

## **Summary**

*Despite macroeconomic stabilization and structural reforms, employment problems have persisted in Latin America. The 1990s have seen a slowdown in the rate of job creation, unemployment rates have stagnated at about 10%; informal sector employment has expanded, and increases in real wages have been particularly favorable to skilled workers. The purpose of this article is to explain this apparent labor paradox. The main conclusion is that economic cycles explain the fluctuations of employment and unemployment rate (around their structural levels), while price stabilizations and structural reforms have affected the composition of labor demand and relative wages.*

*The transmission mechanism connecting the new macro policies with the labor results has been as follows:*

- (1) Stabilization and reforms produced capital inflows and an appreciation in the foreign exchange rate; it has cut the user cost of capital and increased the productivity of the factors.*
- (2) Consequently, relative prices evolved in favor of the nontradable sectors, and stocks of physical capital, as a percentage of GDP, have risen.*

*The mechanism has had four effects on labor:*

- (1) The role of employment in nontradables has risen in response to the signals from relative prices and the more intensive use of machinery in tradable sectors.*
- (2) Informal sector employment has grown due to the nature of the jobs in nontradable sectors and the relative decline in the demand for unskilled labor.*
- (3) Demand for labor has shifted toward skilled workers because of the increase in stocks of machinery, the adoption of new technologies, and the expansion of the nontradable sectors, which use skilled workers more intensively.*
- (4) Lastly, wage differentials have increased because of the rise in relative demand for skilled labor.*

*Structural reforms, particularly the “opening up” of the region’s economies, have not had the effect of raising demand for and relative remuneration of unskilled labor as had been hoped in the light of conventional theories of competitive advantages in international trade.*

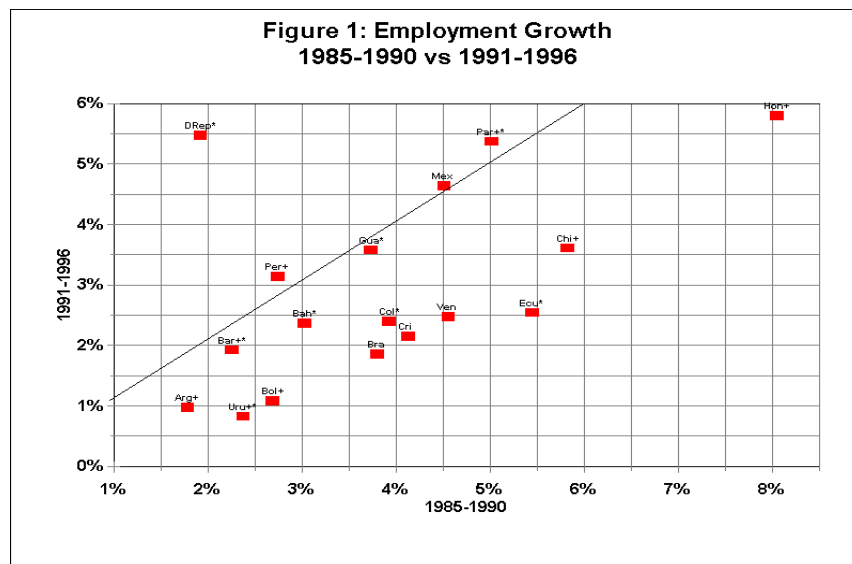
*These results raise a variety of policy questions:*

- (1) Since workers are now more exposed to factors of instability, there is a greater demand for macro stability and social protection. How is the demand to be satisfied?*
- (2) In Latin America’s tax structures payroll taxes and fiscal incentives for investment are commonly found together. Are these structures suitable to promote unskilled labor demand and reduce wage differentials?*
- (3) Should public expenditure in higher education be expanded in order to address the growing scarcity of skilled manpower?*

# 1. Introduction

During the 1990s, Latin America has recovered the macroeconomic stability it had lost in the previous decade and countries have adopted a set of structural reforms that have enabled them to boost economic growth rates and reduce volatility (IADB, 1997). But the new economic model seems not to have fully solved the labor problems<sup>1</sup>

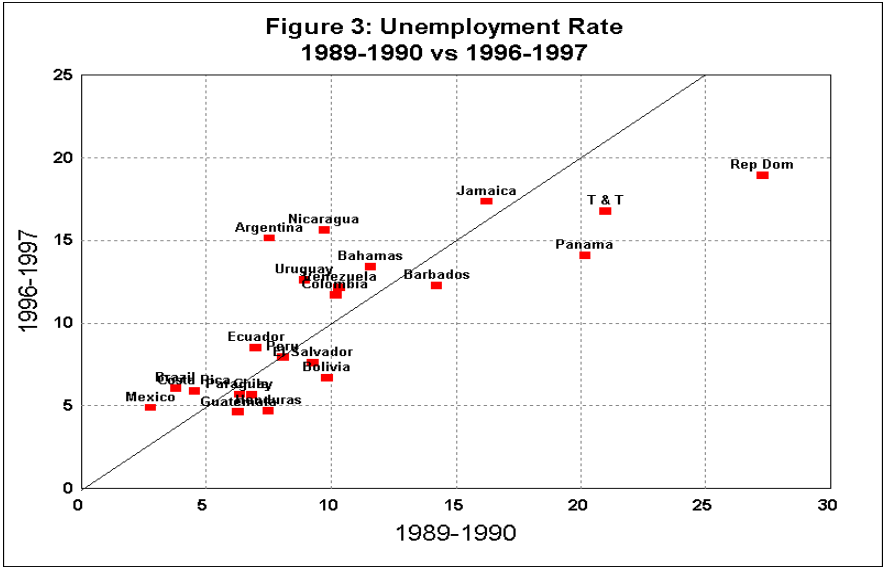
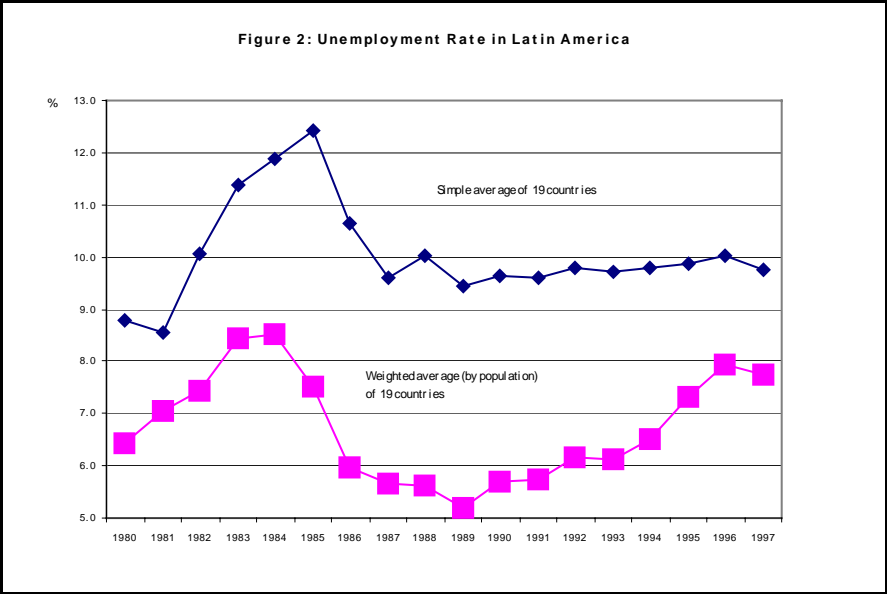
- ◆ The rate of growth in employment has been lower in the 1990s than in the latter half of the 1980s, both in the region as a whole and in most individual countries (Figure 1)<sup>2</sup> ;



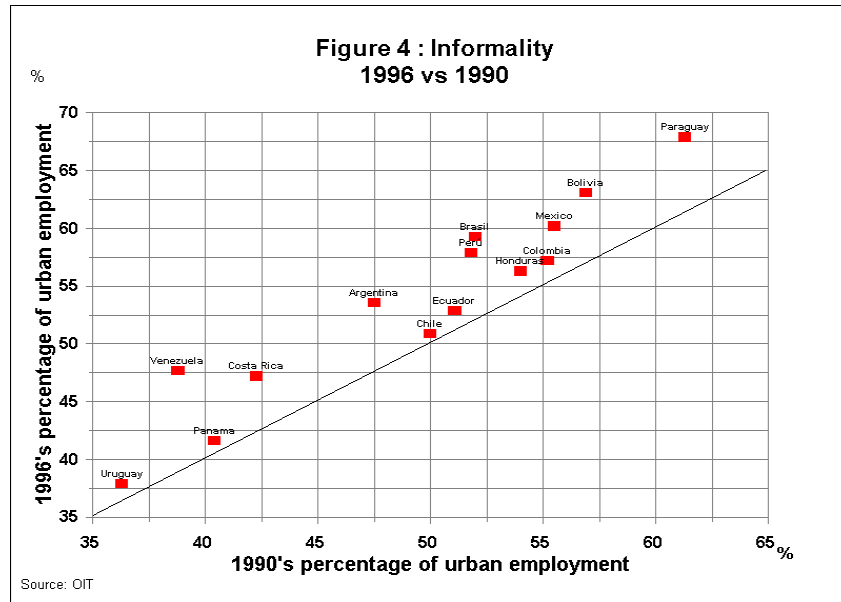
- ◆ No reduction has been achieved in the average unemployment rate in the region during the 1990s. It has remained at about 10 % (with increases in some countries and reductions in others, but showing no clear pattern). Furthermore, since there have been appreciable increases in unemployment in some of the large countries (most notably in Argentina), the percentage of unemployed Latin American workers has jumped from 5% at the end of the 1980s to 8% in recent years (Figures 2 and 3);

<sup>1</sup>A more complete description of the stylized facts of the employment problem in Latin America can be found in the accompanying article by Lora and Márquez (1998).

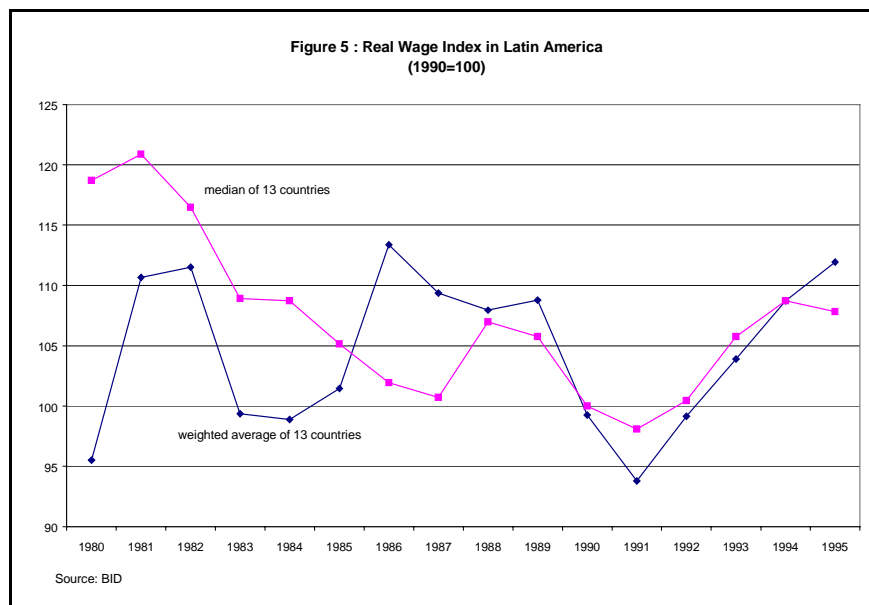
<sup>2</sup>The sources of the series used in the charts and the econometric exercises are listed in Appendix 1.

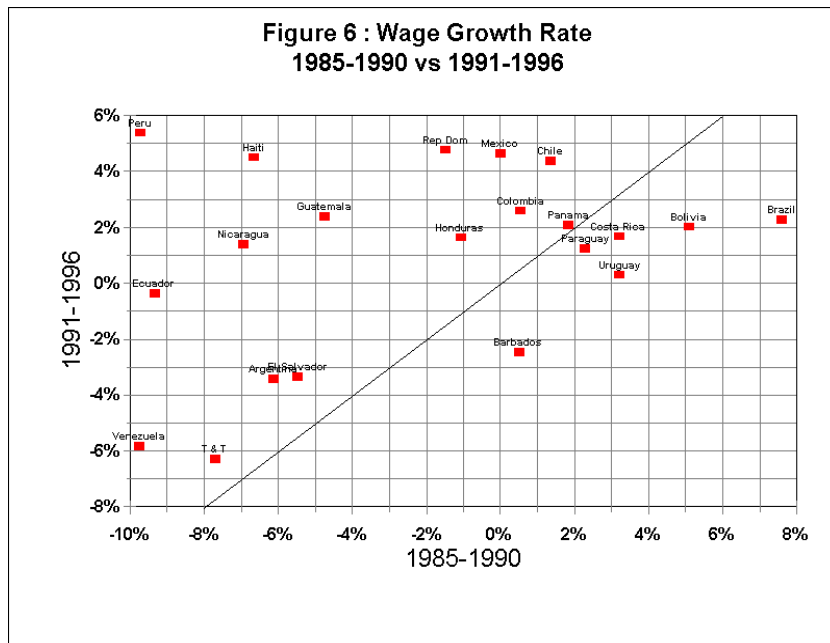


- ◆ Nor has any reduction in the rates of informal employment been observed. On the contrary, according to ILO statistics, in 1996 they were higher than in 1990 in all countries for which data is available. In some cases, the changes assume real importance. (Figure 4);

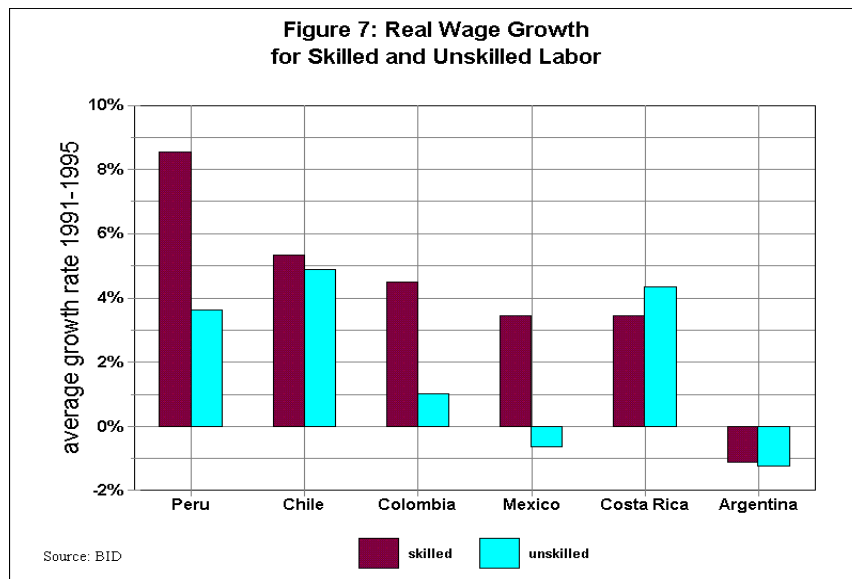


- ◆ Real wages have behaved better in the 1990s than in the second half of the 1980s in most countries, because they are either rising more rapidly or falling more slowly. However, real wage *levels* in some countries are still below those of the early 1980s (Figures 5 and 6);





◆ Of greater concern from the social and distributive standpoint is the circumstance that in some countries, the increases in real wages in the 1990s have been particularly beneficial to skilled workers vis-à-vis the unskilled. Colombia, Mexico, and Peru are three especially prominent cases in which widening wage gaps, based on skill levels, have been observed. In other countries (Argentina, Chile, Costa Rica), wage differentials have remained largely unchanged (Figure 7).<sup>3</sup>



Given this behavior by labor-related variables, it is not surprising that the number one concern of Latin Americans

<sup>3</sup> Two measurements of wage differentials are used in this article: between white-collar and blue-collar workers in industrial sectors, and between workers who have at least a high-school education and the rest of the workers. See the accompanying article by Durycia and Székely (1998) in which other ways to measure wage inequalities are used and it is shown that in all the cases examined, the concentration of earnings, as measured by the Gini coefficient, has increased.

is the shortage of jobs, and that the opinion has become widespread in Latin America that economic and social progress has ground to a halt despite the economic reforms.<sup>4</sup>

At first glance, the results in terms of labor appear paradoxical, since it was to be expected that macroeconomic stabilization and structural reforms would facilitate the creation of higher-productivity jobs by boosting economic growth and investment and bringing about a more efficient allocation of productive resources, thanks to the improved functioning of markets. There is no doubt that the stabilization programs and reforms of the past decade did indeed produce the desired effect on GDP growth. Several studies<sup>5</sup> have found that this effect took the form of an increase of about two points per year in growth of GDP. According to these studies, this increase was made possible by the improved functioning of the markets and the higher levels of efficiency which, in turn, resulted from freer mechanisms of assignment of productive resources. Consequently, there is a “labor paradox” that demands an explanation; it is not obvious why better macro and micro functioning has not produced more perceptible improvements in the labor field.

The purpose of this article is to show that the principal changes in the labor markets in the past decade are related to macroeconomic transformations generated by the processes of stabilization and structural reform. The remainder of this article is organized as follows: in the section following this introduction, we discuss the relationship between employment and economic growth. In Section 3, we summarize the principal changes that have taken place in the composition of the demand for labor. In Section 4, we show the effects of the principal macro phenomena. In Section 5, we tie those effects to the changes in the composition of demand for labor. Section 6 discusses, very briefly, the different channels by which trade patterns influence labor variables. The article ends with a section on potential topics for a debate on economic and social policy as suggested by our analysis. The appendices at the end of this paper provide statistical details on changes in the composition of the demand for labor in six Latin American countries during the past decade, and furnish econometric support for some of the key relationships between labor results and the macro variables derived from this analysis. The appendices also include a short description of a simulation model that helps to understand the differences in results among countries with different degrees of rigidity in their labor markets, and among countries at different development levels.

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<sup>4</sup> For more details about these perceptions, see Lora and Márquez (1998).

<sup>5</sup> Easterly, Loayza and Montiel (1997); Fernández and Montiel (1997); and Lora and Barrera (1997).

## 2. Economic growth, employment, and unemployment

### *More growth, less employment?*

How can we explain the fact that the higher economic growth rates of the 1990s have not translated into a faster pace of job creation, and reductions in unemployment? Average economic growth in the region has increased from 2.7 percent in the second half of the 1980s to 4 percent between 1991 and 1997. However, employment has risen only 2.8 percent during the 1990s, 0.5 percent less than in the late 1980s. However, can it be said that the changes in economic policy during the last decade were misguided, since they have led to a situation of “growth without employment?”

In order to answer these questions, it is desirable to confirm, in the first place, that average rates of growth in employment in each country since 1980 have indeed tended to reflect the pace of expansion of the labor force while, when seen from year to year, growth in employment has oscillated around those average rates in response to fluctuations in the business cycle. As we can see from the econometric results shown in Appendix 3, employment elasticity with respect to the labor supply is, with a very high probability, around 1, while employment elasticity with respect to the economic growth rate stands at about 0.3. It is important to note, however, that this sensitivity of employment to economic growth is strictly a short-term relationship, since a growth rate in employment that differs from the pace of growth in the labor supply cannot be sustained indefinitely.<sup>6</sup>

Having established this basic hypothesis, we must then ask whether there is evidence that the reaction of employment to changes in GDP is different than before, now that countries have adopted the new economic policies. The answer is negative: no significant change has been detected in employment elasticity with respect to greater or lesser growth in GDP (either above or below its permanent rate) since the policies of openness were adopted or other important changes made in economic policy (to be described briefly later in this article).<sup>7</sup>

How, then, can we explain why employment grew more slowly in the presence of the higher growth rates that have prevailed in the 1990s? The answer is that the more moderate pace of growth in employment reflects the slower pace of expansion of the labor force<sup>8</sup>, while the higher rates of *permanent* economic growth have been the result of productivity increases. As we will see later, structural reforms produced a recovery in the rates of growth in total productivity of the factors that explains the bulk of the increase in economic growth rates. By definition, this gain could not have been reflected in greater growth in employment, but the fluctuations around today’s higher rates of economic growth have effects on employment similar to those observed in the past.

In short, (1) the fluctuations of the growth rates of employment are associated, as before, to the economic cycle; (2) the fact that employment growth trends reflects a more moderate expansion of the working forces of the countries, and (3) it is correct to state that the permanent gains that produced the reforms did not generate jobs, since those gains were derived from productivity increases.

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<sup>6</sup> This is why the regressions use as an explanatory variable not the rate of growth in GDP, but the *deviations* from the GDP growth rate with respect to its permanent trend (which is obtained by a non-linear method, as explained in Appendix 1 on the definition of variables).

<sup>7</sup> There may be different ways to establish the moment when macroeconomic and structural policies were changed, in order to define the “before” and “after” periods that are needed in order to make this verification. In the regressions shown in the appendix, we use the year of the *apertura*. (IADB, 1996, Part 2, Chapter 2) as a criterion, since in most countries the other reforms centered around this reform. However, we have also determined that the results do not change when the cutoff point is defined in other ways.

<sup>8</sup> A result that is confirmed via the exercise in breakdown of the changes in the growth in employment presented in Appendix 2 of the introductory article by Lora and Márquez (1998).

## *Changes of unemployment rates*

Implicit throughout this line of reasoning is that rates of unemployment must have fluctuated around relatively stable levels in each country, and that these fluctuations must also have reflected the cycles in economic activity. Is this implication correct? What factors have influenced the behavior of unemployment?

There are three groups of factors that cause unemployment rates to vary: structural, cyclical, and frictional. By structural factors we mean the sociodemographic characteristics (such as age, fertility, and education), and institutional aspects (such as labor laws, minimum wages, etc.) that determine the rate at which participants enter and leave the labor market and the ease with which they can find employment. In the following discussion we shall set aside these factors, which change slowly over time and have been analyzed in other articles.<sup>9</sup> The cyclical factors are the ones related to fluctuations in aggregate economic activity, and the frictional ones are associated with reassignments of labor resources owing to changes in the composition of production, production techniques, or methods of work organization.

Leaving aside the structural factors, it can be verified that the fluctuation in unemployment rates in countries of the region has been closely tied to cyclical and frictional factors.<sup>10</sup> For each point of decline in economic growth, the unemployment rate rises by approximately a quarter of a point per year. In Latin America, periods of deceleration typically bring with them reductions of 6 points in growth with respect to boom periods. This leads to increases in the unemployment rate on the order of 1.5 points per year during the deceleration phase, and vice versa. There is no way to measure frictional factors directly. In the econometric exercises we have used two indicators: one that measures sectoral imbalances in economic growth, and another that attempts to measure the speed of technical and organizational change as the change in the ratio between the stock of imported machinery and the permanent product.<sup>11</sup> Although both have the expected sign—greater friction, greater unemployment—only the second variable is significant and robust. A 1% increase in that ratio (above its trend in each country) turns out to be associated with something less than a 0.1 point rise in unemployment. As we will see later, the recovery of investment has been influenced by macro and structural policies, so it is correct to state that, through this channel, these policies may have had a transitory affect on unemployment rates. On average, this effect may have been responsible for an increase of about half a point in unemployment rates in the 1990s, but in countries where the process of renovation of machinery was very vigorous, as in Argentina between 1991 and 1995, the resulting increase may have been as great as 3 points.

We have seen that short-term fluctuations of employment growth and unemployment rates have been closely associated to cyclical and frictional factors, which can be regarded as transitory in nature, while the more permanent changes in the rates of growth in employment have reflected the trends in the expansion of the labor force. One should not conclude from this, however, that the *apertura* [the “opening” of the economies] and, in general, the set of macro policies adopted in Latin America during the past decade have had no impact on the labor market,

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<sup>9</sup> In Duryea and Székely (1998) these sociodemographic factors are discussed, and the institutional factors are treated in Márquez and Pagés (1998).

<sup>10</sup> See Table A3.2 of Appendix 3. We have not reported estimates including demographic factors (participation by females and by age groups) and institutional factors (index of job protection according to Márquez and Pagés, 1998) because these yielded very low levels of significance, but without affecting the robustness of the other coefficients.

<sup>11</sup> This association has ample support in both theoretical and empirical literature (Pissarides, 1997; Wood, 1997) and is a central component of the changes in the composition of the demand for labor that are discussed later.

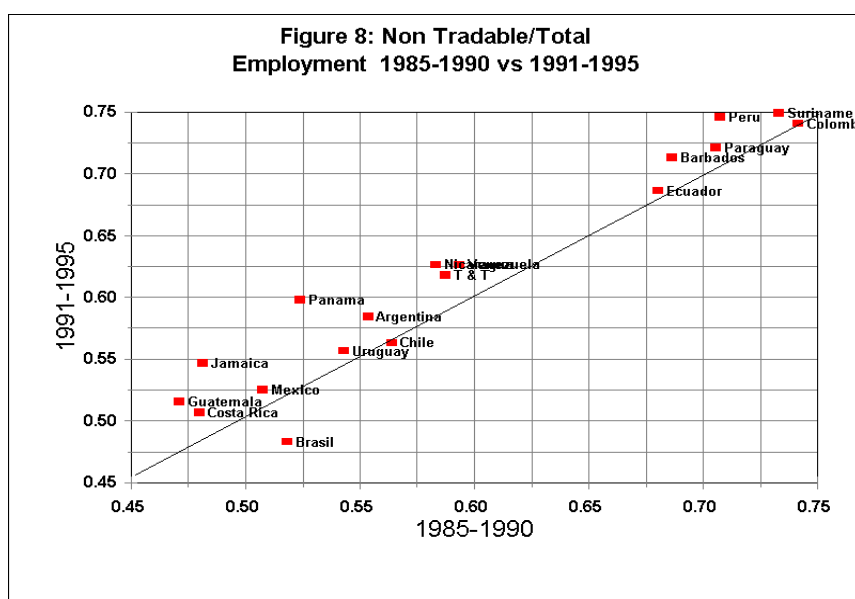


employment, or pay scales. The remainder of this article is intended to show precisely this: that the most important effects have been not so much on the labor aggregates, but on their *composition*. This is a promising avenue of inquiry, not just to satisfy academic curiosity, but because perhaps it is there that we are most likely to find the explanation for the serious dissatisfaction displayed by Latin Americans with respect to the consequences for labor of the new policies.

### 3. What changes have occurred in the composition of demand for labor?

The composition of the demand for labor in Latin America has undergone four significant changes in the 1990s:

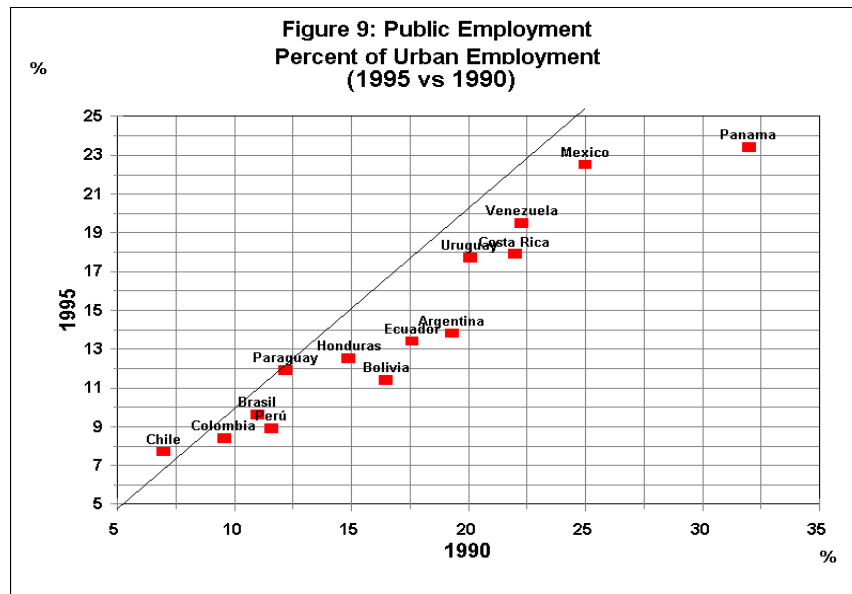
- ◆ Labor demand in the nontradable sectors (construction and services) has increased in terms of total labor demand. Employment in these sectors climbed from 58.4% of total employment in 1990 to 63% five years later (Figure 8). Only in Brazil has the trend been different. Despite this exception, nontradable sectors have typically generated all the expansions in employment seen during the 1990s.



- ◆ The role of informal employment has increased (as we saw earlier, in Figure 4). By “informal employment” we mean self-employment, jobs in microenterprises,<sup>12</sup> and domestic service. In 1996, informal sector employment accounted for 57.4% of total employment, nearly six points more than in 1990. In Latin America as a whole, the expansion in the number of jobs in the informal sector during this period was equivalent to 80% of the net increase in employment. In Argentina and Mexico, this coefficient was greater than 100%, since those countries experienced a net elimination of formal jobs<sup>13</sup>.
- ◆ The share represented by government employment has fallen from 15.3% in 1990 to 13.2% in 1995. In seven countries (Argentina, Brazil, Costa Rica, Ecuador, Panama, Peru, and Uruguay), direct employment in the public sector fell in absolute terms, sometimes very significantly. It is estimated that in Argentina the reduction in government employment was equivalent to 11% of total formal employment, and for Peru this figure was 7% (Figure 9).

<sup>12</sup> Employing no more than five or ten workers, depending on the statistical conventions adopted by each country.

<sup>13</sup> Keep in mind, however, that in 1996, these two countries were still experiencing the effects of the “tequila” crisis.



- ◆ The demand for skilled labor has increased with respect to unskilled labor. Unlike previous changes in composition, this is not a directly-observable phenomenon, since the changes in the composition of employment between skilled and unskilled labor necessarily tend to reflect the changes in the relative *supply* of skilled workers, which has increased throughout the region owing to the expansion in education (see Table 1). Nevertheless, since relative wages paid to skilled workers have increased (or declined only slightly) instead of shrinking markedly, the implication is that the relative *demand* for skilled workers has risen even more rapidly than the supply. Assuming an elasticity of substitution between the two types of workers of 1.5,<sup>14</sup> one can conclude that relative demand for skilled workers has increased at rates between 2.3% and 7.4% annually for the group of countries under consideration (Costa Rica and Mexico being the extreme cases). To put it another way, the demand for labor has not expanded proportionately for all types of work, but has shown a bias toward the more skilled workers. That is why, although these individuals are increasingly plentiful in relative terms, they receive proportionately higher wages.<sup>15</sup>

In short, the demand for labor in Latin America during the past decade has experienced four changes in composition, and this is generally true for all the countries. These changes are the growing preponderance of the services sector [*terciarización*],<sup>16</sup> the increasing importance of the informal sector, privatization, and a preference for workers who have higher skill levels.

**Table 1. Relative Demand Growth for Skilled vs Unskilled Labor**

	Relative supply growth (annual)	Relative wages growth	Implicit relative demand growth (annual)
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<sup>14</sup> Taken from Robbins (1996). See Hamermesh (1993) for a brief description of estimates of elasticities of labor substitution and demand.

<sup>15</sup> This is true even after one corrects for changes in average levels of education between the groups of “skilled” and “unskilled” workers, respectively. In these comparisons, workers are defined as “skilled” if they have at least finished high school. The calculations presented in Table 1 take the changes in education level into account.

<sup>16</sup> Henceforth this term will be used as equivalent to the increase in participation of employment in the nontradable sectors (although, strictly speaking, this is incorrect since construction—a nontradable sector *par excellence*—is not a tertiary sector.)

		(annual)	
<b>Argentina (1980-96)</b>	3,7%	-1,7%	3,3%
<b>Bolivia (1986-95)</b>	3,9%	1,8%	4,7%
<b>Costa Rica (1981-95)</b>	3,1%	-0,8%	2,3%
<b>México (1984-94)</b>	5,1%	4,5%	7,4%
<b>Venezuela (1981-95)</b>	6,8%	-0,6%	5,1%

Note: Changes take account of schooling changes and assume the elasticity substitution of skilled vs unskilled labor demand 1.5

#### **4. What have been the macro consequences of stabilization and structural reforms?**

During the past decade, economic policy throughout Latin America has been aimed at consolidating macro stability and facilitating the functioning of the markets.

Latin America has completely recovered the stability it had lost in the 1980s. In 1997, the average rate of inflation fell below 10%, and only one country recorded inflation higher than 30%. Also the kind of fiscal adjustment needed to back up this “deflation” has been made. Fiscal accounts were virtually at equilibrium on average in the region during the first years of this decade; in 1996, the deficit for the entire region did not exceed 2% of GDP and only two countries had fiscal deficits larger than 5% of GDP. Although many countries in the region face major fiscal challenges in the near term, the 1990s have not been a period of huge or destabilizing fiscal deficits.

To facilitate market functioning and reduce government interference, Latin America has adopted a set of structural reforms in its trade, financial, and tax policy, and in privatization.<sup>17</sup> The more profound changes initially took place in trade and financial policies. In fact, restrictions on imports have been virtually abolished, and tariffs have been cut from 41.6% in years prior to the reforms, to 13.7% in 1995. Steps taken toward liberalization in the financial realm have led to the lifting of controls on interest rates, dismantling of directed-credit systems, and reductions to less than 20% in bank reserve requirements in most of Latin American countries. Although less far-reaching, remarkable progress has also been made in simplification and modernization of the tax codes in many countries since the mid-1980s. In the area of privatization, although initial progress was initially concentrated in a small group of countries, now at least 14 countries have, in some year, carried out privatization operations worth more than 1% of GDP. Brazil, with the privatization program it launched in 1996, could move to the top of the list of all the countries in terms of accrued transactions. There are also new and important developments in Bolivia, Colombia, Peru, and other countries.

In comparison with all these structural changes, which have made the operations of commodities and financial markets more flexible, labor reforms have been less far-reaching, except in a few countries.<sup>18</sup>

Well then, through which channels have these macro and structural policies impacted the changes in composition of the demand for labor that we identified above? In the first place, it is useful to point out that new policies have given rise to heavier capital inflows, an appreciation in real exchange rates, lower user costs for machinery and equipment, and increases in productivity. As we will see later, these four effects together have raised relative prices of nontradable goods and expanded the stock of machinery and equipment, especially of imported origin.

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<sup>17</sup> A full description of the scope of the reforms and some of their macroeconomic and distributive effects can be found in IADB (1996), Part 2.

<sup>18</sup> See, in this regard, IADB (1996), Part Two, Chapter 6.

## *Capital Inflows*

During most of the 1990s, the supply of capital to Latin America has been abundant and has extended to practically all the countries. The Mexican crisis that broke out at the end of 1994 and continued until mid-1995 caused a temporary interruption in the supply, but in only a few countries. More recently, the financial and foreign exchange crisis in Asia did not prevent Latin America from receiving, in 1997, more than half of all capital flows to the developing world, or keep these inflows from reaching record levels, estimated at US\$73 billion. Notwithstanding the vicissitudes of international financial markets, the international situation has permitted heavier capital flows, especially to countries that have adopted price stabilization and structural reforms.<sup>19</sup> Price stabilization programs of the 1990s used exchange anchors that (at least temporarily) helped reduce the exchange risks and, on many occasions, created wide differentials in financial yields in those countries with respect to the United States.<sup>20</sup> Then too, structural reforms have reduced the threat of confiscation and freezing of financial foreign funds and, what is perhaps even more important, they have opened up new opportunities for international financial resources to make profits. Privatization programs in particular have held a powerful attraction for foreign capital.<sup>21</sup>

## *Exchange Rate Appreciation*

Largely due to the heftier capital inflows, real exchange rates in many countries have risen since the end of the 1980s or the early 1990s.<sup>22</sup> Also contributing directly to this development are price stabilization programs, both those based on the exchange rate and those that used monetary anchors.<sup>23</sup>

Only seven out of a total of 26 countries experienced a real devaluation of their exchange rates between 1990 and 1996<sup>24</sup> and this was, on average, only 1.3% annually (the extreme case being Trinidad and Tobago, where the cumulative real devaluation was 17%). In contrast, 17 countries exhibited real appreciation averaging 4.1 % annually.<sup>25</sup> In seven countries, including Argentina, Colombia, El Salvador, Guatemala, Jamaica, Suriname and Uruguay, the rate of exchange has appreciated more than 25% between 1990 and 1996<sup>26</sup> (Table 2). In some countries, the effect of the larger inflows of capital on the real exchange rate has been moderated, at least temporarily, by the accumulation of international reserves.

**Table 2. The Magnitude of the Appreciations in the 1990's**  
(percent changes of the real exchange rate index between 1990 and 1996)

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<sup>19</sup> Table A3.3 of Appendix 3 presents econometric confirmation that the inflows of capital, by country, have been determined by their structural reforms.

<sup>20</sup> See, in this regard, IADB (1996), Part 1, and the references contained therein.

<sup>21</sup> It has been estimated that privatization programs generated, directly, about 20% of direct foreign investment in Latin America between 1990 and 1995 and, indirectly, nearly as much, by stimulating new investment. See Sader (1993) and IADB (1996) Part Two, Chapter 7.

<sup>22</sup> See the evidence presented in the econometric appendix mentioned earlier.

<sup>23</sup> The following countries have used exchange anchors to cut the inflation rate from levels in excess of 60% (year program started shown in parenthesis): Argentina (1991), Brazil (1994), Ecuador (1992), Guatemala (1991), Nicaragua (1991), Surinam (1995) and Uruguay (1991). In addition, many other countries have made at least partial use of the exchange regime to restrain or reduce moderate inflation rates, i.e., those lower than 60%. See IADB (1996), Part 1.

<sup>24</sup> Bolivia, Costa Rica, Honduras, Mexico, Nicaragua, Panama, and Trinidad and Tobago.

<sup>25</sup> The two remaining countries, not included in the calculations, are the Bahamas and Belize, where the real rate of exchange varied less than 1% between 1990 and 1996.

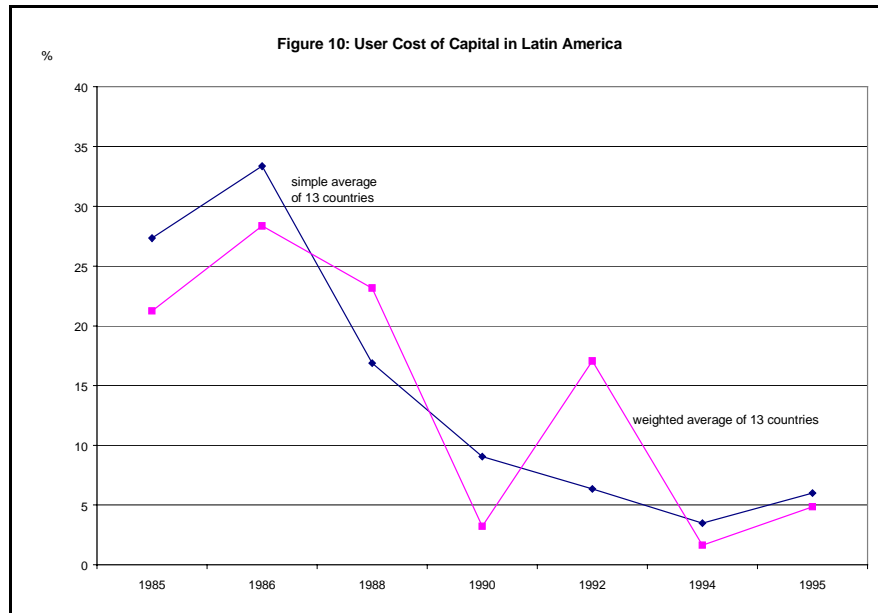
<sup>26</sup> Venezuela joined this list in 1997, when its currency appreciated by around 30% in real terms.

	Strong appreciations (more than 25% accumulated)	Mild appreciations (less than 25%)	No change (±1%)	Mild devaluations (until 15%)
Countries	Argentina Colombia El Salvador Guatemala Jamaica Suriname Uruguay	Barbados Brazil Chile Dominican Rep. Ecuador Guyana Haití Paraguay Perú Venezuela	Bahamas Belice	Bolivia Costa Rica Honduras México Nicaragua Panamá Trinidad Tobago
Annual average	6.4%	2.6%	0.0%	1.8%
Accumulated average in the 90's	32.9%	14.6%	0.3%	11.2%

Source: BID (1997), Apendix 1.

### *Reduction in the user cost of capital*

A third important effect of the new economic policies has been the lowering of the user cost of physical capital. The cost of using capital is determined not only by the relative price of capital goods, but also by the other costs--financial, tariff, and tax--that must be incurred in order to be able to purchase and mobilize an additional unit of capital goods. Therefore, the appreciation in the real rate of exchange has been an important, although not the only, cause of the reduction in the user cost of capital in the 1990s. Other factors have been (1) the reduction in real interest rates, expressed in local currency, charged for the mix of financing that companies use (a circumstance also influenced by the upward trend in the exchange rate); (2) the reductions in customs tariffs; and (3) the lowering of marginal tax rates. The average user cost of capital (calculated for a sample of 13 countries) fell from levels above 20% in the second half of the 1980s, to rates below 10% since 1990 (Figure 10). Almost two-thirds of this drop was due to a reduction in financial costs; the rest came, in similar proportions, from the decrease in tariffs, lower internal tax rates, and the appreciation in the exchange rate.



### *Higher productivity*

In fourth place, it is interesting to point out the effect on productivity of the stabilization programs and structural reforms. The growing emphasis that governments have placed on lowering the inflation rate, and the policies adopted to make markets more responsive, is the result of their having been persuaded that the lower growth rates experienced in the 1980s were due to a deterioration in efficiency, either because of steps taken to deal with the debt crisis, or because of the exhaustion of the earlier model of import substitution and government intervention.

Recent studies have shown that stabilization programs and reforms have indeed generated increases in productivity, and that this has been the principal means by which growth rates have been raised. Using a synthetic measurement of structural reforms,<sup>27</sup> we show, in Figure 11, the relationship between the magnitude of the reforms and improvements in the behavior of total factor productivity. Countries that undertook more comprehensive reforms, such as Peru, Nicaragua, Argentina, the Dominican Republic, or El Salvador (possibly because they started out with less suitable policies) exhibited the biggest increases in the productivity growth rate.

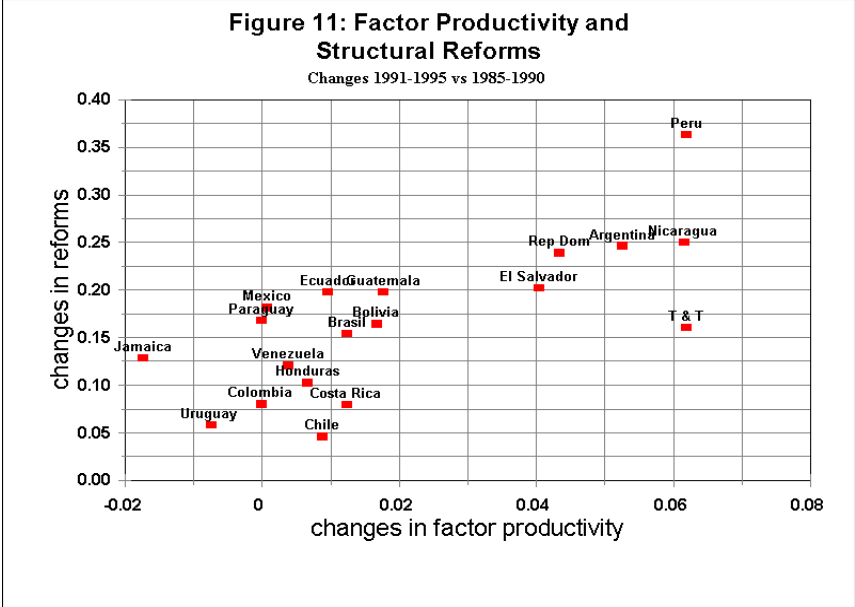
More systematic econometric evidence not only confirms this relationship, but also supports the thesis that the stabilization of inflation rates (and, especially the reduction in the volatility of those rates) was essential to the recovery of productivity in many countries.<sup>28</sup>

<sup>27</sup> Described in the document by Lora (1997) presented at the 1997 meeting of the Board of Governors of the IADB.

<sup>28</sup> See, in this regard, the article by Lora and Barrera (1997) presented at the 1997 meeting of the Board of Governors of the IADB, and IADB (1997), Part 2.



All the evidence indicates that the productivity increases were not homogeneous among sectors; rather, they concentrated especially in the tradable sectors that are open to international competition. Indeed, as Pissarides (1997) argues, the opening up of trade induces technological change and higher productivity in the tradable sectors because (1) it exposes producers to the technological and capital goods use practices followed in the more advanced countries; (2) it sparks a need to compete, to innovate (or disappear); and (3) it makes imported inputs and capital goods cheaper. Detailed microeconomic studies of the Mexican case have shown that trade reforms heightened the competitiveness of the tradables by demanding that they make more rapid technological changes.<sup>29</sup> There is also evidence of productivity gains in the privatized sectors, particularly in the cases of Argentina, Chile, and Mexico, three of the region's biggest privatizers.<sup>30</sup>



<sup>29</sup> Cragg, Epelbaum (1996). In the words of the authors, the commercial reforms produced "an import-catalyzed technological change" that was reinforced by cheaper capital goods and the appreciation in the exchange rate.

<sup>30</sup> The Argentine case was studied by Chisari, Estache and Romeo (1997). The Chilean and Mexican cases are analyzed (along with the case of the United Kingdom) in Galal, Jones, Tandon and Vogelsang (1994).

### *Increase in the relative price of nontradables*

We have seen that stabilization programs and the structural reforms had four effects: they fostered larger capital inflows, helped raise the value of real exchange rates, led to reductions in the user cost of capital, and produced increases in productivity, especially in the tradable sectors. The combination of these situations led, in turn, to an increase in relative prices of nontradable goods and an expansion in the stock of imported machinery and equipment (See Diagram 1 for a summary of these relationships.)<sup>31</sup> In theoretical models, economists customarily identify the real exchange rate with the relative prices of the nontradable to the tradable goods. As is proven in the regressions of Appendix 3, although this relationship exists, it is far from being one of identity. This is due to the method of measuring the two concepts. In usual measurements of the real exchange rate, one is implicitly comparing the cost of one country's typical market basket of goods with that of its trading partners, measuring both of them in a common currency. On the other hand, in examining the relationship between relative prices of nontradable goods and tradables goods, one is comparing the prices (usually the purchase prices) of the goods of both types within the subject country. Strictly speaking, a multitude of conditions would have to be satisfied in order for the two measurements to produce identical results. In any case, for our purposes, the relative prices of the nontradables are more relevant than the real rate of exchange, because they reflect more directly the incentives that producers and workers encounter in determining whether or not to orient themselves toward the nontradable sectors.

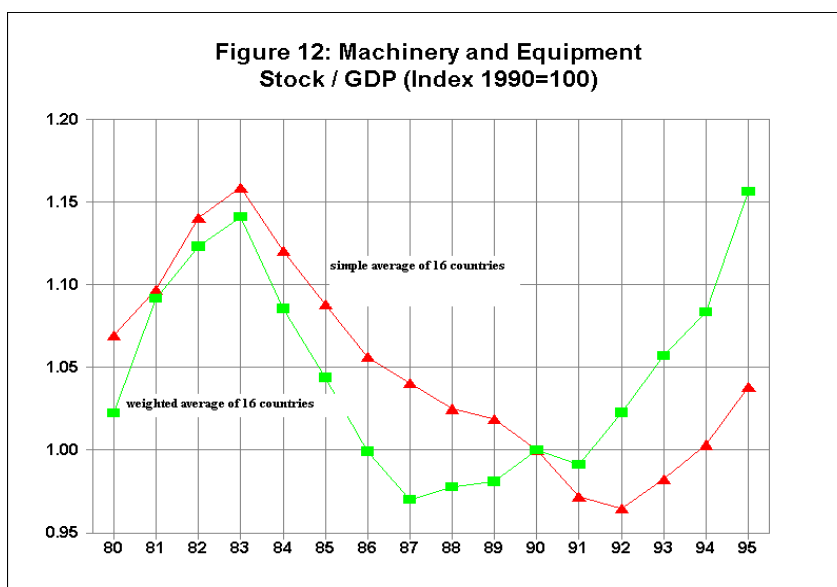
**Picture 1. Macro origin of the changes in labor demand composition**

Policies	Macro effects	Labor effects
Stabilization  Structural reforms: Trade liberalization  Financial Liberalization Privatizations	Capital inflows Appreciation Lower user cost of capital Increase in productivity  ▼  Increase in relative prices of non tradables Increase in imported machinery and equipment stock	"Tertiarization" Informalization Bias toward skilled labor Wider wage differentials

<sup>31</sup> Econometric support for some of these relationships is also found in the econometric appendix mentioned earlier.

### *Larger stock of machinery*

Following the reduction that occurred in the 1980s, the stock of machinery and equipment has risen substantially during the 1990s, especially in the larger countries (Figure 12). This trend reflects, with some lag, the reduction in the user cost of capital. However, in several countries other factors also played a very important role and also helped stimulate investment. These included liberation of imports (which made it easier to buy machinery and also created new investment opportunities); expansion of sources of credit for producers, credit that had previously been rationed at the prevailing rates; a reduction in factors that create economic and legal uncertainty; and gains in productivity.<sup>32</sup>



<sup>32</sup> The econometric appendix shows that both investment in (imported) machinery and the stocks of that machinery have been influenced in a positive and very significant way by an index of structural reforms that captures several of these effects synthetically, since it gathers information on tariffs, tax rates, degree of financial freedom, and privatization.

## 5. How have these macro phenomena impacted the composition of the demand for labor?

### *Growing preponderance of the services sector*

Now that we have described the macro scenario, the changes that have taken place in the composition of the demand for labor are easy to understand. First, it is clear that the increase in relative prices of nontradable goods, observed in many countries and whose origin has already been explained, led to a reallocation of productive resources, particularly labor, toward those sectors. In other words, the increase created a *terciarización*<sup>33</sup> or “de-industrialization” of labor. This relationship is demonstrated in the regressions in Appendix 3.<sup>34</sup> As observed there, the “de-industrialization” of employment was also induced by the increase in the stock of machinery and equipment, which, presumably, was concentrated in the tradable sector, where it replaced workers (especially unskilled labor, as we will see later), thus contributing to the reallocation of labor toward the nontradable sector.

Consistent with these results, looking at a sample of 18 Latin American countries we find that the rate of growth of employment in manufacturing has depended directly, and very significantly, on the real exchange rate and on the rate of growth of GDP.<sup>35</sup> In making these estimates, the objective was to determine whether the *apertura* (measured in terms of both tariff levels and the coefficient of trade) had effects on industrial employment *additional* to those captured via growth and the real exchange rate. The answer proved to be negative: although perhaps if adverse effects did occur, they were limited and of very little statistical significance.

### *Growing role of the informal sector*

Owing to the predominance of small production units in the nontradable sectors, especially construction, retailing, and personal services, the rates of informal employment are higher than in the tradable sectors, as can be seen in Table 3.<sup>36</sup> Consequently, the shift of employment to the services sector has been accompanied by a greater role for informal employment<sup>37</sup>. Note that under these circumstances, an increase in informal activity is not evidence of weakness in the demand for labor, nor of the presence of any kind of economic rigidities. Strictly speaking, and contrary to the usual assumption, it is not even evidence of a deterioration in conditions on the job market. As recent studies have shown, in economies where the labor markets are, in practice, flexible—as is usually the case in Latin America—there is no foundation for traditional theories that consider the informal economy solely as a residual sector, barely integrated with the rest of the economy and a last resort for workers who lack other job options. Not only has it been found that labor mobility between the formal and informal economies is fairly high; it has also been established that, in economies that have little wage stickiness, informal employment tends to rise during economic boom periods, when employment options improve.<sup>38</sup> The informal economy may prove attractive for reasons of organization, flexibility in hours and pay systems, and as a means for taking advantage

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<sup>33</sup> We use this term because it is common in the region, even though it is not very accurate because the construction sector (a nontradable *par excellence*) is not part of the tertiary sector. It should also be mentioned that some services sectors are highly tradable (tourism, for example) while a very few goods (apart from construction) are not very tradable at all.

<sup>34</sup> See the column that explains industrial employment (i.e., in the tradable sector) as a percentage of urban employment. This variable declines as capital stock grows and increases with the relative price of the tradables.

<sup>35</sup> These exercises, taken from the aforementioned study by Márquez and Pagés (1997), done at the IADB, did not analyze the effect of investment in machinery and equipment. See Table A3.5 in Appendix 3.

<sup>36</sup> Although this is not necessarily the case in a comparison with agriculture, the comparison is of little relevance, given the usual criteria for defining “informality” and the fact that labor mobility between the countryside and the city is much lower than between the urban tradable and nontradable sectors.

<sup>37</sup> The econometric appendix demonstrates that investment in machinery and equipment increases informal sector activity and self-employment, while an increase in the relative price of tradables reduces it. These effects are the opposite of the impact these variables have on employment in the tradable (industrial) sector.

<sup>38</sup> For the case of Mexico, see Maloney (1997) and Maloney and Cunningham (1997).

of specific individual experiences or abilities.<sup>39</sup>

### *Bias toward skilled labor*

Owing to the characteristics of the demand for labor in the services sector, *terciarización* has also been associated with a higher relative demand for skilled labor. Indeed, Table 3 shows that, with few exceptions, the services sectors are more labor-intensive (per unit of aggregate value) and use proportionately more skilled labor than the tradable sectors. This is valid even when one excludes the government from the nontradable sectors (taking into account that the government is highly labor-intensive, and especially intensive in skilled labor). The relative decline in government employment might have diminished the bias toward skilled labor, but this is not actually the case. In Bolivia, for example, the average skills level of government employees rose appreciably between 1986 and 1995, so that skilled jobs in the government increased by 10% per year, while unskilled jobs fell by 7% per year. Although in less pronounced form, the proportion of skilled jobs in the public sector has risen in all Latin American countries.

**Table 3. Labor Intensity and Composition Indicators**

(Total = 1 a)

	Total labor intensity		Skilled labor intensity		Unskilled labor intensity		Informal labor intensity	
	Tradables	Non tradables	Tradables	Non tradables	Tradables	No transables	Tradables	Non tradables
Argentina (1996)	0.80	1.16	0.63	1.22	0.83	1.10	0.74 b	1.19 b
Bolivia (1995)	0.60	1.23	0.59	1.24	0.61	1.23	n.a.	n.a.
Costa Rica (1995)	0.93	1.03	0.67	1.15	1.14	0.94	0.71	1.14
México (1994)	1.22	0.95	1.05	0.98	1.15	0.93	0.81	1.12
Perú (1996)	0.56	1.40	0.63	1.36	0.45	1.09	0.77 c	0.93 c
Venezuela (1995)	0.64	1.24	0.59	1.26	0.67	1.21	0.83	1.06

a Without agriculture and government

b 1980 (1996 information not available)

c 1985 (1996 information not available)

Source: Appendix 2.

But public sector reforms and the shift toward a service economy provide only part of the explanation of the bias toward skilled labor--and not even the most important part. As many studies have established for several economies in Latin America and other regions, the incorporation of new technologies via investment in machinery and equipment is the factor that has had the greatest influence during the past decade in shifting labor demand toward workers who have higher skill levels. Apart from any technological change or change in productivity, relative demand for skilled labor (vs. unskilled) tends to be associated with physical investment, since capital and skilled labor are complementary in price and quantity, while capital and unskilled labor are substitutes for each

<sup>39</sup> See Lindbeck and Snower (1991) for a detailed theoretical discussion. De Wit (1993) presents a useful summary of theories and empirical evidence. Lubell (1991) discusses the validity of the traditional association between informality and duality.

other (and the substitutability is higher at lower levels of education).<sup>40</sup> Technological change, which in reality is usually associated with investment in machinery and equipment, seems to have magnified the bias toward skilled labor. This effect has been especially pronounced in the countries that have opened their economies to foreign trade, and has occurred not only because of the increase in the stock of imported machinery, but also because of improved access to inputs and increased competitive pressure.<sup>41</sup>

This discussion suggests that, in the presence of technological changes and increases in the intensity of capital use, relative demand for skilled labor may rise more in the tradable than in the nontradable sectors although, on average, the latter are more skilled-labor-intensive and even though countries are shifting toward a service economy. This was the case in Argentina and Peru, as demonstrated by the (ex-post) elasticities of labor demand presented in Table 4. These calculations reveal, further, two points that are consistent with the preceding line of reasoning: (1) *all* the elasticities of skilled employment are greater than those of unskilled employment, and (2) for unskilled employment, the elasticities are lower in the tradable than in the nontradable sectors. In addition, these calculations show that, for the periods of a decade or longer that were used in the calculations, the elasticities of labor demand are positive (except for unskilled employment in the tradable sectors in Argentina) and, in fact, higher than one in most cases. There is no evidence, therefore, of massive elimination of jobs, or of a pattern of medium-term growth that is especially labor-thrifty. Reductions in employment, when they have occurred, have been concentrated in specific sectors and periods.<sup>42</sup>

**Table 4. Observed Labor Elasticity over GDP**

	Skilled Labor			Unskilled labor			Memo: GDP growth			
	Tradables <sup>a</sup>	Non tradables <sup>b</sup>	Government	Tradables <sup>a</sup>	Non tradables <sup>b</sup>	Government	Tradables <sup>a</sup>	Non tradables <sup>b</sup>	Government	Total
Argentina (1980-96)	12.2	4.3	3.5	-1.1	1.0	1.6	0.2	1.2	1.7	1.1
Bolivia (1986-95)	2.2	2.8	5.6	1.2	1.8	-3.9	4.3	3.6	1.8	4.0
Costa Rica (1981-95)	1.6	1.7	2.3	1.0	1.0	0.7	3.4	3.7	1.9	3.4
Mexico (1984-94)	2.4	2.1	3.3	1.4	0.7	2.1	2.4	2.1	1.9	2.0

<sup>40</sup> An excellent theoretical and empirical summary on the subject can be found in Hamermesh (1993). The complementarity between capital and skilled labor, and the substitutability between capital and unskilled labor has been verified specifically in Latin America for the case of Colombia by Cárdenas and Gutiérrez (1997) and (somewhat indirectly) for Mexico by Cragg and Epelbaum (1995) and by Cañonero and Werner (1996). In a panel of countries, the complementarity hypothesis was corroborated in an earlier study by the IADB prepared by Flug and Hercowitz (1996), whose basic estimates have been reproduced as part of the econometric appendix to this article.

<sup>41</sup> Concerning the bias in technological change in the countries of Latin America, see Tam and Batra (1997) and Robbins (1996).

<sup>42</sup> For greater detail on the changes in employment by sectors, see Appendix 2.

Peru (1985-96)	4.7	3.4	-4.8	1.0	1.8	-3.1	1.7	3.2	-1.5	1.8
Venezuela (1981-95)	3.1	29.8	3.3	0.0	5.8	0.4	2.4	0.3	2.4	1.6

a Without agriculture and government

Source: Appendix 2.

### *Wider wage differentials*

Not enough information is available to enable us to make an econometric analysis of the determinants of relative wages by skills level at the urban or national level.<sup>43</sup> However, there is valuable evidence about pay scales within the manufacturing sector, both at the world level and in Latin America. Estimates (summarized in Table A3.6 of the Appendix) confirm that relative remuneration between skilled and unskilled workers, or between white-collar and blue-collar workers in industry (differentials usually associated with differences in skills<sup>44</sup>) have been positively and very significantly associated with the stock of imported machinery and equipment.<sup>45</sup> The association found is consistent with the hypothesis of complementarity between capital and skilled labor, and with the technological change incorporated into the imported machinery that is biased toward this type of work. Earlier studies have found similar results in what is frequently termed as “skill-enhancing trade.”<sup>46</sup>

## **6. What has been the effect of changes in trade patterns?**

We have argued in this study that changes in the composition of the demand for labor and the relative pay scales between skilled and unskilled workers resulted especially from changes in relative prices between the tradable and nontradable sectors, changes in the levels of investment in machinery and equipment, and the higher productivity and technology associated with them. In this regard, the opening up of trade had an important impact on labor-related transformations in the region, insofar as it contributed to these changes. In fact, we can observe that as soon as economies became more open, a clear pattern emerges of recovery in investment and productivity and a decline in the relative price of the tradables.<sup>47</sup>

But the changes in trade patterns caused by the *apertura* do not show up in this analysis. Specifically, we have not taken into account the fact that in the wake of the *apertura*, trade deficits soared in most Latin American countries (a counterpart to the heavier inflows of capital) and that this could have affected the demand for labor. The approach traditionally used to measure the impacts of changes in trade on employment has consisted of using

<sup>43</sup> This would require regular series of household surveys.

<sup>44</sup> An association that is not necessarily correct, since the composition of demand by educational level can also change within these groups, as it may already have. Hamermesh (1993) contains a full discussion about the problems with this association.

<sup>45</sup> For Latin America, it has also been found that relative wages and salaries have been positively associated with the size of the tradable sector, over time within the countries considered (not between countries). Although this could be interpreted as evidence that expansion of the tradable sector leads to an additional bias in relative demand for skilled labor, one must be careful about making such an interpretation, because of the relative wages used. It could also imply that the skills of white-collar workers in manufacturing are more specific to the sector than are the skills of the blue-collar workers, or that the supply of the former is more rigid than the supply of the latter.

<sup>46</sup> See in particular Robbins (1996) for a group of Latin American countries.

<sup>47</sup> The connection between the *apertura*, productivity, and investment was analyzed in Lora and Barrera (1997).

fixed coefficients of the labor content (direct or total) of export and import products to estimate the number of jobs created (or abolished) by the increases (or reductions) in net exports for each sector. Were we to follow this method, we would conclude that the *apertura* has led to a massive elimination of jobs in most Latin American economies, since it was from that moment on that external trade deficits increased. But, as we have seen, no such “destruction” of jobs has been observed. Obviously, this has been possible because employment has risen in the nontradable sectors and because, in many cases, the tradable sectors have expanded to respond to growing domestic demands (generated by higher growth rates and productivity gains), despite the deterioration in their external balance of trade. Therefore, the traditional approach to employment accounting is simply not adequate, because it does not capture the interactions of general equilibrium that are necessarily part of the phenomenon of *apertura*.

Seen from the opposite angle, another broad stream of economic studies has taken the position that the labor-related effects of greater trade openness can be analyzed by looking at the changes in relative remuneration of the various kinds of work and considering them with respect to capital and other factors. Prior to the *apertura*, relative remuneration depended on the relative factor endowments in the country in question, while after the *apertura*, these were determined by worldwide relative remuneration (which, in turn, depend on worldwide relative endowments). According to this approach, it is to be expected that the *apertura* would raise relative remuneration of the factors that are abundant in a given country and reduce it for those that are scarce. In Latin America, such a development would have entailed changes in relative wages in the direction opposite to what has usually been observed.<sup>48</sup> It would also have implied that, among tradable goods, those most intensive in capital and skilled labor would have become cheaper, and those intensive in unskilled labor would have become more expensive, something that has also not been observed.<sup>49</sup>

It is not the purpose of this article to explain the predictive failure of this theory, its solidity being beyond any discussion on the theoretical plane. Among the arguments that have been bandied about we should, however, mention the following: (1) the relative endowments in Latin America may not be the ones assumed in the preceding paragraph, since they may be fairly similar to the worldwide pattern for the group of countries, and may differ in various ways for each individual country.<sup>50</sup> (2) protection of domestic industry in Latin America was not homogeneous for all goods--those sectors that made most intensive use of unskilled labor<sup>51</sup> were protected much more heavily; and (3) conventional predictions cannot be proven directly because they are highly qualified when one takes into account the existence of nontradable sectors, imported goods that compete partially with domestic production, and the complementarity among factors, particularly between capital and skilled labor.<sup>52</sup>

Whatever the explanation, the existing studies for Latin America concur in their findings that changes in trade patterns influenced employment and labor remuneration, not via the feared displacements of workers brought about by higher imports, nor through the changes in relative remuneration forecast by conventional theories of international trade but via their effect on investment, technology and relative demand for skilled labor, along the lines that we have argued in this article. Appendix 4 presents (in text form) a simple model that enables us to analyze this approach in a more systematic fashion, taking into account the general equilibrium interactions that occur under the different models. Throughout this study we have made almost no mention of the effect of labor-related rigidities (wage stickiness, or constraints on hiring and firing). This omission has enabled us to simplify the analysis while holding always to the assumption that the labor markets in Latin America are relatively flexible.

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<sup>48</sup> It would also entail lower remuneration for capital, which has indeed been observed, and higher remuneration for natural resources, of which there is no significant evidence.

<sup>49</sup> Many studies have reached the conclusion that the predictions of this trade theory have not proven true. For Latin American countries, see the empirical studies by Hanson and Harrison (1995), Robbins (1996), and Robinson and Thierfelder (1996), and the summary presented by Wood (1997).

<sup>50</sup> Wood (1997) and Londoño, Spilimbego and Székely (1997).

<sup>51</sup> Wood (1997) and Revenga and Montenegro (1995).

<sup>52</sup> Robinson and Thierfelder (1996), Cañonero and Werner (1996) and Robbins (1996).



Obviously, this was an expositive recourse, not an exact description of reality. In the model described in the appendix, we consider the possibilities that such rigidity exists and we examine the ways in which they alter the conclusions outlined above.

## 7. Topics for discussion

In this article, we have analyzed the relationship between changes in orientation of macro policies and transformations in the field of labor during the past decade in Latin America. Stabilization and structural reforms have helped push down the relative prices of tradable goods and boost the stocks of machinery and equipment, as well as productivity levels, due to the effects they produced on capital flows, the real exchange rate, and the user cost of capital--and also because they facilitated the functioning of markets, thus improving efficiency. As a result, employment has shifted toward the services sector and the informal labor market has gained a bigger role. Demand showed a bias toward skilled labor, and the gaps in remuneration among workers widened. The subjects we have discussed suggest several starting points for a debate on macroeconomic policy.

### *Macro instability and employment instability*

The apertura and heavier capital flows may have led to higher labor turnover and the perception of greater employment-related risks, especially among workers at the smaller or independent companies, who now face more uncertainty. In other words, it may be presumed that the demand for macro stability and social protection has increased. Thus it is appropriate to debate whether the fiscal and monetary policies (which were not the subject of this article) have operated appropriately in countering the sources of external instability or whether they have, instead, reinforced them by procyclical behavior. It would be a good idea, then to discuss which macroeconomic mechanisms should be used in the future to reduce those instabilities. Furthermore, since the conditions of risk do not affect workers in different sectors or occupations equally, it is worth discussing the question of whether the present systems of labor protection are adequate, or whether broader mechanisms for socializing the risks--mechanisms that would not hamper labor mobility--should be developed in their place.

### *Stabilization of the inflation rate, and wage stickiness*

In countries where the inflation rate has been substantially reduced, real wages may have lost the flexibility that inflation had, in fact, introduced. Rigidities in the mechanisms for negotiating and setting nominal wages have become more critical. Therefore, we should ask ourselves whether greater labor flexibility is needed in these cases and what conflicts this might provoke with the objectives of protection and stability in employment and income.

### *Tax, employment, and incomes policies*

Payroll taxes and social security contributions are common in the tax structures in Latin America, as is favorable tax treatment of investment. These structures foster the adoption by formal companies of technologies that are intensive in capital and skilled labor (and promote the opposite in informal enterprises). Are these the most suitable structures for job creation, for a reduction of inequities in remuneration, and for labor protection? Might it be desirable to replace payroll taxes with higher taxes on consumption, or levies on specific products (gasoline, for example)? Alternatively, would it be a good idea to change the payroll tax system so that rates rise with salary levels, so as to encourage the employment of unskilled workers vis-à-vis skilled workers, thereby countering the effect that investment produces? Or would it be better to eliminate the tax advantages that favor investment, even though they may be desirable as mechanisms for stimulating technological development?

### *Credit markets and the informal economy*

Because of the flaws in the credit markets, returns on capital in small companies and in self-employment can be very high. That is why workers who have been able to accumulate large volumes of savings choose this option, to take advantage of those returns. If that is the case, the imperfections in the credit markets may be an important factor in explaining the composition of employment and remuneration. Have these flaws changed as a result of recent financial reforms? Should policies be adopted to correct them?

### *Government spending on education and training programs*

It is widely accepted that, not only should spending on education be made more efficient, it should be reoriented toward elementary education. But the results of this study suggest that the real restriction on economic growth and improvements in distribution is the scarcity of workers who have the higher-level skills. Therefore, should this idea be revisited?

Should we encourage plans for training and apprenticeship on the job, in order to try to correct the current maladjustments between labor supply and demand? Should this be done by setting minimum requirements for employment of apprentices, or some other mechanism? Should employers be required to spend a certain minimum on personnel training, an allocation that might be partly or wholly substituted by a tax that is earmarked for a public training fund?

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## Appendix 1

### Definition and Sources of the Most Important Statistic Variables

**Capital Inflows:** Change in international reserves minus external current account balance. Source: ESDB-IDB

**Changes in production's composition:** Sum of the absolute values of the differences between GDP growth and growth in each of the three following production sectors: commerce, housing and manufacturing).

**Changes of total factor productivity:** the residual of the growth equation coming from the Cobb-Douglass equation:

$$p = g - \alpha rk - (1 - \alpha) rh$$

where  $p$  is the total factor productivity,  $g$  the growth rate,  $\alpha$  the share of capital in income,  $rk$  the physical capita stock growth rate and  $rh$  the human capital growth rate, which is defined as the product of labor force and her schooling years.  $Rk$  comes from IEC Capital Stock Data, World Bank, 1993, updated with gross investment data from the World Bank (maintaining for each country the depreciation rate of the capital estimated from the stock capital and investment data). To calculate  $rh$ , labor force series coming from the World Tables, World Bank, updated with ESDB-IDB data, were used, and schooling series of population older than 25 years coming from the ESDB-IDB. Alpha is assumed as 0.4

**Employment:** calculated from data on labor force and unemployment. This estimation of employment may not correspond to those produced by the statistical office of the countris whose methodologies and coverage are heterogeneous.

**Formal employment in the private sector:** employment on enterprises with more than 5 or ten workers, depending on the country.

**GDP:** Source: ESDB-IDB

**Informal employment:** self-employed, employment in small enterprises and domestic service.

**Machinery and equipment stock:** Accumulated stock in US constant dollars of imported machinery and equipment, with 6% lineal depreciation. Source: ECLAC, Yearbook Statistic for Latin America and the Caribbean, Santiago de Chile, 1968 to 1996.

**Open trade reform (year of):** Source: IDB (1996), 2nd part.

**Permanent GDP:** Constant GDP filtered with the Hodrick-Prescott method.

**Real exchange rate index:** Source: ESDB-IDB

**Real wage:** Source: ESDB-IDB

**Relative price index (tradables / non tradables):** retail price index over consumer price index. Souce: ESDB-IDB

**Relative real wages (Skilled / unskilled):** White collar / blue collar wages in the manufacturing sector. Source: National statistical offices. In Flug and Hercowitz the information comes from ILO, October Inquiry, between 1983 until 1994

**Service employment:** employment in housing and other services. Source: ILO

**Skilled / unskilled labor:** ratio of the wage of professionals, thecnitians, administration employees, to factory and transport employees. Source: ILO.

**Structural reforms index:** Source: IDB (1997), 2nd part.

**Transitory GDP:** Difference between GDP and permanent GDP.

**Unemployment Rate (urban):** Source: Statistical yearbook for Latin America and the Caribbean and ILO, complemented with national sources.

**User cost of capital:** Source of the variables: IDB (tax and tariffs), IMF (interest rates) and ECLAC (relative prices and real exchange rates). The user cost of capital is the cost of one additional unit of capital when the firm is maximizing

$$UCC = \frac{(1 + VAT + Tariff)}{(1 - \sigma)} * \frac{P_c}{P_y} * (r + \delta)$$

profits, and is given by

Where the cost (UC) is affected taxes (marginal income tax, the VAT and the tariffs: the first term of the right hand), relative prices between price of capital and income price (the second term), and depreciation (delta).



## Appendix 2

**Table A.2.1a. Labor Demand Indicators  
Argentina**

Sector	Relative wages (skilled/ unskilled)			# Skilled / # Unskilled			Labor intensity (total=100)					
			Annual change			cambio anual	Skilled Labor		Unskilled Labor		Total labor	
	1980	1996		1980	1996		1980	1996	1980	1996	1980	1996
Agriculture	2.94	0.24	-14.60%	29.98	49.81	3.22%	0.02	0.02	0.02	0.08	0.02	0.04
Minning	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manufacturing	1.83	1.43	-1.54%	36.95	60.26	3.10%	1.01	0.71	1.10	0.92	1.06	0.81
Electricity	2.50	1.53	-3.04%	23.43	98.87	15.48%	0.13	0.16	0.16	0.13	0.15	0.14
Housing	2.10	1.06	-4.20%	16.09	29.40	3.84%	0.31	0.15	0.70	0.48	0.54	0.30
Commerce	1.50	1.56	0.27%	33.96	69.60	4.59%	10.46	8.15	15.60	9.11	13.43	8.59
Transport and Communications	1.65	1.41	-0.97%	22.63	61.47	6.45%	0.97	1.81	2.05	2.37	1.59	2.07
Financial Services	1.33	1.53	0.91%	264.36	200.67	-1.71%	1.55	1.54	0.33	0.52	0.84	1.07
Government and other Services	2.38	1.37	-3.39%	49.96	82.21	3.16%	1.40	1.32	1.12	1.38	1.24	1.35
Total	1.97	1.49	-1.72%	42.73	76.17	3.68%	1.00	1.00	1.00	1.00	1.00	1.00
Tradables	2.29	0.63	-7.71%	36.91	60.09	3.09%	0.76	0.50	0.83	0.67	0.80	0.58
Tradables without agriculture	1.83	1.43	-1.54%	36.95	60.26	3.10%	0.93	0.64	1.02	0.83	0.98	0.81
Non Tradables	1.84	1.41	-1.64%	45.23	80.85	3.70%	1.14	1.26	1.10	1.18	1.12	1.22
Non tradables without government	1.85	1.56	-1.04%	40.35	73.74	3.84%	1.08	1.71	1.13	1.61	1.78	1.69

Source: National Housing Survey

**Table A.2.1b**  
**Argentina**

Sector	Informality						Schooling (years)				Elasticity	
	Skilled Labor		Unskilled Labor		Total labor		Skilled		Unskilled		Skilled	Unskilled
	1980	1996	1980	1996	1980	1996	1980	1996	1980	1996		
Agriculture	2.43	NA	1.93	NA	2.06	NA	12.0	14.9	6.7	8.6	6.22	4.01
Mining	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manufacturing	0.83	NA	0.69	NA	0.73	NA	13.3	13.6	6.7	5.7	12.21	(1.14)
Electricity	-	NA	0.39	NA	0.34	NA	13.9	13.8	6.5	5.8	3.07	(1.15)
Housing	1.18	NA	1.34	NA	1.37	NA	13.6	13.0	5.4	5.4	(3.05)	0.37
Commerce	1.57	NA	1.32	NA	1.39	NA	12.6	13.6	6.9	6.5	13.65	3.35
Transport and Communications	0.82	NA	0.78	NA	0.80	NA	12.9	13.5	6.7	6.1	3.68	1.35
Financial Services	1.06	NA	0.48	NA	0.79	NA	14.5	15.3	8.2	7.3	1.32	1.79
Government and other Services	0.82	NA	1.14	NA	1.03	NA	13.9	14.7	6.1	5.9	3.51	1.61
Total	1.00	NA	1.00	NA	1.00	NA	13.5	14.2	6.5	6.1	4.96	1.50
Tradables	0.84	NA	0.69	NA	0.73	NA	13.3	13.6	6.7	5.8	4.44	(0.30)
Tradables without agriculture	0.83	NA	0.69	NA	0.73	NA	13.3	13.6	6.7	5.7	12.21	(1.14)
Non Tradables	1.06	NA	1.15	NA	1.12	NA	13.8	14.5	6.5	6.2	4.58	1.72
Non tradables without government	1.23	NA	1.15	NA	1.17	NA	13.5	14.2	6.6	6.3	4.32	1.01

Source: National Housing Survey

**Table A.2.1c****Argentina**

Sector	Annual Growth			# Employees			
	GDP	Skilled	Unskilled	Skilled		Unskilled	
		Employment		1980	1996	1980	1996
Agriculture	1.55%	9.64%	6.22%	892	3891	2975	7811
Mining	2.46%	NA	NA	NA	NA	NA	NA
Manufacturing	0.23%	2.83%	-0.26%	179556	280727	485927	465846
Electricity	2.17%	6.68%	-2.50%	4701	13223	20061	13374
Housing	-1.12%	3.41%	-0.41%	31570	54009	196240	183726
Commerce	0.45%	6.17%	1.51%	117967	307489	347336	441781
Transport and Communications	2.88%	10.58%	3.88%	26612	133022	117608	216407
Financial Services	3.94%	5.20%	7.03%	130454	293693	49347	146355
Government and other Services	1.70%	5.99%	2.74%	202281	512742	404849	623735
Total	1.08%	5.35%	1.62%	694033	1598796	1624343	2099035
Tradables	0.65%	2.89%	-0.20%	180448	284618	488902	473657
Tradables without agriculture	0.23%	2.83%	-0.26%	179556	280727	485927	465846
Non Tradables	1.32%	6.05%	2.27%	513585	1314178	1135441	1625378
Non tradables without government	1.17%	5.07%	1.18%	490860	1082163	1216519	1467489

Source: National Housing Survey



**Table A2.2a**  
**Labor Demand Indicators**  
**Bolivia**

Sector	Relative wages (skilled/ unskilled)			# Skilled / # Unskilled			Labor intensity (total=100)					
	1986		1995		cambio anual		Skilled Labor		Unskilled Labor		Total labor	
	1986	1995	cambio anual	1986	1995	cambio anual	1986	1995	1986	1995	1986	1995
Agriculture	3.11	3.53	1.42%	94.57	42.33	-8.54%	0.30	0.10	0.10	0.14	0.20	0.12
Mining	1.17	4.12	15.00%	201.71	75.83	-10.30%	0.31	0.17	0.16	0.11	0.23	0.15
Manufacturing	1.89	1.87	-0.10%	45.45	70.33	4.97%	1.27	1.03	1.33	1.40	1.30	1.17
Electricity	4.14	3.38	-2.24%	11.46	228.21	39.43%	0.37	0.95	0.73	0.21	0.55	0.68
Housing	1.83	1.79	-0.24%	22.21	32.94	4.48%	1.83	1.50	4.58	5.33	3.25	2.90
Commerce	1.60	2.01	2.53%	38.52	53.52	3.72%	1.72	1.92	2.46	2.79	2.10	2.24
Transport and Communications	1.30	1.45	1.20%	70.40	88.73	2.60%	1.43	0.95	1.53	1.42	1.48	1.12
Financial Services	2.61	2.64	0.12%	512.42	670.74	3.04%	0.73	1.26	0.05	0.10	0.38	0.84
Government and other Services	2.15	1.49	-4.00%	58.06	271.46	18.69%	1.65	2.18	1.39	0.65	1.52	1.62
Total	1.90	2.07	0.96%	50.35	83.19	5.74%	1.00	1.00	1.00	1.00	1.00	1.00
Tradables	1.74	3.15	6.78%	102.80	89.85	-1.48%	0.57	0.38	0.45	0.47	0.51	0.25
Tradables without agriculture	1.30	2.93	9.42%	48.21	70.72	4.35%	0.82	0.58	0.78	0.72	0.80	0.63
Non Tradables	2.17	2.07	-0.57%	50.29	85.30	6.05%	2.27	2.37	1.80	1.85	1.88	1.50
Non tradables without government	2.21	2.06	-0.78%	50.21	88.08	6.44%	1.38	1.59	1.99	1.92	1.41	1.99

Source: National Housing Survey

**Table A2.2b****Bolivia**

Sector	Informality						Schooling (years)				Elasticity	
	Skilled Labor		Unskilled Labor		Total labor		Skilled		Unskilled		Skilled	Unskilled
	1986	1995	1986	1995	1986	1995	1986	1995	1986	1995		
Agriculture	NA	1.00	NA	1.00	NA	1.00	14.0	13.6	4.4	3.7	1.17	4.36
Mining	NA	1.00	NA	1.00	NA	1.00	13.1	14.4	6.8	6.1	1.45	3.28
Manufacturing	NA	1.00	NA	1.00	NA	1.00	12.5	12.9	5.2	5.9	2.23	1.02
Electricity	NA	1.00	NA	1.00	NA	1.00	12.0	15.5	4.7	7.4	5.38	(0.85)
Housing	NA	1.00	NA	1.00	NA	1.00	12.7	12.8	5.3	5.7	2.53	1.67
Commerce	NA	1.00	NA	1.00	NA	1.00	12.6	13.1	4.4	5.1	2.56	1.62
Transport and Communications	NA	1.00	NA	1.00	NA	1.00	12.8	12.9	6.3	6.4	2.06	1.54
Financial Services	NA	0.99	NA	1.00	NA	0.99	15.0	15.2	8.5	7.4	4.18	3.01
Government and other Services	NA	1.00	NA	1.00	NA	1.00	13.0	15.1	5.3	5.2	5.63	(3.89)
Total	NA	1.00	NA	1.00	NA	1.00	12.9	12.9	5.1	6.2	2.67	1.17
Tradables	NA	1.00	NA	1.00	NA	1.00	12.7	13.1	5.2	5.7	2.06	1.28
Tradables without agriculture	NA	1.00	NA	1.00	NA	1.00	12.5	13.0	5.3	5.9	2.24	1.17
Non Tradables	NA	1.00	NA	1.00	NA	1.00	20.5	20.7	7.3	6.0	3.06	1.21
Non tradables without government	NA	1.00	NA	1.00	NA	1.00	13.0	13.4	4.8	5.4	2.76	1.80

Source: National Housing Survey

**Table A2.2c****Bolivia**

Sector	Annual Growth			# Employees			
	GDP	Skilled	Unskilled	Skilled		Unskilled	
		Employment	1986	1995	1986	1995	
Agriculture	3.03%	3.54%	13.21%	3781	5171	3998	12215
Mining	6.92%	10.07%	22.70%	2360	5595	1170	7378
Manufacturing	4.28%	9.55%	4.37%	29627	67348	65186	95762
Electricity	6.00%	32.28%	-5.13%	231	2864	2016	1255
Housing	5.65%	14.32%	9.42%	6767	22567	30463	68507
Commerce	4.26%	10.90%	6.92%	43115	109411	111915	204443
Transport and Communications	5.41%	11.15%	8.33%	15018	38876	21332	43812
Financial Services	2.82%	11.79%	8.49%	13118	35757	2560	5331
Government and other Services	1.82%	10.27%	-7.10%	46276	111521	79710	41082
Total	4.00%	10.67%	4.66%	160293	399110	318350	479785
Tradables	4.41%	9.07%	5.65%	35768	78114	70354	115355
Tradables without agriculture	4.28%	9.59%	5.02%	31987	72943	66356	103140
Non Tradables	3.63%	11.09%	4.37%	124525	320996	247996	364430
Non tradables without government	4.19%	11.56%	7.53%	78249	209475	168286	323348

Source: National Housing Survey





**Table A2.3a**  
**Labor Demand Indicators**  
**Costa Rica**

Sector	Relative wages (skilled/ unskilled)			# Skilled / # Unskilled			Labor intensity (total=100)					
			cambio anual			cambio anual	Skilled Labor		Unskilled Labor		Total labor	
	1981	1995		1981	1995		1981	1995	1981	1995	1981	1995
Agriculture	2.01	2.05	0.11%	3.61	5.76	3.40%	0.19	0.20	1.29	1.24	0.87	0.75
Mining	2.01	2.04	0.11%	9.44	25.10	7.24%	NA	NA	NA	NA	NA	NA
Manufacturing	2.08	1.71	-1.39%	18.60	24.93	2.11%	0.50	0.48	0.75	0.96	0.65	0.74
Electricity	1.50	1.96	1.91%	41.05	127.66	8.44%	0.98	0.85	0.99	0.32	0.98	0.57
Housing	1.94	1.81	-0.48%	8.90	11.78	2.02%	0.43	0.70	1.59	2.82	1.15	1.83
Commerce	1.37	1.62	1.23%	27.05	47.07	4.04%	0.59	1.13	0.89	1.06	0.78	1.09
Transport and Communications	1.48	1.40	-0.39%	17.62	47.34	7.31%	0.40	0.54	1.00	0.78	0.78	0.66
Financial Services	1.72	1.87	0.59%	238.85	198.81	-1.30%	0.99	0.87	0.13	0.21	0.46	0.52
Government and other Services	2.60	2.45	-0.44%	58.34	86.85	2.88%	3.85	3.71	1.65	1.36	2.49	2.46
Total	2.41	2.15	-0.83%	25.81	39.40	3.07%	1.00	1.00	1.00	1.00	1.00	1.00
Tradables	2.04	1.93	-0.40%	8.94	13.63	3.06%	0.36	0.35	0.99	1.09	0.75	0.74
Tradables without agriculture	2.05	1.88	-0.61%	18.42	24.93	2.18%	0.50	0.48	0.75	0.96	0.65	0.74
Non Tradables	1.74	1.83	0.38%	41.95	62.71	2.91%	1.43	1.44	1.01	0.94	1.17	1.18
Non tradables without government	1.60	1.73	0.59%	29.56	49.01	3.68%	0.67	0.88	0.81	0.84	0.70	0.83

Source: National Housing Survey

**Table A2.3b****Costa Rica**

Sector	Informality						Schooling (years)				Elasticity	
	Skilled Labor		Unskilled Labor		Total labor		Skilled		Unskilled		Skilled	Unskilled
	1981	1995	1981	1995	1981	1995	1981	1995	1981	1995		
Agriculture	NA	1.56	NA	1.05	NA	1.21	12.2	12.3	4.3	4.6	1.42	0.47
Mining	NA	1.89	NA	0.63	NA	0.81	11.0	12.6	4.2	6.0	NA	NA
Manufacturing	NA	1.08	NA	0.62	NA	0.70	12.0	12.3	5.8	6.2	1.62	0.98
Electricity	NA	0.16	NA	0.14	NA	0.12	12.0	12.7	6.0	6.5	0.93	(0.50)
Housing	NA	2.53	NA	1.86	NA	2.10	12.7	12.2	5.0	5.6	(5.19)	(2.96)
Commerce	NA	1.66	NA	0.91	NA	1.03	11.5	12.3	5.8	6.2	2.74	1.37
Transport and Communications	NA	0.63	NA	0.96	NA	0.87	11.8	12.3	5.8	6.3	1.73	0.52
Financial Services	NA	1.00	NA	0.70	NA	0.65	13.0	13.6	6.4	6.6	1.29	1.63
Government and other Services	NA	0.56	NA	1.10	NA	0.85	13.2	13.6	5.6	5.7	2.26	0.75
Total	NA	1.00	NA	1.00	NA	1.00	12.6	13.0	5.2	5.6	1.68	0.75
Tradables	NA	1.20	NA	0.88	NA	0.98	12.1	12.3	4.8	5.2	1.55	0.66
Tradables without agriculture	NA	1.09	NA	0.62	NA	0.70	12.0	12.3	5.8	6.2	1.63	0.96
Non Tradables	NA	0.96	NA	1.11	NA	1.01	12.7	13.1	5.6	6.0	1.74	0.83
Non tradables without government	NA	1.34	NA	1.11	NA	1.12	11.7	12.3	5.6	6.1	2.01	0.97

Source: National Housing Survey

**Table A2.3c****Costa Rica**

Sector	Annual Growth			# Employees			
	GDP	Skilled	Unskilled	Skilled		Unskilled	
		Employment		1981	1995	1981	1995
Agriculture	3.63%	5.16%	1.71%	5616	11360	155777	197377
Mining	NA	7.72%	0.45%	162	459	1717	1829
Manufacturing	3.39%	5.50%	3.31%	15985	33806	85945	135629
Electricity	5.76%	5.33%	-2.86%	2720	5631	6626	4411
Housing	-0.93%	4.82%	2.75%	3574	6912	40144	58681
Commerce	3.06%	8.38%	4.18%	18751	57856	69322	122905
Transport and Communications	6.21%	10.77%	3.22%	4072	17052	23105	36018
Financial Services	4.12%	5.31%	6.70%	13734	28336	5750	14253
Government and other Services	1.94%	4.38%	1.45%	63920	116451	109565	134090
Total	3.37%	5.66%	2.52%	128535	277864	497951	705193
Tradables	3.50%	5.43%	2.30%	21763	45625	243439	334835
Tradables without agriculture	3.39%	5.52%	3.27%	16147	34265	87662	137458
Non Tradables	3.29%	5.71%	2.72%	106771	232238	254512	370358
Non tradables without government	3.66%	7.36%	3.55%	42851	115787	144947	236268

Source: National Housing Survey



**Table A2.4a**  
**Labor Demand Indicators**  
**México**

Sector	Relative wages (skilled/ unskilled)			# Skilled / # Unskilled			Labor intensity (total=100)					
							Skilled Labor		Unskilled Labor		Total labor	
	1984	1994	cambio anual	1984	1994	cambio anual	1984	1994	1984	1994	1984	1994
Agriculture	3.55	3.78	0.64%	1.38	2.71	7.00%	0.45	0.27	4.11	2.45	2.95	1.27
Mining	1.36	3.06	8.44%	94.70	60.34	-4.41%	NA	NA	NA	NA	NA	NA
Manufacturing	1.94	2.54	2.72%	20.94	30.95	3.98%	1.05	0.81	1.05	1.19	1.05	1.02
Electricity	1.36	2.92	7.96%	69.16	80.45	1.52%	2.03	0.51	1.38	0.35	1.58	0.44
Housing	2.52	3.42	3.09%	10.28	13.97	3.11%	0.64	1.10	1.10	2.71	0.95	1.84
Commerce	1.63	2.13	2.73%	19.00	39.04	7.47%	0.62	0.76	0.89	0.97	0.80	0.86
Transport and Communications	0.81	1.80	8.22%	22.07	48.49	8.19%	0.54	0.64	0.89	0.66	0.78	0.65
Financial Services	2.20	1.15	-6.27%	152.93	347.46	8.55%	1.02	0.34	0.14	0.09	0.42	0.23
Government and other Services	2.12	3.03	3.65%	63.02	83.63	2.87%	1.78	2.25	0.69	1.10	1.03	1.72
Total	1.99	3.09	4.53%	22.85	37.59	5.11%	1.00	1.00	1.00	1.00	1.00	1.00
Tradables	1.96	3.04	4.47%	8.15	15.04	6.32%	0.83	0.68	1.77	1.42	1.47	1.02
Tradables without agriculture	1.59	2.80	5.83%	22.37	31.68	3.54%	0.97	0.81	0.97	1.11	0.97	1.02
Non Tradables	1.54	2.03	2.76%	37.93	57.25	4.20%	1.06	1.11	0.73	0.85	0.83	0.99
Non tradables without government	1.47	1.90	2.58%	24.65	37.19	4.20%	0.97	0.98	0.98	0.93	0.98	0.95

Source: National Housing Survey

**Table A2.4b**

**México**

Sector	Informality						Schooling (years)				Elasticity	
	Skilled Labor		Unskilled Labor		Total labor		Skilled		Unskilled		Skilled	Unskilled
	1984	1994	1984	1994	1984	1994	1984	1994	1984	1994		
Agriculture	1.57	2.24	1.26	1.24	1.39	1.41	12.7	13.5	2.9	3.4	4.44	0.02
Minning	1.79	1.28	0.79	0.53	0.88	0.66	15.1	14.2	5.6	5.0	2.06	5.87
Manufacturing	0.87	0.80	0.61	0.73	0.63	0.75	13.7	13.6	5.3	5.7	2.56	1.34
Electricity	0.24	0.10	0.26	0.42	0.22	0.29	15.1	14.0	5.5	5.5	(0.75)	(0.97)
Housing	2.10	1.09	1.12	1.00	1.22	1.08	14.1	14.5	3.8	4.7	(4.42)	(2.92)
Commerce	1.48	1.34	0.98	1.05	1.03	1.09	12.7	13.5	4.9	5.5	14.51	2.06
Transport and Communications	0.81	1.16	0.67	0.87	0.68	0.89	13.9	14.0	5.6	6.5	1.77	(0.05)
Financial Services	1.33	0.98	0.59	0.71	0.66	0.63	14.0	15.1	6.9	6.6	(0.04)	(1.18)
Government and other Services	0.76	0.87	0.87	0.90	0.74	0.80	13.7	14.6	4.9	5.5	3.28	2.15
Total	1.00	1.00	1.00	1.00	1.00	1.00	13.6	14.2	4.2	4.9	2.71	0.90
Tradables	1.03	1.02	1.08	1.04	1.15	1.12	13.6	13.6	3.6	4.3	2.88	0.61
Tradables without agriculture	0.94	0.82	0.61	0.73	0.64	0.75	13.8	13.6	5.3	5.7	2.44	1.36
Non Tradables	0.99	1.00	0.91	0.96	0.87	0.92	13.6	14.4	4.9	5.4	2.67	1.17
Non tradables without government	1.09	1.13	1.13	1.12	1.12	1.12	13.5	13.9	4.9	5.4	2.08	0.65

Source: National Housing Survey

**Table A2.4c****México**

Sector	Annual Growth			# Employees			
	GDP	Skilled	Unskilled	Skilled		Unskilled	
		Employment	1984	1994	1984	1994	
Agriculture	1.12%	4.98%	0.03%	79418	156882.1	5767951	5790037
Mining	0.87%	1.80%	5.13%	50253	64524.65	53068	106929.9
Manufacturing	2.39%	6.12%	3.20%	563764	1294316	2692172	4181808
Electricity	4.78%	-3.59%	-4.62%	118890	71277.24	171916	88596.38
Housing	-1.55%	6.85%	4.53%	115386	291578.6	1122309	2087287
Commerce	0.43%	6.21%	0.88%	585812	1360819	3082755	3485292
Transport and Communications	3.18%	5.62%	-0.16%	183487	394352.2	831296	813289.4
Financial Services	4.99%	-0.21%	-5.89%	334022	324519.4	218412	93397.54
Government and other Services	1.88%	6.16%	4.03%	1809620	4176243	2871400	4993540
Total	2.03%	5.51%	1.82%	3840652	8134513	16811279	21640177
Tradables	1.99%	5.74%	1.21%	693435	1515723	8513191	10078775
Tradables without agriculture	2.39%	5.84%	3.24%	614017	1358841	2745240	4288738
Non Tradables	2.04%	5.45%	2.40%	3147217	6618789	8298088	11561402
Non tradables without government	2.11%	4.40%	1.37%	1337597	2442547	5426688	6567863

Source: National Housing Survey





**Table A2.5a**  
**Labor Demand Indicators**  
**Perú**

Sector	Relative wages (skilled/ unskilled)			# Skilled / # Unskilled			Labor intensity (total=100)					
	Skilled Labor		Unskilled Labor		Total labor		1985	1996	1985	1996	1985	1996
	1985	1996	cambio anual	1985	1996	cambio anual						
Agriculture	0.92	1.26	3.55%	8.79	12.67	4.15%	0.17	0.30	3.26	2.50	1.66	1.20
Mining	2.98	2.58	-1.59%	49.18	139.11	12.25%	0.28	0.60	0.19	0.26	0.24	0.46
Manufacturing	1.70	1.44	-1.79%	66.86	110.25	5.72%	0.62	0.65	0.61	0.51	0.61	0.59
Electricity	1.62	1.47	-1.09%	235.86	611.60	11.17%	2.02	0.72	0.63	0.11	1.35	0.47
Housing	1.50	1.37	-1.06%	33.28	71.18	8.81%	0.49	0.44	0.88	0.64	0.68	0.52
Commerce	2.80	1.42	-7.25%	54.03	83.54	4.96%	1.47	1.38	1.31	1.50	1.39	1.43
Transport and Communications	2.15	1.43	-4.43%	87.97	145.76	5.77%	1.32	1.54	0.92	1.05	1.13	1.34
Financial Services	2.49	2.72	1.02%	674.33	724.10	0.79%	0.82	0.66	0.05	0.07	0.45	0.42
Government and other Services	1.93	1.61	-1.97%	164.84	203.09	2.35%	2.63	3.27	0.87	1.45	1.78	2.53
Total	1.99	1.70	-1.71%	60.42	79.27	3.06%	1.00	1.00	1.00	1.00	1.00	1.00
Tradables	1.99	1.91	-0.49%	30.09	33.68	1.26%	0.41	0.53	1.20	1.10	0.79	0.30
Tradables without agriculture	2.51	2.12	-1.84%	65.28	112.83	6.27%	0.49	0.63	0.46	0.45	0.47	0.56
Non Tradables	2.03	1.64	-2.35%	71.81	95.51	3.22%	2.30	1.90	1.07	1.12	1.86	1.18
Non tradables without government	2.04	1.63	-2.45%	95.05	130.12	3.55%	1.51	1.36	1.09	1.09	1.00	1.40

Source: National Housing Survey

**Table A2.5b**

**Perú**

Sector	Informality						Schooling (years)				Elasticity	
	Skilled Labor		Unskilled Labor		Total labor		Skilled		Unskilled		Skilled	Unskilled
	1985	1996	1985	1996	1985	1996	1985	1996	1985	1996		
Agriculture	1.39	NA	1.05	NA	1.11	NA	11.8	11.7	4.3	3.1	4.35	2.81
Mining	0.34	NA	0.14	NA	0.19	NA	13.1	12.5	5.5	5.7	(6.50)	(0.80)
Manufacturing	0.88	NA	0.83	NA	0.81	NA	12.1	12.4	6.2	5.2	4.34	1.00
Electricity	0.33	NA	0.99	NA	0.49	NA	12.7	12.7	7.5	4.6	0.61	(1.35)
Housing	0.97	NA	0.88	NA	0.89	NA	11.8	12.1	5.8	5.5	1.79	0.56
Commerce	1.12	NA	1.02	NA	1.01	NA	12.1	12.3	5.9	5.0	5.66	2.94
Transport and Communications	0.73	NA	0.85	NA	0.75	NA	12.0	12.1	6.5	6.4	7.56	4.25
Financial Services	0.66	NA	0.69	NA	0.55	NA	13.4	13.7	7.4	6.5	2.01	1.76
Government and other Services	0.63	NA	0.81	NA	0.64	NA	13.1	13.0	6.1	5.4	(4.78)	(3.13)
Total	1.00	NA	1.00	NA	1.00	NA	12.5	12.5	5.1	4.1	5.19	3.36
Tradables	1.06	NA	1.01	NA	1.04	NA	12.1	12.2	4.6	3.4	7.87	5.46
Tradables without agriculture	0.85	NA	0.78	NA	0.77	NA	12.2	12.5	6.1	5.3	4.66	1.00
Non Tradables	0.83	NA	0.94	NA	0.85	NA	12.7	12.6	6.0	5.3	4.06	2.40
Non tradables without government	0.96	NA	0.98	NA	0.93	NA	12.3	12.4	6.0	5.3	3.39	1.80

Source: National Housing Survey

**Table A2.5c****Perú**

Sector	Annual Growth			# Employees			
	GDP	Skilled	Unskilled	Skilled		Unskilled	
		Employment	1985	1996	1985	1996	
Agriculture	2.92%	12.69%	8.21%	82367	241479	937116	1905723
Mining	-2.19%	14.22%	1.76%	19746	65344	40148	46973
Manufacturing	1.74%	7.56%	1.75%	274499	529010	410574	479815
Electricity	5.30%	3.21%	-7.16%	21737	28895	9216	4725
Housing	7.45%	13.36%	4.18%	45718	141378	137352	198611
Commerce	1.93%	10.94%	5.69%	371957	946713	688403	1133186
Transport and Communications	1.88%	14.25%	8.01%	102576	340081	116600	233309
Financial Services	3.32%	6.69%	5.85%	126580	226670	18771	31304
Government and other Services	-1.49%	7.11%	4.66%	599342	1112147	363581	547606
Total	1.77%	9.20%	5.96%	1644522	3631718	2721762	4581251
Tradables	1.18%	9.26%	6.43%	376612	835833	1387838	2432511
Tradables without agriculture	1.74%	8.13%	1.75%	294245	594354	450722	526788
Non Tradables	2.26%	9.18%	5.44%	1267910	2795884	1333923	2148740
Non tradables without government	3.18%	10.81%	5.72%	668568	1683737	970342	1601134

Source: National Housing Survey



**Table A2.6a**  
**Labor Demand Indicators**  
**Venezuela**

Sector	Relative wages (skilled/ unskilled)			# Skilled / # Unskilled			Labor intensity (total=100)					
							Skilled Labor		Unskilled Labor		Total labor	
	1981	1995	cambio anual	1981	1995	cambio anual	1981	1995	1981	1995	1981	1995
Agriculture	3.03	2.63	-1.00%	1.47	4.27	7.90%	0.26	0.41	2.13	2.65	1.65	1.65
Mining	1.34	1.52	0.90%	44.00	107.95	6.62%	0.21	0.09	0.11	0.04	0.13	0.06
Manufacturing	2.00	1.64	-1.40%	12.13	34.83	7.82%	0.68	0.55	0.91	0.72	0.85	0.64
Electricity	1.51	0.70	-5.33%	23.00	96.15	10.76%	1.33	0.79	1.28	0.49	1.29	0.62
Housing	1.92	1.81	-0.44%	9.38	21.86	6.23%	0.56	1.17	1.08	2.27	0.95	1.78
Commerce	1.68	1.59	-0.39%	13.45	38.13	7.73%	0.94	1.55	1.40	1.99	1.28	1.79
Transport and Communications	1.31	1.52	1.04%	11.67	36.33	8.45%	0.86	1.05	1.93	1.69	1.66	1.40
Financial Services	1.91	1.82	-0.32%	65.22	196.32	8.19%	1.15	1.22	0.32	0.28	0.53	0.70
Government and other Services	2.19	1.95	-0.81%	29.83	75.66	6.87%	3.11	2.42	1.64	1.43	2.01	1.87
Total	1.99	1.84	-0.55%	17.55	44.00	6.79%	1.00	1.00	1.00	1.00	1.00	1.00
Tradables	1.89	1.80	-0.35%	8.90	19.37	5.72%	0.43	0.33	0.70	0.63	0.63	0.49
Tradables without agriculture	1.60	1.57	-0.11%	14.17	37.56	7.21%	0.45	0.32	0.52	0.39	0.50	0.70
Non Tradables	1.73	1.42	-1.41%	21.67	56.28	7.06%	1.42	1.61	1.22	1.34	1.27	1.46
Non tradables without government	1.66	1.36	-1.44%	16.49	45.53	7.52%	1.44	1.26	1.47	1.21	1.46	1.23

Source: National Housing Survey

**Table A2.6b**

**Venezuela**

Sector	Informality						Schooling (years)				Elasticity	
	Skilled Labor		Unskilled Labor		Total labor		Skilled		Unskilled		Skilled	Unskilled
	1981	1995	1981	1995	1981	1995	1981	1995	1981	1995		
Agriculture	NA	1.77	NA	1.23	NA	1.35	12.3	11.5	2.4	3.7	5.85	1.87
Mining	NA	0.66	NA	0.87	NA	0.74	13.0	11.5	6.1	6.2	1.00	(1.45)
Manufacturing	NA	0.85	NA	0.82	NA	0.83	12.5	11.5	5.7	6.2	3.43	0.09
Electricity	NA	0.49	NA	0.55	NA	0.50	12.6	11.7	5.9	6.3	1.47	(0.35)
Housing	NA	1.32	NA	1.07	NA	1.14	12.6	11.6	4.9	5.7	(1.56)	(0.23)
Commerce	NA	1.39	NA	1.09	NA	1.16	12.1	11.4	5.4	6.0	40.15	10.87
Transport and Communications	NA	1.09	NA	1.09	NA	1.10	12.1	11.4	5.8	6.3	7.15	0.56
Financial Services	NA	1.02	NA	0.63	NA	0.74	13.0	12.1	7.3	6.8	3.46	0.19
Government and other Services	NA	0.78	NA	0.89	NA	0.83	13.2	11.9	5.7	5.9	3.28	0.37
Total	NA	1.00	NA	1.00	NA	1.00	12.8	11.7	5.1	5.7	5.46	1.03
Tradables	NA	0.94	NA	1.03	NA	1.06	12.5	11.5	4.2	4.9	3.16	0.75
Tradables without agriculture	NA	0.83	NA	0.82	NA	0.83	12.6	11.5	5.7	6.2	3.08	0.00
Non Tradables	NA	1.01	NA	0.99	NA	0.98	13.1	11.9	5.7	6.1	10.13	1.75
Non tradables without government	NA	1.22	NA	1.05	NA	1.08	12.5	11.6	5.5	6.0	29.79	5.82

Source: National Housing Survey

**Table A2.6c****Venezuela**

Sector	Annual Growth			# Employees			
	GDP	Skilled Employment	Unskilled Employment	Skilled		Unskilled	
				1981	1995	1981	1995
Agriculture	2.06%	12.04%	3.84%	8105	39792	550107	932026
Mining	2.60%	2.59%	-3.78%	21777	31156	49492	28862
Manufacturing	2.35%	8.05%	0.21%	87873	259618	724154	745283
Electricity	5.78%	8.49%	-2.05%	10576	33102	45992	34427
Housing	-4.74%	7.38%	1.09%	39022	105757	415968	483850
Commerce	0.27%	10.91%	2.96%	107629	458806	800418	1203411
Transport and Communications	1.29%	9.23%	0.72%	35419	121892	303555	335506
Financial Services	2.52%	8.72%	0.49%	87774	282770	134587	144037
Government and other Services	2.38%	7.82%	0.89%	321778	923703	1078545	1220874
Total	1.56%	8.50%	1.61%	719953	2256596	4102818	5128276
Tradables	2.42%	7.65%	1.83%	117755	330566	1323753	1706171
Tradables without agriculture	2.35%	7.21%	0.00%	109650	290774	773646	774145
Non Tradables	0.85%	8.66%	1.50%	602198	1926030	2779065	3422105
Non tradables without government	0.32%	9.53%	1.86%	280420	1002327	1700520	2201231

Source: National Housing Survey





### Appendix 3

**Table A3.1**

Regression Results: Employment

<b>Dependent Variable</b>	<b>Employment growth (annual rate)</b>		<b>Employment growth (annual rate)</b>	
	<b>Panel with random effects (Generalized least squares)</b>		<b>Panel with fixed effects</b>	
<b>Frequency</b>	<b>Annual</b>	<b>Annual</b>	<b>Annual</b>	<b>Annual</b>
Period	1980-95	1980-95	1980-95	1980-95
Labor force growth	1.07 (10.15)	1.07 (10.10)		
Transitory GDP growth	0.29 (6.45)	0.29 (5.28)	0.27 (5.18)	0.30 (4.96)
Transitory GDP growth after trade liberalization reform		-0.00 (-0.02)		-0.07 (-1.06)
# of observations	144	144	152	152
# of countries (latin American)	(19)	(19)	(19)	(19)
Adjusted R2	.48	.48	.15	.15

**Table A3.2**  
 Regression Results: Unemployment  
 (Method of estimation: panel with fixed effects)

Dependent Variable	Unemployment rate (%)			Change in unemployment rate (%)		
	Annual	Annual	Annual	Annual	Annual	Annual
Frequency	Annual	Annual	Annual	Annual	Annual	Annual
Period	1980-95	1980-95	1980-95	1980-95	1980-95	1980-95
Transitory GDP growth	-28.03 (-4.85)	-22.53 (-4.82)	-21.35 (-4.54)	-29.65 (-5.01)	-23.46 (-4.92)	-23.13 (-4.83)
Unemployment rate (lagged)	0.82 (18.97)	0.89 (21.33)	0.89 (21.40)			
Machinery investment / permanent GDP		7.18 (2.48)	9.15 (2.72)		8.87 (3.08)	10.72 (3.20)
Changes in composition of production			0.16 (1.50)			0.01 (0.33)
# of observations	172	144	143	172	144	143
# of countries (latin American)	19 (19)	19 (19)	19 (19)	19 (19)	19 (19)	19 (19)
Adjusted R2	0.68	0.75	0.75	0.12	0.16	0.75

**Table A3.3**

Regression Results: Macro Variables  
(Method of estimation: panel with fixed effects)

<b>Dependent Variable</b>	<b>Capital inflows / GDP</b>	<b>Real exchange rate index (1990=100)</b>			<b>Tradable / non tradable relative price index (1990=1)</b>		<b>Machinery investment / GDP</b>	<b>Machinery stock / GDP</b>
		<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>		
<b>Frequency</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>	<b>Tri annual</b>
<b>Period</b>	<b>1985-95</b>	<b>1981-95</b>	<b>1981-95</b>	<b>1981-95</b>	<b>1981-95</b>	<b>1981-95</b>	<b>1985-95</b>	<b>1981-95</b>
Capital flows / GDP		-6.14 (-4.54)	-4.83 (-3.32)	-4.86 (-2.64)				
Fiscal Balance / GDP				1.65 (1.81)				
Structural reforms index (scale between 1 and 5)	0.10 (3.52)			-0.89 (-1.97)			0.09 (6.42)	0.10 (3.52)
Real exchange rate index (1990=1)					0.85 (3.91)	0.71 (4.81)		
Rho (Hildreth-Lu estimation)			0.37 (2.34)			0.38 (2.70)		
# of observations	40	50	40	40	35	35	40	50
# of countries (latin American)	11 (11)	11 (11)	11 (11)	11 (11)	11 (11)	11 (11)	11 (11)	11 (11)
Adjusted R2	0.21	0.30	0.35	0.33	0.39	0.51	0.51	0.43

**Table A3.4**

Regression Results: Employment Composition  
(Method of estimation: panel with fixed effects)

<b>Dependent Variable</b>	<b>Manufacturing employment (tradable)/ urban</b>	<b>Informal employment/urban</b>	<b>Self-employment/urban</b>	<b>Skilled / unskilled employment</b>	
				<b>Annual</b>	<b>Annual</b>
<b>Frequency</b>	<b>Triannual</b>	<b>Annual</b>	<b>Annual</b>	<b>Annual</b>	<b>Annual</b>
<b>Period</b>	<b>1981-95</b>	<b>1990-95</b>	<b>1990-95</b>	<b>1971-92 a</b>	<b>1973-92 a</b>
Machinery investment / GDP (lagged 1 year)				0.94 (2.35)	
Machinery investment / GDP (lagged 3 years)					1.90 (4.37)
Imported machinery stock	-0.16 (-2.27)	2.65 (1.28)	3.08 (2.23)		
Manufacturing share in urban GDP					
Tradable / non tradable price index (1990=1)	0.11 (4.79)	-8.24 (-3.09)			
Year (trend)				0.02 (16.51)	0.02 (18.4)
# of observatios	39	71	84	488	478
# of countries (latin American)	9 (9)	9 (9)	9 (9)	35 (9)	35 (9)
Adjusted R2	0.40	0.13	0.06	0.92	0.93

a Informationnot available for some periods in some countries

Note: The first column estimatrions come from Flug y Hercowitz (1996).

**Table A3.5**

Regression Results: Employment in the Manufacturing Sector  
(Method of estimation: panel with fixed effects)

Dependent Variable	Annual employment growth in the manufacturing sector			
	Annual	Annual	Annual	Annual
	1970-1995 a	1970-1995 a	1970-1995 a	1970-1995 a
International trade coefficient: (X+M)/GDP	-0.105 (-1.4)		-0.102 (-1.3)	
Average trade tariffs		-0.021 (-0.7)		0.001 (0.0)
Real exchange rate vs USA (log)	0.122 (3.8)	0.053 (1.7)	0.097 (3.0)	0.069 (2.1)
Lagged employment (log)	-0.306 (-3.6)	-0.232 (-3.2)	-0.119 (-2.0)	-0.187 (-2.6)
Real wages (log)	-0.034 (-1.1)	-0.005 (-0.2)	-0.013 (-0.4)	0.015 (0.6)
GDP (log)	0.390 (3.5)	0.272 (2.9)		
Year (trend)	-0.006 (-1.9)	-0.013 (-2.4)	0.002 (0.9)	-0.001 (-0.3)
Lagged manufacturing employment growth	0.071 (0.8)	0.147 (1.4)	-0.009 (0.10)	0.114 (1.0)
# of observations	138	69	138	69
# of countries (latino American)	18 (18)	9 (9)	18 (18)	9 (9)
Adjusted R2	0.195	0.427	0.125	0.368

Source: Márquez y Pagés (1997).

Note: The specification used comes from a partial adjustment function:

$$y_t = \delta y_{t-1} + \beta X_t + \varepsilon_t,$$

being transformed in:

$$\Delta y_t = (\delta - 1)y_{t-1} + \beta X_t + \varepsilon_t,$$

where  $y_t$  is the employment,  $X_t$  the explaining variables and  $t$  the error term.

**Table A3.6**

Regression Results: Relative Wages in the Manufacturing Sector  
(Method of estimation: panel with fixed effects)

<b>Dependent Variable</b>	<b>Relative wages skilled / unskilled</b>	<b>relative wages white collar / blue collar</b>	
	<b>Annual</b>	<b>Trienal</b>	<b>Trienal</b>
<b>Period</b>	<b>1983-1992 a</b>	<b>1981-95</b>	<b>1981-95</b>
Machinery investment/ GDP (lagged)	7.62 (3.49)		
Imported machinery stock/ GDP		0.69 (3.51)	0.64 (3.06)
Manufacturing participation in urban GDP		1.71 (2.17)	
Year (trend)	-0.01 (-1.99)		
# of observations	216	25	25
# of countries (latino American)	39 (8)	6 (6)	6 (6)
Adjusted R2	0.85	0.38	0.28

a With not available information in some countries

Note: The first column estimations come from Flug y Hercowitz (1996).

## **Appendix 4**

### **Description of the Model for Simulation of Macro-Labor Relationships**

A systematic analysis of relations among macroeconomic and labor variables requires a general equilibrium model that specifies the adjustment mechanisms of the various markets for goods and factors and the way in which certain macro policies and some exogenous variables may affect the behavior of those markets.<sup>53</sup>

In this appendix, we describe (non-mathematically) the structure of a simple general equilibrium model that will later be used to assess the effects of changes in some macro variables (that may be the result of policies) on the status of labor.

The features of this model can be summarized as follows:

◆ There are two production sectors: tradables (that are exported or consumed) and nontradables (only consumed). This division of sectors would not be sufficient if one were attempting to capture the effects of the composition of trade on relative prices among tradable goods and their influence on relative remuneration in the tradition of the theory of comparative advantage in international trade. However, as was argued in Section 6, there is a consensus among analysts about the predictive failure of this theory in the Latin American experience in the past decade (at the very least).

◆ There are three production factors: capital, skilled labor, and unskilled labor, which may be formal or informal. These factors combine through functions of production in three stages: in the first, capital and skilled labor join forces under conditions of complementarity<sup>54</sup>. In the second, formal and informal unskilled labor are combined under conditions of high substitutability. In the third, also under conditions of substitutability, the mix of capital and skilled labor combines with the mix of unskilled labor.<sup>55</sup> Capital is partially mobile between the tradable and nontradable sectors (according to a function of transformation). Each type of labor is completely mobile between the two sectors.

◆ Endowments of capital and skilled labor are fixed (and can be changed exogenously). These two factors are always used fully. Total unskilled labor also has a total fixed supply, but workers can move between the formal and informal sectors, depending on the relative remuneration offered by the two segments.<sup>56</sup> Total endowment of unskilled labor may not be fully utilized when it is assumed that there is formal wage stickiness (a minimum wage that is restrictive in the formal segment) or rigidity in the numbers of jobs in the formal sector (laws that completely restrict hiring or firing).

◆ The factorial composition in each of the two sectors, and the relative size of the sectors, is calculated to reflect three types of countries, based on their income levels (which, for the sake of brevity, we shall call poor/average/wealthy).

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<sup>53</sup> The utility of this kind of model in labor analysis has been justified, theoretically and empirically, in a number of studies. See Hamermesh (1993), Agénor and Aizenman (1994), Richardson (1995) and Robinson and Thierfelder (1996).

<sup>54</sup> Or of “non-separability” See Hamermesh (1993).

<sup>55</sup> See Fitzroy and Funke (1994). At all three levels, the functions used are of the CES (constant elasticity of substitution) type, with a substitution parameter that is different at each level.

<sup>56</sup> This decision is modeled on a function of constant of elasticity transformation (CET). This functional form is consistent with the existence of heterogeneity in the tastes of workers for either segment. See Lindbeck and Snower (1991) and DeWit (1993). On the other hand, it is not consistent with the usual duality theory, according to which the informal workers are a residue that queues up to enter the formal sector at higher wages, a theory that has been refuted by the evidence of relative wages and by the procyclical behavior of the informal labor market. See Maloney (1997) and Maloney and Cunningham (1997).

◆Consumers receive all the income that the economy generates. They pay taxes at a single rate, save a fixed portion, and spend the rest, maximizing a consumption function that combines tradable and nontradable goods.<sup>57</sup>

◆The government's revenue comes from taxes, and its expenditure on nontradable goods is fixed. Its deficit is endogenous.

◆The external sector must assure equilibrium in the macro balances: the current account balance is identical to the value of net exports of the tradable good that, under equilibrium, corresponds to the savings by families, less the government's deficit. The real exchange rate is endogenous and corresponds to the relative price of the tradables (the numeraire) with respect to the nontradables (which moves in order to assure equilibrium in the market for goods).

This model has been calibrated to represent, in a very stylized form, three types of economies, by income level. Its utility lies in the fact that it permits analyzing the effect that various macroeconomic shocks may have on the different types of economy. The model also makes it possible to perceive the influence that wage stickiness or rigidities in hiring and firing may have on the formal sector of unskilled labor.

In Table A4, which is part of this appendix, we present a summary of the results of simulating the following four shocks, which correspond to some of the macro effects that produced the stabilization policies and the structural reforms:

◆Increase in capital inflows used to finance a reduction in the rates of savings by families;<sup>58</sup>

◆Increase in the stock of total capital (whose origin or means of financing is not considered);

◆Neutral increase in productivity in the tradable sector of the economy;

◆Increase in productivity in the tradable sector biased toward skilled labor (increase in productivity of this factor with a reduction in the productivity of unskilled labor).

Among the results of the simulation that are summarized in the table, it is worth pointing out the following in relation to the macro variables:

◆Higher rates of growth in GDP may be the result of an increase in stocks of capital or of changes in productivity. By themselves, the heavier inflows of capital have very few important effects on growth, although where there is wage stickiness, they may reduce it.

◆The appreciation in the real exchange rate may be the result of the heavier inflows of capital or of increases in productivity. A larger stock of capital distributed proportionately between the tradable and nontradable sectors would lead, instead, to a depreciation (since it would reduce the price of the nontradables, as that of the tradables is being given internationally).<sup>59</sup>

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<sup>57</sup> Of the CES type.

<sup>58</sup> Due to the nature of the model, the results can also be interpreted as having the same effect as an increase in external income owing to greater exploitation (or higher prices) of a natural resource that does not require any other factor and whose earnings are received and consumed fully by the private sector.

<sup>59</sup> Of course, an increase in capital stocks that is concentrated in the tradable sector would produce an appreciation.



◆Without changes in productivity, participation by the tradable sector goes in the same direction as the real exchange rate (increase is depreciation, following usage in Latin America). Nevertheless, the increases in productivity in the tradable sector must produce a real appreciation with increases in the participation by this sector.

With respect to the labor effects of the shocks, it is pertinent to point out the following results:

◆Real wages for unskilled workers tend to rise as a result of improvements in productivity, but can fall as a result of the heavier inflows of capital or of the increase in the stock of capital, depending on the regime by which the labor market functions;

◆All the shocks we have considered increase the wage differentials between skilled and unskilled workers. The only exception occurs when there is wage stickiness, in the event of heavier inflows of capital in wealthy economies (Argentina resembles this case).<sup>60</sup>

◆Total employment of unskilled workers (formal and informal) may rise or fall, depending on the combination of shocks, when there is wage stickiness (and also with differences according to the type of economy). The variety of results for this variable explains the difficulty of using econometric estimates to explaining changes in employment. The same can be said of unemployment.

◆Participation of employment in tradable sectors moves in line with the real exchange rate (which, as we have said, is defined in the model as the relative price of the tradables with respect to the nontradables). This result is consistent with the econometric estimates (see Appendix 3).

◆The importance of the informal economy does not decline under any of the shocks we have considered, a result that is consistent with what has occurred in the region. Inflows of capital systematically increase “informality,” regardless of the type of economy or labor market. The productivity shocks in the tradable sectors have this effect in the wealthiest economies, but not in the poor ones.

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<sup>60</sup> See an analysis of the Argentine case along these same lines, in García Swartz (1997).

**TABLE A4**  
**MACROECONOMIC AND LABOR EFFECTS FROM DIFFERENT SHOCKS: SIMULATION RESULTS**

formal and unskilled labor market type	Higher capital inflows			Higher capital stock			Higher tradable productivity			Tecnologia sesgada vs mo		
	Flexible	Rigid Wage	Rigid Employment	Flexible	Rigid Wage	Rigid Employment	Flexible	Rigid Wage	Rigid Employment	Flexible	Rigid Wage	Rigid Employment
<b>Macro Variables</b>												
Growth	≈	-	~	+	+	+	+	+	+	+	+	+
Tradable GDP sharing	-	-	-	+	+	+	+	+	+	+	+	+
Real exchange rate (+ is depreciation)	-	-	-	+	+	+	-	-	-	-	-	-
<b>Labor variables</b>												
Unskilled labor salaries	~/-/-	+	-	+	-	+	+	~/~/+	+	~	+	~
Relative wage (skilled / unskilled)	+	+/+/-	+	+	+	+	+	+	+	+	+/+/~	+
Unskilled labor employment	~	-	+	~	+	~	~	+/+/-	~	~	~/-/-	~/~/+
employment sharing in tradables	-	-	-	+	+	+	-	-	-	-	-	-
Informality sharing	+	+	+	~	~	~	~/~/+	~/~/+	~/~/+	~/~/+	~/+/+	~/~/+
Unskilled labor unemployment	~	+	-	~	-	~	~	-/-/+	~	~	~/+/+	~/~/-

Note: when different signs are on the shells, it correspond to poor/medium/rich countries