3 The role of industrial and exchange rate policies in promoting structural change, productivity and employment

Rodrigo Astorga, Mario Cimoli and Gabriel Porcile

3.1 Introduction

In mainstream economic theory the issue of employment is usually discussed in terms of a natural rate of unemployment and "distortions" in the labour market through institutions such as minimum wages, unemployment benefits and strong labour unions. However, developing economies whose labour market institutions are often weak or are ineffective outside the formal economy have experienced long periods of high unemployment. Furthermore, countries where labour unions greatly lost influence – as in Latin America in the 1970s and 1990s – nevertheless experienced rising unemployment (Stalling and Peres, 2000). Therefore, it is necessary to look at other variables when exploring the issue of employment.

In addition, most developing economies have a large surplus of labour in the subsistence sector or in sectors with extremely low levels of productivity (underemployment).[1] They are "dual" economies in Lewis' sense, or at least they comprise labour market segments with productivity levels close to subsistence level. These models view economic development as a process of moving labour from low- to high-productivity segments. The engine that draws labour out of the subsistence sector is structural change (Cimoli, 1988; Cimoli and Porcile, 2011; ECLAC, 2007; McMillan and Rodrik, 2011). Countries need to transform the production structure, that is, create new sectors and technologies that generate more productive and better jobs.

[1] This is the starting point of ECLAC's structuralist theory (Prebisch, 1950).

This chapter argues that job creation and the reduction of underemployment critically depend on the diversification of the production and export structures. Here, diversification is taken to mean developing and expanding sectors that are more dynamic in a Keynesian and Schumpeterian sense (KS dynamic), i.e. they show higher rates of demand growth and more opportunities for technical change.[2] Two variables that determine the diversification process will be highlighted: the real exchange rate (RER) and industrial and technological policies (ITPs). The RER is defined as the price of foreign goods in terms of domestic goods. Therefore, a high RER, reflecting a depreciated domestic currency, implies more competitiveness. In recent years the literature has clearly established the importance of the RER in structural change and growth.[3] As for ITPs, this chapter defines them in a very broad sense, including all measures that create incentives in favour of certain sectors and in favour of technological change. Although the idea that successful catching up requires active ITPs has only gradually reached mainstream economics, this is an old, well-established point in the tradition of economic history and heterodox growth theory.[4]

This chapter discusses the trajectories of four Latin American economies – Argentina, Brazil, Chile and Mexico – between 1970 and 2008 and compares them with that of a successful catching-up economy, the Republic of Korea. These four economies have been chosen because they represent a significant share of Latin America's total gross domestic product (GDP) (81.6 per cent in 2008[5]); they also illustrate the diversity of experiences in economic policy in the region. First, trends in production, employment, productivity and structural change are discussed for the manufacturing sector. Then, the evolution of these variables is studied for the whole economy.

A caveat is necessary. Manufacturing is the starting point because it has been, as is generally acknowledged, a privileged locus of learning, accumulation of

---

[2] Dosi, Pavitt and Soete (1990) define sectors with Keynesian or growth efficiency and Schumpeterian efficiency in terms of the dynamism of demand and of technology, respectively. Usually, there is a large overlap between these two categories. Of course, some countries may just have good luck in the "commodity lottery" (Díaz-Alejandro, 1983) and perform well (for some time) in the international economy without building technological capabilities, but this is not the rule in economic history. Evidence of a positive relation between export diversification and growth can be found in Saviotti and Frenken (2008); Hausmann, Hwang and Rodrik (2007); and Agosín, Alvarez and Bravo-Ortega (2012).

[3] 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); Razmi, Rapetti and Skott (2009); and Rapetti (2011). Early contributions are Baldwin (1988), and Baldwin and Krugman (1989).

[4] See Amsden (1989); Reinert (1995); Bell (2006); Cimoli and Porcile (2009 and 2013); and Ocampo (2011).

[5] Based on ECLACSTAT, Latin America and the Caribbean, by economic activity.

technological capabilities and diffusion of technology to the whole economic system – at least for most of the period addressed in this chapter. In the post-war years, to catch up and to promote structural change in developing economies has largely meant to industrialize. While other sectors play an important role in development and production of externalities, it will be argued here that a rising share of technology-intensive activities in manufacturing is a good proxy for the process of learning in the whole economy. Manufacturing does not monopolize learning, but it tracks well the learning process in a developing economy. In addition, along with construction and services, manufacturing is responsible for a substantial share of total employment. What happens to employment in manufacturing has significant repercussions for employment and productivity in the rest of the economy.

The remainder of the chapter is organized into three sections. Section 3.2 briefly presents a theoretical framework for discussing the interactions between technology, structural change, demand growth and employment growth in developing economies. This framework provides the basis for a typology of patterns of growth. Section 3.3 offers empirical evidence of different trajectories of growth, productivity and employment in manufacturing under different scenarios defined by macro policies, ITPs and external shocks. Section 3.4 identifies growth patterns for the whole economy. Section 3.5 offers concluding remarks.

3.2 Employment, structural change and growth in developing economies

3.2.1 Demand, productivity and structural change regimes

This section discusses the interactions between employment, patterns of specialization and the growth of effective demand (a formal discussion can be found in the Appendix). At one level the evolution of unemployment depends on the difference between the growth rates of GDP and of labour productivity. At another level, GDP growth is frequently constrained by external disequilibrium or balance of payments (BOP) constraints, particularly for countries specialized in low-tech commodities. These countries have a low income elasticity of demand for exports and a high income elasticity of demand for imports. As a result, the deficit in the current account as a percentage of GDP tends to rise when economic growth accelerates. Such a situation is not sustainable in the long run, and hence the country is forced to reduce its rate of growth in order to curb external disequilibrium.

Productivity growth is determined by changes in the RER, economic growth and structural change. The RER influences productivity growth for two reasons. First, in developing economies a significant share of total investment in capital goods is imported. Therefore, a fall in the RER reduces the price of these goods and accelerates the replacement of earlier vintages of equipment. Second, a lower RER heightens competitive pressures in domestic and external markets.[6] Foreign goods will be cheaper, and domestic firms will have to invest more in technology than when they are "protected" by a high RER. In the analysis below, increases in productivity also come from learning-by-doing and depend positively on the rate of economic growth, a relationship referred to as the Kaldor–Verdoorn law.

Structural change, a key factor determining productivity growth, is closely associated with the diversification of production, increasing returns, new skills and capabilities and various knowledge spillovers that a more complex economic structure makes possible.[7] Structural change also depends on the RER and productivity growth in various other ways. The RER and productivity determine unit labour costs of production in each sector. An increase in the RER and/or productivity growth allows domestic firms to break in and compete in new sectors, and it promotes both export diversification and import substitution.

Together, effective demand, productivity and structural change define the parameters that describe different growth typologies and how changes in policies and external conditions affect growth prospects and employment. The RER is influenced by the combination of macroeconomic policies, external shocks in lending and the terms of trade. Although the RER is not fully controlled by the government, it is assumed that macro policies do have an influence on this variable.

3.2.2 The three regimes and emerging patterns of growth

There are various possible combinations of the demand, productivity and structural change regimes in equilibrium. These combinations define different scenarios, which are in turn directly related to macro and industrial policies. Four scenarios will be highlighted that represent different growth and employment paths found in developing economies (table 3.1), although other combinations are possible. These scenarios correspond to the four scenarios suggested by Ocampo (2005) in terms of structural dynamics and may be seen as a complement to his typology.

[6] See Blecker (1999).

[7] See, for instance, ECLAC (2008) and Dosi, Lechevalier and Secchi (2010).

Table 3.1 Growth in productivity, employment and structural change: alternative scenarios

Employment growth (z)	Productivity growth (a)	
	Fast productivity growth	**Slow productivity growth**
Fast employment growth	**I** *Virtuous circle* – Strong demand regime – Strong productivity regime – Strong structural change regime	**II** *Labour absorption* – Strong demand regime – Weak productivity regime – Weak structural change regime
Slow employment growth	**III** *Defensive rationalization* – Weak demand regime – Strong productivity regime – Weak structural change regime	**IV** *Vicious circle* – Weak demand regime – Weak productivity regime – Weak structural change regime

- The first scenario is the **virtuous circle**, represented in panel I of table 3.1. This scenario emerges from macro policies that focus on competitiveness and strong ITPs, generally in a context of expansion of the world economy. A competitive RER and structural change spur economic growth. The positive effect of structural change on the growth of exports (or on reducing the growth rate of imports) boosts the rate of growth of labour demand compatible with external equilibrium. For this positive effect on labour demand to occur, the impact of structural change on demand growth must exceed its impact on productivity growth.[8] At the same time, productivity growth is positive and rapid because spillovers and externalities produced by structural change largely overcome the drag on technical change arising from a depreciated RER.

- The second scenario is driven by **labour absorption**, represented in panel II of table 3.1. This scenario is produced by a macro policy that stresses competitiveness, while ITPs are absent or weak. Structural change is very slow, but a depreciated RER sustains demand growth. As a result, employment grows. However, productivity growth slows as a high RER raises the costs of capital goods and increases monopoly power of domestic firms. The difference between this scenario and the previous one lies mainly in the specific role of ITPs. In the first scenario active ITPs closely link the diversification

[8] Formally, $y'(z) > a'(z)$ (see Appendix).

of production to productivity growth and thereby compensate for the negative impact of the RER. In the second scenario the RER effect prevails due to weak spillovers and limited learning. A weak industrial policy is a policy that does not provide incentives to shift into economic activities that generate externalities, increasing returns and the absorption of new technologies. This lack of support may be the result of negligible transfers of resources to dynamic activities; weak differential incentives that are unable to counteract path dependence that reinforces static comparative advantages; the transfer of rents to industries or firms that lack clear targets and objectives; and the failure to build up infrastructure and human capital and other requirements for catching up with the technological frontier (Cimoli, Porcile and Rovira, 2010).

- The third scenario is related to macro policies or external shocks that increase the RER. In the case of external shocks, such increases may stem from easy lending in international capital markets or from rising terms of trade. The appreciation of the RER leads to **defensive rationalization** as the main competitive strategy and to losses of capabilities, as some sectors cannot survive. This is shown in panel III of table 3.1. A paradox may emerge in this situation, in which productivity growth accelerates while the specialization pattern moves towards low-tech commodities. The process of job destruction advances faster than job creation, and unemployment increases. The corollary of this is that productivity may significantly increase in some sectors in a context of slow growth of aggregate demand and growing unemployment in the aggregate. Labour is reallocated towards non-tradables, largely to service activities with low labour productivity.

  Some policy-makers may see this scenario as a healthy process of moving back to comparative advantages and to what the economy does best. They may welcome such a combination of slower employment growth and faster productivity growth, particularly if they are concerned primarily with inflation.[9] However, there is a significant risk of trading long-run productivity growth for short-run productivity growth. In the long run the loss of technology-intensive sectors would harm productivity growth. In other words, the adverse impact of RER on learning may be important in the short run, while adverse *structural* effects become increasingly important in the long run (see Lima and Porcile, 2013).

[9] It is necessary also to distinguish between appreciation of the RER arising from better terms of trade and appreciation arising from easy lending. The former may be associated with high rates of demand growth, pushed by booming exports; the latter is more likely to produce slow economic growth.

- The fourth scenario is a **vicious circle** of falling productivity and employment, shown in panel IV of table 3.1. Aggregate demand stagnates or falls even with a competitive RER, either because the country is heavily indebted and has to use most of its foreign exchange to service the debt (it becomes a net exporter of foreign exchange) or because there is a large negative shock in the terms of trade that heightens the external constraint on growth. Decline in the role of structural change and loss of productivity growth reinforce each other and stifle the efforts of the country to escape from the vicious circle using the RER. Only some exogenous intervention alleviating the burden of the external constraint (through either a default on the debt or a favourable renegotiation of its terms) would be effective in this scenario.

The next section presents these scenarios in the productivity–value added plane to discuss how they relate to employment growth.

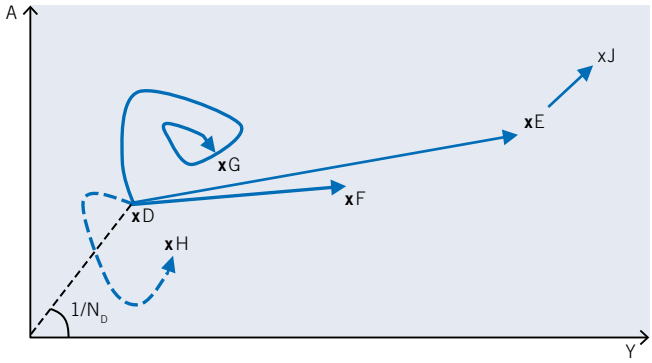
3.2.3 Combining demand side and supply side variables

The scenarios described above can be seen in terms of the co-evolution of labour productivity (A) and aggregate demand/production (Y) (figure 3.1; see also Cimoli and Porcile, 2009). In the AY space point D indicates the prevailing levels of productivity and income at t = 0; ND indicates the level of employment; and the ratio 1/ND corresponds to the slope of the line drawn from the origin to point D.[10] Different trajectories in productivity versus aggregate demand (and hence employment) from $t = 0$ to $t = T$ are described by the curves from D to E, F, G and H. These trajectories are related to how the country combines demand-side and supply-side interactions – which, as mentioned, depend on specific combinations of macro policies and ITPs as well as on external shocks.

Consider, for instance, the virtuous circle scenario, in which ITPs aim at strengthening technological capabilities and changing the pattern of specialization towards high-growth sectors, while the macroeconomic policy sustains both a high and stable RER and the expansion of autonomous expenditure consistent with external equilibrium. This virtuous circle will take the economy – after time T – from point D to point E. The labour market will increasingly enhance the bargaining power of workers, as the rate of employment rises and real wages tend to move upwards as well.

[10] This ratio multiplied by the productivity level gives total product and total aggregate demand.

Figure 3.1 Alternative patterns of productivity and income growth



In the labour absorption scenario, the RER and the expansion of world trade sustain effective demand, but structural change and learning advance at a much slower pace. After the same period *T*, the economy will be at point *F* rather than at point *E,* as in the virtuous circle scenario. This pattern of growth is reflected in horizontal shifts in figure 3.1, with labour productivity contributing slightly to growth (labour absorption only). The management of the demand side favours growth, but there is not enough learning to reduce the gap with the international technological frontier (weak ITPs). Employment grows, but jobs will be of lesser quality in this scenario. This also means that the demand for qualified labour will be feeble, which in turn implies almost no incentives to train and educate the workforce.

The scenario of defensive rationalization reflects a context of RER appreciation and lack of ITPs. Such a trajectory is represented by the curve from point *D* to point *G*, driven by RER effects on productivity and falling employment. In this case there is a strong initial jump in productivity – due to a short-lived investment spike based on imports of capital and intermediate goods – but it soon recedes. Moreover, if the appreciation of the RER leads to deficits in the current account, a recessive period may follow the initial expansionary shock of higher productivity. The economy may then show cyclical swings around a lower equilibrium rate of growth. The effects on the labour market may be highly negative for two reasons. The first is the direct impact of a low RER on competitiveness, effective demand and, hence, employment. The second is that the regime of defensive rationalization is associated with strong fluctuations in the RER, inflation and GDP. This regime entails the accumulation of disequilibria (external and internal) that at the end of the day are followed by deep recessions, which may hurt in a lasting way the production structure and the labour market.

The vicious circle scenario, represented in figure 3.1 by the dashed line from *D* to *H,* emerges when there is a severe external shock and large exports of capital. Such a curve depicts the case in which GDP falls or else grows at a very slow rate, while levels of labour productivity fall. The vicious circle is associated with sluggish labour markets and falling real wages. A fall in total investment accompanies this scenario and makes catching-up in technology still more difficult.

The different scenarios can be sequential. For instance, a phase of the virtuous circle of growth in productivity and employment, if it exhausts the reserve of labour in the developing economy, may lead to a period of growth led by productivity growth. The accumulation of technological capabilities after a long period of learning allows the country to depend less on a depreciated RER and more on rising productivity to compete in the international market. Labour markets change in favour of workers, and real wages rise. This case is represented by the arrow connecting the points *E* and *J* in figure 3.1. Inversely, a period of easy lending associated with defensive rationalization may produce a large external debt that has to be paid in the following phase. A negative shock in external conditions triggers the crisis and moves the economy towards a vicious circle (from *G* to a lower point close to *H*, not shown in figure 3.1).

Historically, in developed economies the expansion of employment along with labour productivity is related to the diversification of the economy, the expansion of high-tech activities and exports and the consequent dynamism of domestic and international demand. In developing economies, on the other hand, technical change is highly localized in a few export activities (in both the agricultural and industrial sectors), with feeble effects on total demand and structural change. As a result productivity tends to grow at higher rates than demand, implying that unemployment and underemployment persist. Countries that succeeded in catching up, such as the Republic of Korea and, more recently, China, have had a macro policy committed to competitiveness and comprehensive ITPs. While industry in China seems to follow the path described by the arrow from *D* to *F*, as in the labour absorption scenario, the Republic of Korea is already on the path described by the arrow from *E* to *J*.

In the next section (section 3.3) different patterns of growth, employment and structural change in the manufacturing sector will be discussed for four Latin American countries and the Republic of Korea. These patterns are related to the exogenous variables of the model – macro and industrial policies and shocks in capital lending and terms of trade. In section 3.4 the same variables are analysed for the aggregate economy.

3.3 Patterns of structural change, growth and employment in the manufacturing sector

This section discusses different paths followed by the manufacturing sectors of four Latin American economies (Argentina, Brazil, Chile and Mexico) and the Republic of Korea. The latter provides an example of a successful catching-up economy. For each country the different phases described in the text are identified in table 3.2 at the end of the section (see also figures A3.1–A3.5 in the Appendix). Growth in value added and employment growth is measured based on data obtained from the PADIWIN for Latin America and from the STAN Database for Structural Analysis (OECD) for the Republic of Korea. The RER was obtained from the Penn World Table.

Structural change is measured through a proxy that aims to capture the technological intensity of manufacturing, the Index of Relative Participation (IRP). The IRP is the ratio between the share of engineering industries[11] in the total manufacturing value added in a certain country (Argentina, Brazil, Chile or Mexico) and that share in a benchmark country. This chapter uses the United States as the benchmark country. Therefore, an IRP = 0.5 in country *i* means that the share of the engineering industries in manufacturing in country *i* is half of its share in the United States. A higher IRP indicates a higher KS dynamism in the production of manufactured goods. The change of IRP over time represents progressive structural change ($z > 0$; see Appendix).

To make the typology operational, the different patterns of growth are identified by applying quantitative thresholds. We consider two variables: employment growth and productivity growth. We adopt the following criteria: (i) employment growth is positive or zero/negative and (ii) productivity growth is higher or lower than 2 per cent.[12] Combining these two criteria produces the following matrix.

Patterns of growth in manufacturing

Employment growth	**Productivity growth**	
	≥ 2 per cent	**< 2 per cent**
Positive	*Virtuous circle*	*Labour absorption*
Zero or negative	*Defensive rationalization*	*Vicious circle*

[11] Engineering industries comprise, in the Standard International Trade Classification (SITC), Fabricated metal products except machinery and equipment; Machinery and equipment; Transport equipment.

[12] Choosing the thresholds is to some extent arbitrary. The choice of the cut-point of 2 per cent productivity growth and positive employment growth is intended to ensure that the economy grows above 2 per cent annually.

In the remainder of this section, the different phases of growth of Argentina, Brazil, Chile, Mexico and the Republic of Korea will be classified according to this matrix.

3.3.1 Argentina

In Argentina since 1970 three different scenarios can be identified (see table 3.2 and figure A3.1 in the Appendix). Defensive rationalization was the prevailing scenario in two periods (1976–81 and 1990–2001), characterized by low RER, regressive or slow structural change and falling or stagnant industrial employment. These periods correspond to two major experiments in economic policy. The first was implemented by the military government that came to power in 1976. That government adopted a bold plan of trade and financial liberalization. The nominal exchange rate was used as an anchor to curb expectations of inflation, leading to strong real appreciation, and trade barriers were unilaterally reduced. This period ended with the debt crisis of 1982. The second period of defensive rationalization was related to the "Convertibility Plan" and the adoption of a fixed exchange rate regime (Cavallo Plan) under democracy. In both cases the low RER was used as the main anti-inflationary weapon as Argentina emerged from a period of super- or hyper-inflation in the early 1970s and the late 1980s. In both cases there was an attempt to return to static comparative advantages and to minimize government intervention, which was seen as the main cause of economic stagnation in Argentina. As with the previous experiment at rapid trade and financial liberalization, the "Convertibility Plan" led to a major external crisis and recession.[13]

The labour absorption scenario – high RER, slow structural change and increases in industrial employment – is found in Argentina in two quite different periods: in the first half of the 1970s and after the major devaluation of 2002. In the first period (1970–75) the RER was as appreciated as in the 1990s, but at the same time a vast array of protectionist measures kept the manufacturing sector relatively sheltered from external competition. In the second period (from 2004) the government sought to keep the exchange rate at a competitive level while encouraging a more equitable income distribution, with positive effects on aggregate effective demand. Manufacturing GDP grew twice as fast as in the first half of the 1970s, accompanied by a moderate increase in labour productivity.

[13] See Frenkel (2004), and Damill and Frenkel (2009).

The last scenario seen in Argentina is that of the 1980s in which value added and employment fell due to the costs of the debt service, which sharply compromised growth and investment. Productivity grew moderately in this period, but this was due to the fact that output collapsed even faster than employment. Such a scenario reflects a vicious circle of technological backwardness and declining competitiveness.

Structural change responds more slowly to changes in policy than do productivity and employment. The evidence shows that the IRP (whose change captures structural change) tended to remain more or less stable until the outbreak of a crisis and then to drop sharply. This does not mean, however, that the structure is insensitive to macro prices. During the period of currency appreciation, firms are harmed by falling competitiveness and demand, while capabilities and skills are gradually eroded. During the crisis firms, production and human capabilities are destroyed on a large scale as a result of accumulated disequilibria of the previous period. The adverse impact of the crisis on the engineering sector is heightened by the fact that in time of crisis investment contracts more than other components of aggregate demand.

Hysteresis phenomena are important in structural change. Slow growth and low investment imply falling behind the rest of the world in terms of technological capabilities. In a world of fast-moving international technological frontiers, it is extremely difficult for an economy to recover its technology-intensive sectors once it has lost them. This is why periods of currency appreciation based on defensive rationalization are followed by a vicious circle of slow growth in employment and value added.

Argentina dismounted most of the instruments it had as ITPs after 1976, but some protectionist measures remained in place for sectors such as automobiles, steel and petroleum.[14] In recent years the Argentine government has sought to rebuild its instruments for industrial ITPs, largely as a defensive response to the global recession of 2008 and subsequent appreciation of the RER. Appreciation since 2007 is due not only to higher commodity prices but also to rising inflation, which exceeded 20 per cent in the last few years. In parallel, there was a significant move towards the adoption of protectionist measures that are not clearly related to learning and catching up. All in all, the Argentine experience in industrial policy has been weaker and more discontinuous than that of Brazil.

[14] See Katz (1997).

3.3.2 Brazil

Two critical differences between Argentina and Brazil should be emphasized. The first is that, throughout its post-1930 history, Brazil has been more committed to industrial development than Argentina. In contrast to manufacturing in Argentina, manufacturing in Brazil grew in all the periods considered (table 3.2 and Appendix figure A3.2). In particular, while Argentina made an early attempt at financial and trade liberalization in the late 1970s and abandoned most of its instruments for industrial policy in the same period, Brazil adopted the Second National Plan of Development (II PND), which gave a significant push to industrial diversification. Import-substituting industrialization and subsidies to industrial exports were extensively used in the 1970s. The continuous use of industrial policy in Brazil led to higher levels of IRP than in any other Latin American country. The IRP in Brazil in the 1970s was almost 0.7, while in Argentina it was 0.3.

The second difference lies in the RER policy after 1990.[15] Like Argentina, Brazil used the RER as an anchor for inflation in the 1990s, but without adopting a full-fledged fixed exchange rate regime like Argentina's. Brazil's "Real Plan" adopted instead a band of fluctuation for the nominal exchange rate. This band was used for anti-inflationary purposes but still gave the Brazilian government more freedom to devalue and react to external disequilibrium. For this reason the appreciation of the Brazilian currency, the real, was not as critical as that of the Argentine peso. Positions reversed after 2002. Argentina then sought to keep the RER at a competitive level (and was successful until inflation began to bite the RER), while in Brazil, by the end of the first decade of the 2000s, the RER had fallen to the levels of the 1990s.

Analysis of industrial transformation in Brazil suggests four different phases. One comprises the period 1970–81, in which ITPs secured high manufacturing and employment growth, albeit in a context of low competitiveness. The IRP increased steadily, driven by ITPs, giving rise to a virtuous circle. However, the RER appreciated in the late 1970s. This was associated with rising external debt and falling rates of growth. In the 1980s the debt crisis inaugurated a vicious circle phase that lasted until the early 1990s. Defensive rationalization prevailed as a consequence of the stabilization programmes of the 1990s (which used the RER as an anchor). A labour absorption phase started after the devaluation of 1999. In recent years the RER has tended to appreciate again in Brazil. This has moved Brazilian employment and structural change towards a path more like that of the 1990s, although it is too early to assess impacts on industrial structure.

[15] An account of policies in the 1990s in Latin America can be found in ECLAC (2003).

3.3.3 Chile

The analysis of economic evolution in Chile delineates several phases since 1970 (table 3.2 and Appendix figure A3.3). In the second half of the 1970s, Chilean performance in terms of growth, particularly for the manufacturing sector, was dismal. Chile adopted a policy of rapid trade and financial liberalization that brought about the appreciation of the RER in 1976–81. This hampered competitiveness, particularly in the manufacturing sector. Under a policy of reducing the presence of the State and deregulating the markets, sector policies were abandoned, while – as in Uruguay and Argentina – macro policies were based on the "monetary approach to the balance of payments". The consequences were a sharp drop in the IRP and a mounting external debt that created the conditions for the vicious circle observed during the first half of the 1980s.

The country entered a dynamic path of growth only in the mid-1980s, *pari passu* with the adoption of a competitive RER and policy efforts at export diversification.[16] While the IRP rose during the virtuous circle phase of 1986–97, the gradual appreciation of the RER hindered the momentum of growth and so led to a new fall in the IRP. Capital controls (administrative controls and an "unremunerated reserve requirement" between 1991 and 1998) allowed for a higher degree of autonomy in monetary policy. However, these controls were abandoned after the Asian financial crisis, making more room for subsequent currency appreciation. Since 1997 manufacturing has moved towards defensive rationalization. Employment in manufacturing ceased to rise, reflecting the slowing of diversification and growth.

Chile shares with Argentina the radical move towards trade and financial liberalization along with currency appreciation in the 1970s and the collapse of the 1980s. The difference between the two countries in the 1990s seems to lie in Chile's commitment to a policy of export diversification and to a more competitive RER, which – in contrast to the "Convertibility Plan" in Argentina and (to a lesser extent) the "Real Plan" in Brazil – was intended to spur diversification. The difference in the development of the IPR in the two countries reflects this difference in policies.

After 1998 the momentum of export diversification receded in Chile, leading to both a fall of the IRP and a marked fall in the growth of productivity. There is still considerable debate as to which factors lie behind lower productivity growth.

---

[16] On the institutional and productive changes that encouraged the emergence of new export activities in Chile in the 1990s, see Katz (2008).

The initial wave of diversification succeeded in exploring technological trajectories based on natural resources. Such technological trajectories were gradually exhausted, however. To overcome decreasing returns, more active industrial policy would be required, aimed at developing capabilities with technological bases beyond the primary sector. Although Chile has a few instruments devised to promote innovation and diversification, these instruments are fragmented and poorly funded. The effects of such programmes were limited, and Chile remains dependent on natural resources, particularly on copper exports. Also, the appreciation of the exchange rate through 1997 has compromised the continuity of export diversification (Ffrench–Davis, 2000 and 2002).

3.3.4 Mexico

Like Brazil, Mexico continued to promote industrialization in the 1970s and did not renounce industrial policy until the mid-1980s. During most of the 1970s, Mexico followed a virtuous path of growth (table 3.2 and Appendix figure A3.4), although import substitution lost momentum late in the decade, except for some intermediate and capital goods sectors (Ros, 2000). In the late 1970s the RER appreciated in the context of increasing oil exports, while disequilibria in the current account accumulated, leading to the 1982 default on the external debt.

In the 1990s Mexico moved sharply towards a more liberal stance in trade and finance, abandoning ITPs. In 1994 the country joined the North American Free Trade Association (NAFTA). This had two major consequences for manufacturing growth. On the one hand, manufacturing gained easy and stable access to the large US market, an advantage that promoted exports. On the other, Mexico had to compete with US industry on an equal footing. As a result, the use of foreign inputs and imported technology increased. The export drive sustained industrial growth but diluted the domestic technological content of growth. Significant parts of manufacturing classified formally under the heading of engineering were indeed labour-intensive activities (maquila). In this sense, although the Mexican IRP was close to the IRP in Brazil, the IRP in Mexico cannot be taken as an accurate indication of technological intensity.

Mexico sharply devaluated its currency in 1995, giving rise to a phase of labour absorption. Exports grew rapidly but produced little endogenous technology and domestic value added. The export surge failed to create linkages with the rest of the economy, which led the government to revisit the previous rejection of ITPs. More recently, both horizontal and vertical industrial policies have found a place on the agenda of the newly elected (in 2012) Mexican government.

Table 3.2 Patterns of growth in the manufacturing sector, 1970–2008

Argentina: manufacturing sector, 1970–2008

Period	IRP (%)	RER	VA (%)	Employment (%)	Productivity (%)
1970–75 (LA)	−0.45	0.99	3.49	3.58	−0.08
1976–81 (DR)	0.23	1.12	−1.90	−6.93	5.29
1982–190 (VC)	−4.07	1.41	−0.67	−2.18	1.58
1991–2001 (DR)	−0.74	0.99	2.01	−2.29	4.35
2002–08 (LA)	−0.66	2.17	6.50	5.53	0.90

Brazil: manufacturing sector, 1970–2008

Period	IRP (%)	RER	VA (%)	Employment (%)	Productivity (%)
1970–81 (VirtC/LA)	3.25	1.07	7.28	5.38	2.00
1982–92 (VC)	0.07	2.00	0.62	−0.67	1.45
1993–98 (DR)	−0.31	1.31	2.59	−3.28	6.16
1999–2008 (LA)	−0.56	1.75	2.76	3.96	−1.10

Chile: manufacturing sector, 1970–2008

Period	IRP (%)	RER	VA (%)	Employment (%)	Productivity (%)
1970–73 (LA)	7.26	0.88	2.70	2.69	0.07
1974–81 (DR)	−4.83	0.93	1.55	−3.79	5.50
1982–85 (VC)	−12.99	1.14	−1.57	−0.63	−1.03
1986–97 (VirtC)	5.61	1.21	6.43	4.08	2.40
1998–2008 (DR)	−3.49	1.32	2.53	0.66	2.01

Mexico: manufacturing sector, 1970–2008

Period	IRP (%)	RER	VA (%)	Employment (%)	Productivity (%)
1970–81 (VirtC)	2.93	0.89	7.02	3.67	3.24
1982–94 (VC)	0.43	1.11	2.03	0.16	1.83
1995–2000 (LA)	−0.09	0.96	5.72	4.12	1.51
2001–08 (DR)	−2.45	0.77	1.10	−2.55	3.74

Republic of Korea: manufacturing sector, 1970–2009

Period	IRP (%)	RER	VA (%)	Employment (%)	Productivity (%)
1970–80 (VirtC)	7.29	0.82	16.16	8.87	6.75
1981–90 (VirtC)	6.66	0.69	12.50	5.09	7.15
1991–2000 (DR)	3.52	0.57	8.91	−1.47	10.46
2001–09 (DR)	1.08	0.57	5.38	−1.22	6.67

Key: *Variables:* RER=average real exchange rate of the period; IRP=rate of growth of the Index of Relative Participation; VA=rate of growth of manufacturing value added; Employment=rate of growth of employment in the manufacturing sector; Productivity=rate of growth of labour productivity in the manufacturing sector.

Growth regimes: LA=labour absorption; DR=defensive rationalization; VirtC=virtuous circle; VC=vicious circle.

Source: PADIWIN (CEPAL), STAN Database for Structural Analysis (OECD) and Penn World Table (University of Pennsylvania).

In the second half of the 1990s, the RER began to appreciate again in Mexico, first in a context of high instability and subsequently in a more stable environment (following the adoption of an inflation target regime in 1999). The country ended the first decade of the new century with a RER much more appreciated than in the 1990s, which helps to explain the emerging pattern of defensive rationalization of the 2000s (Gallagher and Moreno-Brid, 2008).

3.3.5 Republic of Korea

It is interesting to compare the trajectories of the Latin American economies with a successful catching-up economy such as that of the Republic of Korea. Table 3.2 and Appendix figure A3.5 clearly show four main contrasts.

First, in the Republic of Korea productivity growth in manufacturing did not experience the reversals seen in the Latin American economies. Second, very high rates of productivity growth went hand in hand with very high rates of employment growth until the 1990s. Thereafter, employment in manufacturing fell, but at the same time manufacturing value added grew rapidly – a pattern that suggests this was not a defensive strategy (i.e. an effort to avoid losing market shares due to declining competitiveness). Third, the RER shows a slow and steady path of appreciation over time, without the volatility that plagued the Latin American experience. Such appreciation mirrors the increase in productivity that allowed the Republic of Korea to become less dependent on the RER to compete. Last but not least, the IPR moved up throughout the period, reflecting a very strong process of structural change in favour of KS dynamic sectors in production and exports. The central role of structural change in the Republic of Korea, which avoided any discontinuity in virtuous growth, is apparent in the table.

3.4 Where do workers go? Aggregate productivity and employment

The preceding analysis focused on the co-evolution of productivity and employment to describe different patterns of growth in the manufacturing sector. However, this sectoral analysis does not allow conclusions for the whole economy. Rapid losses of employment in manufacturing are not necessarily harmful if new, good-quality jobs (i.e. jobs with similar or higher productivity) are created elsewhere. In this section, therefore, we extend the analysis to the whole economy and contrast the patterns of overall growth with those in manufacturing.

If productivity growth in manufacturing goes hand in hand with productivity growth and employment creation in the whole system, then the process of economic development – at least from the perspective of structural change – is on the right track. However, this has not always been the case in the four Latin American countries considered. Peaks of productivity growth in manufacturing under defensive rationalization may not be productivity-enhancing for the rest of the economy. During phases of defensive rationalization, manufacturing does not diffuse technology, but rather defensive rationalization cuts off some of manufacturing's linkages with the rest of the economy.

Three indicators demonstrate this. The first is trends in value added and productivity in the whole economy. The movement of employment and productivity in opposite directions at the aggregate level suggests that workers dismissed in the manufacturing sector could not find jobs of similar productivity in other sectors of the economy. The second indicator is the evolution of unemployment. Even when productivity per employee rises, if at the same time open unemployment or informality increases, then the productivity of the total labour stock may fall. The third indicator is a shift–share exercise that decomposes total productivity growth into two sources: productivity growth in each sector, on one hand, and, on the other, the reallocation of workers from lower to higher productivity sectors. If the signal of both sources is positive and strong, then a virtuous process of growth is taking place.

Table 3.3 and Appendix figures A3.6 through A3.10 show patterns of aggregate growth in productivity and value added. It can be seen that virtuous circle periods show a similar pattern in the aggregate. In contrast, defensive rationalization in industry is associated with stagnant employment or declines in productivity growth. The available information allows for extending the analysis to 2010.

In effect, employment stagnated in Chile during the liberalization – cum – appreciation phase of the second half of the 1970s, while in Argentina in the same period value added stagnated and productivity fell (figures A3.6 and A3.8). A similar stagnation in productivity and employment can be seen in Brazil and Argentina during the years of currency appreciation in the 1990s ("Real Plan" and "Convertibility Plan") and in Mexico in the 2000s (Appendix figures A3.6, A3.7 and A3.11). After 1998 Chile experienced slow productivity growth at the aggregate level despite rapid productivity growth in the manufacturing sector. In Mexico defensive rationalization in manufacturing resulted in a decline in employment of 2.5 per cent per year on average between 2001 and 2005, which was accompanied by a fall in aggregated employment by 0.5 per cent on average in the same period.

The Republic of Korea displays a different pattern. Its sustained economic growth characterized by growing productivity and employment in the aggregate is

Table 3.3 Patterns of growths for the economy, 1970–2010

Argentina, 1970–2010

Period	VA (%)	Productivity (%)	Employment (%)
1970–75	3.1	3.2	−0.1
1976–81	2.0	1.0	1.0
1982–90	−0.5	−2.9	2.4
1991–2001	2.8	1.8	1.0
2002–10	7.6	3.6	3.9

Brazil, 1970–2010

Period	VA (%)	Productivity (%)	Employment (%)
1970–81	7.22	3.11	3.99
1982–92	2.05	−1.50	3.60
1993–98	3.05	1.47	1.55
1999–2010	3.64	1.84	1.77

Chile, 1970–2010

Period	VA (%)	Productivity (%)	Employment (%)
1970–73	0.9	−0.3	1.2
1974–81	4.0	3.5	0.5
1982–85	3.6	−2.0	5.8
1986–97	7.8	4.4	3.2
1998–2010	3.4	2.3	1.1

Mexico, 1970–2010

Period	VA (%)	Productivity (%)	Employment (%)
1970–81	6.87	1.31	5.49
1982–94	2.03	−1.37	3.45
1995–2000	5.45	2.16	3.23
2001–10	1.98	0.72	1.25

Republic of Korea, 1970–2010

Period	VA (%)	Productivity (%)	Employment (%)
1970–80	7.2	3.7	3.5
1981–90	9.0	6.0	2.9
1991–2000	5.7	4.3	1.4
2001–09	3.9	2.6	1.3

Key: VA = rate of growth of the value added; Productivity = rate of growth of labour productivity; Employment = rate of growth of employment;

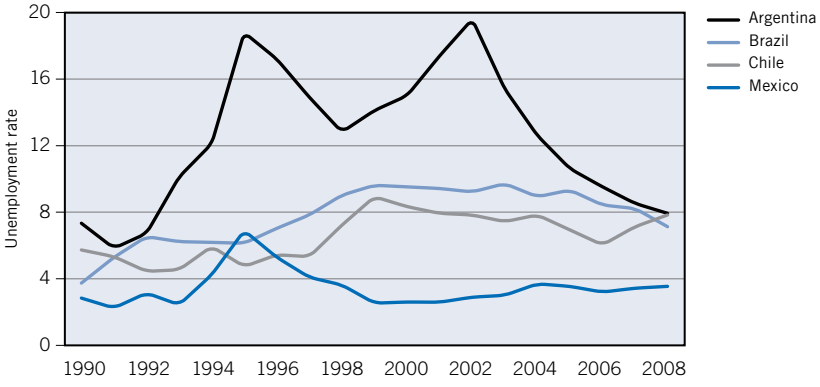
Source: Computed by the authors based on the Groningen Growth and Development Centre database.

remarkable. Although employment growth slowed in the 1990s, rates of economic and productivity growth were still high. In the 2000s the performance of the Republic of Korea was less impressive, although still positive. However, growth rates became negative after the 2008 Great Depression. In contrast to many Latin American countries, the Republic of Korea did not benefit from the rising global demand for natural resources since 2004.

Argentina performed particularly well in terms of aggregate GDP growth after 2002. Several factors coincided to produce this outcome. The year 2002 marked the lowest point in the Argentine business cycles; external conditions for Argentine exports significantly improved after 2004. In addition, the country followed more heterodox policies that favoured growth. Default on the external debt freed Argentina (at least temporarily) of the heavy constraints imposed by the transfer of resources to creditor countries – the type of constraint that hampered growth and investment in the 1980s. Maintaining the RER at a competitive level has been crucial as well. There are still clouds of uncertainty concerning the sustainability of growth, which, notably, receded in recent years, while inflation remains high. The need for more vigorous policies aimed at spurring productivity growth and structural change will probably be at the top of the agenda of the policy debate in Argentina in the coming years.

In the four Latin American countries examined, trends in unemployment are consistent with the patterns seen in figure 3.2. In Argentina unemployment increased throughout the 1990s and then rapidly fell after the 2002 devaluation. In Brazil it rose sharply in the Real Plan years (1994–99), remained at high levels, and then began to fall slowly after the devaluations of 2002. Chile showed low

Figure 3.2 Unemployment rates in four Latin American countries, 1990–2008 (percentages)



Source: ECLAC, Economic Development Division.

and stable levels of unemployment until the late 1990s. The rates then jumped to around 9 per cent and then fell again. Among these four countries, Mexico had the lowest levels of unemployment. Unemployment levels peaked during the tequila crisis in 1994. In the second half of the 1990s, they returned to pre-crisis levels and then slightly increased again in the 2000s.

The shift–share analysis aims at identifying two different sources of productivity growth: the "within" component, which represents productivity increases within each sector, and the "between" component, which represents the effect of workers moving from lower- to higher-productivity sectors. It should be borne in mind that the between-sectors component captures just a small part of the role that structural change plays in development. In the model set forth in section 3.2, structural change affects the behaviour of (domestic and external) effective demand and the balance of payments (BOP)-constrained rate of growth, as well as productivity and the quality of jobs created.

The shift–share analysis covers the period 1990–2008, using data from the ECLACSTAT database; there are no comparable data for the shares of total employment in the different sectors before the 1990s. Table 3.4 shows the results of this analysis.

In the case of Argentina, it is remarkable that aggregate productivity growth in the 11 years of the "Convertibility Plan" did not exceed that of 2002–08, in spite of much higher productivity growth in manufacturing in the earlier period.[17] It seems that, while manufacturing expelled labour to lower-productivity sectors in the 1990s, it attracted labour from lower-productivity sectors in the 2000s. Accordingly, the between-sectors component was more significant in Argentina in the 2000s than in the 1990s. The same is true for Brazil. Despite all the productivity growth in manufacturing in the 1990s, aggregate productivity growth was much lower than in the 2000s. Moreover, the between component was negative in Brazil in the first period.

A somewhat puzzling case is Argentina in 1970–75: manufacturing was labour-absorbing, while the economy showed a pattern of defensive rationalization. In this case protection assured increases in manufacturing employment at very low productivity levels, while rising economic instability led to slow growth and a drop in aggregate employment.

In the case of Chile, the shift–share analysis shows that economic growth between 1990 and 1998 was associated with higher productivity growth and a higher between-sectors component than in the subsequent period. This confirms

[17] The rate of growth of the second period may be exaggerated because it began at the bottom of the crisis in 2002, but it is nevertheless impressive.

Table 3.4 Shift–share analysis

Argentina, 1990–2008

Period	Labour productivity growth (%)	Effect	
		Within (%)	Between (%)
1990–2001	21.49	19.06	2.43
2002–08	21.47	17.06	4.42

Brazil, 1992–2008

Period	Labour productivity growth (%)	Effect	
		Within (%)	Between (%)
1992–98	6.01	8.07	–2.06
1999–2008	18.11	17.90	0.21

Chile, 1990–2008

Period	Labour productivity growth (%)	Effect	
		Within (%)	Between (%)
1990–97	33.66	24.20	9.46
1998–2008	29.43	26.62	2.81

Mexico, 1990–2008

Period	Labour productivity growth (%)	Effect	
		Within (%)	Between (%)
1990–94	1.40	13.34	–11.94
1995–2000	10.49	6.41	4.08
2001–08	9.21	1.45	7.77

Source: CEPALSTAT, Latin America and the Caribbean, by economic activity.

the presence of a virtuous pattern in the 1990s. In Mexico, in contrast, there was regressive structural change early in the decade. Productivity growth accelerated after the 1995 crisis and continued in the 2000s, albeit in a context of slower aggregate growth. As a result, productivity in the 2000s was less dynamic in Mexico than in Argentina, Brazil and Chile.

What emerges from the analysis of the aggregate behaviour of the economy? Periods of high productivity growth in manufacturing may not foster productivity growth in the rest of the economy. Rising unemployment and slower economic growth associated with external constraints compromise the performance of the economy in a context of appreciation of the RER – particularly if ITPs are absent or in some cases reinforce the adverse effects of the RER on competitiveness.

3.5 Concluding remarks

We have discussed technological upgrading, structural change and productivity and employment growth in four Latin American economies (Argentina, Brazil, Chile and Mexico) and in the Republic of Korea (used as a benchmark for successful catching up) in the period 1970–2008. The structuralist-evolutionary framework is giving rise to different growth scenarios based on the combination of three regimes: demand regime, productivity regime and structural change regime. Different income growth, employment growth, productivity growth and structural change trajectories emerge under different parameter values, defined by the combination of macro policies, ITPs and shocks in the international economy.

We contend that, when the RER is appreciated and ITPs are weak or absent, productivity growth is driven by rationalization and defensive responses not related to the expansion of effective demand. In this case sectors that are more technology-intensive lose competitiveness, and employment moves to activities of lower productivity. Inversely, when the exchange rate is competitive and active IT policies favour the diversification of production, higher-quality employment increases, as does productivity. The combination of the RER policy and ITP is critical: without ITP, the RER can sustain only a labour absorption pattern that is unable to close the technology gap. At the same time, without a competitive RER, the ITP cannot promote rapid demand growth and fully exploit increasing returns. Our analysis also highlights the risks of long periods of RER appreciation, which adversely affect structural change and hence long-run growth.

References

Agosín, M.R.; Alvarez, R.; Bravo-Ortega, C. 2012. "Determinants of export diversification around the world", in *The World Economy*, Vol. 35, No. 3, pp. 295–315.

Amsden, A. 1989. *Asia's next giant: South Korea and late industrialization* (New York, Oxford University Press).

Baldwin, R. 1988. "Hysteresis in import prices: The beachhead effect", in *American Economic Review*, Vol. 78, pp. 773–785.

—; Krugman, P.R. 1989. "Persistent trade effects of large exchange rate shocks", in *Quarterly Journal of Economics*, Vol. 104, No. 4, pp. 635–654.

Bell, M. 2006. "Time and technological learning in industrialising countries: How long does it take? How fast is it moving (if at all)?", in *International Journal of Technology Management*, Vol. 36, No. 1–3, pp. 25–39.

Blecker, R. 1999. "Kaleckian macro models for open economies", in J. Deprez and J.T. Harvey (eds): *Foundations of international economics: Post-Keynesian perspectives* (London, Routledge).

—. 2009. *Long-run growth in open economies: Export-led cumulative causation or a balance-of-payments constraint?*, paper presented at the 2nd Summer School on Keynesian Macroeconomics and European Economic Policies, Research Network Macroeconomics and Macroeconomic Policies, Berlin, 2–9 August.

Bresser-Pereira, L.C. 2008. "Dutch disease and its neutralization: A Ricardian approach", in *Brazilian Journal of Political Economy*, Vol. 28, No. 1, pp. 47–71.

Cimoli, M. 1988. "Technological gaps and institutional asymmetries in a North-South model with a continuum of goods", in *Metroeconomica*, Vol. 39, No. 3, pp. 245–274.

—; Porcile, G. 2009. "Sources of learning paths and technological capabilities: An introductory roadmap of development processes", in *Economics of Innovation and New Technology*, Vol. 18, No. 7, pp. 675–694.

—; —. 2011. "Learning, technological capabilities and structural dynamics", in J.A. Ocampo and J. Ros (eds): *The Oxford handbook of Latin American economics* (Oxford, Oxford University Press).

—; —. 2014. "Technology, structural change and BOP constrained growth: A structuralist toolbox", in *Cambridge Journal of Economics*, Vol. 38, Issue 1, pp. 215–237.

—; —; Rovira, S. 2010. "Structural convergence and the balance-of-payments constraint: Why did Latin America fail to converge", in *Cambridge Journal of Economics*, Vol. 34, No. 2, pp. 389–411.

Damill, M.; Frenkel, R. 2009. "Las políticas macroeconómicas en la evolución reciente de la economía argentina", in *Nuevos Documentos CEDES*, 65.

Díaz-Alejandro, C.F. 1983. "Stories of the 1930s for the 1980s", in P.A. Armella, R. Dornbusch and M. Obstfeld (eds): *Financial policies and the world capital market: The problem of Latin American countries* (Chicago, IL, University of Chicago Press).

Dosi, G.; Pavitt, K.; Soete, L. 1990. *The economics of technical change and international trade* (London and New York, Harvester Wheatsheaf Press and New York University Press).

—; Lechevalier, S.; Secchi, A. 2010. "Introduction: Interfirm heterogeneity? Nature, sources and consequences for industrial dynamics", in *Industrial and Corporate Change*, Vol. 19, No. 6, pp. 1867–1890.

ECLAC (Economic Commission for Latin America and the Caribbean). 2003. *A decade of light and shadow: Latin America and the Caribbean in the 1990s* (Santiago, United Nations).

—. 2007. *Progreso técnico y cambio estructural en América Latina* (Santiago and International Development Research Centre). Available at: http://www.eclac.cl/publicaciones/xml/9/32409/LCW136.pdf (accessed 18 Dec. 2013).

—. 2008. *Structural change and productivity growth: Old problems, new opportunities* (Santiago, United Nations).

Eichengreen, B. 2008. *The real exchange rate and economic growth,* Working Paper No. 4, Commission on Growth and Development (Washington, DC, International Bank for Reconstruction and Development, World Bank).

Ffrench-Davis, R. 2000. *Reforming the reforms in Latin America: Macroeconomics, trade and finance* (London, Palgrave Macmillan).

—. 2002. *Chile between neoliberalism and equitable growth* (Ann Arbor, MI, University of Michigan Press).

Frenkel, R. 2004. *From the boom in capital inflows to financial traps,* Initiative for Policy Dialogue Working Paper Series (New York, Initiative for Policy Dialogue).

Freund, C.; Pinerola, M.D. 2008. *Export surges: The power of a competitive currency*, Policy Research Working Paper 4750, October (Washington, DC, World Bank).

Gallagher, K.; Moreno-Brid, J.C. 2008. "The dynamism of Mexican exports: Lost in (Chinese) translation?", in *World Development*, Vol. 8, No. 36, pp. 1365–1380.

Hausmann, R.; Hwang, J.; Rodrik, D. 2007. "What you export matters", in *Journal of Economic Growth*, Vol. 12, No. 1, pp. 1–25.

Katz, J. 1997. *Structural reforms, the sources and nature of technical change and the functioning of the national systems of innovation: The case of Latin America*, paper presented at the STEPI International Symposium on Innovation and Competitiveness in NIEs, Seoul, Republic of Korea, May.

—. 2008. *Una nueva visita a la teoría del desarrollo económico*, Colección de Documentos de Proyecto, lc/w.167, lc/bue/w.21 (Santiago, United Nations).

Lima, G.T.; Porcile, G. 2013. "Economic growth and income distribution with heterogeneous preferences on the real exchange rate", in *Journal of Post Keynesian Economics*, Vol. 35, No. 4, pp. 651–674.

McMillan, M.; Rodrik, D. 2011. "Globalization, structural change and productivity growth", in M. Bacchetta and M. Jansen (eds): *Making globalization socially sustainable* (Geneva, ILO and WTO).

Ocampo, J.A. 2005. "The quest for dynamic efficiency: Structural dynamics and economic growth in developing countries", in J.A. Ocampo (ed.): *Beyond reforms, structural dynamics and macroeconomic vulnerability* (Palo Alto, CA, Stanford University Press).

—. 2011. "Macroeconomy for development: Countercyclical policies and production sector transformation", in *CEPAL Review,* Vol. 104, pp. 7–35.

—; Rada, C.; Taylor, L. 2009. *Growth and policy in developing countries: A structuralist approach* (New York, Columbia University Press).

Pacheco-Lopez, P.; Thirlwall, A.P. 2006. "Trade liberalization, the income elasticity of demand for imports and economic growth in Latin America", in *Journal of Post Keynesian Economics,* Vol. 29, No. 1, pp. 41–61.

Prebisch, R. 1950. *The economic development of Latin America and its principal problems* (New York, United Nations).

Rapetti, M. 2011. *Macroeconomic policy coordination in a competitive real exchange rate strategy for development*, Working Paper 2011–9 (Amherst, MA, Department of Economics, University of Massachusetts).

Razmi, A.; Rapetti, M.; Skott, P. 2009. *The real exchange rate as an instrument of development policy*, Working Paper 2009–07 (Amherst, MA, Department of Economics, University of Massachusetts).

Reinert, E.S. 1995. "Competitiveness and its predecessors: A 500 year cross-national perspective", in *Structural Change and Economic Dynamics*, Vol. 6, pp. 23–42.

Rodríguez, O. 2007. *El estructuralismo latinoamericano* (Mexico, Siglo XXI).

Rodrik, D. 2008. "The real exchange rate and economic growth", Brookings Papers on Economic Activity, Vol. 39, No. 2 (Washington, DC, Brookings Institution).

Ros, J. 2000. *Development theory and the economics of growth* (Ann Arbor, MI, University of Michigan Press).

Saviotti, P.; Frenken, K. 2008. "Export variety and the economic performance of countries", in *Journal of Evolutionary Economics*, Vol. 18, No. 2, pp. 201–218.

Setterfield, M. 2009. *Neoclassical growth theory and heterodox growth theory: Opportunities for and obstacles to greater engagement*, Working Paper 09–1 (Hartford, CT, Trinity College, Department of Economics).

Stalling, B.; Peres, W. 2000. *Growth, employment and equity: The impact of economic reforms in Latin America and the Caribbean* (Washington, DC, Brookings Institution Press).

Thirlwall, A. 2011. *Balance of payments constrained growth models: History and overview*, School of Economics Discussion Paper 1111 (Canterbury, University of Kent).

Appendix

Theoretical framework: Demand, productivity and structural change regimes

Understanding the evolution of unemployment requires discussing the determinants of the demand for labour. Growth of total employment (n) equals GDP growth (y) minus the rate of growth of labour productivity (a):

$$(1) \quad n = y - a$$

Lowercase letters represent proportional rates of growth (e.g. income growth is $y \equiv \left(dY/dt\right)/Y$). We focus first on economic growth and subsequently on the determinants of productivity growth.

Keynesians point out that, to curb unemployment, one should look mainly to the growth of effective demand rather than to changes in the institutions of the labour market (such as changes in the strength of labour unions, the flexibility of labour contracts and nominal and real rigidity of wages and prices). In this appendix we present a simple North (developed economy) – South (catching-up economy) heuristic model that illustrates the interaction among employment, the pattern of specialization and the growth of effective demand.

The point of departure is the literature on the external constraint on growth. This literature argues that, in countries specialized in a few sets of (usually low-tech) commodities, rates of growth are constrained by the recurrent emergence of external disequilibrium, which frequently takes the form of balance of payments (BOP) crises. Countries cannot grow for long periods with a rising deficit in the current account as a percentage of gross domestic product (GDP); therefore, rates of growth should adjust to restore equilibrium.[18] Supply-side variables (technological asymmetries with the North) and demand-side variables (patterns and shifts in the international demand for consumer and capital goods; rate of growth of the global economy) combine to define the rate of growth compatible with long-run equilibrium in the current account.

[18] Several developing countries have experienced discontinuous, stop-and-go patterns of growth punctuated by external crisis – some of them with effects that persist for long periods. For a discussion of the external constraint on growth from the perspective of Latin American structuralism, see Rodríguez (2007). Recent revisions and extensions are Blecker (2009), Cimoli and Porcile (2011), Setterfield (2009) and Thirlwall (2011). For a discussion of the external constraint and its links with macro policies, see Ocampo, Rada and Taylor (2009, Chapter 7).

Equations (2) and (3) express the rate of growth of exports (x) and imports (m) as a function of the real exchange rate (r), the growth of domestic income (in the imports equation), international income (in the exports equation) and structural change:

$$(2)\quad x = x\left(\rho, z, y^*\right),\ x'\left(\rho\right) > 0, x'\left(z\right) > 0, x'\left(y^*\right) > 0$$
$$(3)\quad m = m\left(\rho, z, y\right),\ m'\left(\rho\right) < 0, m'\left(z\right) < 0, m'\left(y\right) > 0$$

In equations (2) and (3) y is growth of real GDP in the South; y^* is the growth of real GDP in the North; z represents the diversification of the economic structure (structural change towards sectors with higher Keynesian and Schumpeterian efficiency); and $r = P^*E/P$ is the real exchange rate (P^* and P are foreign and domestic prices, respectively, and E is the nominal exchange rate defined as units of domestic currency per unit of foreign currency). Equilibrium in the trade balance, where M and X are the volume of imports and exports, implies:

$$(4)\quad P^* EM = PX$$

The dynamic condition for equilibrium in the current account (assuming a balanced current account initially) is:

$$(5)\quad p^* + e + m = p + x$$

Using (2) and (3) in (5) gives:

$$(6)\quad y = y\left(\rho, z, y^*\right),\ y'\left(\rho\right) > 0, y'\left(z\right) > 0, y'\left(y^*\right) > 0$$

In Kaldorian terms equation (6) represents *the demand regime* of the economy, which gives the rate of economic growth compatible with equilibrium in the current account. The elasticity of growth with respect to r is positive, which implies that the Marshall–Lerner condition holds. In turn, the elasticity of growth relative to diversification is represented by the positive (negative) derivative of the rate of growth of exports (imports) relative to structural change (z). The Kaldorian demand regime is usually associated with export-led growth. However, as Blecker (2009) shows, such a rate of growth may be incompatible with current account equilibrium and, hence, not sustainable in the long run. It is necessary to consider the response of imports to faster growth, and not only the response of growth to more exports. For this reason the demand regime is defined in accordance with the BOP-constrained growth model.

Productivity growth (*a*) depends on the RER, economic growth and structural change. Formally:

$$(7) \quad a = a(\rho, y, z),\ a'(\rho) < 0,\ a'(y) > 0,\ a'(z) > 0$$

Equation (7) defines Kaldor's *productivity regime*. The argument in equation (7) has three variables. The first is the RER, which is assumed to affect productivity growth for two reasons:[19] it fosters imports of capital goods and increases the pressure of foreign competition on domestic firms (see subsection 3.2.1).[20] The second variable in the argument of equation (7) represents learning-by-doing, which depends on the rate of economic growth (y), as stated in the Kaldor–Verdoorn Law.

Finally, structural change (z) depends on the RER and productivity growth:

$$(8) \quad z = z(\rho, a),\ z'(\rho) > 0,\ z'(a) > 0$$

A higher RER and a higher *a* favour competitiveness and diversification, and this is why the derivatives of z with respect to *r* and *a* are positive.

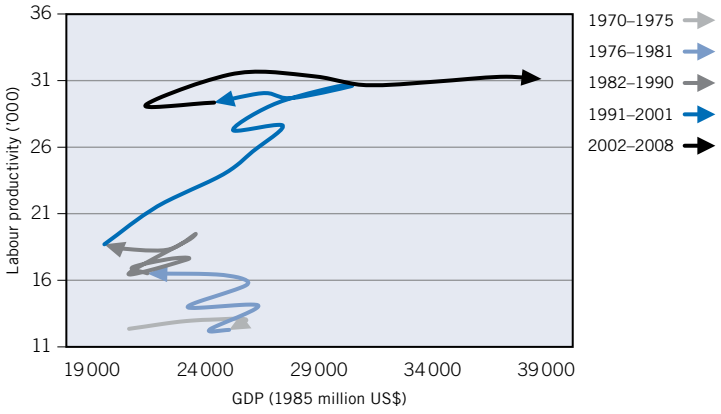
Equations (1), (6), (7) and (8) form a system of four equations with four unknowns: economic growth (*y*), productivity growth (*a*), employment growth (*n*) and structural change (*z*). The exogenous parameters are the RER (*r*), the rate of growth of the global economy (y^*) and the Kaldorian coefficients that link productivity growth to economic growth and structural change. The values of the parameters respond to changes in policies and external conditions. The RER is defined by the mix of macroeconomic policies and by external shocks in lending and terms of trade. Technological coefficients are affected by industrial and technological policies (ITPs). Note that, although government does not fully control the RER, it is assumed that macro policies do have an influence on this variable. The experience of countries such as Brazil, Germany and the Republic of Korea in the 1960s and part of the 1970s, and more recently China, support this hypothesis.

[19] This is a point of debate in the literature. See Lima and Porcile (2013).

[20] See Blecker (1999).

Evolution of productivity and value added in the manufacturing sector, 1970–2008

Figure A3.1 Argentina: manufacturing sector, 1970–2008



Note: The reciprocal of the employment level is given by $\frac{\partial(Q/L)}{\partial Q}=1/L$, the slope of the curve in the graph above.

Figure A3.2 Brazil: manufacturing sector, 1970–2008

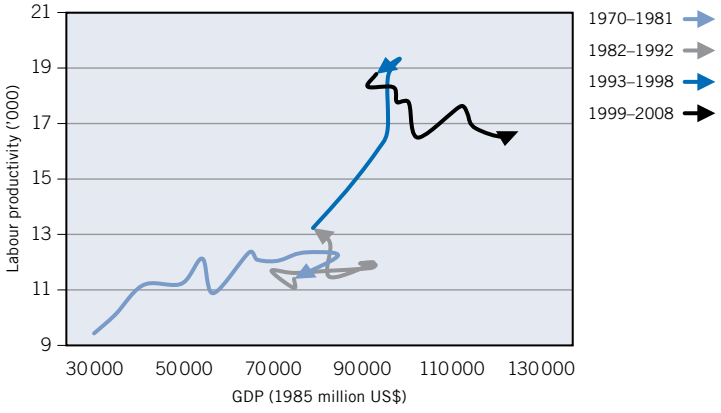


Figure A3.3 Chile: manufacturing sector, 1970–2008

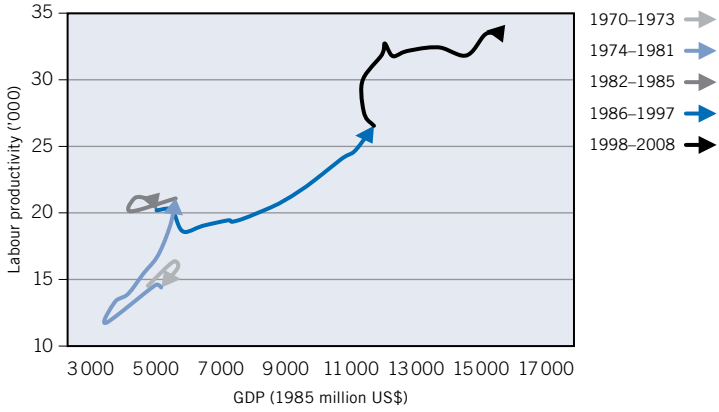


Figure A3.4 Mexico: manufacturing sector, 1970–2008

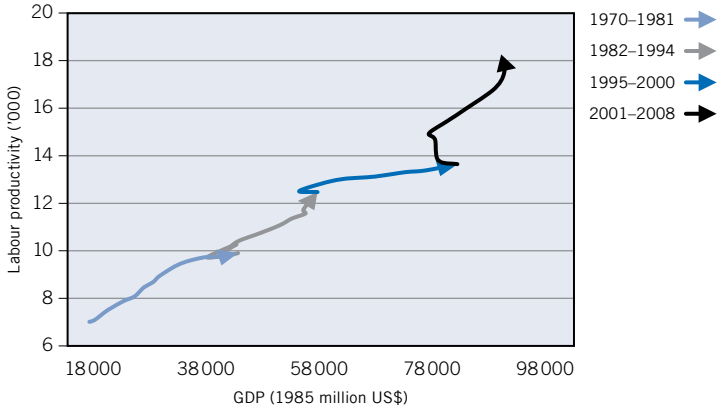
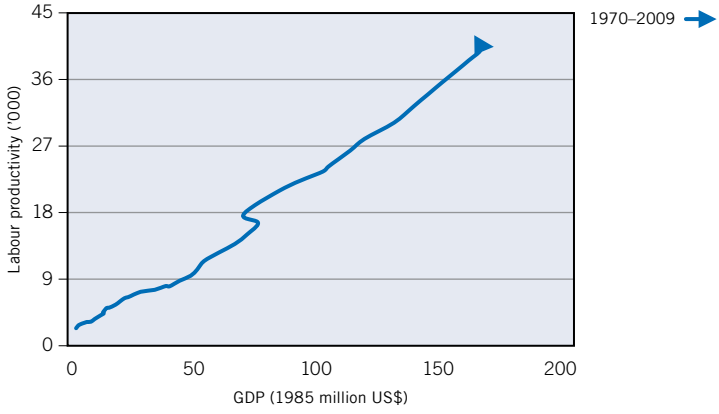


Figure A3.5 Republic of Korea: manufacturing sector, 1970–2009



Evolution of productivity and value added in the economy, 1970–2010

Figure A3.6 Evolution of productivity and value added in the economy, 1970–2010: Argentina

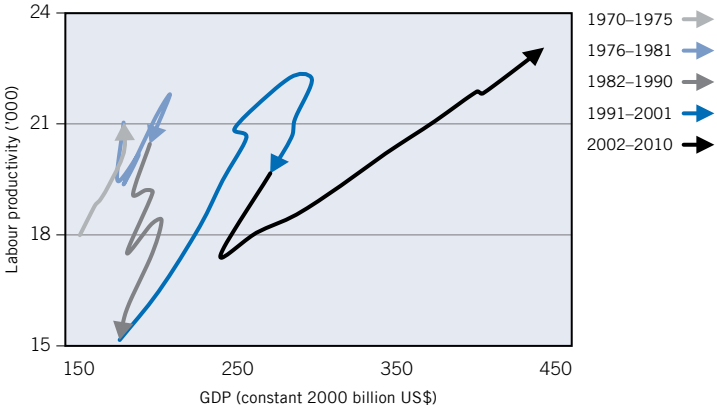


Figure A3.7 Evolution of productivity and value added in the economy, 1970–2010: Brazil

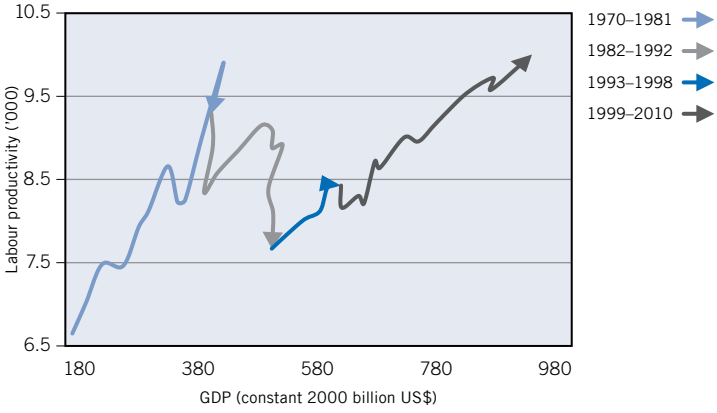


Figure A3.8 Evolution of productivity and value added in the economy, 1970–2010: Chile

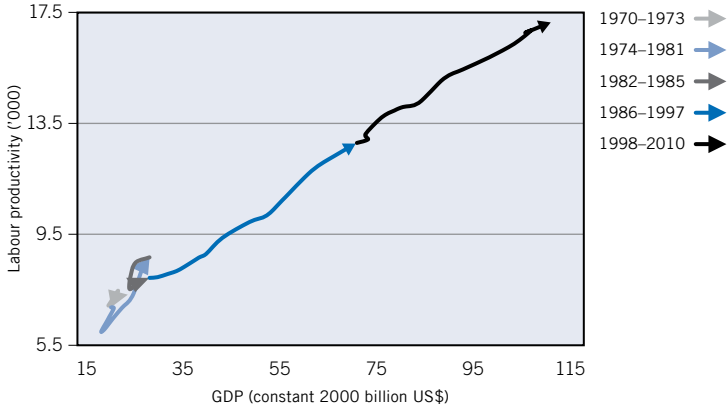


Figure A3.9 Evolution of productivity and value added in the economy, 1970–2010: Mexico

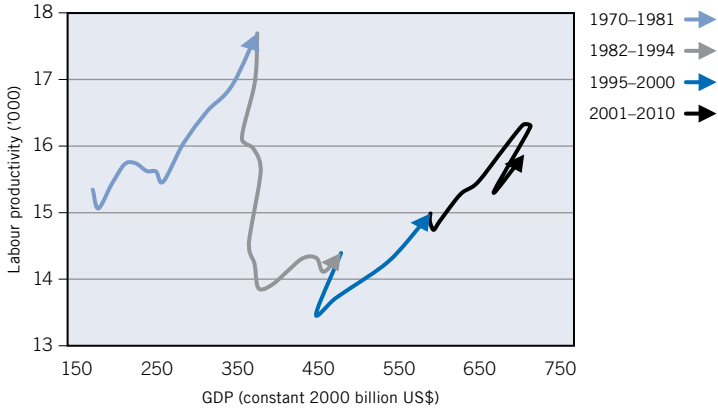


Figure A3.10 Evolution of productivity and value added in the economy, 1970–2009: Republic of Korea