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The E15 Initiative

STRENGTHENING THE GLOBAL TRADE SYSTEM

Industrial Policies in Lower-Middle-Income Countries

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June 2015

E15 Expert Group on Reinvigorating Manufacturing:
New Industrial Policy and the Trade System

Think Piece

Co-convened with

北京大学国家发展研究院
National School of Development

ACKNOWLEDGMENTS

Published by

International Centre for Trade and Sustainable Development (ICTSD)
7 Chemin de Balexert, 1219 Geneva, Switzerland
Tel: +41 22 917 8492 – E-mail: ictsd@ictsd.ch – Website: www.ictsd.org
Publisher and Chief Executive: Ricardo Meléndez-Ortiz

World Economic Forum
91-93 route de la Capite, 1223 Cologny/Geneva, Switzerland
Tel: +41 22 869 1212 – E-mail: contact@weforum.org – Website: www.weforum.org
Co-Publisher and Managing Director: Richard Samans

Acknowledgments

This paper has been produced under the E15Initiative (E15). Implemented jointly by the International Centre for Trade and Sustainable Development (ICTSD) and the World Economic Forum, the E15 convenes world-class experts and institutions to generate strategic analysis and recommendations for government, business and civil society geared towards strengthening the global trade system.

For more information on the E15, please visit www.e15initiative.org

The Expert Group on Reinvigorating Manufacturing: New Industrial Policy and the Trade System is co-convened with the National School of Development at Peking University. www.en.nsd.edu.cn/

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Citation: Guadagno, Francesca. *Industrial Policies in Lower-Middle-Income Countries.* E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2015. www.e15initiative.org/

The views expressed in this publication are those of the authors and do not necessarily reflect the views of ICTSD, World Economic Forum, or the funding institutions.

ISSN 2313-3805

ABSTRACT

Lower-middle-income countries (LMICs) are heterogeneous countries with various economic experiences. Many underwent different types of structural transformation from agriculture to manufacturing and services. Within manufacturing, they are generally specialised in low-tech labour-intensive or natural resource-intensive industries. Today, therefore, LMICs face a dual challenge. First, they must increase productivity in low-tech labour-intensive industries to improve their international competitiveness and provide employment to their large populations. Second, competing on costs with low-income countries is becoming increasingly difficult, implying that they have to diversify their production structures towards more sophisticated product niches.

This paper analyses the industrial policies implemented by some LMICs in selected industries and discusses the main conditions that affected their successes or failures. It shows that while multilateral trade rules may have restricted the policy space of LMICs, domestic conditions often affected the outcomes of industrial policies more than constraints induced by the current trade regulatory regime. Lack of domestic technological capabilities was a key constraint to the success of industrial policies. This can be addressed by science and innovation policies, which include research and development (R&D) incentives, science parks, and support to collaborative projects with universities and research institutes. The experiences of various countries show that these policies created solid knowledge bases and stimulated learning and the accumulation of capabilities within firms. It is worth noting that while innovation policies could complement and create pre-conditions for other industrial policies to be more effective, the available policy space could itself be better exploited by LMICs.

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LIST OF ABBREVIATIONS

ASCM	Agreement on Subsidies and Countervailing Measures
DPP	defence procurement procedures
EPZs	export processing zones
FDI	foreign direct investment
GDP	gross domestic product
GVCs	global value chains
IPR	intellectual property rights
ISI	import-substitution industrialisation
LDCs	least developed countries
LMICs	lower-middle-income countries
MMRCA	medium multi-role combat aircraft
R&D	research and development
SOEs	state-owned enterprises
TRIMs	Trade-Related Investment Measures
WTO	World Trade Organization

INTRODUCTION

The importance of industrial policies for economic transformation is no longer disputed, although experiences vary widely across countries. While it appears that there has been a resurgence in interest for industrial policy (for example, Stiglitz et al. 2013; Weiss 2013), the evidence (for example, Ciuriak and Curtis 2013; Mazzucato 2014) shows that most countries, including the most industrialised ones, have continued to actively use targeted policies of one kind or another to support their industries.

Lower-middle-income countries (LMICs) have not lagged behind in having their share of industrial policy approaches and instruments. Their experiences have been quite diverse, with as much evidence of successes as failures, resulting from a combination of their policy choices, endogenous economic and political conditions, and external factors at the time they put their industrial policies in place.

The debate around industrial policies continues to remain relevant for LMICs. As the remainder of the paper will suggest, these countries are faced with multiple challenges and a double dilemma. They are considered too rich to benefit from the treatment accorded to the least developed economies, but, at the same time, they are not rich enough to inject resources (financial, human, technological, and so on) to catch up quickly with emerging frontiers and more advanced economies.

This paper focuses on policies and measures adopted by selected LMICs, analyses their achievements, and discusses some of the conditions that affected their success.[1]

INDUSTRIAL POLICIES IN LOWER-MIDDLE-INCOME COUNTRIES

In the old days, industrial policies were aimed at creating and protecting national industries. Today, the focus has evolved and is increasingly aimed at how policies can support firms, and encourage them to upgrade and connect to global value chains (GVCs). This change in approach relies on several types of policies, including policies for accumulating knowledge and capabilities, which, in turn, requires firms to invest in innovation and make efforts to catch up through enhancing skills and capabilities (for example, Szirmai and Verspagen 2012). Even in so-called low-tech sectors such as agriculture or traditional manufacturing, the application of science and technologies is widespread (Von Tunzelmann and Acha 2005).

Industrial policy needs to conform to commitments countries have made with their major trading partners and to rules of the multilateral trade system if they are members of the World Trade Organization (WTO). These may, to some extent, restrict the policy space available to developing countries to undertake certain forms of policies[2] —a latecomer's disadvantage if one compares it to the international trade environment when East Asian countries were catching up.

While under the current international trade regulatory regime least developed countries (LDCs) may enjoy more special and different treatment through more exemptions and exceptions, LMICs need to be more creative in finding grey policy areas and alternative policy instruments to fully exploit their policy space.

KEY CHARACTERISTICS OF LOWER-MIDDLE-INCOME COUNTRIES

LMICs are a very heterogeneous group of countries, classified according to their levels of income per capita by the World Bank, but seem to have little else in common at the outset. A closer look at the list of 48 countries shows various disparities—in size (from large economies such as India to microstates in the Pacific); in economic structures (from less diversified commodity-dependent countries to more diversified economies); and in political situations (from conflict-ridden countries to large democracies). This explains why experiences are so varied in LMICs, and it calls for some caution while making general statements.

That said, LMICs face several constraints, such as lack of sufficiently skilled labour, inadequate infrastructure, institutional challenges, and insufficient bureaucratic and fiscal capacity. These affect the chances of success of many industrial policy instruments, hinder technological upgrading, and affect firms' investment decisions.

Some LMICs are growing more rapidly than others. These others still need to raise their economic growth rates and

1 The definition of lower-middle-income countries follows the World Bank classification. We exclude countries with less than 500.000 inhabitants (Cabo Verde, Vanuatu, Sao Tome and Principe, Samoa, Micronesia, Kiribati, Kosovo, Lesotho, South Sudan, Swaziland, Solomon Islands, and the West Bank).

2 For a comprehensive analysis of industrial disciplines, see the WTO Report of the First Expert Group Meeting on Reinvigorating Manufacturing: New Industrial Policy and the Trading System.

substantially improve domestic conditions. Compared to low-income countries, many LMICs have managed to undergo some structural change from agriculture to manufacturing and services, though to different extents and with different levels of success. Within manufacturing, some have specialised in low-tech labour-intensive or natural resource-intensive industries. Medium and high-tech manufacturing industries play a minor but increasingly larger role.

Most LMICs still benefit from labour cost competitiveness. However, at their stage of development, an industrial development strategy that is too dependent on cost competitiveness may not be a sustainable option in the longer term. Their rapidly rising labour costs and increased competition from lower-income countries with even lower costs are likely to quickly erode their international competitiveness.

Finally, given their production structures and large populations, most LMICs face a dual challenge. First, to provide sustainable employment to their large populations, LMICs need to increase productivity in low-tech, labour-intensive industries. This would improve their international competitiveness and ultimately expand production in these industries. With rising labour costs, competing on costs with low-income countries becomes increasingly difficult (and undesirable). Hence, the second challenge for LMICs is diversifying their production structures towards increasingly sophisticated product niches (UNIDO 2013).

EXPERIENCE WITH INDUSTRIAL POLICIES IN LMICS

LMICs have adopted various industrial policy approaches. Tables 1 to 3 in Appendix 1 follow the classification of industrial policies proposed by Low and Tijaja (2013) and give an overview of the policies implemented in 29 LMICs. This classification distinguishes between import-substitution industrialisation (ISI), including instruments of domestic market protection (for example, tariffs and quantitative restrictions) and subsidies to domestic production; export-oriented industrialisation, including export subsidies and tariffs; resource-based industrialisation (implemented mainly through export taxes and export restrictions); export processing zones (EPZs); and innovation policies (including instruments such as research and development [R&D] incentives and high-tech clusters). As the tables show, almost all LMICs implemented import-substitution and export-promotion strategies and set up EPZs. Many LMICs are resource rich, but only a few of them used resource-based industrialisation strategies. Finally, only a few undertook innovation policies, but the list of countries implementing innovation policies is not limited to relatively diversified countries such as India, but also includes less-diversified countries such as Mongolia, Bolivia, and Zambia. This is an indication of the increased recognition of innovation as a driver of structural change in developing countries.

Based on this categorisation, this section looks at import-substitution policies; export-promotion policies and EPZs; and innovation policies that a selected group of LMICs have used.

Many industrializing countries have used the automotive industry as a laboratory for their import-substitution efforts (Lall 1980). The Indonesian automotive industry was strongly supported and protected since the mid-1960s by a number of vertical policies (tariffs, bans on completely built-up vehicles, local content requirements, and foreign ownership restrictions). Some of the policy measures that accompanied Indonesia's ISI strategy, such as local content requirements, foreign ownership restrictions, and import restrictions, did not have the desired effect. In 30 years of protection, domestic firms only accumulated limited capabilities and specialised in the assembly and production of low-tech components. Upgrading (that is, producing higher-tech components) was hampered by domestic economic and political constraints.[3] The problems of lack of skills and production capabilities were not effectively tackled by a government that did not set realistic policy goals and was not adequately focused on skill enhancement. Due to the low level of capabilities of local suppliers and the failure to invest in innovation policies, most of the local content requirements were not adhered to and only components with the lowest technology requirements were produced domestically. Added to this was the almost complicit understanding between domestic and international suppliers to focus on quick profits rather than build a strong and competitive production base in Indonesia. Further, some of the instruments used in the Indonesian ISI strategy, particularly local content requirements and import restrictions, could potentially be challenged under WTO rules.

After the Asian financial crisis in 1997, market liberalization and deregulation opened the way to foreign companies, resulting in Japanese auto producers securing 90 percent of the Indonesian market (Nag et al. 2007). The assembly capabilities of some local firms complemented the capabilities of foreign

3 For example, it has been argued that in the automotive industry, the government-business nexus was harmful to the development of industry: "Indonesia's local auto tycoons made use of their political connections to obtain government protection in exchange for cooperation with foreign companies, whereas multinational corporations took use of local tycoons to gain an easy access to expand their auto market in Indonesia. In this way, Indonesia's local auto dealers are to purchase auto parts from foreign companies for auto assembly in Indonesia. Accordingly, both local auto tycoons and multinational corporations profit, but Indonesia's auto industry remains unchanged" (Tai and Ku 2013: 13).

firms in production. This mix determined the structure of the Indonesian automotive industry (Dhanani 2000; Pasha and Setiati 2011). Due to the domestic constraints mentioned, the industry is today essentially an assembly industry, dominated by foreign firms that are attracted by the large and growing domestic market, and high market protection (Nag et al. 2007).

The experience of Indonesia shows that less protection or more timely abolition of restrictions, together with improving domestic skills, could have created learning opportunities from foreign firms, and for reverse engineering high-quality component products. Without strong domestic market protection, costs of assembly would have decreased, and the quality of Indonesian cars might have increased. It has also been argued that in the automobile industry, ISI resulted in inefficiencies and fragmented production (Aswicahyono et al. 2000).

Low levels of production and technological capabilities among domestic firms would have been better addressed through policies that provide incentives to human capital formation and R&D. These policies would have stimulated learning and innovation, as happened in Thailand with the Automotive Industry Master Plan.

India is also implementing a strategy to strengthen its domestic capabilities in the auto component industry. The country's strategy is to attract global leaders by increasing its R&D expenditure and tightening its intellectual property rights (IPR) regime (Nag et al. 2007). In Indonesia, the recent establishment of a research institute to foster knowledge creation shows that the government is tackling this issue (Pasha and Setiati 2011).

The aerospace industry (a capital-intensive and high-tech industry) has emerged as an Indian export-promotion success story. Indian exports of aerospace products grew by 82 percent annually from 1988 to 2008. An offset clause in defence public procurements, introduced in 2005, explains a large part of this export growth (Mani 2010).[4] According to India's defence procurement procedures (DPP), for public procurements above INR 3 billion, the offset policy requires foreign vendors to reinvest at least 30 percent of their defence procurement in Indian industries.[5] The offset routes available to foreign vendors include direct purchase by foreign firms (which are treated as export orders of eligible products and services); foreign direct investment (FDI) in joint ventures with Indian enterprises (equity investments); technology transfer agreements; and the provision of equipment to Indian firms or government institutions (investments in kind).[6] Therefore, when foreign vendors choose the option of buying parts or components from Indian manufacturers, domestic exports of aeronautical parts increase. However, to supply to global leaders (lead firms in GVCs), Indian manufacturers have to ensure compliance with stringent safety, quality control, and precision standards (Mani 2010). Given the large value of orders of the aeronautics equipment industry, high-value purchases imply high values of exports for the Indian aeronautics industry. For example, thanks to the offset clause, the purchase of 126 medium multi-role combat aircraft (MMRCA) by the Indian Air Force (also known as the Indian MCRA competition, the largest Indian defence deal) is expected to generate more than USD 5 billion in exports of Indian aeronautical parts.

This policy, however, would have not been so successful without a number of other flanking policies and enabling conditions. While the aeronautic industry did not benefit from an articulated industrial strategy, India made considerable investments in the past five decades in developing a solid knowledge base (by establishing public research institutes such as the National Aerospace Laboratory), creating a competent national firm (Hindustan Aeronautics Limited), establishing a dynamic cluster (Bangalore), and attracting global leaders in the industry (Airbus and Boeing) to locate production and research units there (Mani 2010). The success of this policy is also explained by the abundance of highly prepared graduates in science and engineering and the presence of knowledge-intensive firms in electronics hardware, software, and auto parts. Firms in electronics hardware and software supply high-quality inputs to the aeronautical industry. Firms in auto parts are diversifying into the aerospace industry, thanks to their competences in precision engineering and mechanics.

To conclude, India spurred exports through an alternative instrument to export subsidies, even though it is allowed to give export subsidies for non-agricultural products under the WTO.[7] Therefore, India was not constrained by the available policy space—favourable domestic conditions and complementary investment, science, and innovation policies allowed it to benefit from the policy space available.

EPZs were (and are) a key instrument in export promotion. As Appendix 1 shows, EPZs are a popular instrument among LMICs. In the Philippines, the EPZ policy achieved export diversification into electronics. Low wages and an educated, technically capable, and English-speaking workforce attracted FDI, especially in semiconductors (Rasiah 2004). To make EPZs more attractive, the Philippines developed its infrastructure,

4 Offset clauses are common in defence procurements. Offsets are compensatory requirements that establish how foreign suppliers would offset the cost of the procurement by supporting the domestic economy. Offsets are used to encourage the development of domestic industries and (or) improve balance of payments accounts.

5 In India, 80 percent of all offset agreements are in the aerospace industry (Mani 2010), so this industry has benefited the most from this policy.

6 Since 2011, both defence and civilian offsets are possible.

7 Annex 7 of the Agreement on Subsidies and Countervailing Measures (ASCM) establishes that countries are allowed to use export subsidies for non-agricultural products until they reach a gross domestic product (GDP) per capita of $1,000 (in constant 1990 US dollars) for three consecutive years.

provided generous tax incentives, subsidised access to the domestic capital market, and simplified import and export procedures (Warr 1989). However, EPZs became, and have remained, enclaves with usually few linkages to the rest of the economy (Warr 1989; Usui 2012). Due to tariff exemptions granted to firms in EPZs, upstream local production for them did not take off in most cases. Activities performed in the EPZs normally added low value (Aldaba and Aldaba 2010; Usui 2012) and technological upgrading was not stimulated. For instance, plans for science and technology were developed and incentives for private R&D were put in place, but, in practice, they were not adequately implemented (Niosi 2010). Finally, limited communication between foreign buyers and local suppliers also limited the opportunities to benefit from knowledge spillovers (Agarwalla 2005).

Experience suggests that a liberal legal framework is a powerful tool to attract FDI (for example, the Philippines), but this is not enough in itself to create the basis for long-term competitiveness. While the Philippines could count on its large pool of educated workers, other domestic factors such as a lack of political stability and limited implementation of plans affected the investment decisions of firms and eventually the success of the EPZ strategy.[8] This also suggests that policy must adapt to different phases of development. While it may be initially easy to attract FDI, these types of investments could be footloose. So, if incentives or policies do not change to retain FDI, foreign investors will always find more attractive (lower-cost) locations. In this case, public support to develop a competitive industry for high-quality inputs or business services could help to retain foreign investments and maximize FDI spillovers. As mentioned, this was the case in India, where Boeing and Airbus were attracted by the high level of innovativeness of the Bangalore cluster.

Indian innovation policy can be traced back to the 1960s (Krishnan 2003). Today, India has a well-established pharmaceutical industry. Before the 1970s, the Indian IPR regime was strong because patents on both product and process innovations were enforced. This patent system did not allow reverse engineering. In 1970, the patent regime was reformed and patents on product innovation in the pharmaceutical industry were no longer recognized.[9] This allowed firms to reverse engineer drugs patented overseas and accumulate reverse engineering and production capabilities. The new patent regime enlarged the availability of low-cost drugs and lowered firms' costs—in general, imitation (reverse engineering) is less expensive than innovation. Consequently, Indian firms could produce low-cost drugs for both the domestic and foreign markets (Mani 2009; Guennif and Ramani 2012; Ramani 2014).

The rise of domestic pharmaceutical firms was also possible because India could count on a longer tradition of producing medicines and a science-focused education system. Also, India had the advantage that its labour costs were lower compared to advanced countries. Machinery and equipment to produce pharmaceuticals were locally available, as a result of import-substitution policies in the capital goods industry. Moreover, in the 1950s and 1960s, the government created two enterprises (Hindustan Antibiotics Limited and Indian Drugs and Pharmaceuticals Limited). These firms played a crucial role in creating knowledge (which was then transferred to the private sector), stimulating the demand for skilled labour, and spinning off high-tech firms. Finally, product and quality regulations ensured the incorporation of good clinical practices protocols, which increased the international competitiveness of the industry (Mani 2009).

In 2005, to comply with the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement, India reformed its patent regime. So commercialization of branded medicines through reverse engineering is no longer allowed. In the period from 1995 (when India joined the WTO) to 2005 (when India had to fully comply with the TRIPS agreement), firms began to increase their R&D expenditures to create the conditions to prosper in a new regulatory regime.

Since the early 1980s, Indian pharmaceutical and chemical firms have been successfully diversifying into biotechnology. After four decades of weak IPR policies, pharmaceutical firms are today better prepared to produce innovative drugs. But biotechnological firms are likely to be highly affected by the TRIPS agreement because it requires firms to skip the imitation phase and be innovative from the early stages. To do so, Indian biotech firms have entered into partnerships and licensing agreements with foreign market leaders. Biotech firms are benefiting from the enabling conditions mentioned earlier (scientifically trained and relatively cheap workforce). Given that biotechnology and pharmaceuticals are technologically related, firms can build on the knowledge and capabilities accumulated in the pharmaceutical industry. The government is also supporting the development of the biotechnology industry by providing financing for public research centres and public-private partnerships, and grants and soft loans to private firms (Reid and Ramani 2012). This shows that policies must be ready to follow new windows of opportunity opened by new technologies, as in the case of biotechnology, or by new market opportunities, as in the case of generics for lower-income market segments.

These two cases illustrate the importance of IPR regimes. The TRIPS agreement limits the policy space of developing countries and hampers their innovation processes. With TRIPS, in addition to relevant domestic conditions (for example, domestic technological capabilities), new policy instruments and strategies for firms must be found. The biotech case provides examples of some of these instruments and strategies, but due to its stronger position in the pharmaceutical industry, India is relatively better prepared to deal with these challenges than many other LMICs. With a

8 The political instability of the 1980s halted FDI inflows until the 1990s (Rasiah 2004).

9 According to the Indian Patent Act of 1970, manufacturers were allowed to patent only one method of production per drug, and other manufacturers were allowed to sell imitations of drugs (without any sanction), provided that they used new production processes.

change in rules, LMICs would find operations more costly or difficult. Imitation was a cheap way to learn, while the policy instruments available today result in higher expenses because now producers would require substantial investments. At the same time, it can be argued that by imposing information disclosure, strong IPR regimes facilitate diffusion of the technical knowledge behind a patented innovation, leading to higher rates of innovation and an orderly development of applications of the patented innovation. Therefore, compliance with the TRIPS agreement can be part of a strategy aimed at spurring innovation and increasing opportunities for learning from market leaders via technology licensing agreements and FDI.

CONCLUSION

Table 4 in Appendix 2 summarizes the policies reviewed in this paper, the conditions (and constraints) to their success, and their implications for WTO rules. What Table 4 and the paper demonstrate is that conditions are country and time specific, because they depend on countries' institutions, histories, and idiosyncratic processes, and on the evolving trade regulatory regime and windows of opportunity. In spite of this, it is possible to identify some recurrent conditions that are important for industrial policymaking in LMICs.

Among others, policies must be driven by constant learning, both at the firm and state levels. Firms accumulate knowledge that is used to develop an industry or enter technologically related industries (as shown in the Indian pharmaceutical and biotechnology industries). When incentives for the accumulation of capabilities are not sufficient or not adequately supported, insertion in the low value part of GVCs might still be possible to some extent, but technological upgrading would be difficult unless appropriate skills and production conditions are generated by LMICs (for example, the electronic industry in the Philippines). States learn how to design, implement, and recalibrate policies. If states do not adjust their policies, time and resources might be wasted in trying to achieve unrealistic policy objectives (as was the case of local content requirements in the Indonesian automotive industry).

This paper also shows how policies' interactions affect the chances of success of certain industrial policies. Vertical industrial policies interact with horizontal policies (such as education policies) and other political conditions (for example, political stability in the case of the Philippines).

Despite exceptions (mainly for LDCs) and grey areas (for example, offset clauses or safeguard measures), plurilateral and multilateral rules have made it more difficult to use certain types of industrial policies, such as export subsidies and local content requirements. For example, while in the old days countries such as South Korea could use long-term subsidised export credits to build export capabilities in strategic industries, today alternative instruments have to be found (for example, offset clauses in public procurements such as in the Indian aerospace industry). However, in the cases reviewed here, domestic conditions and capabilities in LMICs often had a larger impact on the success or failure of industrial policies than any constraints induced by the prevailing trade regulatory regime, probably because countries did not have the capacity to use them. Limited technological capabilities are found to be the most recurrent constraint to policy success. For example, domestic market protection in the Indonesian automotive industry was not sufficient to create high value added. A number of complementary policies to support knowledge creation and capabilities' accumulation could have stimulated learning and facilitated technological upgrading in the value chain. In a globalized world where production is organized in GVCs, domestic market protection is difficult to sustain. Building domestic capabilities is important also because possibilities of insertion in GVCs increase when countries can upgrade their participation in higher parts of value chains. Therefore, capabilities are indispensable to make a difference.

Even when countries choose to rely on FDI-dependent models (for example, Vietnam and the Philippines), they could only benefit from knowledge spillovers if they acquired absorptive capacity. FDI is a major channel of technology transfer, and access to foreign technology and expertise is key to learning and catching up. In this context, apart from innovation policies that provide incentives to accumulate absorptive capacity and technological capabilities, strong IPR regimes have been considered relevant to attracting FDI and encouraging technology transfer because they ensure legal protection against imitation of any innovation that foreign firms introduce in the country. Moreover, if firms possess enough technological capabilities, strong IPR regimes can stimulate innovation because the protection granted to innovators induces them to innovate. At the societal level, information disclosure facilitates diffusion of the technical knowledge behind the innovation, which stimulates further innovation and permits an orderly development of applications. Therefore, while it is clear that the TRIPS agreement has reduced the policy space available to many LMICs, compliance with it can also constitute a competitive advantage for developing countries.

For LMICs, there are a number of innovation policy instruments that are not constrained by bilateral and multilateral trade agreements (for example, R&D incentives, public-private partnerships, and consortia and joint ventures with international market leaders). The East Asian experience has shown that the role of the state is critical in stimulating learning and accumulating capabilities. Innovation policies and development of relevant skills are essential to create the pre-conditions for greater effectiveness of industrial policies if LMICs aim to be competitive in global markets. However, the available policy space is not being sufficiently used by LMICs, and greater strategic focus should be given in this area through policy support.

APPENDIX I

Table 1: Industrial Policy in Selected Large Lower-Middle-Income Countries

Notes: Industrial policy classification follows Low and Tijaja (2013). Yemen, Sudan, and Syria are excluded from this list due to lack of sufficient information.

Source: Elabouration based on author's research.

	Import substitution	Export promotion	Resource-based industrialisation	EPZs	Innovation policies
Fairly diversified					
India	x	x		x	x
Ukraine	x	x		x	x
Morocco	x	x		x	x
Uzbekistan	x	x		x	
Specialised in resource-based industries					
Indonesia	x	x	x	x	x
Nigeria	x	x		x	x
Egypt	x	x			x
Cameroon	x	x		x	
Zambia	x	x	x	x	x
Specialised in labour-intensive industries					
Pakistan	x	x		x	
Philippines	x	x		x	x
Vietnam	x	x	x	x	x
Sri Lanka	x	x		x	
Specialised in agriculture or agri-business					
Ghana	x	x	x	x	
Cote d'Ivoire	x		x		
Guatemala	x	x	x	x	x

Table 2: Industrial Policies in Selected Medium Lower-Middle-Income Countries

Notes: Kyrgyz Republic, Mauritania, Congo, and Moldova are excluded from this list due to lack of information.

Source: Elabouration based on author's research.

	Import substitution	Export promotion	Policies for natural resources	EPZs	Innovation policies
Fairly diversified					
Armenia	x				x
Georgia	x			x	
Specialised in resource-based industries					
Bolivia	x	x	x	x	x
Mongolia	x		x		x
Papua New Guinea	x	x	x		
Specialised in labour-intensive industries					
El Salvador	x	x		x	
Specialised in agriculture or agri-business					
Honduras		x		x	
Laos	x	x		x	x
Moldova	x			x	
Nicaragua	x	x		x	
Paraguay		x	x	x	

Table 3: Industrial Policies in Selected Small Lower-Middle-Income Countries

	Import substitution	Export promotion	Policies for natural resources	EPZs	Innovation policies
Guyana	x				
Djibouti				x	

Notes: Selection of countries is based on the availability of information.

Source: Elabouration based on author's research.

APPENDIX II

Table 4: Policy Instruments, Conditions for Success, and Implications for WTO Rules

Policy domain	Policy instruments	Examples	Conditions for success	Implications for WTO rules
Trade	Import tariffs	Indonesia (auto)	Large domestic markets, and capable domestic manufacturers.	Import tariffs are allowed under WTO rules.
	Local content requirements	Indonesia (auto)	Institutional capacity to set realistic policy objectives and revise policies when needed, and capable domestic firms to produce high-quality goods domestically.	Local content requirements are not consistent with the Trade-Related Investment Measures (TRIMs) agreement (and so are likely to be challenged). Alternative strategies that can spur domestic production and are allowed under WTO rules must be sought (for example, offset clauses).
	Offset policy	India (aerospace)	Domestic knowledge and capable domestic firms to supply to foreign vendors, cooperate with them, and benefit from knowledge spillovers.	Generally prohibited under the Agreement on Government Procurement, but allowed for defense procurements. Also, at the time of accession, developing countries can negotiate conditions for the use of offsets.
	EPZs	Philippines (electronics)	An educated, technically capable, and English-speaking workforce, and capable domestic firms to supply to firms in EPZs and benefit from knowledge spillovers from them.	Accepted under WTO rules.
Investment	Production via state-owned enterprises (SOEs)	India (pharma and aerospace)	Entrepreneurial state, willing to invest where private firms would not invest.	Accepted under WTO rules.
Innovation	IPR regime	India (pharma, biotech, and auto)	Educated skilled labour, universities and research institutes, and capable R&D-intensive firms.	Relaxed IPR regimes are no longer allowed under the TRIPS agreement. Strong IPR regimes, however, can spur innovation, encourage partnerships and technology licensing agreements with foreign market leaders, and help to attract FDI.
	Science policy	India (aerospace, pharma, biotech)	Educated workforce.	Accepted under WTO rules.
	R&D incentives	India (pharma and biotech)	High-level human capital, research institutes with business linkages, and capable manufacturers.	Accepted under WTO rules, but fiscally expensive.

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