Still blowin' in the wind: Industrial Policy, Distorted Prices and Implicit reciprocity

Mario Cimoli[*]
Gabriel Porcile[**]
Elisa Calza[***]

[*] ECLAC (Economic Commission for Latin America and the Caribbean) and Professor of Economics, University of Venice, Italy.

[**] ECLAC (Economic Commission for Latin America and the Caribbean) Professor of Economics, Federal University of Parana and Researcher, CNPQ, Brazil

[***] ECLAC (Economic Commission for Latin America and the Caribbean)

 Corresponding author: mario.cimoli@cepal.org

Introduction

Structuralist and evolutionary theories agree on the fact that one of the main challenges of development is diffusing technological progress so as to change the pattern of specialization by incorporating new sectors and reducing inter-sectoral disparities, raising productivity levels and improving income distribution. Then, once overcome external constraints, faster growth will allow for a decline in unemployment and underemployment in the subsistence sector.

Since its beginning in the 1950s, the Structuralist school has focussed on the relationship between structural change and economic development, investigating how the participation of industry in total value-added would generate spillover effects, backward and forward linkages, technological externalities, which in turn accelerate capital accumulation, a continual upgrade towards new industries and more dynamic sectors with higher rates of demand growth and higher opportunities for technical change. Technological capabilities are the engine at the root of these transformations: they are the basis for the expansion of production and employment at the firm, sector and industrial levels, and the building of capabilities requires a continuous process of learning.

Building and accumulating technological capabilities would require a continuous process of learning, time and resources. Analyzing this process is not an easy task, and one of the main contributions of the Evolutionary school is precisely having given a look into the "black box" of these dynamics at micro level. Since at least the beginning of 1970s, it has been recognized that in developing economies productivity growth relies on borrowing, imitating, mastering and improving on the advanced technology used by countries that had reached the technological frontier. Significant factors favouring this process include the literacy and skill level of the workforce, the skills and technical competence of engineers and designers in the mechanical artefacts and (increasingly) the existence of managers capable of efficiently running complex organisations.

Given its peculiarities and its importance for long term economic growth, the generation of technological capabilities and the transformation of the production structure in developing economies should not be left at the mercy of market forces and at the volatility of market signals (Cimoli, Dosi and Stiglitz, 2009). Although the idea that successful catching up requires active industrial policies[1] has only gradually reached mainstream economics, this is an old, well-established point in the tradition of economic history and heterodox growth theory[2], where industrial policies are seen as fundamental tools for reducing technology gap and increasing international competitiveness for industrializing and catching up countries. Furthermore, also a certain degree of coordination across economic policies has to be pursued and macroeconomic priorities should be set consistently with innovation and industrial targets; on the contrary

[1] Industrial policy is defined in the paper in a very broad sense, including all measures that create incentives in favor of and / or directly allocate resources to industrial growth and technological change.
[2] Amsden (1989), Reinert (1995), Bell (2006), Cimoli and Poricle (2009; 2011).

obsessively pursuing what are believed to be the "right" macroeconomic prices could nullify the efforts of even the strongest industrial policy.

For example, a decrease (appreciacion) of the real exchange rate (RER) may be induce a destruction of existing technological capabilities, when the appreciation is so strong or its volatility so high to affect negatively the development of strategic technological sectors by limiting their export performance and thus their expansion. Moreover, if the macroeconomic shocks are repeated and/or fluctuations are recurrent, this could even lead to a state of hysteresis, locking the economy into a self reinforcing path of capabilities destruction, lack of structural change and low (and even decreasing) productivity (Cimoli and Porcile, 2008; 2009).

The effects of a shock can become particularly persistent because technological capabilities are sticky, non-reversible and fragile. Stickiness in capabilities and technologies is a feature that characterizes the real economy, and it helps explain why the process of re-composition and re-adaptation of the microeconomic structure cannot be smooth and fast and why the technological and production systems cannot respond in a flexible way to changes in market signals. These properties suggest that the effects of macro shocks on the production structure tend to be less easily reversible, since they may leave long-lasting marks in productivity growth and in the production structure if they affect the learning paths of capabilities accumulation.

Once applied to the actual international situation, the structural "recipe" of active policies for structural change and development may turns out to be just a naïf theoretical exercise, in practice unable to attain its final goals in industrializing countries affected by a widening technology gap. In fact, active industrial policies and consistent macroeconomic policies are agreed to be a necessary condition for reducing technological asymmetries and boosting structural change, but they are far from being enough in the current global economic scenario.

In order to carry on with the process of structural change, the industrializing and catching up countries have to expand their effective demand and to import from abroad the technological and capital goods that they need to upgrade the technological contents of their productions and to growth. In this way, they activate what has been defined by the Structuralist school as "the principle of implicit (or automatic) reciprocity", which states that the industrializing countries will convert in technological import every dollar of foreign exchange they obtained from export. Thus, they are "reciprocal" in the sense that will use export revenues to buy capital goods from abroad, thus implicitly sustaining the expansion of effective demand and growth in advances countries.

The shortcoming of the implicit reciprocity is its sustainability in the long run. In fact, given the import of technological goods, the industrializing and catching up countries will end up facing serious disequilibria of the balance of trade in the long run, thus constraining their growth potentials. This situation can be warded off only by a parallel expansion of export, which will help ease the external constraint on growth and will make it possible to maintain the inflow of foreign exchange.

However, sustaining an actual increase of the export does not depend solely on industrializing countries, but it requires global political cooperation. A corollary of the principle of implicit reciprocity argues that technologically advanced countries should open their markets and implement parallel expansionary policies to sustain the rise of industrializing countries' export. This will not only facilitate process of structural change in industrializing countries, but it will also represent a win-win solution of mutual growth for both groups of countries. On the contrary, if advanced countries will not offer space to sustain this expansion, protectionism and trade closure represent the only viable solution for industrializing countries to transform the production and employment structure and to generate the technological capabilities without incurring in unsustainable trade unbalances.

Hence, the corollary of the principle of implicit reciprocity suggests that a Keynes plus Schumpeter policy-mix contains the ingredients required for both catching up and a positive-sum game in the international system. This approach sharply contrasts with the combination of orthodox monetary and fiscal policies plus a static Ricardian approach to trade which has been so frequent in Latin America since the nineties, and that now, as aftermath of the economic crisis, is starting to be applied in many developing economies with the aim of restrictive fiscal adjustments. This is in line with most recent OECD's view, which it says that *"… priority should be given to boosting jobs in the context of ongoing fiscal consolidation. For now, there is a clear case for sheltering activation policies aimed at retraining displaced workers and encouraging return to work from fiscal consolidation efforts.."* (OECD, 2012).

Reducing the lack of structural change and technological asymmetries at global level requires a consensus about new international rules for political cooperation. The time has come to rethink rules in a global world and to suggest solutions in which concerns with growth and distribution at global level are paramount. In this sense, the principle of implicit (or automatic) reciprocity and its corollary propose a "win win" scenario of global growth based on coordinated expansionary policies, and it represents a new pillar for renewed global governance based on international coordination.

1. Technological capabilities

Both economic history and economic theory generally acknowledge a deep relationship between technical change and economic development. Since the mid-eighties, the Schumpeterian evolutionary literature has steadily developed new microeconomic tools for analyzing learning in catching up economies[3]. The opening of the technological black box by the Schumpeterian literature has produced new insights on how learning and technological capabilities co-evolve and why technology gaps rise or fall across nations and time (Cimoli and Dosi 1995).

Technological learning features a set of inter-related regularities that can be briefly summarized as follows:

[3] See among other s Bell and Pavitt (1983), Lall (1982), Fransman and King (1984), Katz (1984), Teitel (1984, 1987), Teubal (1984) and Bell (2006).

i) Requires real time;
ii) It is subject to path-dependency, i.e. the evolution of capabilities depends on previous experience and directions of past learning;
iii) There exists complementary between sectors and capabilities, in such a way that externalities and increasing returns are crucial at both the industrial and economy levels;
iv) There is irreversibility in the building of certain (physical and technological) assets, which cannot be just abandoned or replaced;
v) It has a critical tacit component that could not be obtained from importing capital goods nor from reading manual and other forms of codified information;
vi) Countries and firms that are closer to the technological frontier have an advantage in innovation and will tend to increase their distance with respect to the laggards. There exists cumulative processes leading to vicious or virtuous cycles that contribute to explain why some countries traverse to a path where learning, production capabilities and institutions interact virtuously, while others remain in a hysteresis state within a low-growth (divergence) trap

These properties suggest that there is no reason for naïve optimism about convergence, since phenomena such as path-dependency and cumulativeness lead to strong inertia in the patterns of learning and specialization. On the other hand, catching up may be possible under specific circumstances: when industrial and institution-building policies create a favorable environment for learning from imported technology.

In the process of catching up there is no clear-cut distinction between innovation and diffusion. The speed of diffusion is related to the capacity to acquire technology (in the form of capital goods, know-how, training and so forth), adapt it to specific local conditions and – gradually –develop specific competitive advantages in the international economy by means of incremental innovations. The generation of technological and production capabilities requires time and is based on progressive learning in organizations, that implies the sequential deployment of various forms of tacit and incremental learning. Initial efforts concentrated on product design activities (most likely as a result of past incentives provided by import substitution policies) and, increasingly, on quality improvements and product differentiation. Attention has to be directed towards engineering, the organization of production and the mechanized production processes. The organization can thus move towards the development of managerial capacities, such as the scientific design of production processes, the search for a higher division of labor (deskilling jobs and separating mental and manual labor), the organization of fixed product lines and the implementation of vertical integration to improve learning.

Effective learning necessarily relies on active policies whose instruments and objectives change over time (Cimoli, Dosi and Stiglitz 2009). Market signals alone are often not enough for fostering the accumulation of technological capabilities, and in some case they compromise such accumulation. This occurs because learning takes place around existing technological capabilities, and investment concentrates in low-tech sectors that

have already achieved comparative advantages and higher profitability. There are sound learning-related reasons that explain the historical evidence showing that just prior to industrial catching-up, average industrial import tariffs are relatively low, but they rise rapidly in the catching-up phase and eventually fall when mature industrialization has been attained. Indeed, it is during the catching-up phase that the requirement of distorting (international) market signals is more acute, precisely because learning-intensive industries are at this stage relatively fragile infants (Amsden 1989; Chang 1994, 2001; Cimoli, Dosi and Stiglitz, 2009)[4]. In this process a key role is played by the management of rents to generate incentives and credible compulsions for learning (Khan and Blankenburg, 2008).

2. Production structure and diversification

In order to foster the expansion of productivity, employment and output, the accumulation of technological capabilities needs to come along a transformation of the production structure[5]. In fact, sectors are different in terms of their potentials of generating and accumulating technological capabilities: some of them boost externalities, complementarities, innovation and technological innovation and diffusion, while others do not. Thus, the diversification of production leads to the creation of higher-productivity strata and various forms of increasing returns, stemming from new skills, capabilities and knowledge spillovers that a more complex economic structure (with more externalities and complementarities) makes possible[6]. Moreover, there is a clear association between technological capabilities and the ability to compete in sectors whose demand grows faster[7] – thus, facilitating to overcome the balance-of-payment constrain on growth.

At the same time, innovation and diffusion occur unevenly across sectors: technology gaps and technological asymmetries between groups of countries emerge precisely because the most dynamic activities of the continuum of (heterogeneous) activities concentrate in a few areas, while lower-end activities prevail in the rest of the world – thus, such as in the industrializing and catching up countries. This is why heterogeneity is the inevitable result of Schumpeterian competition[8].

This complex relationship between structural change and economic development was first explored by the development theory pioneers[9]. A number of empirical studies describe how technological capabilities matured in a group developing countries from the 1950s to the early 1980s (Fransman and King, 1984) enabled the reallocation of

[4] Safeguarding the possibility of learning was indeed the first basic pillar of the infant industry logic. In order to maintain an inefficient industry (or plant) in the market, some sort of "learning protection" must be by force introduced for a limited period of time (Lall, 1982; Fransman and King, 1984).
[5] Cimoli (1988), ECLAC (2007), Cimoli and Porcile (2011), Rodrik (2011).
[6] See for instance ECLAC (2008) and Dosi et al (2010).
[7] See Dosi et al (1990), REINERT (2005), Chang (2001), ECLAC (2007), Goueva and Lima (2010), Cimoli et al. (2010).
[8] Saviotti and Pyka (2004) and Dosi et al (2010).
[9] Hirschman, Prebisch, Rosenstein-Rodan, Gerschenkron, Chenery and Sirkin are some of the classical authors in development theory.

production factors from low-productivity sectors to high-productivity areas in which increasing returns prevailed, allowing them to gradually export medium and high tech goods and even become technology exporters. For these countries, industrialisation became a way out of their "backward" condition: the increasing participation of industry in total value-added would generate spillover effects, backward and forward linkages and technological externalities, which in turn would accelerate capital accumulation and growth. This process would be reinforced by the continual development of new industries and new knowledge if demand and investment in new products were sustained. Hence, in the post-war years, to catch up and promote structural change in developing economies have largely meant to industrialize.

This historical experience made it clear that the manufacturing sector holds a special role in the process of structural change. In fact, the increasing returns provided by the manufacturing sector make it a privileged locus for the development of technological learning, accumulation of technological capabilities and diffusion of technology to the whole economic system. While other sectors play an important role in development and production of externalities, a rising share of technology-intensive activities in manufacturing is a good proxy for the process of learning in the whole economy. However, manufacturing does not monopolize learning, but it tracks well the learning process in a developing economy. In addition, manufacturing responds for a significant share of total employment, along with construction and services. What happens to employment in manufacturing has significant repercussions for employment and productivity in the rest of the economy.

In developed economies, the expansion of employment along with labor productivity has been related to the diversification of the economy, the expansion of high-tech activities and exports and the consequent dynamism of domestic and international demand. On the contrary, in most developing economies technical change tends to be highly localized in few export activities (both in the agricultural and industrial sector) with feeble effects on total demand and structural change. As a result, productivity tends to grow at higher rates than demand, implying that economies have a large surplus of labor allocated in the subsistence sector or in sectors with extremely low levels of productivity, making unemployment and sub-employment persistent[10]. This allows us to define them as "dual" economies in the Lewis' sense, or at the very least they comprise employment strata whose productivity is close to subsistence.

The process of development consists precisely in moving labor form low-productivity strata to high-productivity strata; hence, catching up and industrailizing countries need to accumulate technological capabilities and grow at very high rates to be able to transfer the labour force underemployed in low-productivity sectors towards higher-productivity sectors. This is the only form of overcoming heterogeneity in labour productivity. The direct implication of this is that the only engine that could drain labor out of the subsistence sector is structural change: it will not be possible to move workers

[10] This is the starting point of ECLAC's s structuralist theory (Prebisch, 1950). (Pinto 1970, 1976 and Sunkel 1978).

to better jobs if there is no creation of new sectors and technological upgrading, and in order to create these higher-productivity strata it is necessary to transform the production structure[11]. In less technologically advanced countries, job creation and the reduction of underemployment critically depends on the diversification of the production and export structures.

This approach to the problem of employment differs from the way it is usually addressed in mainstream theory - that is, in terms of a natural rate of unemployment and related to distortions in the labor market, such as minimum wages, unemployment benefits and strong labor unions. However, many developing economies have gone through long periods of unemployment and have even experienced nevertheless rising unemployment (such as in Latin America in the 1970s and 1990s)[12] without significant changes in the labor market that could explain why this happened. It is then necessary to start looking at other approaches to understand what drives and characterizes employment dynamics.

3. RER and structural change

In conventional trade theory, the pattern of specialization depends on endowments, which define the relative cost of producing goods with different factor intensities. This theory is at the very least insufficient: also technology contributes to define competitive advantages in international trade, and technological leads and lags play a dominant role in trade of goods with medium and high technological intensity. At the same time, trade can be a valuable handmaiden in fostering structural change. However, various variables affecting trade may have a more prominent and interesting part in influencing the direction and intensity of the diversification process; among others, the role of the real exchange rate (RER) will be discussed in this section.

The importance of the RER in structural change and growth has been consistently established by the literature in recent years[13]. Since the real exchange rate (RER) is a significant policy variable affecting trade, its movements contribute to affect the pattern of specialization, inducing to the reallocation of resources across sectors. Such a reallocation, however, does not just represent a quantitative variation: it means more than just producing different quantities of the same goods produced before, and it frequently implies beginning new activities and/or closing those that cease to be competitive. Thus, behind reallocation there is a story of structural change that may either strengthen or dampen sectors intensive in technology and knowledge, reflecting the behaviour of firms that are creating capabilities. As a result, managing the RER may have significant implications for the subsequent trajectory of technological learning.

A simple form of directly linking RER and technology to the production structure is by provided by a Ricardian model, as the one showed in Figure 1. Figure 1 presents a two-

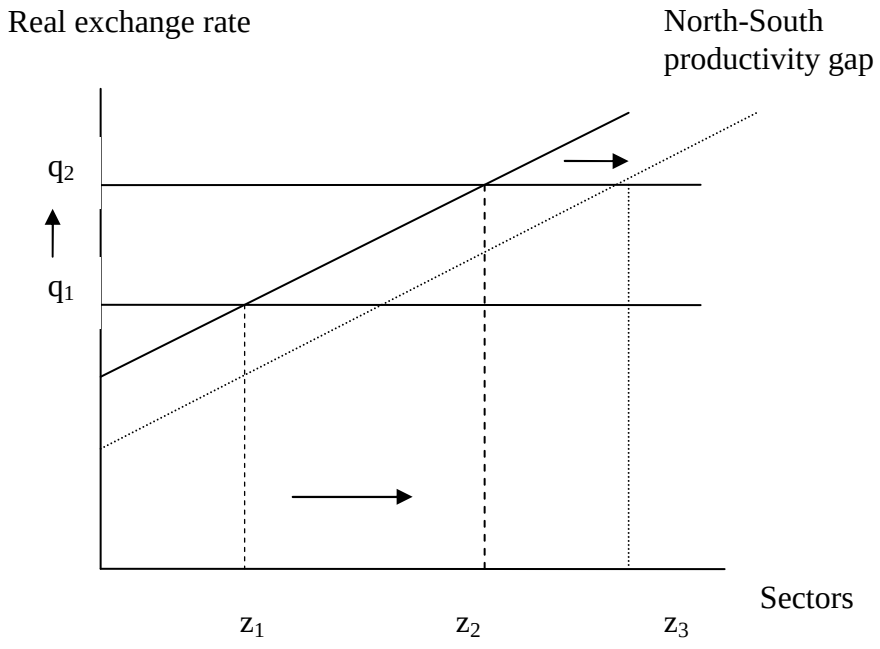
[11] Cimoli (1988), ECLAC (2007), Cimoli and Porcile (2011), Rodrik (2011).
[12] Stalling and Peres (2000).
[13] The literature is extensive; see for instance Frenkel (2004), Pacheco-Lopez and Thirlwall (2006), Bresser-Pereira (2008), Eichengreen (2008), Freund and Pinerola (2008), Rodrik (2008) and Razmi et al (2009), Rapetti (2011). Early contributions are Baldwin (1988) and Baldwin and Krugman (1989).

axis diagram, where the level of the RER lies on the vertical axis and the groups of goods actually produced by catching up and industrializing countries are on the horizontal axis, monotonically ordered from higher to lower relative productivity. The curve that represents the relative productivity of industrializing countries (in the model, the South) with respect to technologically advances countries (in the model, the North) has a positive slope (North-South productivity gap), and its interception with the RER line will give the degree of diversification reached by the production structure.

Two main features of the model can be immediately highlighted. First, a depreciation of the RER favors the diversification of exports: if the RER increases from q_1 to q_2, the Southern economy diversifies from z_1 to z_2 (increase in *z)*. Secondly, a rise in RER is not neutral across sectors: the move from z_1 to z_2 implies moving towards activities that are more technology-intensive than before (it is assumed that an increase in *z* implies an increase in the technological intensity of the goods produced in the South).

Furthermore, the adjustment process does not end in point z_2: new exports will shift the position of the productivity gap curve to the right, out of cumulativeness in learning and productivity growth (the mechanisms of the Kaldor-Verdoorn Law). The learning process that accompanies structural change prompts further diversification in the South until the good denoted by z_3. The economy emerges from the adjustment process with new technological capabilities and skills.

Figure 1. RER and Specialization



Source: Cimoli, Fleitas and Porcile (2012)

The mechanism explained in the Ricardian model resembles the experience of several economies in Latin America, that in past decades have gone through periods of currency appreciation with subsequent external crises, either as result of cyclical improvements in the terms of trade (for example, the case of a rising commodity demand) or cycles of high liquidity in the international financial markets. In both cases, the negative shocks of the RER (appreciation) affect the productive structure of industrializing countries in the long run.

The final degree of diversification (and hence the positioning of z_3) that results from the model depends also on another factor: the adoption of industrial and technological policies in compensating for the effects of the RER on the composition of production structure. In fact, in absence of industrial and technological policies, an appreciation of RER could affect the pattern of specialization in the long run by reducing the diversification and the intensity of technological capabilities in the economy. Moreover, although a depreciation (appreciation) of the RER may serve as a starter (inhibitor) for a surge in exports and a consequent (via increasing returns) upgrading of the export structure, it should be combined with active industrial and technological policies boosting both, the learning coefficients of the Kaldor-Verdoorn Law and the implantation of new sectors not related to current comparative advantages.[14].

In sum, this section discussed to what extend the role of the RER on the transformation of the pattern of specialization is a key issue in economic development and long run growth. When a RER appreciation discourages the production of tradable goods, particularly those of medium and high technological content, it may lead to a slowdown of structural change (if these goods cannot be absorbed by a rising internal demand). Only strong and active policy measures can compensate for an uncompetitive (appreciated) RER and can overcome the constraints on by altering the parameters governing structural change.

3. Macro shocks and hysteresis

This section aims at understanding what happens to the microeconomics of learning when an unexpected macroeconomic shock hits the economy, keeping in mind the characteristics of technological capabilities and its relation with economic growth.

Stickiness in capabilities implies that the technological and production systems cannot respond in a flexible way to fluctuations and changes in market signals. If macro shocks (such as speculative shocks, price volatility in commodities and in the RER) are recurrent, they may produce a process of a gradual but continuous weakening of capabilities and of productivity. Their consequences may seem less dramatic than a financial crisis' s ones, but they may not be less costly in the long run, given their lasting marks in terms of loss of productivity and of potential growth: the more the shocks affects the microeconomics of learning and the process of accumulation of technological

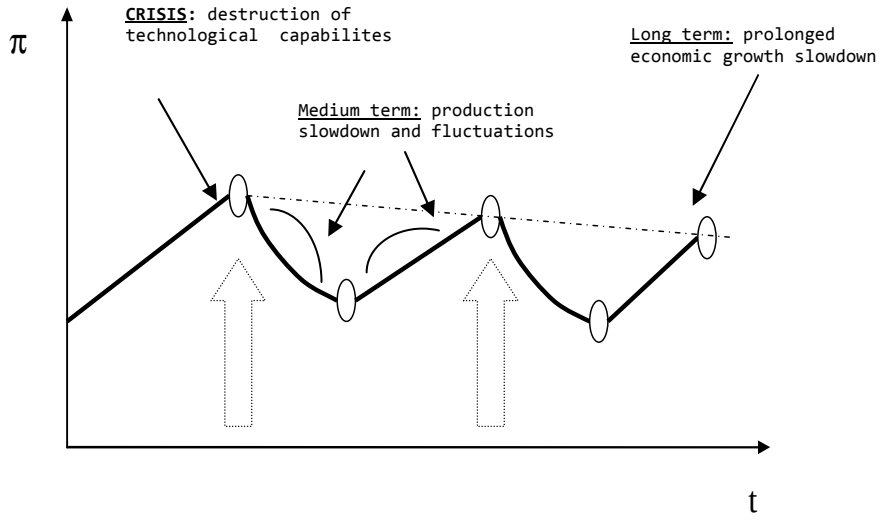
[14] See Metcalf (2001), Nelson (1993) and Narula (2002)

capabilities, the deeper and more persistent will be the impact on the whole economic structure.

Figure 2 summarizes this inter-relation between loss of capabilities, productivity and systemic effects during a period of recurrent shocks. An abrupt shock (in price or/and GDP) obliges the firm to readapt and reorganize the production process and, consequently, to redefine the capabilities needed to face the current scenario. These changes require time and resources and, despite the fact that the velocity with which the firm responds is crucial to remain competitive in the market, the effects of re-adaptation on productivity will not be immediate; it takes time, and during this time there will necessarily be a slowdown in productivity growth. In addition, according to the Smith-Young-Kaldor perspective, output growth triggers increases in the division of labour and improves learning in each of the complementary activities, as well as the skills required in the use of equipment, the adaptation and transformation of machines tools and the management of complex organisations. Conversely, productivity growth falls when the expansion of production falls, and increasing returns are lost. In Figure 2, this is represented by the first segment of the productivity curve with negative slope.

After this initial after-shock slowdown in productivity growth (or even a transitory fall in productivity), this variable will grow again at the same or at higher rates than at the moment of the shock. But if shocks are recurrent and/or uncertainty persists, the firm would have to be constantly readapting its processes and the product mix, or will have to adjust at a slower pace (as it is represented in Figure 2), at least until the emerging structure of relative prices becomes more transparent. At the end of the day, the evolution of the firm productivity with successive shocks and uncertainty will look like as if productivity were stagnant, while it indeed fluctuates; adding up the productivity slowdown across firms, it gives a lower rate of productivity growth in the aggregate.

Figure 2. Productivity slowdown and destruction of technological capabilities



Source: Division of Production, Productivity and Management (ECLAC)

The short-term fluctuations in productivity may represent more than a temporary loss in the quantities produced: if fluctuations are recurrent, they also represent a loss of capabilities and therefore a loss of future potential growth. In fact, if technological capabilities and complementary assets are weak and/or have previously been destroyed, after the shock the productivity growth will slowdown for a period of time eventually longer than the adjustment process alone; in this way, when the shock ends, the economy will be less able to respond to new challenges, or to increase productivity at the same rate as before. Hence, when the destruction of knowledge has occurred, each shock may depress the rate of productivity growth even after the adjustment for an indefinite time span. The countries will be running at a slower pace than the rest of the world, being unable to advance and thus keep in the same place, what has been called "The Red Queen effect" (Cimoli and Porcile, 2008).

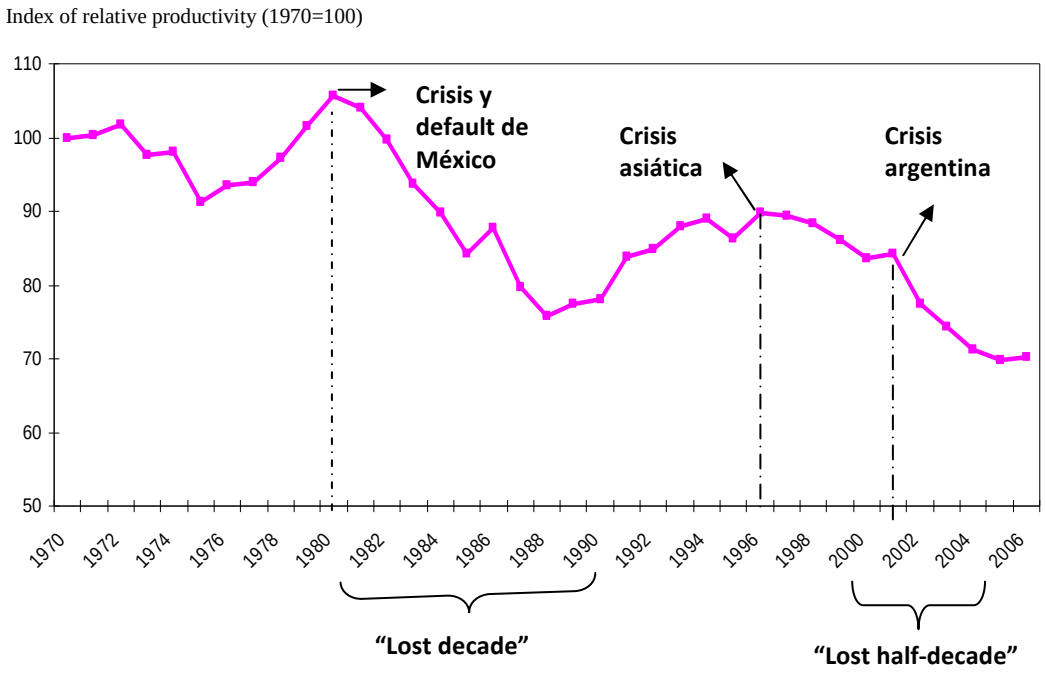
This progressive destruction of technological capabilities represent one of the main threat for the process of structural change of industrializing and catching up countries, which are precisely in the process of creating and consolidating their (still frail) endogenous capabilities. This point holds in particular for commodity rich countries. In fact, economic specialization in primary commodities does not seem to represent the best strategy in the attempt to upgrade technological capabilities: when rising commodity prices favour the development of sectors that are less technology-intensive and whose stimulus to human capital formation is weak, they may inhibit the replacement of obsolescent technological capabilities and the emergence of knowledge intensive sectors. The structure that emerges will have less technological capabilities and less diversification (fewer sectors), implying a reduction of systemic learning and economic returns. Both effects combine and reinforce each other, giving rise to vicious circles that will hamper economic growth in the long run. Thus, commodities may provide early industrialization opportunities, but they limit the possibilities of maintaining rapid development through deepening and diversification in the primary sector. Countries rich in natural resources can delay industrialization, but in general they cannot reach a sustained growth without a strong industrial base that permit to minimize the risks of price fluctuations (ECLAC, 2007).

Most of the discussed features of the effects of shocks on production structure and productivity are easily identified in the historical experience of many Latin American economies. By comparing the productivity levels in the region with that of the US (considered here as the technological frontier), Figure 3 shows how relative productivity has moved very slowly over time in Latin America. Since the 1980s, the index of relative productivity between Latin America and the USA decreased (meaning that the productivity gap increased) and this fall was especially intense in the last part of the decade. Despite a sustained economic growth between 2003 and 2008, the performance of the region in terms of relative productivity was the worst of the last 36 years - with the only exception of the eighties (the lost decade). On the contrary, the productivity of the US has increased at a rate of 5% at year, an acceleration mainly explained by an on-going process of transformation of the industrial structure through the incorporation of the ICTs, leading to the accumulation of TCs and the incorporation of new paradigms.

The effects of the shocks on Latin America are well visible in Figure 3 - and they

vaguely remind the shape of productivity line in Figure 2. The three main breaks in the curve represent a dramatic fall during the Latin American debt crisis of the eighties, a moderate improvement in the late eighties and the new fall after the Asian crisis in the second half of the nineties and early 2000s; these breaks are followed by periods of slowly increases of relative productivity constantly interrupted by negative shocks thateduce productivity, employment and output. Existing technological capabilities in sectors with medium or high technological intensity have been destroyed without the symmetric construction of new ones; thus, the region seems still unable to break out this vicious circle and unable to "close the gap" with the developed world.

Figure 3. Productivity Gap between Latina America and EEUU



Note: The relative productivity index of Latin America was calculated as the simple average of relative productivity index for four countries (Argentina, Brazil, Chile and Mexico).
Source: Stumpo, 2009.

In sum, in general every shock (in prices and/or GDP) will induce a productivity slowdown during the adjustment process. When the shock has an impact on the economic structure, and some sectors and capabilities are destroyed (R&D departments are closed, producer-user interactions ceased, public research agencies underfinanced, human capital lost and so on and so forth), productivity growth may fall after the adjustment. Given the destruction of technological capabilities, the efforts of the firms to adjust to new shocks will become increasingly less effective, and the ability to learn and restore productivity growth undermined. This will be particularly the case if shocks are frequent.

4. Implicit reciprocity and its corollary

In the aftermath of international financial crisis, which global rules should be implemented to remove the multiple burdens to global growth? So far the focus has been placed on the need of devising new rules for the international financial system, which is probably the most urgent challenge to be addressed in the next years. However, other dimensions of the global growth equation have not been yet adequately considered, despite their important implications in the long run - first of them, structural change. In this sense, a structuralist perspective on international trade and development could be a useful starting point for discussing a new set of policies in which concerns with structural change, distribution and global growth are paramount.

In order to undertake a process of structural change – and thus overcoming heterogeneity in labor productivity and transferring the labor force underemployed in low-productivity sectors towards higher-productivity sectors-, industrializing countries need to accumulate technological capabilities and grow at very high rates. This implies that will require to import from abroad – hence, from more technologically advanced countries - the technological and capital goods that they need to upgrade the contents of their productions. However, in this way their process of structural change and growth will be constrained by the availability of foreign exchange, and consequently a substantial share of labor is possibly forced to remain in the subsistence sector.

The need of industrializing countries to speed up growth and absorb the underemployed is expressed in a key tenet of the structuralist school: the principle of implicit (or automatic) reciprocity. Based on structuralist ideas on trade and growth, the principle states that the industrializing countries offer implicit (or automatic) reciprocity to industrialized because they will convert in technological import the foreign exchange they obtained from export. In other words, the industrializing countries will not accumulate reserves, but convert every additional unit of foreign exchange into global growth - purchasing additional imports of capital and high-tech goods from the advanced countries and thus reducing the size of the subsistence sector. They are “reciprocal” in the sense that will use export revenues to buy capital goods from abroad, thus sustaining the expansion of effective demand and growth also in advances countries. Thus, if the automatic reciprocity holds, industrializing and catching up countries will not adopt mercantilist policies, but use all its foreign exchange to buy imports from the advanced countries.

However, external disequilibria set a limit to the degree of implicit reciprocity. The implicit reciprocity ensures that fiscal policy in industrializing countries is managed with a view to filling in any gap between actual growth and the balance-of-payment-constrained growth: if fiscal policy is used as the only instrument to sustain demand without diversifying and expanding exports and improving international competitiveness, then growth will be hampered by external disequilibrium; inversely, in case of an alleviation of the external constraint, this will stimulate the government to pursue a more active fiscal policy aimed at reducing unemployment and underemployment.

These external unbalances can be avoided only with a sustained expansion of export, which will help ease the external constraint on structural change and growth[15]. Hence, the feasibility of an actual increase of the export does not depend solely on industrializing countries. A corollary of the principle of implicit reciprocity argues that the participation of industrializing countries in international trade is to a large extent a function of its own capacity to export. Hence, according this corollary, technologically advanced countries should open their markets and implement expansionary policies to sustain the rise of industrializing countries' export, thus calling for international cooperation in reducing the lack of structural change at global level. On the contrary, if advanced countries will not offer space to sustain this expansion, protectionism and trade closure represent the only viable solution for industrializing countries to transform the production and employment structure and to generate the technological capabilities required to foster long term economic growth, without incurring in unsustainable trade unbalances.

The lesson of the implicit reciprocity and its corollary holds even when applied to macroeconomic policies. When both groups of countries coordinate expansive policies, industrializing on can sustain the process of expansion of effective demand and of diversification of production structures, combining consistently macro and industrial policies; inversely, if the implementation of Keynesian expansive policies adopted by industrializing countries will not come along with similar policies in technologically advanced countries, which in turn will pursue austerity and fiscal consolidation policies, the efforts towards structural change in catching up regions will be nullified global growth will slowed down. Thus, there is a real threat that the technological asymmetries that characterized these blocks of countries at different stages of structural change will turn into irreconcilable political asymmetries. This picture resembles the contraposition that is taking shape in the actual international scenario between developed countries and some industrializing and catching up countries, where the expansionary and diversification-led policies of these last one are mirrored by fiscal austerity policies on the other side.

In an interdependent international economy with significant technological and productive asymmetries, a purely market-led approach to international relations will fail to explore all the potential of trade for global growth. For industrializing countries, a purely pro-competitiveness policy and a purely activist fiscal policy will be both, at the end of the day, self-defeated: a 'pure' structural change approach may produce a mercantilist drive in trade policy, while a 'pure' fiscal policy approach will meet the barrier of the external constraint. Furthermore, for a sustainable global growth, not just industrializing countries, but advanced ones should support a combination of policies stimulating structural change along with traditional Keynesian macroeconomic policies. Thus, the corollary of implicit reciprocity suggests that a Keynes plus Schumpeter

[15] See the literature on external constrain of growth. For a discussion of the external constraint on growth from the perspective of the Latin American structuralism see Rodriguez (2007). Recent revisions and extensions are Blecker (2010), Cimoli and Porcile (2011), Setterfield (2009) and Thirwall (2011). For a discussion of the external constraint and its links with macro policies see Ocampo et al (2009, chapter 7).

policy-mix contains the ingredients required for both catching up and a positive-sum game in the international system.

In sum, the principle of implicit (or automatic) reciprocity ant its corollary propose a win-win solution of mutual growth for both industrializing and advanced countries: advanced countries should stimulate industrializing countries exports, as this would not compromise its own growth objectives; and the industrializing countries, in turn, should combine fiscal and industrial policies in order to keep the rule of automatic reciprocity working. This offers a rationale for supporting the consolidation of international coordination across blocks or groups of countries which are at different developmental and technological stages. For this reason, the implicit reciprocity could represent a new pillar for renewed global governance based on international coordination.

Concluding Remarks

In the experience of many newly developed and emerging countries, structural change played a primary role as engine of the development process. Their catching up had been based on the diffusion of technological progress and the gradual incorporation of new sectors, leading to changes in the pattern of specialization, rises of productivity levels, reduction of intersectoral disparities, and improved distribution.

However, the international scenario that the globalization process has been shaping during past decades still presents many open challenges for development and growth. Various issues concerning economic development have remained unsolved – such as the stubborn persistence of unsustainable environmental deterioration, social exclusion with rising inequality, and the lack of structural change - and they have started representing a heavy burden for global growth, both in developed and developing countries. Technological asymmetries and gaps still exist between more advanced countries and those that are still lagging behind in terms of diversification of production; investigating the reasons of their persistency and proposing new policies and rules to deal with them is still one of the main challenges for pursuing global growth.

Given its relevance for economic development, this paper tried to shade some lights on structural change, analyzing what underlies this process and which forces are affecting the pace of structural change, either accelerating or slowing down – or even inhibiting - the transformation of the production structure. The analysis started with focusing on the role played by learning and technological capabilities, which are at the core of the process of structural change and long term growth. Their characteristics shape the reaction of the production structure to shocks and volatility in prices and macroeconomic variables. In particular, a special attention has been given to understanding the process of destruction of technological capabilities and of loss of diversification that can follow a macroeconomic shock such as an appreciation (decrease) of the RER.

This paper also aims at proposing feasible policy solutions to address the lack of structural change through new global governance rules. In fact, the shortcomings of current international economic regulations have become evident after the outbreak of the financial crisis. The increasing asymmetries and the uncertainty that characterizes the post-crisis scenario have been generating a debate on the urgency of rethinking forms of governance and changing rules for a renewed development model, where these same economic and social gaps that the globalization has widened could be contained.

Structural change requires the adoption of adequate industrial and technological policies. In newly industrializing countries, the role of industrial policy is to reduce the technology gap, increase international competitiveness and allow for an expansion of exports in global markets, thereby alleviating the external constraint on growth. Moreover, for industrial and technological policies to be effective, the existence of a strong consistency between macroeconomic priorities and industrial and technological policy targets has to be pursued. On the contrary, focusing on the “right” macroeconomic fundamentals without taking into account their impact on the production

structure could nullify the effects of even the strongest industrial policy. In this sense, the experience of countries that succeeded in catching up - like Korea and more recently China - shows a macro policy committed to competitiveness and comprehensive industrial and technological policies.

However, reducing the lack of structural change and technological asymmetries at global level needs more than the adoption of adequate policies in industrializing countries; it requires a consensus about new international rules for political cooperation. In the actual interdependent global economy, the time has come to propose solutions in which concerns with global growth and distribution are paramount.

The principle of implicit (or automatic) reciprocity and its corollary do comply with structuralist views as regards the possibility of a positive-sum game in the international economy. They represent a good starting point for discussing a new set of coordinated global policies, since it proposes a sort of “win win” scenario of global growth based on a mechanism coordinated expansionary policies, with higher rates of growth and lower technology and income gaps.

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