb, modify, and generate scientific and technological knowledge, and to stimulate innovation activities in the organizations that make up innovation systems. The industrial policy support for this category of industries should include contestable funds, tax elasticity, and admissible subsidies to drive R&D on innovation and technology for manufacturing. Good industrial policies should provide incentives, skills, information and technical support, resources, and technological policies.
- Trade policies: These policies are decisive for establishing the level of international competition and international market access faced by domestic firms. Instruments include multilateral and bilateral free trade agreements, the liberalization of FDI inflows, and export promotion schemes delineating the special economic zones, export-oriented units, and maquiladoras-contract manufacturing units.
- Policies to promote industries sector: It has been observed that in the industrial policy reforms approach, Mexico has not laid enough

insights on developing the incentives for the various sectors of industries within the prevailing taxonomy. This group could include policies with specific intervention goals in strategic sectors (such as agribusiness, consumer products, consumer durables, computer industry) or industries or size of the firms. The most widely used instruments to promote the industrial sector include concessional loans, tax incentives, government subsidies to selected sectors, and public procurement. The industrial policy should also include instruments to promote productive articulation in industrial clusters Perez and Alvarado (2014).

Industrial reforms in Mexico need to foster a business-friendly environment in major industrial sectors including agribusiness, consumer goods, industrial machinery, and automobile and transport industries by creating economic incentives to drive international market competitiveness. A wide variety of instruments are used in these policies: tax and financial incentives, the development of efficient regulations, a competitive real exchange rate, and regulatory adjustment (Peres 2006). The reforms on industrial policy should also delineate the measures set for antitrust regulations and competition policies, along with laws that aim to underpin the proper functioning of the market and thus ensure efficient resource allocation. The antitrust and market competition laws should cover all instruments that affect the functioning and structure of markets and competition, including a number of trade-policy tools such as host country practices, countervailing measures, and safeguards (ECLAC 2012). The trend of economic growth, industrial production, and international trade of Mexico in the shifting industrial policy regime is exhibited in Table 2.1.

The data exhibited in the above table reveal that the economic growth in Mexico is inconsistent and has discretely established the diminishing rate of economic growth since the economic recession. This situation has been evidently caused due to the low investments, industrial production, and deficit balance of trade occurred in the country. Upon analyzing the trade and economy growth during 2010–2014, it may be stated that the low industrial production has driven the decline in the economic growth and pushed the trade balance to the negative bracket.

Structural change in the industrial policy still needs to be enforced strictly in Mexico toward higher productivity activities categorizing the companies in the special economic zones as export-oriented units, and

Table 2.1 Economic growth, industrial production, and international trade of Mexico (2010–2014)

<i>Indicators</i>	<i>Measure</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>
Economic growth	Annual variation in	5.1	4.0	4.0	1.4	2.1
Investment	percent	1.3	7.8	4.8	−1.6	2.1
Industrial production		4.6	3.4	2.9	−0.6	1.8
<i>International trade</i>						
Trade balance	Billion US	−3.0	−1.4	0.0	−1.2	−2.4
Exports	dollars	298 (29.9)	349 (17.1)	371 (6.1)	380 (2.5)	398 (4.6)
Imports		301 (28.6)	351 (16.4)	371 (5.7)	381 (2.8)	400 (4.9)

Figures in parentheses indicate annual variation in percent. *Sources* Mexican National Institute of Statistics (INEGI) and author calculations

to drive intensive innovation and technological knowledge in manufacturing and marketing. Of the two approaches based on structural change, the transformation of target productive activities that are more closely related to comparative advantages needs to stem from the existing structure of factor of productions (Lin 2012). The government should play a key role in implementing the industrial policy to promote a production development strategy by deriving comparative advantages on factors of production in the sector and focusing on the following areas:

- Providing information on new industries on factors of production
- Coordinate investments in related industries and improve infrastructure
- Offer subsidies on selected industrial sectors to increase their market competitiveness
- Attract new industries through business incubation
- Promote opportunities for FDI.

The economic growth of Mexico showed a decline soon after the recovery from the economic recession began in 2013, largely because of the change of the political regime. A slowdown in both the manufacturing and construction sectors as well as weak economic activity in the USA caused GDP growth to moderate in the early 2013. However, Mexico's Central Bank revised the growth forecasts and now expects the economy

to grow between 2.0 and 3.0% in 2015. The growth projections for 2016, by the Central Bank of Mexico, have shown a marginal increase in economic growth between 2.5 and 3.5%. However, to achieve this target, it is necessary for the government to implement the new economic development plan along with a rigorous industrial policy to attract investments and improve the balance of trade situation.

US Industrial Policy

Industrial policy is often embedded in the concept of a “developmental state.” As a principal key determinant within a developmental state, the industrial policy generally focuses on encouraging R&D, driving innovations and technology emerging from R&D investments for commercial use. Historically, industrial policy in the USA has been developed in close relation with the military sphere and has been aimed at stimulating competition and innovation, in addition to promoting education and human capital formation (Buigues and Sekkat 2009). The state supports for R&D through grants and budgetary allocations of state patronage institutes contribute to the innovation and technology breakthroughs giving impetus to raise productivity and market competitiveness by attracting businesses to adopt these innovations for international growth. Industrial policy as a tool includes R&D subsidies for the government, university, or private business research centers. It also has the provisions of preferential tax treatment, credit opportunities, and direct subsidies for the specific sectors of the economy and regions. Some types of business regulations such as auto fuel-efficiency standards, or financial regulations aimed at channeling credit to preferred sectors, or industrial activities at subsidized rates could also be seen as industrial policy interventions within the state jurisdictions of the country. However, in the recent economic crisis of market downturn (2007–2011), the federal government provided a very large bailout package for the automotive industry as this segment was badly affected due to the consumer credit defaults and declining consumption trends in the USA. The trend of industrial production and capacity utilization of industrial plants and infrastructure in the USA during and post-economic recession period is exhibited in Table 2.2.

The data exhibited in the above table reveal that the industrial production increased by 5.2% in 2014 as compared to the previous year. The capacity utilization rate for manufacturing moved up by 4.0% by

Table 2.2 Industrial production and capacity utilization in the USA (2007–2013)

<i>Function</i>	<i>Measure</i>	2007	2008	2009	2010	2011	2012	2013	2014
Industrial production	Percent change	2.7	−4.7	−13.6	6.1	3.4	4.1	2.6	5.2
Capacity utilization	Percent utilization	78.7	74.6	65.6	71.1	73.9	75.5	76.1	80.1

Source Federal reserve statistical release, December 15, 2014

the end of 2014 against the previous year. Such growth trend indicates the positive dimension of industrial production and utilization of plant capacities and industrial infrastructures in the country. On analyzing further data from the source mentioned in the above table, it is observed that factory output is estimated to be above its late-2007 pre-recession peak in both October and November in 2014. In November, the indexes for both durables and nondurables increased more than 1%, and the output of every major industry group increased or remained unchanged. Among durable goods industries, the output of motor vehicles and parts jumped 5.1% as a result of an increase of 900,000 units at an annual rate in total motor vehicle assemblies. Miscellaneous manufacturing, wood products, and machinery each recorded gains exceeding 1%. Among nondurable goods industries, output advances of more than 2% were registered by petroleum and coal products and by apparel and leather. The indexes for food, beverage, and tobacco products and for plastics and rubber products both increased by 1.4%.

As the globalization is seeding technologies through many emerging markets predominantly India and China in leading industrial technologies such as advanced batteries, high-speed rail, hybrid automobiles, solar modules, offshore wind turbines, and machine tools, the USA finds itself competing against or even catching up with foreign companies and engineers. Historically, the country has been the undisputed leader of next-generation technology, from semiconductors to IT to space. The composition of global demand has changed dramatically over the past few decades. For the first time in recent history, more than 50% of the global middle class lives outside North America. Meanwhile, many next-generation engineered products are in high demand not by the US or European customers but by those in Asia, Latin America, and the Middle East. The customization of innovation and technology has driven the manifold growth of

small enterprises that handle industrial innovation and technology for new products as seed companies and transfer the commercial right to potential companies for diffusing the breakthroughs. The rapid expansion of small, inventive companies that grow up to become large ones innovating at scale is one of the hallmarks of US leadership. The country should continue to encourage this model, and more executives of large companies should embrace it (Manyika et al. 2011).

Recognizing the importance of manufacturing industry in the country's growth and in the creation of jobs, the second release of industrial policy was issued in 2013 to promote investments in the manufacturing industry, clean energy, infrastructure, and education. In the employment sphere, the plan aims for education and training to provide US citizens the skills needed for global competition through public–private partnerships. In the case of manufacturing industry, the goal is to revitalize it through the following three broad objectives (OSTP 2012):

- Partnering with businesses and communities to invest in manufacturing new innovations products
- Ending tax breaks to ship jobs overseas and making the USA more competitive
- Bringing jobs back attracting investment to the USA

The revival of manufacturing in the USA will entail innovations that raise competitiveness, expand job opportunities, and advance the construction of a clean energy economy. To pull this off successfully, a clustering of large-scale public policy initiatives is required that could, as a combination, fairly be described as industrial policies. The military-based industrial policy has indeed been a major force shaping the development trajectory of US capitalism for at least a century.

Industrial bailout policies in the USA add unique support to the manufacturing sector. In 2008 and 2009, General Motors (GM) and Chrysler received \$65 billion in loans from the federal government. The loans were provided by the government to stabilize the financial condition of the companies. These bailouts had an important precedent in the 1979 government bailout of Chrysler. In this prior case, the federal government provided \$1.5 billion worth of loan guarantees as well as “voluntary” quotas on foreign cars being imported into US markets. One can make a reasonable case for both bailouts on the grounds that, in

1979 as well as in 2009, the collapse of GM and Chrysler would have caused massive unemployment and more general economic hardship, especially in the Midwest. But when the tools of industrial policy are cobbled together amid a crisis, we cannot expect the results to be stellar, beyond preventing the firms from shutting down outright. The 2009 GM bailout, for example, imposed devastating concessions on autoworkers, including the elimination of 21,000 union jobs, while the United Auto Workers itself had to accept GM stock of uncertain value to replace \$10 billion in guaranteed health care funds.

Over the past four decades, states and municipalities in the USA have competed among themselves, sometimes intensively, to attract businesses to locate with them. The main advantage in this competition has been various types of tax incentives. Foreign auto companies have been among the most favored recipients of such support since 2006 that include Kia Motors, Honda, Toyota, and Volkswagen. These efforts have achieved some success in their primary aim of attracting businesses to their locations. But they have done so almost entirely on a zero-sum basis by reducing job creation in neighboring states and localities that have not offered the same incentives.

EXPORT TRENDS IN MEXICO

Trade liberalization as an impact of NAFTA has been associated with the dynamic moves of Mexico into global markets and its rising importance in non-oil exports. Mexico has ranked among the top ten countries in terms of increasing its share in the world (non-oil) market since 1985 (Brid-Moreno et al. 2005). This positive performance is particularly evident in the evolution of its manufactured exports. Mexico ranked fifth among countries with the largest increases in their share of world manufactures exports during 1994–2001, and then, it was pushed to second place behind China. The export drive in the manufacturing sector in the country started during the late 1980s, before NAFTA came into force. The boom was partly rooted in the trade liberalization processes that began at that time, but also in the sectoral development programs initiated during the previous phase of state-led industrialization. NAFTA opened an unprecedented window of opportunity to export to the USA, the largest world market. In 1994, total exports represented 16% of Mexico's real GDP. By the year 2000, this figure had more than doubled, reaching 35.1%. Although subsequently it declined somewhat,

in 2003, it still stood at 34.9%. The export drive was based on the dynamism of manufactured exports, which meant a shift for Mexico, whose main exports had traditionally been primary commodities—shrimp, coffee, cotton, and tomatoes.

Since the mid-1980s, the external sector has undoubtedly been the most dynamic component of demand for Mexican manufacturing. In 1988, exports were equivalent to 49.7% of the total value added by the manufacturing industry. In 1994, it climbed to 71.9%, and by 2003, it even exceeded by 61% due to various value additions. NAFTA contributed positively toward the export performance of the country as it forced firms to seek external markets to recover from the economic crisis of Mexico in 1994 and overcome the severe depreciation of the domestic currency to the US dollar in the following year, which caused foreign exchange crisis in the country.

This export boom in Mexico began in 2001, and it stood among the most successful competitors in many industrial and consumer goods export segments of the US market. The *maquiladoras*, which are the contract manufacturing enterprises, constituted a vital force behind this export drive in Mexico. In the early 1990s, they provided more than half of total exports of manufactured goods and over 40% of the total exports. Other important contributors to the export boom included foreign manufacturing firms in automobile parts, pharmaceuticals and consumer goods segments, and new ventures engaged in floating FDI. The contributions of FDI have been largely in the manufacturing sector, mining and metal products, industrial chemicals, food, beverages, and tobacco. One of the major contributions of NAFTA toward making the FDI more attractive in Mexico is that this agreement eliminated significantly the investment barriers, ensured basic protections for investors, and provided a mechanism for the settlement of disputes between investors and a partner country. This trilateral agreement provided non-discriminatory treatment for foreign investment in certain sectors and envisaged explicit country-specific liberalization commitments. Exemptions from NAFTA investment provisions include the energy sector in Mexico in which the Mexican government reserved the right to prohibit foreign investment. It also included exceptions related to national security and to Canada's cultural industries (Villarreal and Fergusson 2015).

FDI came in at a record US\$35.2 billion (2.8% of GDP) during 2013. However, it should be noted that US\$13.2 billion of this came from a

single transaction toward the purchase of Cervecería Modelo by AB InBev (Belgium–Brazil) during the second quarter of this year. At the same time, direct investment by Mexican firms abroad fell to US\$10 billion, less than half of the 2012 figure and the lowest since 2009. Portfolio inflows maintained their momentum, despite greater global volatility than in the previous years (2010–2012), which accounted for US\$50.4 billion remitted in the country during 2013, the second highest amount on record of US\$81.3 billion received in 2012. During the above reference year, there was a US\$13 billion increase in foreign reserves, resulting in an end-year stock of US\$168.6 billion in 2013. Overall, Mexico's international trade profile appears solid during the post-economic recession period, which makes the country trade competitive in the international market and with sustainable purchasing power parity. Its current account deficit, despite widening, remains far lower in both relative and absolute terms than many other emerging economies, including Brazil, and is easily covered by capital inflows. However, the weak levels of FDI remain a sore spot, which should be taken care of by the structural reforms over the near future (KPMG 2014).

The export drive was not uniformly distributed across all its manufacturing industries; it was highly concentrated in only a few. Motor engines and auto parts, automobiles, and computers and other electronic equipment accounted for more than half of the total exports. Parallel to the export boom in manufactures, the Mexican economy has experienced a massive penetration of imports, mainly manufactured goods, since the 1980s. It was expected that after decades of protectionism, trade liberalization would provoke an intense, but temporary, flood of imports. The swift growth rate of Mexican imports since the second half of the 1980s was induced not only by the elimination of non-tariff barriers to foreign trade but also by the expansion of domestic demand amid a persistent appreciation of the real exchange rate. Facilitated access to external funds resumed at that time and likewise played a role. After decades of tightly restricted access to foreign products, Mexican consumers began to eagerly satisfy their demand for a wide variety of goods and brands from abroad. However, to some extent, such import demand also mirrors the strong relations between exporting firms and foreign suppliers. The case of maquiladoras, which make up the most successful export sector to date, is typical because they rely on imported inputs and materials and have weak relations with local suppliers. Another factor that boosted import penetration to the domestic market, and that should

not be ignored, is the breakdown of some internal linkages in domestic productive structure, as local producers have been put out of business by foreign competition.

The updated scenario of international trade of Mexico with the USA indicates that exports to Mexico in 2013 were \$226.2 billion, which were up by 4.7% (\$10.2 billion) from 2012 and market an overall increase of 132% from 2003. An increase of 444% is recorded since 1993, the pre-NAFTA period. The US exports to Mexico accounted for 14.3% of overall US exports in 2013. On another side of the international trade, the US goods imports from Mexico totaled \$280.5 billion in 2013, driving an increase of 1.0% (\$2.9 billion) from 2012, and accounted for an overall rise of 103% from 2003. The imports from Mexico to the USA have been augmented by 603% since the pre-NAFTA period (1993), establishing the fact the NAFTA significantly stimulated the international trade dynamics for Mexico as a partner country (USTR 2015). Sustaining high long-term economic growth should be a top priority on the national agenda. The rate of economic growth would have to be even higher to significantly improve the living standards of the people in rural geo-demographic settings. The evolution of employment in Mexico after NAFTA has clearly fallen short of the expectations, although it has been restructured in favor of international trade-related activities, but the overall employment growth is still underachieved.

FINANCIAL INTEGRATION AND INTERNATIONAL TRADE

As an emerging market economy, Mexico has taken advantage of globalization to implement structural policies and modernize regulation in order to strengthen its financial system. The country should meticulously drive the financial integration in view of the benefits of international integration for the money, bond, and foreign exchange markets for improving the international trade conditions of the country. The international financial competition has broadened the range of intermediaries and investors leading to more transparent pricing, higher liquidity, and lower transaction costs in the domestic markets. It has also enlarged the scope of investment alternatives to attract more specialized and sophisticated business partners. This has generated a cycle of increased integration, modernization, competition, and need to achieve higher efficiency. Mexico's monetary policy framework is gradually getting closer to that of its counterparts, and this is not only the case for the Banco de Mexico's

instruments but also for its communication. The Central Bank of Mexico publishes statements summarizing the meetings of its Monetary Policy Committee (MPC). Its governing body is proactive in delivering speeches focused on monetary policy issues and the outlook for the Mexican economy. The use of interbank rates to analyze the ability of the central bank to communicate its messages to the financial markets relies on the ground that the interbank money market is highly liquid (Garcia-Herrero et al. 2015).

NAFTA has also given its member countries opportunity to develop policies toward a high level of financial integration within the financial instruments as well as to develop requisites to manage international financial integration for flawless money and banking movements in the region. The governments of the USA and Canada have provided, within limits, the atmosphere which has allowed this state of integration to exist. This state of integration may not be optimal in the sense of regional differences or in the sense of overall efficiency of money. However, given the national and regional priorities, it may be argued that North America is an optimum currency area, with the provisions of regional and cultural differences. The government in Mexico implemented the financial integration policies on stabilization program aimed at inducing a rapid macroeconomic adjustment, mainly by enlarging domestic savings and eliminating, for good, fiscal dominance by curtailing expenditures and broadening tax revenues. Exchange controls began to be gradually dismantled, and compulsory direct financing from commercial banks began to be replaced by liquidity requirements. The new requirements took the form of marketable debt instruments which provided banks with an incentive to foster the development of the government debt market. Increased financial integration has been particularly evident in the foreign exchange market. Increased integration is also evident in the fixed income market, mainly in the government bond segment. Intermediation in the primary and secondary markets continues to be carried out predominantly by traditional, large deposit-taking institutions. However, subsidiaries of foreign institutions, which have focused more on securities trading, have gained importance in the economy over the period of globalization.

According to a recent analysis by the Bank of Mexico, the increase in foreign participation also corresponds to a period of greater competition among commercial banks when measured in terms of overall income, lending activity in the mortgage market, and consumer credit. Greater

competition and financial innovation, together with macroeconomic stability and improvements in regulatory and supervisory frameworks, have allowed for a gradual restoration of credit by commercial banks and other intermediaries. These conditions have increased the effectiveness of the credit transmission channel of monetary policy. In the foreign exchange market, increased competition has led to an extension of active trading hours to other time zones and a significant reduction in bid–ask spreads. As participation in the foreign exchange market has extended to time zones outside the USA, the hours in which the peso is traded more actively have shifted accordingly. Financial integration has contributed to the development of deeper and more liquid capital markets. The central bank has therefore been able to execute monetary policy without having undesirable effects on the functioning of markets. In conducting its operations, the Bank of Mexico has tried to rely mostly on marketable instruments, further promoting market development. Financial integration, mainly reflected in the increased competition in domestic markets, has contributed to a more developed and sounder local financial system. Exposure to global capital markets has increased competition as well as the number of intermediaries and investors, leading to more transparent pricing and lower transaction costs (Sidaoui 2008).

However, there is a high degree of heterogeneity in domestic financial markets across countries, and these differences remain largely unaltered despite financial globalization and financial development. There were large differences even among advanced economies, with the USA ranked first. Since the recent financial downturn, there has been a significant reevaluation of the effects of financial market integration. Financial integration tends to increase investor leverage and risk-taking, over and above the opportunities that it affords for portfolio diversification and inter-temporal borrowing and lending. In order to manage the dichotomy of financial opening and increased risk-taking, it is required to increase the value of existing asset holdings by increasing the collateral value of investors' portfolios to enhance the borrowing capacity and financial integration process. Also, it is necessary to reduce the overall consumption risk so that financial integration reduces precautionary saving and leads to an increase in investor's desire to borrow (Devereux and Yu 2014).

The governments of developing countries and leading emerging markets also need to explore the possibility of raising private capital for industrial development as it is an enormous source of global wealth

that has not historically played as significant a role in development as its scale would suggest. The private capital sector is contemporary to industrial growth and is constantly active toward seeking investment opportunities. However, it only commits to those prospects that fall within the scope of predetermined risk and reward. Due to a variety of factors, many opportunities in developing countries such as Mexico are often perceived as of high risk or uncertain for the majority of investors. Institutions that offer to guarantee portions of loans made for such investments help investors rebalance their assessments of risk and reward and subsequently unlock considerable capital into developing countries. For example, in the past decade, the World Bank has approved 28 guarantees worth a total of \$1.4 billion. These guarantees have stimulated more than \$5 of private capital for every dollar spent by the Bank (World Bank 2010).

Another scope of attracting domestic and international investments is sovereign-wealth funds, which are typical of stretched investment nature for reasonably longer periods and are often more flexible in their investment rules than other types of investors. The concept of sovereign-wealth funds is not new as some countries have recently been forming innovative enterprises to develop coalitions for bringing together such diverse players. For instance, Chinese funds, Middle Eastern funds, multinational corporations, and local industrial development funds from the emerging markets and developing-country governments might be well explained serving with this concept (Bensoussan et al. 2013).

RESEARCH AND DEVELOPMENT SPENDING

Expenditures for R&D include recurring and capital expenditures, both public and private on creative work undertaken systematically to increase knowledge including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development aspects in an international socioeconomic growth sector. The share of expenditure to the GDP of Mexico and the USA toward R&D to promote industrialization and serving the mankind is exhibited in Table 2.3.

It may be observed from the above table that the USA has the highest spending concentration on R&D. However, Mexico needs to improve its share of expenditure toward R&D to provide innovation and technology to push the industrialization and market competitiveness of the

Table 2.3 Expenditure on research and development in NATFA region (percent of GDP)

<i>Country</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014^P</i>
Mexico	0.46	0.43	0.50	0.50	0.50
USA	2.74	2.76	2.79	2.80	2.80

P Provisional data

Source World Bank, Battelle-R&D Magazine, International Monetary Fund, CIA Fact Book

country. The geographic concentration of R&D is more apparent when looking at specific countries. The USA is by far the largest R&D performer (\$429 billion in 2011), accounting for just under 30% of the global total, but down from 37% in 2001. Overall, the global R&D performance remains highly concentrated in three geographic regions including North America, Asia, and Europe while North America (the USA, Canada, and Mexico) accounted for 32% (\$462 billion) of world-wide R&D performance in 2011. The ranking of the top ten countries as measured by R&D spending remained unchanged during 2014, with the USA reprising its role as the dominant force in global research across numerous industries. The projected investments on R&D in the USA during 2014 have shown declining trend in defense and aerospace R&D but tended to increase in energy-related research, increase in life science R&D, and toward establishing strong growth in information technology. Except for a decline in the 1970s at the point where industry surpassed government as the dominant research sponsor, the US total commitment to R&D has ranged between 2.5 and 3% of GDP for decades.

The intensity investment toward the R&D has been correlated with macroeconomic growth, which has laid the foundation of US technological innovation. This evidence of impact and economic return may account for much of the stability in the share of GDP. In addition, there may be a stabilizing portfolio effect in the complementary roles of public and private research, as well as the diversity of societal objectives and commercial markets they encompass. The reliable trend in research intensity continued in 2013 (2.8%), although multiple contemporary factors influence the prediction of 2014 activity. Though many individual firms and some industries increased their investment, industry investment in R&D was in slow pace during 2013 due to the slow global economy but continued to rationalization of R&D activities in selected industries.

There has been a dramatic change in the extent of globalization involved in research, as well as shifts in the way funds are spent. With the initiative of China on aggressive R&D programs, Southeast Asia has become the world's largest region for research investments, a trend expected to continue through at least the end of the decade. Collaborations with technology firms and research organizations in the USA and Europe are also increasing as Asia seeks to leverage global scientific knowledge and capabilities. However, major spending on infrastructure investments for R&D continues to be the center of budgetary attentions. R&D capabilities also follow markets for technology-enabled products. Automobiles are a good example since the major manufacturers have R&D operations around the world. In the commercial sector, innovation capabilities tend to follow the wealth created by manufacturing and catalyzed by accelerating product development cycles and sometimes by regulation.

Governments around the world, and particularly in Asia, recognize the importance of investing in the building blocks of innovation-based economies. The US government tends to seed innovation with investment in basic research and some tax and policy incentives, but the free market decides which technology is deployed at large scale. China, on the other hand, has fixed a macroeconomic goal of spending 2.2% of GDP on research by 2015, toward becoming an innovation-based economy by 2020. Such a command approach can sometimes accelerate the translation from research to development. R&D is a long-term investment in the future, serving as the cornerstone for innovation-driven growth. R&D investments are the foundation for generating new knowledge through basic research and ultimately for generating products and services through applied research and commercialization (Grueber and Studt 2013).

Advanced manufacturing is emerging as a potential driver of future economic growth to optimize the manufacturing potential and ensure continual improvement in innovation and technology management processes, to stay abreast in international markets, and to introduce timely new products. It is this paradigm shifting toward advanced manufacturing to spin off entirely new industries and lead to production methods that are most likely to stay in the USA because they are hard to imitate. Global competition in advanced manufacturing is growing at a rapid pace as innovation and technology life cycles are accelerated, which open the opportunities for new industries to emerge in the global marketplace. The industrial life cycle starts with the basic concept for a technology

and grows with the focus on differentiation and commercialization. For many technologies, scientific knowledge created through basic research provides key insights that enable the basic concept, which is often validated through applied research. The development efforts at mature stage drive the technology toward developing a prototype of a commercial product and finally commercialization, scale-up activities, and develop the commercially viable product. At this stage, companies typically recapture the costs of technology investment through profits in the scale-up phase (OSTP 2012).

DISRUPTIVE TENDENCIES IN MARKETS

A disruptive innovation initially grows in a niche market and gradually penetrates in the existing market cultivating its demand among the consumers. Over a period of time, the new product or idea completely redefines the industry. A disruptive innovation helps in developing a new market and value network, but drives to disrupt the long-standing market demand and value network displacing an earlier technology. Disruptive innovation may be described as the process that improves a product or service in a different way against the normal market drivers, typically first by developing a new consumer segment in a new market or by defecting the consumers from the existing market. Most of the disruptive innovations are radical as they skip some stages of the process of the existing products and technologies to gain competitive advantages in the market quickly. In contrast to disruptive innovation, a sustaining innovation does not create new markets or value networks but only evolves the existing ones with better value, allowing the firms within to compete against each other's sustaining improvements. In view of the globalization and marketing practices of the emerging companies, it has been observed that market disruption has become a growth function for technology and its application.

Clayton M. Christensen has revolutionized the concept of disruptive innovation, which is referred as technology mudslide hypothesis (Christensen and Overdorf 2000). This is a simple notion expressing that an established firm fails because it is unable to cope up with the changing technological advances with the competing firms. In this hypothesis, attributes of a firm can be explained with the analogy of creepers—one which finds its own path to climb and the other that survives as a parasite to climb. Products emerging out of the disruptive technology are like

parasites, which are built on the products available in the market with popular technologies. Disruptive innovation products largely focus on low cost and utilitarian values of the consumers. Good firms are usually aware of the emerging innovations underneath the market, but their business environment does not allow them to intersect the disruptive innovations as they are risky to pursue due to low profit, and may drain resources of the firm. Generally, a firm's existing value networks place insufficient value on the disruptive innovation to allow its pursuit by another firm. Start-up firms live with different value networks until disruptive innovation is able to invade their value networks, grow parallel in the market and create a me-too entry, and strengthen its chances of co-survival in the existing market.

Disruptive innovation may be a product or a service designed for a new set of customers by defecting them from the existing stream of buying. Generally, disruptive innovations are technologically straightforward, convincing to consumers, and generate value for money. Some disruptive innovations offer more for less to customers through a different package of attributes that have higher significance to the consumers in the bottom-of-the-pyramid market segment than to those of the mainstream market. Christensen argues that disruptive innovations can damage successful brands and well-managed products of reputed companies that are responsive to their customers and have invested resources in conducting excellent R&D to support innovation. These companies tend to bypass markets that are most susceptible to disruptive innovations as there appears the risk of low profit and scope of business growth. Thus, disruptive technology provides products and services with a focus on the customer and drives strategically counterproductive impact on the existing products in a market. However, in a positive sense, the disruptive innovation may be considered as the constructive integration of attributes to the existing technology. Disruptive innovations generate radical insights that could help in improving the economic benefits to consumers and provide better opportunities for the firms to grow in the mass market.

As companies tend to innovate faster, customers' needs evolve over the period and set demand for the products with new technologies in the market. However, most organizations develop complicated, high-technology, and expensive products for customers. High-technology, high-value products help companies to succeed in the premium market segment by maintaining high price-high profit ratio. Such strategy

encourages disruptive innovations at the bottom of the market and allows consumers at the bottom of a market to access the products. Major attributes of the disruptive innovations include:

- Low-price profile
- High perceived use value
- Low gross margins
- Small target markets
- Simple products and services
- Attractive solutions

The bottom-of-the-pyramid market offers lower gross margins and is non-competitive to other firms to develop strategies to move upward in the market and create space at the bottom of the market for new disruptive competitors to emerge.

Disruptive market behavior and streamlined differentiations in products and services by the companies exist simultaneously in the competitive marketplace. As companies introduce differentiated products in the markets, disruptive products grow underneath the mainstream retailing in the mass market as well as in the bottom-of-the-pyramid market segment. The prominence of disruption of products and services in the market causes serious threats to the mainstream marketing strategies of the companies and might also cause failure of business in specific markets or consumer segments. One of the most consistent patterns in business is the failure of leading companies in combating with the unnoticed disruptions emerging in the market whenever new technologies or product differentiations are introduced. The reason at the grassroots why companies succumb to disruptive products is the defection of their customers to the low-end disruption. However, to stay sustainable within the industries and competitive marketplace, companies must be able to spot disruptive technologies and protect their market and consumer segments that are serving mainstream customers (Bower and Christensen 1995).

Most companies position differentiated and new competitive products in high-end markets by promoting high-cost technology, high price, and developing high brand equity for gaining sustainable competitive advantage. However, as the new products are positioned in the high-end markets, there exists the threat of new entrants. Sometimes, the companies choose to launch the differentiated products in a market niche catering to the consumer needs in a limited territory. Companies gain the first

mover advantage in low-end markets by positioning the differentiated and new competitive products through low-price offers and creating high perceived use value for the products among consumers. However, new products takeoff in the low-end markets slowly but fetch wider outreach among consumers. Companies need to play safe in this market segment as disruptive innovations might grow here and cause damage to any new differentiated products brought to this market segment. Hence, most companies introduce low-cost differentiations in the low-end markets.

The low-end disruptive innovation products are targeted to customers who are satisfied even with the partial performance of the product but derive high emotional satisfaction, while new market disruption aims at the new consumer segment to cater both high product performance as well as emotional satisfaction. Low-end disruption in the market takes place when the demand for the product exists but products are unavailable. Consumers have the latent desire to experience the high-end products but often these products are not affordable. Consequently, at some point, the performance of the disruptive products overshoots the needs of certain customer segments, and at this point, a disruptive technology may enter the market and provide a product with high perceived use value, gaining a reasonable market share. In low-end disruption, the disruptive product is focused initially on serving the least profitable customer, who is happy with the partial performance of the product. Such customers will be willing to pay a lower price than others and have higher satisfaction on having the product over its performance. Once the disruptive products gain a sustainable market share, it seeks to improve its profit margins over the established brands, and in order to achieve higher profit margins, the disruptive products enter the differentiated price segment where the customer is willing to pay a little more for higher quality. Hence, the disruptor firms set the innovation process for the products to meet the desired quality and establish as a black market product. Over time, the disruptive products will move to up-market and focus on penetrating into attractive consumer segments. This business situation makes the disruptive products spur out of the niche. The new market disruption occurs when a product fits a new or emerging market segment that is not being served by the existing incumbents in the industry (Rajagopal 2015).

Sustaining innovation pioneered by established companies ensures its competitive status in a market by enhancing and improving the existing products' performance in an expected way that customers value

(Christensen and Overdorf 2000). However, disruptive innovation usually originates from newcomers and upsets the market status by fundamentally altering the way customers think about product performance because it exceeds their expectations in an unexpected way. In comparing both innovation types, it can be seen that sustaining innovations are the type of technological outcomes that can be outperformed by large and established competitors within a short period of time, while disruptive innovations cannot be imitated or outdone by established companies due to the number of difficulties faced by them (Kim and Mauborgne 2005). With disruptive innovation, the vital concern is to make such a leap that the relevant offering provides a better product/service than anything that existed beforehand. It is almost impossible for established companies to cope with the change as they are focusing on their sustained innovation that helps to maximize profits and keep making their products more desirable. However, established companies can be disruptive by attracting low end of customers as in the case of the portable digital music player. Many companies are in search of an innovative strategy to move on to a market where there is no competition yet. In view of that, many academics and managers are trying to find a systematic framework for a strategic innovative business model. The disruptive technology largely serves to the low-end or new niche market customers, and upon establishing a strong market foothold, it enters the market competition and engages in continuous R&D to improve the performance of products and services. The R&D strategy comprising simplification of usage of technology and application of new products drives the disruptive innovations (Yu and Hang 2010).

NOTES

1. Transnational companies are engaged in diversified business portfolios in the region but hold common ownership. Such companies serve diverse markets and support national economic growth as well as stay competitive in the international markets.

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