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**Industrial Policy, Macroeconomics and
Structural Change**

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Abstract

The main argument of this paper is that the key to rapid economic growth is the dynamic efficiency of economic structures, defined as their capacity to generate new waves of innovative activities. After reviewing the empirical literature that confirms this view, the paper argues that the dynamics of production structures may be visualized as the interaction between two basic forces: innovations (broadly defined) and the learning processes associated with them; and the complementarities, linkages or networks among firms and production sectors. The paper then analyzes the specific structural transformation challenges that natural resource-dependent economies face. It finally argues that industrial policies should be accompanied by appropriate macroeconomic and financial policies that should guarantee in particular a competitive and stable real exchange rate and long-term financing for innovative activities, with a crucial role for national development banks.

Keywords: innovations, complementarities, structural change, dynamic efficiency, commodities, real exchange rate, national development banks.

Introduction

This paper argues that structural change is at the heart of a dynamic process of economic development, and that active industrial (production-sector development) policies must be at the heart of an appropriate development strategy. The major policy focus of that strategy should, therefore, be on the *dynamic efficiency* of economic structures, defined as their capacity to generate new waves of structural change.² This concept is in sharp contrast with *static efficiency*, the central focus of traditional microeconomic and international trade theories. Dynamic efficiency requires degrees of state intervention that traditional defendants of static efficiency would also consider unacceptable.

¹ This paper was prepared as a chapter for Arkebe Oqubay, Christopher Cramer, Ha-Joon Chang, and Richard Kozul-Wright (eds.), *The Oxford Handbook of Industrial Policy*, Oxford: Oxford University Press, 2020. It borrows from the author's previous work on the subject, and from joint work with Bilge Erten, Stephany Griffith-Jones, Martin Guzman, Codrina Rada, Joseph E. Stiglitz, and Lance Taylor, whose contributions are gratefully acknowledged. In particular, the section on the dynamics of production structures borrows from Ocampo (2017b) and my analysis of financing issues from my work with Stephany Griffith-Jones (Griffith-Jones and Ocampo, 2018). The author thanks Reda Cherif, Fuad Hasanov, Arkebe Oqubay, Gabriel Porcile, and Rajah Rasiah for comments on a previous draft of this paper, also Verónica Pérez for her support in its drafting.

² This concept is borrowed from Ocampo (2017b). Note that it is entirely different from that of "dynamic efficiency" used in neoclassical optimal growth models.

What this means is that economic growth in emerging and developing countries—the focus of this paper—is intrinsically tied to the dynamics of production structures, the learning processes associated with technological catch-up and the capacity to gradually join the world of innovators, and the specific policies and institutions created to support these processes. The promotion of dynamic efficiency in these countries also includes the creation of linkages among domestic firms and sectors, and the adequate management of natural resources in countries that have a strong static comparative advantage in commodity production. It equally involves the reduction of the heterogeneity of their production structures, due to the coexistence of low-productivity (informal) activities alongside high-productivity (modern) firms—a phenomenon that has been alternatively called both “dualism” and “structural heterogeneity”. Avoiding macroeconomic instability is also essential, particularly guaranteeing competitive and stable real exchange rates, which are critical for adequate structural change, in the face of terms-of-trade fluctuations and capital account volatility.

These are basic ideas that have been advanced by all brands of—broadly defined—“structuralism” in economic thinking.³ The work of Schumpeter, the neo-Schumpeterian and evolutionary schools are included within this concept. This encompasses the view, which originates in Schumpeter’s (1939) analysis of business cycles, that technological revolutions come in waves of innovation that gradually spread through the economic system (Freeman and Soete, 1997; Pérez, 2002, Part I), replacing previous technologies and the firms and sectors that used them, and generating a process of ‘creative destruction’ (Schumpeter, 1962, ch. VIII). In relation to developing economies, some of the ideas come from different brands of Latin American structuralism that followed the work of Raúl Prebisch and the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), including its most recent brand, “neo-structuralism”. We should also embrace within this broad concept of structuralism the emphasis of classical development economics on industrialization and external economies as core elements of economic development, including the notions of backward and forward linkages associated with the work of Hirschman (1958). We can add the growth-productivity connections

³ See, among an extensive literature, Prebisch (1951 and 1973), Furtado (1961), Nelson and Winter (1982), Dosi et al. (1988), Wade (1990), Taylor (1991), Chang (1994), Nelson (1996, 2019), Aghion and Howitt (1998), Rodrik (1999 and 2007), Ros (2000 and 2013), Amsden (2001), Ocampo et al. (2009), Lin (2012), Stiglitz and Greenwald (2014), and Cherif and Hasanov (2019).

associated with Kaldor's (1978, chs. 1 and 2) analysis of economic growth, as well as the role of increasing returns in contemporary neoclassical models of economic growth.⁴

Contextual conditions for a dynamic development process have also been emphasized in the literature. However, they generally play the role of background conditions rather than that of direct determinants of changes in the growth momentum.⁵ They include an adequate education system and a proper physical infrastructure. They also include an institutional context that guarantees a measure of stability in the basic social contract, a non-discretionary legal system, an impartial (and, ideally, efficient) state bureaucracy, and smooth business–labour–government relations. There are, however, significant differences in concepts about what constitutes a proper institutional context, and certain institutional features are fairly constant over decades in specific countries, whereas growth is not.⁶ This paper therefore leaves aside the analysis of these contextual conditions, referring only to institutions that directly relate to structural change.

It should be added that the distributive effects of structural transformation strategies depend on how far such strategies help reduce the heterogeneity of production structures through training, technological diffusion, appropriate financing channels, the promotion of different forms of associations among small entrepreneurs, and commercial links between large and small firms. However, this is a subject that is only marginally covered here.

The paper is divided into six sections, the first of which is this introduction. The second takes a look at growth patterns identified in the old and more recent literature. The third focuses on the dynamics of production structures, and particularly on its two fundamental elements: innovations and complementarities. The fourth considers the specific issues raised by natural resource dependence. The fifth looks at the interrelated issues of financing structural change and managing financial fluctuations. The last section draws major policy implications.

⁴ See the classical contributions by Romer (1986), Lucas (1988), and Barro and Sala-i-Martin (2003).

⁵ See in this regard the differentiation between “proximate” and “ultimate” causality of growth processes by the economic historian Maddison (1991, ch. 1).

⁶ See, for example, Easterly et al. (1993) and Pritchett (2000).

Growth patterns

The large empirical literature has identified that economic growth involves the simultaneous movement of a series of economic variables: improved technology, human capital accumulation, investment, savings, and systematic changes in production structures.⁷ Disentangling cause and effect is not always an easy task. Thus, higher investment and savings ratios are generally seen as essential for growth accelerations, but they may be the result rather than the cause of faster growth: the effects of the accelerator mechanism on investment, and higher savings associated with income growth and redistribution effects that go along with it, such as raising firms' retained profits. In turn, the accumulation of skills, an essential element of human capital, is mainly the result of learning associated with production experience, and the expansion of education systems is facilitated by the increased social spending enabled by economic growth. Productivity improvements may also be the result of growth: learning processes, as well as technical improvements embedded in new equipment—the causal link emphasized by Kaldor (1978), which is the opposite of that assumed by neoclassical growth theory since Solow (1956 and 2000). Thus, many of the regularities mentioned in the growth literature may be subject to sharply differing interpretations, depending on views on the causal links involved.

A few “stylized facts” may serve, however, as point of departure for this paper.

The first is the persistence and even enhancement of the vast inequalities in the world economy that arose quite early in the history of modern economic growth. As Rodrik (2014) has emphasized, convergence in per-capita incomes has been the exception rather than the rule. Indeed, using Maddison's (2001) data, we can estimate that slightly over 60 per cent of the variance of per-capita income levels in the world at the end of the twentieth century can be explained by income differences that already existed in 1914. This indicates that, although there have been changes in the world income hierarchy, these have been exceptions. Even in the case of developed countries,

⁷ Nonetheless, it has also been argued that there is much less association between some of these variables and economic growth than was traditionally assumed. This has been claimed particularly in relation to physical and human capital. See Easterly (2001), Part II.

strong convergence took place during the post-WWII “golden age” of 1950–73, but not before WWII (Maddison, 1991).⁸

The most important feature, however, is the divergence of incomes between developed and developing countries in the nineteenth and twentieth centuries, which Pritchett (1997) aptly characterized as ‘divergence, big time’. Among the exceptions to this rule, we can also include the rise of Latin America to middle-income levels since the late nineteenth and early twentieth centuries and through the inter-war period⁹ and, of course, the success of Asian newly industrializing economies since the 1960s and that of China since the 1980s. The first decade of the twenty-first century, and at a slower rate until the end of the “super-cycle” of commodity prices in 2014, is perhaps the only case of fairly broad convergence of per-capita income between developed and developing countries in history.

The reasons for divergence are well known. They include the “poverty trap” analyzed by classical development economists, as well as the “middle-income trap” identified in the recent literature (see, for example, Gill and Kharas, 2007, 2015; Eichengreen et al., 2012, 2013). They also reflect basic international asymmetries: (i) prohibitive entry costs into mature sectors and technologically dynamic activities; (ii) differences in domestic financial development and in the stability or volatility of external financing; and (iii) macroeconomic asymmetries that generate quite different degrees of freedom to adopt countercyclical macroeconomic policies and even a tendency for developing countries to adopt procyclical policies, due to their dependence on unstable external financing (Ocampo, 2001, 2016).

The main implication of this fact is that economic opportunities are largely determined by the position that a particular country occupies within the world hierarchy. For this reason, economic development is not about following “stages” of growth, but carrying out the associated structural transformations, and employing the appropriate macroeconomic and financial strategies within the restrictions that each country’s position within the world hierarchy creates. This was the essential

⁸ The development that took place in Japan after the Meiji Restoration, and the escalation of this country to the top group of developed countries in the post-WWII years should be included as successful convergence processes.

⁹ In relation to Latin America, see Bértola and Ocampo (2012), ch. 1.

insight of the Latin American structuralist school and the literature on late industrialization since Gerschenkron (see Gerschenkron, 1962; Amsden, 2001).

As underscored in the classic work by Chenery and collaborators, growth is accompanied by regular changes in the sectoral composition of output and the patterns of international specialization (see Chenery et al., 1986). Episodes of convergence have been generally associated with processes of industrialization and the reallocation of labour from low- to high-productivity sectors subject to economies of scale and scope (specialization), but many have also ended in truncated convergences or growth collapses (Ros, 2000, 2013; Easterly, 2001).¹⁰ Furthermore, a significant feature of developing countries in recent decades has been the premature deindustrialization of Latin America and Africa, i.e., the reduction in the share of manufacturing in employment and GDP at much lower levels of income per capita than has been typical in similar processes in developed countries—a concept and a trend that was first highlighted by Palma (2005) and Dasgupta and Singh (2006), and more recently by Rodrik (2016). Deindustrialization may have been generated by the way economic liberalization was undertaken, and by the “Dutch Disease” effects of the super-cycle of commodity prices of the early twenty-first century. Such a trend is in sharp contrast with the persistent industrialization of East Asia and its spread to a group of middle- and lower-income countries in South-east and South Asia. Asian countries are also the only ones where recent growth accelerations have mixed structural change with improvements in labour productivity at the sectoral level, whereas Latin America has lacked the first element and Africa the second (Diao et al., 2019).

Several authors have also pointed out that episodes of structural change come in spurts rather than as steady flows, an idea that may be seen as related to the concept of waves of innovation. The capacity to generate a wave of innovations or absorb one that has already been developed in advanced economies depends, in any case, on production experience, and follows, therefore, a process of path dependence (Arthur, 1994). The complementarities (externalities) among sectors are crucial for a strong growth process to take place (Rosenstein-Rodan, 1943; Taylor, 1991; Ros, 2000, 2013) and, if they cannot be developed simultaneously, they may generate successive phases

¹⁰ The lasting effects of the debt crises of the 1980s in Africa and Latin America are the most telling example in this regard, but that of several peripheral European countries (notably Greece) after the 2007–09 North Atlantic financial crisis has similar features (I use this term rather than the more commonly used “global financial crisis”, because although the crisis had global effects, it centred in the United States and Western Europe).

of disequilibrium (Hirschman, 1958). These views imply, in short, that the dynamics of production structures are an active determinant of economic growth and, therefore, that this process cannot be reduced to its aggregate dimensions.

Elastic factor supplies play an essential role in facilitating a smooth expansion of dynamic activities. Financing facilities for innovative sectors are essential in this regard, as emphasized in the literature on late industrialization in the now developed countries; as we will see, public-sector development banks can play a crucial role in this regard. In turn, the reallocation of labour from traditional to modern sectors also plays an essential role, as underscored by Lewis (1954, 1969) and many later authors.¹¹ At the same time, however, low economic growth may generate the opposite pattern, in which traditional or informal activities—or the public sector—absorb the labour that modern sectors do not demand (Ocampo et al., 2009). The interplay between labour mobility and economies of scale has also been the essential insight of regional economics since its origins, generating urban and regional growth poles (for a modern version, see Fujita et al., 1999). The “vent for surplus” models of international trade, which go back to Adam Smith, also provide an alternative source of elastic factor supplies: un- or underexploited natural resources (Myint, 1971, ch. 5).

The role of economic policy in these processes has been the subject of heated controversies. In recent decades, the orthodox emphasis has been on the positive role that trade openness plays in facilitating economic growth, but the simplistic relation between trade liberalization and growth has been shown to be incorrect, as underscored by several authors after the seminal paper by Rodríguez and Rodrik (2001). Indeed, to the extent that scale economies and learning play an important role in international specialization,¹² comparative advantages can be or even are generally *created*. More broadly, successful development experiences have been associated with variable policy packages involving different mixes of orthodox incentives with unorthodox institutional features (“local heresies”) (see the comparative analyses of development experiences in Hellenier, 1994, and Rodrik, 2007, 2014). Thus, protection has been a source of growth in some periods in specific countries, but has blocked it in others; the same thing can be said of freer trade

¹¹ Interestingly, Kaldor (1978, ch. 4) and Cripps and Tarling (1973) show the importance that this process also had during the post-WWII golden years in industrial countries.

¹² See the seminal analysis of this issue in Krugman (1990), and Grossman and Helpman (1991) and, in relation to developing countries, Ocampo (1986).

–the degree of openness in the world economy being critical in this regard. Export growth has been, of course, a crucial element of East Asian success in recent decades, but has involved significant elements of state intervention. Mixed strategies have worked well under many circumstances. Indeed, an interesting historical observation is the evidence that successful experiences of manufacturing export growth in the developing world were generally preceded by periods of import-substitution industrialization (Chenery et al., 1986). Bairoch (1993, Part I) came to a similar view regarding the role of protection in the growth of the “late industrializers” during the pre-WWI period, concluding that the fastest periods of growth in world trade before WWI were not those characterized by the most liberal trade regimes.

In macroeconomic terms, there is evidence that long-term growth in developing countries is positively associated with the capacity to guarantee a competitive real exchange rate, and thus with the idea that an active exchange rate policy can help foster structural change.¹³ In this sense, a competitive exchange rate can be viewed as a type of industrial policy that can partially substitute for traditional industrial policies, particularly in the face of restrictions on subsidies to production and exports under the World Trade Organization (WTO) rules. However, it should also be complemented by other industrial policies (e.g., on access to technology and credit) that increase the elasticity of the aggregate supply to the real exchange rate.

The dynamics of production structures

As stated in the introduction, the capacity to permanently generate new dynamic activities is the essence of successful economic development. In this sense, structural change is essentially a *meso-economic* process that includes the variations in the composition of production, intra- and inter-sectoral linkages, market structures, the functioning of factor markets, and the institutions that support all of them. Dynamic microeconomic changes are the building blocks, but it is *system-wide* structural change that matters. Furthermore, this process has a strong impact on macroeconomic dynamics through its effects on investment, employment, and trade, and macroeconomic policy can also affect this process.

¹³ See Rodrik (2008), Rapetti et al. (2012), Razmi et al. (2012), Rapetti (2013), and for a review of the literature, Frenkel and Rapetti (2014) and Missio et al. (2015).

The dynamics of production structures may be visualized as the interaction between two basic forces: (1) innovations, broadly defined as new technologies, new activities and new ways of doing previous activities, and the learning processes that characterize their full realization and their diffusion through the economic system; and (2) the complementarities, linkages or networks among firms and production activities. The institutions required to enhance these structural processes are crucial and also subject to learning. Elastic factor supplies are essential to guarantee that these dynamic processes can deploy their full potentialities. It is the combination of these factors that determines the dynamic efficiency of a given production system (Ocampo, 2017b).

Innovations

This definition of innovations follows the broad concept of ‘new combinations’ suggested by Schumpeter (1961, ch. II): new qualities of goods and services; new production methods or marketing strategies; opening up of new markets; new sources of raw materials; and new industrial structures. Today we would also add new ways of managing the environment, including mitigating the effects of climate change. The definition includes technological innovations—the more common use of the concept of innovations in the economic literature—but also a broader set of micro- and meso-economic processes.

Innovation, as we saw in the previous section, includes not only the creation of firms, production activities, and sectors, but also the destruction of others—or, using Easterly’s (2001, ch. 9) terminology, complementary and substitution effects. Schumpeter’s ‘creative destruction’ is, of course, essential if innovations are to lead to growth. However, there may be other outcomes: limited destruction but also large-scale destruction or a mixed negative case, “destructive creation”, when the destruction prevails over the creative parts of the transformation. Also, some locations may concentrate the creative and others the destructive effects, for example, when a synthetic substitute is discovered in an industrial centre that puts producers of the natural raw material located elsewhere out of business.

In industrial countries, the incentive to innovate is provided by the extraordinary profits that can be earned by the pioneering firms that introduce technical, commercial, or organizational changes, or which open new markets or find new sources of raw materials. This incentive is necessary to offset the uncertainties and risks involved in the innovators’ decisions, the incomplete

nature of the knowledge they initially have, and the fact that, due to the externalities that the innovation generates, they may not be able to fully appropriate its benefits.

In contrast, in developing countries, innovations are largely associated with the transfer of sectors, new products, technologies, and organizational or commercial strategies previously developed in the industrial centres. The industrial countries' innovations thus represent the “moving targets” which generate the windows of opportunity for developing countries (Pérez, 2001). The extraordinary profits that innovators enjoy in developed countries may be absent, as they may involve entry into mature activities with thinner profit margins. Thus, in the absence of policy incentives, there may be a suboptimal search for new economic activities (Hausmann and Rodrik, 2003).

No innovative process is passive, as it requires investment and learning. It requires investments in physical capital as well as in intangibles, including technological learning. Technical know-how must indeed go through a maturing process that is closely linked to the production experience. Climbing up the ladder in the world hierarchy entails shortening transfer periods, taking “detours” to manage existing intellectual property rights in place and, most importantly, gradually becoming a more active participant in technology generation (Lee, 2019). It requires national innovation systems to be built up, which should include an institutional framework to coordinate the various actors engaged in innovation and learning—research and development centres, universities and technology schools, extension services, and the innovating firms themselves—and to redirect investments over the long term towards new capabilities and, of course, an ambitious educational strategy that supports these processes.

Essential insights into learning dynamics have been provided by “evolutionary” theories of technical change.¹⁴ These theories emphasize the fact that technology is to a great extent tacit in nature, i.e., that detailed “blueprints” cannot be plotted. This has three major implications. The first is that technology is incompletely available and imperfectly tradable. This is associated with the fact that technology is, to a large extent, composed of intangible human and organizational

¹⁴ See Nelson and Winter (1982), Nelson (1996), and Dosi et al. (1988) and, with respect to developing countries, Katz (1987), Lall (1990, 2003), and Lee (2019). Similar concepts have been developed in some versions of the new neoclassical growth theory, in which “knowledge capital” is a form of “human capital” with three specific attributes: it is “embodied” in particular persons, it is capable of generating significant externalities, and it is costly to acquire (Lucas, 1988).

capital, which implies that even firms that purchase or imitate it must invest in mastering the acquired or imitated technology, a process that involves adaptation and even redesigns and other secondary innovations. Since this process will be specific to each firm, heterogeneous producers will coexist in any sector of production. The second implication is that technology proficiency cannot be detached from production experience: it has a strong learning-by-doing component. This will also apply, at least in part, to technology creation, which implies that the probability of major innovations would depend on the accumulated technological knowledge and production experience of firms, which in new technological fields would include new firms. The third feature of technical change, unrelated to tacitness, is that diffusion of innovations implies that innovative firms only imperfectly appropriate their benefits. Intellectual property rights provide a mechanism for appropriating those benefits more fully in the case of technological innovations, but they are not present in other forms of innovation (such as the development of new activities or a new marketing strategy). Innovations, therefore, have a mixture of private and public good attributes.

It must be emphasized that these three features of technical change—imperfect tradability, close association with production experience, and private/public attributes—are equally characteristic of other forms of knowledge, particularly organizational and commercial know-how, and institutional development. Imperfect tradability, due to its social-capital attributes, is paramount in the case of organizational knowledge. In turn, commercial know-how and the development of commercial reputation (goodwill) plays a pivotal role in international trade (Keesing and Lall, 1992). Moreover, familiarity with the market enables producers to modify their products and their marketing channels and helps buyers learn about suppliers, generating client relations that are important to guarantee the stable growth of firms.

Complementarities

Complementarities are associated with the development of networks of suppliers of goods and specialized services, marketing channels, and organizations and institutions that disseminate information and coordinate the relevant agents. This concept summarizes the role that backward and forward linkages play in economic growth (Hirschman, 1958) but also that of (private, public, or mixed) institutions that are created to reduce information costs (e.g., on technology and markets) and to mitigate the coordination failures that characterize interdependent investment decisions

(Chang, 1994). Complementarities generate positive externalities among agents, which help reduce their costs. They are the basis of the dynamic meso-economic economies of scale that determine the competitiveness of production sectors in a given region or country—or the lack of it. Under these conditions, competitiveness involves more than microeconomic efficiency: it is essentially a meso-economic or even a system-wide feature (Fajnzylber, 1990).

The cost and quality of the non-tradable inputs are particularly important in this regard. They contain specialized services, including knowledge, and logistic and marketing services, for which closeness to producers who use the inputs or services may be a critical factor. They may also include specialized financial services, where closeness can also be important due to asymmetric information. Also, and although importing tradable inputs from the best supplier worldwide can encourage export competitiveness, the capacity to generate value chains in which exports have a large domestic value-added content based on national clusters determines how much a given country benefits from trade. Such contents differ considerably among countries. According to OECD-WTO data, and focusing only on developing countries that are important manufacturing exporters, the share of value added in gross exports in 2016 was 83.6 per cent for China, where it has been rising over the past decade, 69.6 per cent for the Republic of Korea, also rising, but 63.6 per cent and falling for Mexico, and only 56.4 per cent, also falling, for Vietnam.¹⁵

As we have seen, the ability of innovative activities to attract capital and labour, and to gain access to the natural resources they need, will be a critical factor in facilitating the growth of these activities. One factor is the role of national development banks in facilitating long-term finance for innovative activities. International capital mobility—particularly foreign direct investment—can also play an important role. International labour migration may be critical for skilled labour. Unemployed or, more typically, underemployed natural resources can facilitate the expansion of innovative sectors that require them—for example, innovative agricultural activities. And, of course, in the developing world, low-productivity activities, characterized by a considerable element of underemployment (or informality), act as a residual supplier of the labour required by a surge of economic growth. The distinction that dualistic models make between “traditional” and “modern” sectors is inappropriate for describing this feature of the developing world, as high- and

¹⁵ See OECD, Trade in value added database, <https://www.oecd.org/sti/ind/measuring-trade-in-value-added.htm#access>

low-productivity sectors are heterogeneous in their structure. The term “structural heterogeneity”, coined by Latin American structuralists (Pinto, 1970) to describe this phenomenon, is more appropriate and will thus be used in this paper.

Structural heterogeneity implies that the dynamism generated by innovative activities and the strength of the linkages they generate determine the efficiency with which the aggregate labour force is used (i.e., the extent of labour underemployment as well as the underemployment of other factors of production, particularly land). A similar process can be generated by the better use of existing infrastructure. At the aggregate level, these processes give rise to Kaldorian growth–productivity links of similar characteristics, but in addition to the micro- and meso-economic dynamic economies of scales associated with learning and the development of complementarities. This means, of course, that aggregate productivity growth is both a cause and an effect of dynamic economic growth (see further below).

The interplay of innovations and complementarities

The interplay between these factors will determine the dynamic efficiency of a given process of structural transformation. Innovations accompanied by strong complementarities will be reflected in the absorption of an increasing number of workers into dynamic activities. The result will be a virtuous circle of high investment, accelerated technological learning, and institutional development. On the other hand, destructive forces may prevail, giving rise to a vicious circle of a slowdown in productivity and economic growth, decline in investment, increased structural heterogeneity as surplus manpower is absorbed into low-productivity activities, and loss of production experience that widens the technology gap vis-à-vis industrialized countries.

A simple typology of different processes of structural transformation can be suggested (Ocampo, 2017b). “Deep transformation” is characterized by strong learning (including induced technological innovations) and complementarities (economies of agglomeration and specialization, and knowledge spillovers) and hence also by strong micro- and meso-economic dynamic economies of scale, and by the additional productivity effects generated by the reduction in underemployment. This tends to be the pattern in periods of rapid growth in the developing world and has characterized the East Asian success stories of recent decades. The opposite, which can be called “shallow structural transformation”, is characterized by the weakness of both

learning and complementarities. A classic case is natural resource enclaves, but as we shall see, this may also be true today of certain forms of assembly manufacturing.

A first mixed case combines strong learning with weak linkages, due to high import requirements. Some import-substitution investments of the past were of this type; in this case, the initial innovative effect may soon be exhausted due to its limited sectoral or systemic effects. A second mixed case is the combination of strong linkages with weak learning processes. In this case, productivity growth at the firm level may be low, but there may be significant aggregate productivity effects associated with the development of complementarities and reductions in underemployment. The expansion of labour-intensive export crops (e.g., coffee) is a case in point.

The association with large-scale international networks of suppliers—global value chains¹⁶—that comes from very active foreign direct investment by multinational firms and more codified technology that can be borrowed by paying the associated intellectual property rights reduces the costs for developing countries to enter new activities. However, the centralization of research and development efforts and the marketing of the associated products—which can be seen as the two poles of the value chain—also risk “shallow” structural transformation for the developing countries where assembly manufacturing takes place; the lack of domestic complementarities also makes these export activities footloose. Governments would have to challenge this outcome by promoting domestic complementarities and transition to new sectors that can benefit from existing specialization patterns.

Finally, the typology is useful for understanding some of the social effects of structural transformations. In this regard, deep transformations have better effects on formal employment and standards of living than shallow processes. However, if there is technical bias in the demand for labour in the first case, wage differentials may increase if the education policy does not rapidly increase the supply of skilled labour. Strong learning with weak linkages may lead to increased structural heterogeneity, whereas the opposite combination may generate strong demand for low-skilled labour.

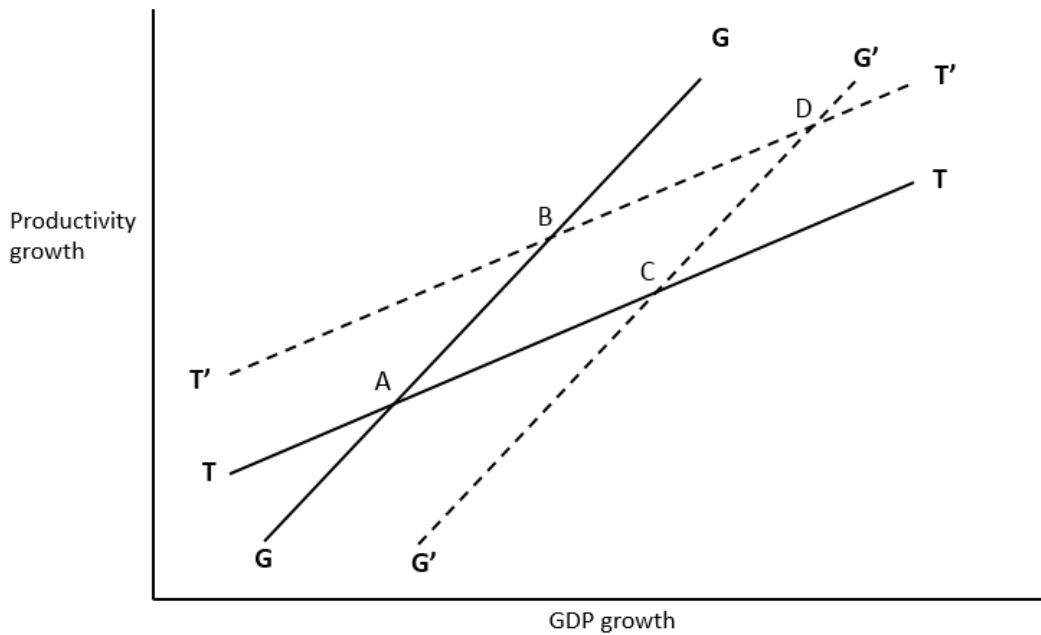
¹⁶ Now, of course, being challenged by US protectionist policies.

The links between productivity and growth

The relationships between structural dynamics and long-term growth can be formalized as a dual link between economic growth and productivity (Ocampo and Taylor, 1998; Ocampo et al., 2009, ch. 8). On the one hand, economic growth has positive effects on productivity through four channels: (i) dynamic economies of scale of a microeconomic character, associated with learning and induced innovations; (ii) if technology is embodied in new equipment, a higher rate of investment induced by faster growth will also increase productivity; (iii) the productivity effects of the development of complementarities, associated with the exploitation of intra- and inter-sectoral external economies (economies of agglomeration and specialization, and knowledge spillovers); and (iv) the transfer of underemployed workers to higher-productivity activities. ' Kaldor (1978, chs. 1 and 2) called this link between productivity and production growth (shown as TT in Figure 3.1) the 'technical progress function'. Following the literature on the topic, it could also be referred to as the Kaldor-Verdoorn function.

It must be emphasized that the technical progress function is not an aggregate production function. Rather, its positive slope implies that there is some underutilization of resources at any point in time and, therefore, that growth induces a better allocation of resources—and the lack of growth reduces aggregate productivity, mainly through the underemployment of labour.

Figure 1
Productivity and GDP dynamics



The second relationship, shown as GG in Figure 3.1, focuses on the reverse causality link: productivity growth increases economic growth. It can have diverse determinants, which alternatively capture either aggregate supply or aggregate demand effects. First, technical change directly increases aggregate supply; this is the channel most emphasized in the growth literature. It also generates new investment that increases aggregate demand, generating a GG curve of a Keynesian nature. If the economy is foreign exchange constrained—a situation not uncommon in developing countries—the GG function would be effectively an aggregate supply function determined by the balance of payments restrictions (Thirwall, 2011a, 2011b).¹⁷ Technical change also improves international competitiveness and thus the trade balance and aggregate demand; if the economy is foreign exchange constrained, it weakens this constraint and has aggregate supply effects.

As both curves have positive slopes, the effects that they capture reinforce each other, generating alternating positive feedbacks but also possible negative feedbacks. A stable

¹⁷ See also the October 2019 issue of the *Review of Keynesian Economics* in honour of Thirwall. There may also be savings constraints. For a full analysis of the gaps in macroeconomic adjustment that may be reflected in the GG curve, see Taylor (1994).

equilibrium A exists when TT is flatter than GG, as shown in Figure 3.1.¹⁸ Given the determinants of the technical progress function, TT will be flatter if micro- and meso-economic dynamic economies of scale are not too strong, or labour underemployment is moderate. In a Keynesian model, the slope of GG will depend on the elasticity of investment to productivity growth, whereas in foreign exchange-constrained models, it will depend on the elasticities of exports and imports to productivity. In both cases, the higher the elasticities the flatter GG will be.

It is important to emphasize that the relationships shown here are assumed to be medium or long term in character (some short-term macroeconomic effects associated with the balance of payments will be analyzed below). If there is a new wave of innovations, the TT function will shift upward, to T'T', accelerating both productivity and income growth at a new equilibrium point B. As this particular wave of innovations becomes fully exploited, the function may shift down. In turn, a favourable macroeconomic shock—improved investment financing in a Keynesian model, or improved export prospects or access to external financing in a foreign exchange-constrained economy—will shift the GG function rightwards to G'G', generating a new equilibrium at C; a negative macroeconomic shock will, of course, have the opposite effect. With positive productivity and macro effects, the two curves could shift, generating a new equilibrium at D.

In Ocampo (2017b), this simple framework is used to analyze the effects of trade liberalization on growth. The net effects are uncertain since they depend on many factors that affect both functions. In the orthodox view that opening the economy to competition (including external competition) unleashes more innovations, then the TT function will shift up. However, if the response of firms to liberalization is a rationalization of their production (i.e., a defensive attitude) rather than a new wave of innovation and investment, the TT curve may not be affected; it may even be adversely affected if the static comparative advantages are in sectors with limited innovations and complementarities (see next section). On the other hand, through either Keynesian mechanisms or the supply effects characteristic of a foreign exchange-constrained economy, the increase in the propensity to import generated by a trade reform will lead to a leftward shift in the GG function, with adverse effects on equilibrium growth. Overall there is, therefore, no general

¹⁸ Under significant initial labour underemployment or underutilization of other resources, the slope of TT could be steeper than that of GG, generating an unstable equilibrium at A. In this case, any displacement from saddle point A will lead the economy into explosive virtuous or vicious growth processes.

presumption that trade liberalization will accelerate growth, as the positive microeconomic links emphasized by defenders of liberalization may be swamped by adverse structural and macroeconomic effects.

Commodity dependence

Commodities have been and will continue to be at the heart of development in several parts of the developing world, notably Africa, several parts of Latin America (particularly South America), the Middle East, and some other Asian countries. Furthermore, the recent commodity boom, which started in 2004 and lasted for a decade, generated a “re-primarization” (or “re-commoditization”) in several Latin American countries, understood as a growing share of natural resource goods in the export basket.

The links between commodity dependence and development have been the subject of heated debate in the development literature as to whether commodity dependence promotes or obstructs structural change, and particularly whether it benefits or harms the development of manufacturing and modern services. There is also discussion on how the macroeconomic challenges associated with commodity price trends and fluctuations should be managed.

The historical debate on these issues started with the Prebisch–Singer hypothesis, which claimed that commodity prices tended to deteriorate in the long term relative to those of manufactures (Prebisch, 1973; Singer, 1950). The original hypothesis involved two complementary ideas (Ocampo, 1986). The first was that commodities are characterized by low income and price elasticities of demand. The second and more interesting suggestion was that there is an asymmetry between the labour markets of advanced and developing countries, which implies that technological progress in manufactures tends to increase real wages in developed countries whereas, given the pool of unskilled labour, it tends to depress the prices of commodities in the developing world. This coincides with Lewis’ (1969) analysis of the terms of trade of developing countries. It implies that manufactures exported from developing countries may face similar pressures.

Focusing first on long-term commodity price trends, following heated debate the Prebisch–Singer hypothesis was largely discarded on empirical and analytical grounds in the three decades

after its formulation. Interestingly, it was revived by the work of Grilli and Yang (1988) at the World Bank, who showed that real commodity prices had declined through the twentieth century. These findings triggered a significant flow of empirical contributions.¹⁹ A major conclusion of this literature is that the factors underlying such long-term trends and cycles vary through time, including, in recent decades, for example, the rising Chinese demand for commodities, notably for metals, and that this gives rise to specific features in different periods.

Overall, Grilli and Yang's view that the terms of trade have deteriorated through the twentieth century has been confirmed in the empirical literature. According to Erten and Ocampo (2013), the adverse trend was stronger in terms of length and intensity for tropical agricultural goods than for temperate-zone agriculture and metals, and short and weak for oil prices. However, there was no adverse long-term trend in the nineteenth century, and there has not been one in the early twenty-first century, where there has been rather an upward trend for metal and oil prices. In turn, non-oil commodities have experienced four long-term 30–40-year cycles since the late nineteenth century (the last still ongoing), with substantial overlap among different commodity groups, as they are largely determined by trends in world GDP.

The broader macroeconomic effects of commodity dependence should be analyzed from both a short- and a long-term perspective. The short-term dimensions are closely associated with the cyclical patterns of commodity prices, which generate fluctuations in income levels, aggregate domestic demand, and the balance of payments. The procyclical patterns of investment tend to be particularly strong, and are enhanced by those of both external and domestic finance (see next section). In commodity-exporting countries, financing cycles tend to follow those of commodity prices, and the recent “financialization” of commodity markets has reinforced this pattern.

Among the main implications of these cyclical fluctuations are their effects on the real exchange rate. The cyclical fluctuations of this variable tend to reinforce the variations of aggregate demand in economies with net liabilities in foreign currency: real exchange-rate appreciation during booms generates windfall wealth gains that enhance spending, whereas depreciation during crises generates wealth losses, which accentuates the contraction of spending.

¹⁹ See a review of the literature in Erten and Ocampo (2013), the conclusions of which are summarized in the next paragraph.

The distributive effects go in the same direction: if the appreciation benefits workers and the depreciation hurts them, there will also be procyclical effects, given the higher propensity to spend out of wages. As the more traditional macroeconomic literature has argued, the effects of real exchange-rate fluctuations on the current account of the balance of payments will tend to be countercyclical (non-primary exports decreasing and imports rising during commodity booms, and the opposite evolution occurring during crises). However, if there is an initial surplus during the boom (e.g., due to macroeconomic adjustments adopted to manage the previous commodity crisis), or an initial deficit during the crisis (as a result of the strong expansion of aggregate demand during the boom), the initial effect would also be procyclical and the countercyclical effects will come with a lag.

In terms of cyclical behaviour, the critical choice for governments is whether to adopt a countercyclical stance, as macroeconomic theory recommends, particularly in its Keynesian variants, or follow a procyclical pattern, associated with either economic or political-economy pressures, or both. In commodity-dependent economies, an important countercyclical instrument is a commodity stabilization fund through which the government saves, during the boom, some of the increased revenues from taxes on commodity sectors and the profits from state-owned enterprises active in those sectors (particularly important in oil and minerals sectors).²⁰ This also helps to mitigate the procyclical effects of commodity prices on real exchange rates if those revenues are kept abroad or saved as foreign exchange reserves by the central bank. There may, however, be strong political pressures to spend those revenues, in which case the procyclical effects of commodity prices will be transmitted in a stronger way to the domestic economy. As we will see in the next sections, the government's ability to counteract the procyclical effects of a mix of a commodity boom and procyclical financial flows with countercyclical monetary policy would be limited if there is free movement of capital; the use of some other instruments would, therefore, be necessary.

The long-term structural effects of commodity dependence are associated, in turn, with whether the commodity sectors generate strong or weak linkages with other economic activities, and whether commodity dependence is associated with strong or weak productivity growth and

²⁰ This choice is part of a broader dilemma of how much to save or invest out of commodity booms. For an analysis of this choice in oil economies, see Cherif and Hasanov (2013).

learning. In classical analyses of commodity dependence, including those associated with Prebisch and Singer, the basic arguments were that manufacturing generates stronger linkages and is a better mechanism to transmit technical progress. As we have seen, the more recent literature has tended to confirm that rapid economic growth in emerging and developing countries continues to be associated with industrialization drives and, in contrast, that the deindustrialization that Latin America and Africa have experienced in recent decades is an adverse trend.

It can be argued in favour of commodity dependence that the opportunities for technical progress and linkages with both the manufacturing and service sectors have been behind the capacity of commodity-dependent developed countries to prosper.²¹ Pérez (2010) mounts a strong defence of the development opportunities provided to Latin America by its natural resources, arguing that there are ample technological opportunities—biotechnology, nanotechnology, environmentally friendly products—associated with natural resources and the opportunities to exploit the whole value chains of natural resource-intensive sectors. In contrast, states Pérez, Latin America is too far behind in other technology sectors and is no longer a low-wage region. There are also strong complementarities with Asia, an argument that applies even more strongly to Africa, where China is both a major market and investor. The major challenge in both cases is how to diversify into non-commodity sectors, using rising commodity revenues (including those from commodity-producing state-owned enterprises).

The long-term effects are not independent of the cyclical effects of commodity dependence. This implies that the structural vulnerabilities associated with commodity dependence are combined with short-term macroeconomic vulnerabilities. Those associated with real exchange-rate fluctuations are particularly important. Real exchange-rate appreciation during commodity booms has a negative effect on non-commodity tradable sectors (both exporting and import competing) during booms—an effect that has been strongly emphasized by the “Dutch Disease” literature.²² Firms in non-resource tradable sectors may go bankrupt during commodity booms, generating permanent effects on economic structures and productivity if the latter is associated with production experience (Krugman, 1990, ch. 7). The unstable incentives associated with real

²¹ One interesting analysis is the comparative history of Scandinavian vs. Latin American historical development, in the essays collected in Blomström and Meller (1991).

²² On the “Dutch Disease”, see, among many others, Corden and Neary (1982), van Wijnbergen (1984), and Krugman (1990, ch. 7).

exchange-rate fluctuations through the business cycle also make the profitability of those sectors highly volatile, reducing investment in structural diversification.

Beyond the structural and macroeconomic vulnerabilities mentioned lie other vulnerabilities of a more political-economy or institutional character. In this regard, the literature on the “Dutch Disease” has emphasized the institutional effects of the rentierism associated with natural resources. There may also be significant distributive effects associated with land concentration in agriculture and, in the cases of hydrocarbons and mining, high industrial concentration.

Macroeconomics, finance and structural change

There are two crucial links between macroeconomics, finance, and structural change. The first is the positive contribution made by financial institutions that support innovative sectors with long-term risk capital and lend ‘patient capital’ (Mazzucato, 2013). Funding can, of course, be external or domestic, with national development banks (NDBs) have a particular role to play in domestic financing. The second link, in contrast, concerns whether finance risks undermining growth, because it generates boom–bust macroeconomic cycles—again of external or domestic origin—that may end up in costly crises. Important links between capital flows and structural change are (i) the possible misalignment of exchange rates during booms and (ii) exchange-rate volatility through the business cycle, with a negative effect on innovative tradable sectors.

Focusing first on international capital flows, the key question is which of two effects on the domestic economy will prevail. The first is the direct contribution to growth if it leads to higher domestic investment, and particularly to key areas of innovations or domestic competitiveness. The contrasting effect is the risk that growth is undermined because external financing can be consumed, and in that case substitutes domestic savings, but particularly because it is potentially reversible and can lead to “sudden stops” that generate costly crises (Calvo 1998).

If investment is increased, whether it is channelled to sectors with higher productivity or faster productivity growth will generally depend on domestic economic structures rather than on capital flows as such. From a policy perspective, it may be possible, however, to encourage foreign direct investment which brings technological innovations, increases exports, and/or produces for the domestic and foreign markets with higher domestic value-added contents.

Multilateral development banks (MDBs) can also play a role in supporting research and development and innovations, including the development of relevant domestic institutions. They can also support activities with significant externalities, notably infrastructure and investments that contribute to combatting climate change. Recent analyses have underscored the role of MDBs and sovereign wealth funds in providing financing to reduce the large infrastructure gaps that characterize the developing world, as well as the full development of infrastructure as an asset class (see, for example, Bhattacharya et al., 2015).

A major countercyclical role, recognized by all MDBs since the 2007–09 North Atlantic financial crisis, is that of increasing their lending or investments by their financial corporations in developing countries when international private capital flows experience a major downward swing or a sudden stop. MDBs significantly increased their financing during that crisis and its aftermath (Ocampo, 2017a, Table 5.3). All MDBs were also capitalized during those years; two more recent creations are the Asia Infrastructure Investment Bank (AIIB) and the BRICS’ New Development Bank, in both of which China is playing a leading role.

An extensive literature discusses the macroeconomic risks associated with cross-border capital flows and the policies required to manage them. The major risks are the volatility of international private capital flows, the procyclical pattern of country risk premiums, and the contagion that characterize both booms and sudden stops of external financing. The literature has identified a sort of hierarchy of volatility, with FDI being the more stable, and short-term bank lending and portfolio flows more unstable (Rodrik and Velasco, 2000).²³ These problems are particularly important in relation to emerging economies, but also affected peripheral Europe during the North Atlantic crisis, and are also increasingly important to low-income countries—the “frontier markets” in current terminology.

From a theoretical perspective, the major problem of volatile flows is that they have negative externalities, as individual investors and borrowers do not take into account the effects of their financial decisions on other investors and, overall, on the level of financial stability in a particular country (Jeanne and Korinek, 2010; Korinek, 2011). From an empirical perspective, the

²³ As the IMF (2011, ch. 4) has shown, there is evidence that FDI has also become more volatile, largely because it has become partly financialized. This relates to greater use by multinationals of intra-corporate and other international loans to fund subsidiaries, as well as derivatives, both to hedge their exposure, but also to speculate on currencies.

intellectual battle over the effects of capital market liberalization was settled by a major International Monetary Fund (IMF) study (Prasad et al., 2003), which showed that it generates stronger business cycles in developing countries, and to a lesser extent in developed countries. This was also a major conclusion of the Commission on Financial Stability convened by the Bank of International Settlements after the outbreak of the North Atlantic financial crisis (BIS, 2009).

Strong evidence also comes from later studies. Gourinchas and Jeanne (2007), among others, have shown that countries that have grown more are the ones that have relied less, not more, on capital flows for growth, and have therefore run stronger current account balances; this result is, of course, related to the links between competitive exchange rates and growth. The “meta-regression” analysis by Jeanne et al. (2012, ch. 3) also found very limited evidence of a link between financial globalization and growth in the period 1970–2007.

In terms of macroeconomic and financial policy, the major implications of these effects are that capital account liberalization generates major risks in emerging and developing countries, and that a proper macroeconomic policy in these countries should include the use of capital account regulations (CARs) to manage the risks of cross-border flows, as part of the broader family of ‘macroprudential’ regulations (Ocampo, 2017a, ch. 4).²⁴ The final section of this paper provides an additional discussion of this issue.

At the domestic level, the central problem in many (or even most) emerging and developing countries is that their financial markets are thin, that is, they are characterized by the strong prevalence of short-term financial assets and liabilities. This means that long-term financing is limited, forcing firms to rely on short-term loans for their investments, or limiting them to what they can finance with retained profits. From a stability perspective, the major issue is the variable mixes of maturity and currency mismatches in portfolios. This means that, during crises, creditors may not roll over short-term loans, thus generating a liquidity crunch, or may subject domestic borrowers to interest rate increases at a time when their revenues are falling. Domestic bond markets—if they have developed—will also shrink and be subject to shorter maturities and/or higher interest rates. For larger firms that have borrowed abroad, debt ratios will rise if exchange

²⁴ I prefer the term “capital account regulations” to “controls”, because most are not direct regulation and are rather similar to other prudential regulations.

rates depreciate. The limited development of future markets implies that the capacity of agents to cover these mismatches would be very limited.

Given the limitations and stability issues that domestic financial sectors face, NDBs play an essential role from both growth and stability perspectives. As argued in Griffith-Jones and Ocampo (2018), NDBs should have five main functions, which help cover associated market failures: (i) providing countercyclical financing; (ii) promoting innovation and structural change; (iii) financing infrastructure investment; (iv) enhancing financial inclusion; and (v) supporting the provision of public goods, particularly combatting climate change.

Function (ii) is particularly important for the topics analyzed in this paper, but other dimensions also potentially are. Function (i) makes development banks an additional instrument of countercyclical macroeconomic policy, and (iii) makes them an instrument of infrastructure financing, two functions we have discussed in relation to MDBs. Promoting small start-ups or SMEs that link to them, as part of the broader objective of financial inclusion (iv), may also be essential for structural change. And many of the activities associated with mitigating and adapting to climate change, included under (v), are innovative activities in themselves. But I will underscore the function of development banks as providers of ‘patient capital’ to support innovative sectors and firms.

The failure of private financial markets to deliver adequate long-term funding is behind the history of NDBs in many developing but also developed countries. They are a crucial feature of financial sectors in successful emerging economies like China, India, and the Republic of Korea, but also in prosperous developed countries, notably Germany. After a long period of neglect in the academic and policy literature, they have been the subject of renewed interest by MDBs²⁵ and by policymakers in several developed and developing countries, some of which have created NDBs over the past decade.

The evidence from World Bank data indicates that NDBs were countercyclical in the wake of the North Atlantic financial crisis (Luna Martinez and Vicente, 2012). In turn, Mazzucato and Penna (2018) have argued that there is mounting evidence that NDBs have fostered patient, long-

²⁵ See, for example, the work of the World Bank economists Luna Martinez and Vicente (2012).

term committed finance for mission-oriented investment in innovative activities. The case studies analyzed in Griffith-Jones and Ocampo (2018) corroborate this: the role of KfW, the German development bank, in the development of renewable energy; of the CDB, the Chinese NDB, in nurturing high-tech ventures since the 2000s; of Brazil's BNDES in financing programmes targeted at high-tech firms and promoting a successful venture capital fund; and of the successful start-up programme of CORFO, the Chilean development agency, among others.

One of the key features of successful NDBs is, of course, providing leverage to attract private investors and deepen domestic financial markets. The development of new instruments, such as guarantees, equity—including venture capital—and debt funds have been major innovations in this regard. Loan instruments continue to be important, though greater emphasis than in the past is placed on second-tier loans. A key is, of course, the long-term character of NDBs' loans (over 50 per cent of their lending is for 10 years' maturity or more). In the area of financial inclusion, correspondent stores have also been an important new instrument that can be widely used by commercial banks (Colombia being a success story in this regard). In Mexico NAFINSA also operates an online reverse factoring system called Productive Chains, which allows SMEs to sell their accounts receivables from large companies to private banks, providing themselves with working capital. Several NDBs have helped deepen financial markets by introducing local currency and green bonds into their local capital market.

Expanding the role of NDBs in countries that have them, or creating them in those that do not, would therefore help create a financial system that better serves development needs. These activities should be linked to strong development policies with structural change at their heart, they should have adequate support from macroeconomic policies, and be buttressed by good governance structures that guarantee, in particular, that they are not used for rent-seeking. This does not necessarily imply large government resources, as the only public contributions would be an increase in their paid-in capital and special programmes that governments want to promote. NDBs would then fund their operations on the private domestic market, as well as international capital markets—including through the support of MDBs and their financial corporations.

Policy implications

The main conclusion of this paper is that the key to rapid growth in the developing world is the dynamic efficiency of economic structures, defined as their capacity to generate new waves of innovative activities. The strategies aimed at promoting structural change should be mixed with appropriate macroeconomic and financial policies. They also require appropriate institutional frameworks, the formation of human capital, and the development of infrastructure, but these additional conditions (not analyzed here) only serve as the context for the structural transformation, and are not in themselves sufficient to guarantee dynamic economic growth.

The focus on structural dynamics helps to identify the policy areas and specific institutions that authorities should target to accelerate economic development. The first is encouraging innovations—in the broad sense of the term—and the associated learning processes in the areas of technological development, productive organization, and marketing strategies. In emerging and developing countries, the diversification of production structures that this policy requires may be largely associated with the transfer of sectors of production from the industrialized world. The second policy area is the development of complementarities—backward and forward linkages in Hirschman’s terminology—aimed at guaranteeing that innovations spread through the economy, at the same time ensuring system-wide competitiveness. Non-tradable inputs and specialized services (knowledge, logistics, and marketing services) are particularly important, but tradable inputs also are, as part of a policy aimed at increasing the domestic value added of a given economic activity.

An adequate structural transformation strategy should therefore develop a fair balance between individual entrepreneurial initiatives—microeconomic dynamics—and equally appropriate meso-economic processes that diffuse innovations through the economy and help create appropriate complementarities. This includes the establishment of institutions aimed at increasing information and coordination among agents; different mixes of public and private institutions can play that role, according to the tradition of each country. Moreover, different mixes of international, national, and local institutions can play a positive role in this regard.

The appropriate strategies should mix horizontal and selective policies. Although a fundamental advantage of the former is their neutrality vis-à-vis individual agents, selective policies must be part of an effective structural diversification strategy that reinforces successful

specialization patterns, helps nurture “infant sectors”, and creates comparative advantages. These policies must include support for research and development in the relevant sectors, the institutions that link firms in those sectors, their export strategies, and special long-term credit lines from NDBs. Furthermore, when there are limited resources, any “horizontal” policy must be detailed and, hence, necessarily becomes selective. Clear examples are the allocation of resources from funds for technological development and export promotion. Recognizing that there is an implicit selectivity in horizontal policies will lead to a better allocation of resources than a supposedly neutral stance.

Under current global conditions, emphasis should be placed on integrating into dynamic global markets and thus on developing competitive export sectors, as well as mixing industrial and competition policies. Incentives should be granted based on performance, generating ‘reciprocal control mechanisms’, to borrow Amsden’s (2001) term. In this regard, the capacity to export is indeed the best control mechanism, as underlined by Oqubay in his contribution to this volume and by Cherif and Hasanov (2019)—and, of course, as the East Asian success stories indicate. The institutional structure that guarantees this should be subject to periodic evaluations, within its learning path.²⁶

A complex issue is the framework of international rules, especially those of the WTO and the wave of bilateral and plurilateral free-trade agreements. In this regard, although priority should be given to taking advantage of the maneuvering room provided under existing agreements, there is a strong sense that a larger policy space (to borrow the term extensively used in UN debates) should be made available to the governments of developing countries, as policy autonomy has been severely restricted in trade negotiations. In particular, according to the analysis presented in this paper, they should be allowed to apply selective policies and performance criteria to encourage innovation and create the complementarities that are essential for development. To the extent that the current ongoing trade wars undermine the world trading system, regional integration processes among emerging and developing countries may be particularly attractive.

According to our analysis, structural transformation is not a “once and for all” process, but rather a persistent task, as the structural transformation process is continuous and may face

²⁶ See also on these issues Haussmann and Rodrik (2003).

obstacles at any stage. To the extent that in developing countries innovative activities are largely the result of the spread of new sectors and technologies previously created in the industrial centres, these activities may be regarded as the new set of “infant sectors” to be promoted—particularly infant export activities. Furthermore, according to the analysis presented here, the process of transformation is by no means smooth: destruction is a constant companion of creation, and structural heterogeneity is a persistent feature that may increase at different stages. Distributive tensions are presumably associated with both factors. In this context, supporting the restructuring of firms in old sectors and regions that concentrate them, avoiding transformation processes that increase structural heterogeneity, and working to upgrade low-productivity activities and generate positive links with high-productivity sectors are critical for achieving a more equitable development process.

As part of their broader set of functions, NDBs can play a crucial role in guaranteeing the availability of long-term financing for innovative sectors, and should interact closely with private financial agents. Private investment banking and venture capital can also play a role, but past and recent experience indicates that they do not automatically expand optimally in developing countries. Hence the importance of private financial agents working together with NDBs, which in their turn should help build deeper domestic financial sectors. Access to international financial services of this sort may also be important to guarantee funding of innovative activities, but this may generate a strong bias in favour of multinational and large domestic firms and against small and medium-sized enterprises.

Macroeconomic policies should aim, in turn, at smoothing business and investment cycles, and guaranteeing a competitive and relatively stable real exchange rate. Smoothing cyclical commodity price fluctuations and external financing boom–bust cycles is essential for the relative stability of the exchange rate. Absorbing part of the commodity booms with stabilization funds or taxes is critical for managing the first of these problems, while CARs are essential to regulate the second. The latter should be complemented at the domestic level with regulatory policies aimed at avoiding unsustainable credit booms, and managing the maturity and currency mismatches in portfolios, and the incompleteness of futures markets. NDBs should also be active in the provision of countercyclical financing at the national level, complementing role played by MDBs at the international level.

A competitive exchange rate can be seen as a type of industrial policy, indeed perhaps as the best “neutral” industrial policy, particularly in the face of restrictions on subsidies to production and exports under WTO rules. However, exchange-rate policy alone may fail to encourage diversification: it should be complemented by other industrial policies that increase the elasticity of the aggregate supply of tradables to the real exchange rate. A competitive exchange rate may also benefit sectors, particularly natural resource sectors that should not be subject to specific incentives. This implies that an active exchange-rate policy must be combined with taxes on sectors with no externalities, smaller learning spillovers, and weak domestic complementarities (Guzman et al., 2018). The stability of the real exchange rate is also essential to provide stable profit incentives, which would help reduce the uncertainties that characterize investment in innovative sectors.

The policy interventions necessary to guarantee a competitive and stable real exchange rate should include CARs and exchange-rate management; both aim at facilitating a more positive relationship between international capital flows and macroeconomic management (Ghosh et al., 2017; Ocampo, 2016, 2017a, ch. 4). CARs play the dual roles of both macroeconomic and financial stability tools. As a macroeconomic instrument, they provide greater room for countercyclical monetary policies. During booms, they increase the space needed for contractionary monetary policies while mitigating the exchange-rate appreciation pressures that such monetary policies may generate. During crises, they can create space for expansionary monetary policies while constraining capital flight as well as excessive exchange-rate depreciation that would otherwise partly translate into domestic inflation and rising debt/GDP ratios. In turn, when viewed as a financial stability tool, CARs recognize the fact that there is a “hierarchy” of volatility, as reversibility is particularly important for portfolio flows and short-term bank lending.

There is a broad consensus in the literature that CARs help improve the composition of capital flows toward less reversible flows, and provide room for countercyclical monetary policies. As Erten and Ocampo (2017) have shown, they also reduce the “foreign exchange pressure” generated by capital flows in emerging and developing countries. All these advantages mean that there is now a broad consensus in the international policy debate that the full liberalization of the capital account is not desirable and that CARs can play a positive macroeconomic role—views that can particularly be seen in the IMF’s “institutional view” on capital account management (IMF, 2012).

CARs can and should be combined with active intervention in foreign exchange markets and effective management of foreign exchange reserves in a countercyclical way: accumulation during booms and use of reserves as a stabilization tool during crises. Countercyclical foreign exchange reserve management has indeed been a widespread practice in emerging and developing countries since the East Asian crisis (Ocampo, 2017a, ch. 2). However, the “self-insurance” that they provide is costly, as it involves accumulating an asset that has low yields (foreign exchange reserves) to compensate for the entry of private capital inflows, which have higher costs; if reserve accumulation is sterilized, central banks will also incur losses. CARs are, therefore, a less costly policy instrument, but countries may be reluctant to use them because they are seen as a distortion in financial markets, and there may be restrictions on their use associated with investment treaties.

In summary, the combination of CARs with exchange-rate and foreign exchange management, the countercyclical monetary policy that they facilitate, and countercyclical fiscal policies, forms the appropriate macroeconomic policy package. Aside from its contributions to countercyclical management, this policy package has long-term development implications, in that it contributes to maintaining a competitive and relatively stable real exchange rate. It creates a positive relation between international capital flows, macroeconomic stability, structural transformation, and economic growth.

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