

Working in a Volatile World: Macroeconomic Shocks and the Labor Market

Labor markets in Latin America operate in a volatile macroeconomic environment. This chapter documents the sources of this volatility and discusses its impact on the labor market. Although shocks affect both labor demand and labor supply, the chapter focuses on the former (movements in labor supply are discussed in chapter 3).

After documenting the high degree of macroeconomic volatility that characterizes Latin America, the chapter shows that shifts in labor demand translate into changes in employment or changes in wages (or both). The analysis explores why, compared with developed countries, Latin American countries tend to adjust more through wages and less through employment. It also discusses characteristics of emerging market countries that may amplify the impact of external shocks.

DISAPPOINTING PERFORMANCE

Latin America's macroeconomic performance has been disappointing. The growth rate of the region's income can be described in two words: low and volatile. Over the past 30 years, average annual growth of income per capita in the region has been just above 1 percent, well below that of East Asia and the rest of Asia (which ranged between 3.5 and 6 percent) and developed countries (see Figure 4.1). Only Sub-Saharan Africa and the Middle East

did worse than Latin America. In the long run, the difference between 1 and 4 percent is dramatic. At the end of 2000, Latin America's gross domestic product (GDP) per capita was 40 percent higher than it was in 1970. The corresponding figures for East Asia and developed countries were 320 percent and 80 percent, respectively.

Not only has Latin America's growth been slow, but it could also be described as "unsafe at any speed." Table 4.1 shows that Latin America is characterized by a high degree of economic volatility. Again, only Sub-Saharan Africa and the Middle East have been more volatile than Latin America. Studies suggest that this high degree of economic volatility contributes to the poor growth performance of the region.¹

There are two main reasons why Latin America is so volatile. First, the region is subject to large shocks, and second, countries in the region are poorly equipped to cope with these shocks.

Latin America is subject to large terms of trade and capital flow volatility (again, only Sub-Saharan Africa and the Middle East are subject to larger shocks (Table 4.1). It is well-known that nega-

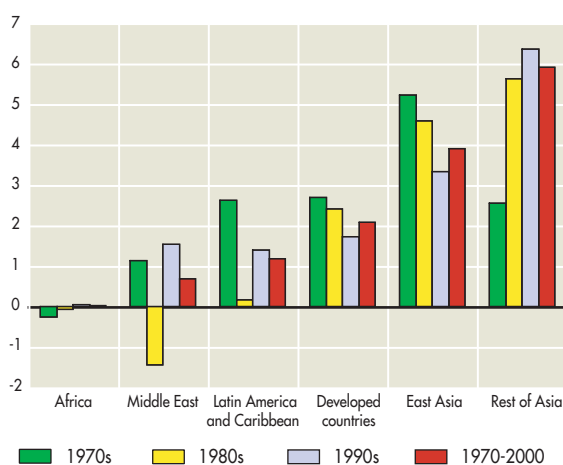
¹ Ramey and Ramey (1995) show that volatility leads to lower growth. Inter-American Development Bank (1995) discusses in greater detail the links between volatility and growth performance, and the determinants of macroeconomic volatility in Latin America.

Table 4.1 Growth and Volatility by Region, 1970–2000

Region	Average GDP growth	Volatility		
		Output gap	Terms of trade	Capital flows
Developed countries	2.10	0.04	6.65	6.47
Latin America	1.20	0.09	13.09	9.25
Africa	0.03	0.10	20.11	10.77
Middle East	0.70	0.14	28.42	22.64
East Asia	3.92	0.07	7.68	7.95
Rest of Asia	5.94	0.09	15.76	7.59

Note: Volatility is the standard deviation for the whole period.

Source: IDB calculations based on data from World Bank (various years).

Figure 4.1 Per Capita GDP Growth
(Percent)

Note: Averages are weighted by GDP.

Source: IDB calculations based on data from World Bank (various years).

tive terms of trade shocks have a large impact on net exports and hence on aggregate demand; volatile capital flows are, if anything, even more destructive. When access to capital markets is closed, which happens with distressing frequency in Latin America, the collapse of real activity is dramatic. A sudden swing in the level of the capital account, or “sudden stop,” sets in motion a destructive process as credit dries up throughout the economy and production is strangled.² The drastic growth slowdowns and recessions that follow sudden stops in net capital flows are striking. The difference in average growth between years with open access to financial markets and those with closed access to them is more than 2

percentage points. The magnitude of these external shocks is amplified by inability to conduct counter-cyclical policies (see Box 4.1).

Although macroeconomic volatility and low growth play an important role in explaining unemployment in the region, they cannot fully explain the behavior of unemployment. A simple way to show this is to look at the share of the variance of unemployment that is explained by the cyclical component of GDP. In a sample of 15 Latin American countries for which data are available, the business cycle explains more than 50 percent of the variance of unemployment in seven countries (Figure 4.2), but plays a limited role in explaining unemployment in the other eight countries. Figure 4.3 makes the same point by showing that the business cycle plays a modest role in explaining the difference in unemployment between the 1980s and the 1990s. In particular, the green bars in Figure 4.3 plot the difference between average unemployment in the 1990s and the 1980s and indicate that unemployment increased in nine of the 15 countries for which data are available. The red bars measure the difference in unemployment between the two periods that is not due to the cyclical component of GDP.³ The figure shows that the output

² See Calvo, Izquierdo, and Talvi (2002).

³ Technically, the red bars are the coefficients on a decade dummy (taking the value 1 for the 1990s and 0 for the 1980s) obtained by running a regression in which the dependent variable is the level of unemployment and the explanatory variables are the output gap and the decade dummy.

Box 4.1. How to Reduce Volatility

Greater openness, trade diversification, and ability to implement countercyclical policies are necessary conditions for reducing the impact of external shocks. Openness is important because, other things equal, the costs of the macroeconomic adjustment required by a sudden stop in capital flows is lower in countries that have a larger share of international trade (Calvo, Izquierdo, and Talvi 2002).¹ Trade diversification can play a role in reducing terms of trade volatility.² Stabilization funds can also reduce the negative impact of terms of trade volatility.

Macroeconomic policies could limit the impact of external demand shocks, but, contrary to most developed countries, Latin American countries have been unable to respond to shocks by implementing countercyclical monetary and fiscal policies. If anything, the region has been characterized by procyclical macroeconomic policies that magnify the effect of external shocks.

The inability to implement countercyclical policies is due to several factors. The most important are: (i) weak fiscal structure, (ii) procyclical international financing (that is, international financing often disappears during economic downturns when it is most needed to finance countercyclical policies), (iii) underdeveloped financial markets, and (iv) limited willingness (or ability) to let the exchange rate float freely. Political factors may also be significant. Rodrik (2001) suggests that there is a correlation between economic volatility and political systems that are under the control of a small elite. Some of these problems have a domestic solution, others require an international solution, and still others may have no clear solution, at least in the short run.

Developed countries can finance countercyclical fiscal policies by increasing public debt during recessions. There is a large literature (for a recent survey, see Braun [2003]) that shows that this may not be the case in developing countries. Talvi and Végh (2000) argue that procyclical policies arise from government's inability to accumulate surpluses during economic expansions. Gavin and Perotti (1997) and Gavin and others (1996) emphasize the role of limited creditworthiness and subinvestment-grade status in leading to a situation in which developing countries face higher borrowing costs and lack of access to capital markets during recessions. Although there is no easy solution for this problem, better budget institutions and cyclically adjusted hard budget constraints could help in reducing the effects of procyclical fiscal policies. In particular, policies that lead to accumulation of surpluses during periods of economic expansion would allow for limited countercyclical policies during recessions.

Better fiscal positions could also help in reducing the procyclical effects of international capital flows and inter-

national contagion. It should be pointed out, however, that it is unlikely that these problems will be fully solved by domestic measures. In this sense, international contagion can only be addressed by reforming the international financial architecture.

Underdeveloped financial markets are also part of the story. There is some evidence that financial intermediation dampens the macroeconomic effects of terms of trade volatility (Beck, Lundberg, and Majnoni 2001) and capital flow volatility (Caballero and Krishnamurthy 2001). Low inflation, better regulation and supervision, investor protection, and pension reforms are key conditions for deepening Latin American financial markets.

A floating exchange rate regime is important for conducting independent monetary policy. However, there is a lack of agreement on whether Latin American countries can afford such a regime. On the one hand, some analysts claim that, because of liability dollarization, countries in the region cannot respond to shocks with expansionary monetary policy.³ On the other hand, others point out that, even in the presence of liability dollarization, emerging market countries can maintain a limited degree of monetary autonomy, and that dollarization and currency boards cannot solve the fundamental problems of emerging markets.⁴

Calvo and Mishkin (2003) argue that the debate on the exchange rate regime does not capture the main point that emerging market countries are fundamentally different from developed countries. In emerging markets, the institutional framework is often weak and the key to macroeconomic success is not the exchange rate regime, but the fundamental institutions underlying it—those associated with fiscal, financial, and price stability. Therefore, the debate should focus less on whether a float or an exchange rate peg is a better arrangement, and more on the deeper institutional arrangements that support the exchange rate regime of choice.

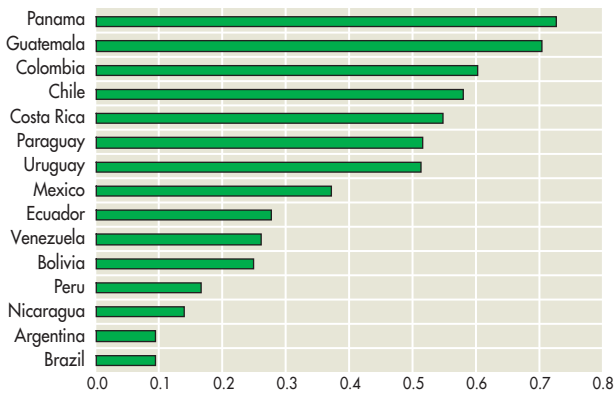
¹ Another option would be to impose restrictions on capital flows, but this may have costs in terms of growth. However, the evidence is not clear-cut; see Eichengreen (2001).

² If international trade is not diversified, greater openness could increase the macroeconomic effects of terms of trade volatility.

³ See Calvo and Reinhart (2002) and Hausmann, Panizza, and Stein (2001).

⁴ For the two sides of the debate, see Calvo (2000) and Sachs and Larraín (1999). Alternative proposals aim at dealing with liability dollarization head-on by developing mechanisms through which emerging market countries can increase their ability to borrow in their own currency. See Eichengreen, Hausmann, and Panizza (2002).

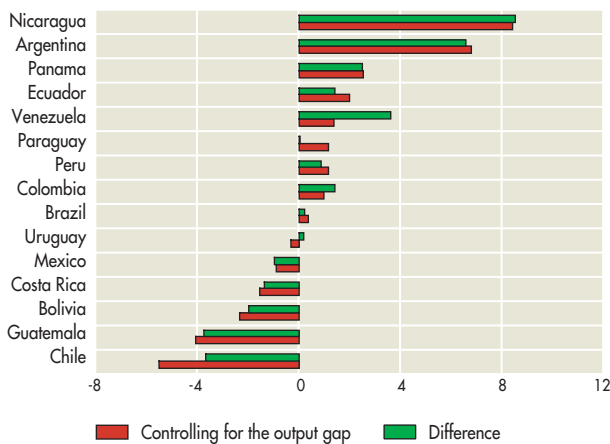
Figure 4.2 Variance of Unemployment Explained by the Output Gap



Note: The figure plots the R^2 of regressions of the level of unemployment over the output gap and lagged output gap. The output gap is measured as the deviation between the log of actual GDP and the log of trend GDP (trend GDP is computed using a Hodrick-Prescott filter with $\lambda=1000$).

Source: IDB calculations.

Figure 4.3 The Difference between Average Unemployment in the 1980s and 1990s (Percent)



Note: Coefficients on a decade dummy (taking the value 1 for the 1990s and 0 for the 1980s) obtained by running a regression in which the dependent variable is the level of unemployment and the explanatory variables are the output gap and the decade dummy (trend GDP is computed using a Hodrick-Prescott filter with $\lambda=1000$).

Source: IDB calculations.

gap cannot explain the difference between average unemployment in the two decades (except in Chile and Venezuela).

The cases of Argentina and Nicaragua are particularly puzzling. Both countries exhibited a large

increase in unemployment in the 1990s that could not be explained by GDP growth. The increase in unemployment in Nicaragua could be explained by the post-civil war adjustment in the early 1990s (there was a downward trend in unemployment in Nicaragua after 1993). But there is no explanation for the behavior of unemployment in Argentina, which, until the late 1990s, had excellent economic performance and increasing unemployment.

EMPLOYMENT

Most people find it intuitive that when economic conditions are good, employment increases (and unemployment decreases) and that when economic conditions are bad, employment decreases (and unemployment increases). But why is this? Is the relationship between economic activity and employment the same across countries and periods?

The economy could be in a situation in which all factors of production are fully employed, or in a situation with unemployed factors. In the first case, output growth could be due to either technological progress or an increase in the amount of available factors of production (more capital or more labor). Interestingly, growth could increase employment even in a situation of full employment. An increase in capital accumulation (or a positive technological shock) might increase the productivity of labor and, by increasing wages, attract new workers into the labor market. In this sense, long-run growth is key for employment growth.⁴ Rather than determining employment, however, long-run growth is much more important in determining wages. Chapter 6 discusses the relationship between technological progress and wages.

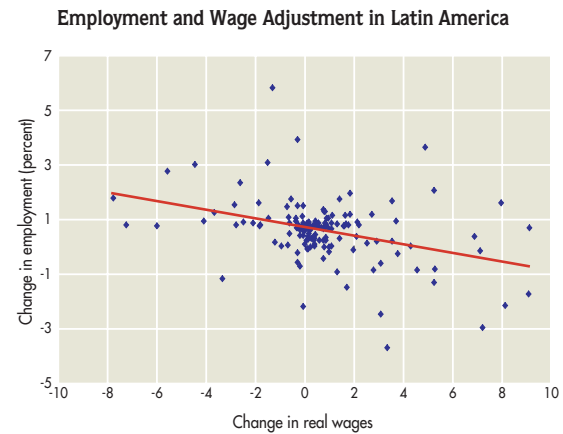
The link between macroeconomic conditions and employment is stronger in the presence of unemployed resources or, in the jargon of econo-

⁴ However, lack of aggregate demand can generate a situation in which a positive technological shock (that increases labor productivity) leads to higher unemployment. Increases in labor productivity and contractionary economic policies have been used to explain the increase in European unemployment (see Blanchard and Wolfers 2000).

Box 4.2. Wage or Employment Adjustment?

What determines cross-country differences in employment responses to changes in aggregate demand? In principle, the share of income that is captured by each factor of production is more or less constant over time.¹ Most studies show that in developed countries, labor captures two-thirds of production. (It is not clear whether labor shares are lower in developing countries; see Gollin [2002].) Thus, in a country with a GDP of \$10 billion, workers would earn (including taxes and nonwage benefits) a total of \$6.6 billion and the owners of capital would capture the remaining \$3.4 billion. With constant factor shares, a negative shock that reduces total GDP by 10 percent would reduce the income captured by labor to \$6 billion. Assuming that before the negative shock the economy employed one million workers (with average earnings of \$6,600), employment after the shock could be maintained at one million only if average earnings dropped to \$6,000. If average earnings remained constant at \$6,600, employment would drop by about 91,000 units. This example shows that a negative macroeconomic shock does not necessarily lead to a proportional drop in employment. Part of the shock could be absorbed through an adjustment in wages. However, if wages did not adjust, the effect of the shock would fully translate into lower employment.

The Figure illustrates this idea. The vertical axis plots the change in employment and the horizontal axis plots the change in real wages brought about by a 1 percent change in income. The negative slope shows that there is a trade-off between employment and wage adjustment.



Note: Each point in the scatter is one year for one country in Latin American and shows changes in response to a 1 percent change in income. Source: IDB calculations.

Countries that have a large adjustment in terms of wages have a smaller adjustment in terms of employment.

¹ This is true only in principle. Labor shares do change over time, but the changes tend to be small. In general, it is always true that the burden of a decrease in total production will be absorbed by both factors of production.

mists, when output is demand determined. In this situation, changes in aggregate demand determine how much is produced and, in turn, this determines the demand for factors of production. However, the employment response to changes in macroeconomic conditions is not constant across countries or across time within countries. In fact, there is a trade-off between adjustment in terms of real wages and adjustment in terms of employment or unemployment (see Box 4.2). For instance, Brazil, Costa Rica, Mexico, and Peru tend to adjust more through wages, and Chile, Jamaica, Panama, and Colombia through employment (Table 4.2).

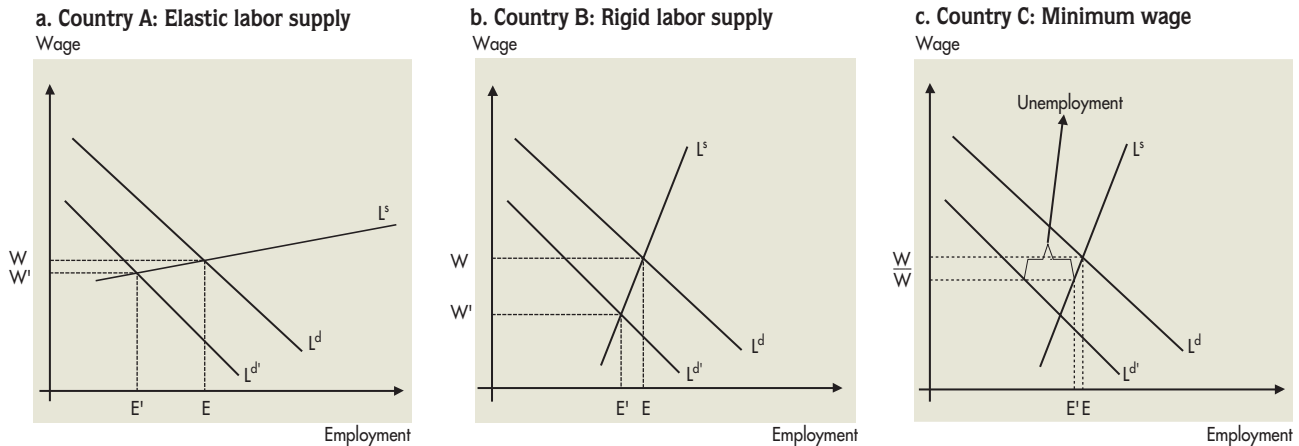
But why do some countries adjust more in terms of wages and others more in terms of employment? One explanation has to do with differences in the willingness of workers to supply

Table 4.2 Employment and Wage Elasticity, Selected Countries, 1980–2000

Employment elasticity	Wage elasticity		
	Low	High	Very high
Very low			Argentina (1980s) Brazil Costa Rica Mexico Peru
Low	Argentina (1990s) Chile Jamaica Panama	Uruguay Venezuela	
High	Colombia		

Source: IDB calculations.

Figure 4.4 Employment and Wage Adjustment



labor. In Figure 4.4, panels a and b represent two countries, A and B, that are subject to the same negative shock, resulting in a shift of labor demand (line L^d) to the left. This implies that, at any given wage, firms want to hire fewer workers. In country A, labor supply (line L^s) is relatively flat (or, in economic jargon, elastic). This means that small drops in wages will lead workers to drastically reduce the amount of labor they are willing to supply. In country B, labor supply is much steeper (inelastic). The figure shows that the same negative shock will lead to a larger drop in employment in country A and a larger drop in wages in country B. However, labor markets in both countries are in equilibrium, the decrease in employment is voluntary, and there are no unemployed workers in either country.⁵ Workers in country A decide to exit the labor market rather than work at a lower wage. They may decide to stay home or go to school when wages are low, and go back to work when economic conditions improve. Their decision not to work is fully voluntary and the two situations cannot be ranked from a welfare point of view.

If the drop in employment brought about by a negative income shock were fully explained by high labor supply elasticity, there would be no need to worry. Economic activity would decrease, but workers would not be worse off because they would be happy to substitute working activity for leisure or to invest in education.⁶ By contrast, if labor supply were inelastic, the observed decrease

in employment would be involuntary and would lead to an increase in unemployment.

Research on developed countries finds that the hypothesis of high labor supply elasticity has limited empirical backing (Hall and Lilien 1986). Results of a set of simple regressions suggest that this is also the case for Latin America. A 1 percent increase in the growth rate of GDP per capita is associated with a 0.1 percent increase in the labor force participation rate (defined as labor force divided by population aged 15-64). In turn, this increase in participation can be decomposed into a 0.2 percent increase in the employment rate and a 0.1 percent decrease in the unemployment rate. However, estimation of these elasticities does not take into account the fact that female participation has increased over the past 20 years (see chapter 3). Including a time trend in the regressions helps control for this factor, and shows that a 1 percent

⁵ The discussion in the text pushes the argument to the extreme by concluding that in the absence of rigidity, there are no unemployed workers. In the real world, all countries, even those with perfectly flexible labor markets, have positive voluntary unemployment. This is referred to as "frictional" unemployment and is determined by the time taken by workers to switch from one job to another. Frictional unemployment is the main determinant of what economists call the "natural" rate of unemployment (that is, the long-run equilibrium rate of unemployment).

⁶ There is some evidence that in the case of Brazil school attendance increases during periods of economic downturn (but not during deep crises). See Duryea and Arends-Kuenning (2003).

Table 4.3 Volatility of Growth in Employment, Unemployment and Wages in Latin America and Developed Countries, 1980–2000

Period	Volatility					
	Employment growth		Unemployment growth		Wage growth	
	Latin America	Developed countries	Latin America	Developed countries	Latin America	Developed countries
1980–2000	0.024	0.019	0.243	0.185	0.100	0.024
1980–90	0.022	0.015	0.293	0.171	0.127	0.026
1990–2000	0.021	0.018	0.194	0.170	0.066	0.019

Note: Volatility is the standard deviation for the whole period. Values are calculated only for countries for which data are available for the 1980s. The sample includes 18 countries in Latin America and the Caribbean and 23 developed countries.

Source: IDB calculations.

acceleration in the growth rate of GDP per capita is associated with a 0.02 percent increase in the labor force participation rate, which can be decomposed into a 0.15 percent increase in employment and a 0.13 percent drop in unemployment.⁷ Thus, the elasticity of labor force participation is rather low, and output shocks do have an effect on unemployment.

Several factors might lead to involuntary unemployment. In Figure 4.4, panel c illustrates the role of wage rigidity. In this case, labor supply is inelastic and hence workers would react to a negative shock by taking a wage cut rather than stopping working. However, rigidities in the labor market (in this case, the presence of a minimum wage at \bar{W}) do not allow the wage to move to the new equilibrium. This creates a situation in which some workers are involuntarily unemployed.⁸

This kind of rigidity is clearly inefficient because it leads to a waste of resources. Furthermore, it creates winners and losers. Workers who keep their jobs at a wage that is above that which would prevail in the absence of rigidities are clearly better off, but workers that are involuntarily unemployed are worse off.⁹ In theory, losers could be compensated with transfers (unemployment benefits are a standard compensation method), but while this practice is rather common in developed countries, it is much less common in Latin America. Furthermore, the increase in unemployment is not homogenous across social classes. Those with low skills and low incomes are often the first to move to either unemployment or low-quality jobs.

In this sense, recessions have negative distributional consequences and play an important role in increasing poverty. Therefore, mechanisms that guarantee wage flexibility might help in spreading the cost of recessions more evenly with respect to a situation characterized by wage rigidity.

VOLATILITY

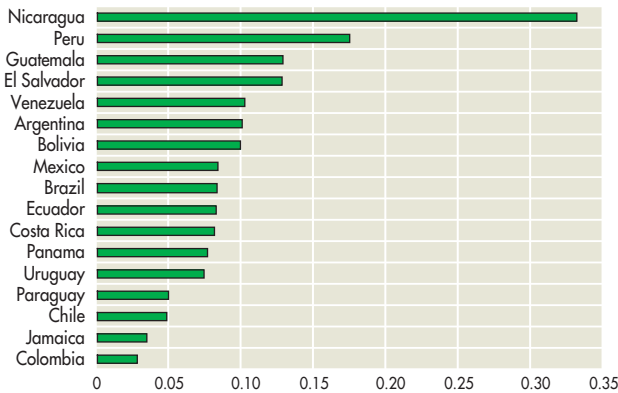
So far, the chapter has discussed the volatility of GDP in Latin America, and that this volatility can be transmitted into wage and/or employment volatility. Table 4.3 compares average wage, employment, and unemployment volatility in Latin America with averages in developed countries. The differences between the two groups of countries are striking. Although Latin America's GDP is much more volatile than that of developed countries, the volatility in Latin American employment and unemployment is not very different from

⁷ These estimations are averages for a group of heterogeneous countries. A detailed study of Chile (Cowan and others 2003) finds that workers exit the labor market during bad times and return during good times. This high elasticity of labor supply is in contrast with the results for Mexico, which indicate that the income effect dominates the substitution effect, leading to an increase in labor market participation during bad times (see chapter 3).

⁸ There are other reasons, besides minimum wages, why nominal wages can be downward rigid. See Akerlof, Dickens, and Perry (2000).

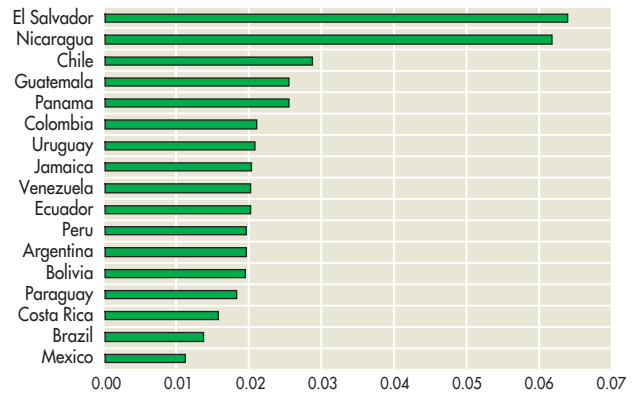
⁹ It should be pointed out that by giving extra bargaining power to low-income workers, a moderately binding minimum wage can also play a role in redistributing income from capital to labor.

Figure 4.5 Real Wage Volatility



Note: Volatility is the standard deviation.
Source: IDB calculations.

Figure 4.6 Employment Volatility



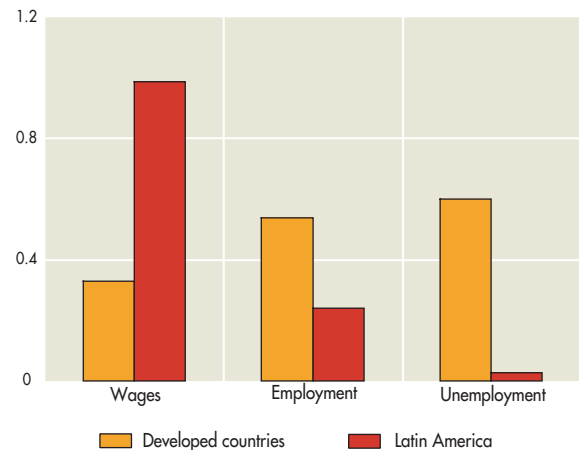
Note: Volatility is the standard deviation.
Source: IDB calculations.

those of developed countries. The relative stability in terms of employment is more than balanced by highly volatile real wages; Latin American real wages are five times more volatile than real wages in the sample of developed countries.

Average values mask large cross-country differences within Latin America. Real wages tend to be especially volatile in Nicaragua, Peru, Guatemala, and El Salvador, and relatively stable in Paraguay, Chile, Jamaica, and Colombia (Figure 4.5). Employment is highly volatile in El Salvador, Nicaragua, Chile, and Guatemala, and relatively stable in Costa Rica, Brazil, and Mexico (Figure 4.6).

Although looking at the volatility of wages and employment can give an idea of the most important channels through which the labor market adjusts to macroeconomic shocks, it should be recognized that these volatilities depend on the magnitude of the shocks. Thus, countries with a relatively stable macroeconomic environment would have lower wage and employment volatility than countries that are hit by larger shocks. (This is why some Central American countries appear to be very volatile in terms of both wages and employment.) A way to address this issue is to look at the response of wages and employment to a given income shock. For example, Figure 4.7 illustrates a message that is similar to that of Table 4.3. In developed countries, the effect of a 1 percent decrease in GDP is a 0.6 percentage point increase in unem-

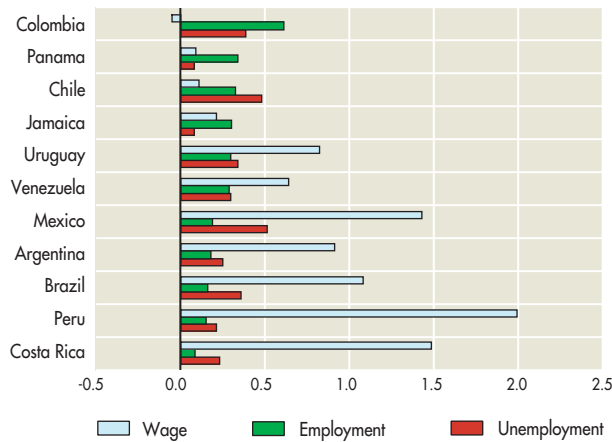
Figure 4.7 Effect of a 1 Percent Decrease in Output on Wages, Employment, and Unemployment (Percent)



Note: The coefficients were obtained by running a set of fixed-effects regressions in which the dependent variable is real wage growth (or real employment or unemployment growth) and the explanatory variable is real GDP growth. The unemployment coefficient is the negative of the actual coefficient.
Source: IDB calculations.

ployment, a 0.5 percentage point decrease in employment, and a 0.3 percentage point decrease in wages. In Latin America, the response is smaller for employment and unemployment (0.24 and 0.028 percentage points, respectively), and much larger for wages (1.00 percentage point).

Therefore, on average, Latin America seems to behave by the book. Compared with developed countries (which can provide better safety nets for unemployed workers), Latin America adjusts more

Figure 4.8 Wage, Employment, and Unemployment Elasticity

Source: IDB calculations.

through wages than through employment.¹⁰ This helps in spreading the cost of an economic crisis more evenly. The problem lies in the fact that, in Latin America, crises are particularly painful for workers. Rough estimations indicate that the share of income that goes to labor tends to change over the business cycle. In developed countries, workers tend to receive a larger share of income during downturns (a 1 percent drop in GDP is associated with a 0.8 percent drop in income accrued to labor); in Latin America, the share of income that goes to labor tends to decrease during downturns (a 1 percent drop in GDP is associated with a 1.2 percent drop in income accrued to labor).

However, there are large cross-country differences within Latin America (Figure 4.8). On the one hand, Colombia, Panama, Chile, and Jamaica are characterized by low wage elasticity and relatively high employment and unemployment elasticity. On the other hand, Mexico, Argentina, Brazil, Peru, and Costa Rica have high wage elasticity and low employment and unemployment elasticity. Furthermore, these elasticities are not constant within countries. In the case of Argentina, for instance, wage elasticity in the 1980s was about 10 times higher than wage elasticity in the 1990s, and employment elasticity in the 1990s was twice as large as employment elasticity in the 1980s. This provides prima facie evidence for an argument

developed later in the chapter, that is, that inflation stabilization may have reduced wage flexibility and increased employment volatility.

ADJUSTMENT COSTS

High wage flexibility is not the only possible explanation for the relatively low employment volatility that characterizes Latin American countries. An alternative explanation focuses on the response of labor demand to changes in the demand for final goods. A series of country and industry-specific characteristics—including adjustment costs and product market competitive structure—influences the level and timing of the demand for labor in response to the demand for final goods. Oligopolistic industries are likely to have less responsive labor demand than industries that are more competitive.¹¹ In turn, industries with low adjustment costs are likely to have more responsive labor demand.

In particular, there is a concern that labor market regulation—high hiring and firing costs, for example—may have a negative effect on labor flexibility in Latin America, leading to a low response of labor demand to aggregate or idiosyncratic shocks. If true, this has important welfare consequences: after a demand or productivity shock, the faster the economy reallocates resources to their new best use, the sooner it will reach an efficient allocation of inputs.

To explore the degree to which labor market institutions (or other variables, like the presence of credit constraints) might affect labor adjustment costs in Latin America, it is useful to analyze

¹⁰ Clearly, the availability of unemployment insurance and other safety nets plays a role in determining the higher employment elasticity observed in developed countries. These factors increase workers' reservation wage and their willingness to remain unemployed during periods of economic downturn. In this sense, unemployment insurance reduces the cost of layoffs. Therefore, there should be a positive correlation between the generosity of unemployment insurance and employment volatility.

¹¹ Campa and Goldberg (2001) find that demand for labor in industries with lower markups is more responsive to changes in demand for final goods.

employment flows across subsectors in manufacturing after reallocation shocks for a large set of countries. The purpose of this exercise is to determine whether labor adjustment costs in the region are abnormally high or low. With high labor adjustment costs, firms would move slowly to their new desired level of employment. Lower costs would induce firms to reach their desired level of employment in a short time.¹²

One way to measure adjustment costs is by computing the speed of employment adjustment. Caballero, Engel, and Micco (2003) provide a method for calculating the desired level of employment. Based on that method, the estimated speed of employment adjustment can be calculated for different regions during the 1980s and 1990s. Normalizing the English-speaking developed countries (this group excludes the United States) to 1, East Asia shows the fastest speed of adjustment, about 1.8 (statistically different from both English-speaking developed countries and Latin America). At the other extreme, Continental Europe has significantly higher adjustment costs, with a speed of adjustment of 0.8. For Latin America, the speed of adjustment is about 1.6. Thus, Latin American countries adjust more slowly than East Asian countries, but significantly faster than the English-speaking developed countries and Continental Europe. This suggests that differences in adjustment speed are not the key to explaining the relatively low employment elasticity of Latin American countries.

INFLATION STABILIZATION

There are two problems with the estimations of wage and employment elasticity discussed so far. First, they are based on a small sample. Second, they assume no structural change over the period of estimation (1980–2000). This is a problematic assumption because this was a period when most countries in the region went through a process of structural reforms and macroeconomic stabilization that may have affected the degree of rigidity of the labor market. (It was already pointed out that, in the case of Argentina, wage flexibility decreased substantially during the 1990s.)

Figure 4.9 Wage and Unemployment Elasticity during Deep Recessions, 1980s and 1990s



Note: The figure considers the 1985 and 1995 recessions for Argentina, the 1982 and 1999 recessions for Chile and Uruguay, the 1992 and 1995 recessions for Mexico, and the 1983 and 1999 recessions for Venezuela.
Source: IDB calculations.

Interestingly, although labor market reforms may have increased the degree of flexibility of the Latin American labor market (see chapter 7), the disinflation process may have had the opposite effect. González (2002) studies labor market flexibility in 13 Latin American countries since the 1960s. He computes employment, unemployment, and real wage Okun coefficients and argues that structural reforms and the disinflation process may have affected how all three variables responded to output shocks.¹³ González shows that in countries that went through a disinflation process, employment elasticity increased and wage elasticity decreased. He concludes that price stabilization reduces wage flexibility and hence increases the cost of labor market regulations.

Figure 4.9 compares wage and (the negative of) unemployment elasticity during the deep recessions of the 1980s and 1990s (the sample is restricted to countries for which there are data for both periods)

¹² Because of data limitations, the exercise focuses on the manufacturing sector. Adjustment speeds are estimated using a measure of the desired level of employment based on the method suggested by Caballero, Engel, and Micco (2003). For more on this methodology, see Hamermesh (1993).

¹³ The Okun coefficient measures the unemployment (or employment or wage) response to a 1 percent change in GDP.

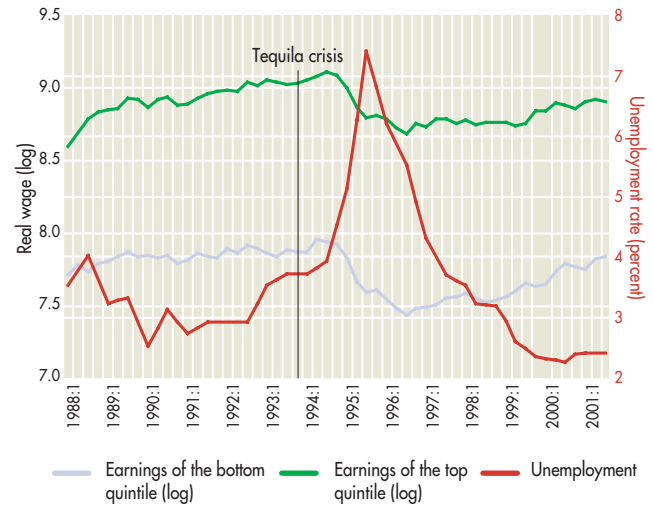
and confirms that, in most countries, wage flexibility was higher in the 1980s. In the case of Argentina and Chile, the drop in wage elasticity was associated with a large increase in unemployment elasticity. The opposite is true in the case of Mexico. In the case of Uruguay and Venezuela, there were no substantial changes in unemployment elasticity.

The behavior of Mexico and Argentina during the “Tequila” crisis—which originated in Mexico and spread contagion waves throughout Latin America—illustrates the costs and benefits of wage rigidity. Although the effect of the crisis on output was much stronger in Mexico than in Argentina (per capita GDP dropped by nearly 8 percent in Mexico and by 4 percent in Argentina), the effect on unemployment was much stronger in the latter. The Mexican unemployment rate went from approximately 3.5 percent to a peak of 7.5 percent and then quickly dropped back to its original level (Figure 4.10). In Argentina, the unemployment rate moved from an already high level of 11 percent to a peak of 18.5 percent and then stabilized at a level well above 13 percent (Figure 4.11).

Differences in wage rigidity are key in explaining the difference in the behavior of Mexican and Argentinean unemployment. Mexican real wages fell immediately after the crisis (and the effect on wages was uniform across income groups, with workers in the top and bottom quintiles of the earnings distribution observing similar drops in earnings). In the case of Argentina, the crisis had no effect on the earnings of workers in the top income quintile and a limited effect on workers in the bottom quintile (the cumulative drop in real wages over a two-year period was 12 percent compared with more than 35 percent in Mexico).

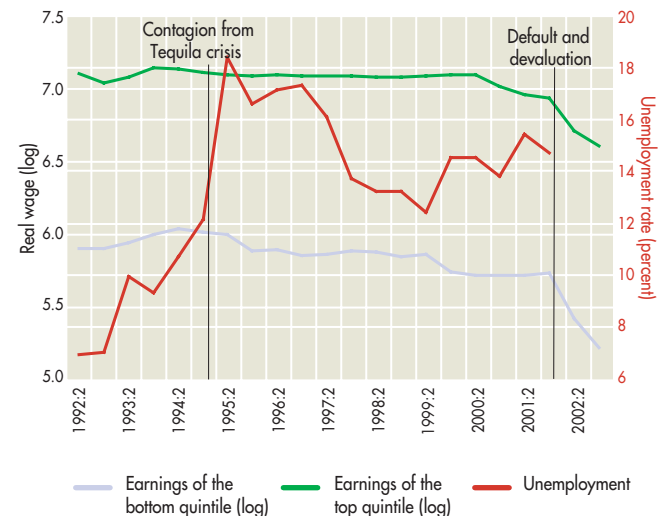
The Tequila crisis affected Mexican workers mostly through lower wages, and Argentinean workers mostly through higher unemployment. Although it is difficult to make value judgments on which adjustment mechanism is better, it should be recognized that wage adjustment helps spread the cost of the crisis, while unemployment has a more unequal effect. This can be seen by looking at the effect of the crisis on poverty, which increased by 20 percent in Mexico (7 percentage points) and by more than 50 percent in Argentina (9 percentage

Figure 4.10 Unemployment and Wages in Mexico



Source: IDB calculations based on household surveys.

Figure 4.11 Unemployment and Wages in Argentina



Source: IDB calculations based on household surveys.

points), notwithstanding the fact that the drop in total output was much larger in Mexico.¹⁴

Figure 4.11 shows that although Argentinean real wages did not drop during the 1995 crisis, they

¹⁴ Data on poverty are from World Bank (2001, Table 9.1, p. 163).

dropped substantially after the default and devaluation that occurred at the end of 2001. This suggests the presence of nominal rigidities and indicates that inflation may play an important role in increasing wage flexibility in times of crisis.

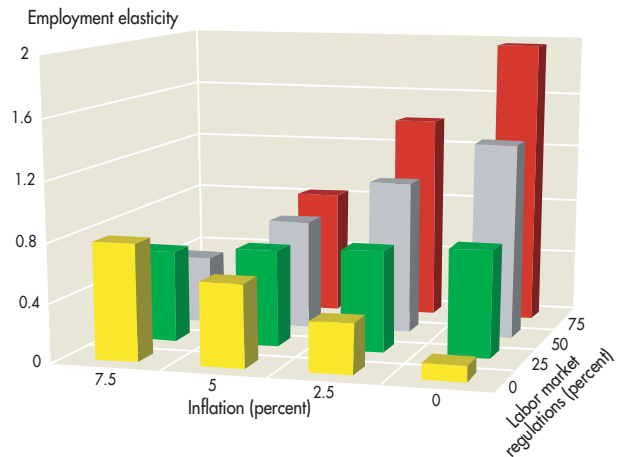
The idea that increases in prices, by allowing real wages to drop by more than nominal wages, may reduce the employment cost of a recession is one of the central tenets of Keynesian economics. In this sense, inflation can offset nominal wage rigidities and play a beneficial role by “adding grease” to the wheels of the labor market. However, there is also a “sand” view of inflation, championed by Milton Friedman. According to this view, high and volatile inflation leads to errors in the wage-setting process. These errors, together with the costs associated with firms’ attempts to avoid them, lead to inefficiencies and resource misallocation and increase the natural level of unemployment.¹⁵

Empirical evidence has not been kind to the grease hypothesis.¹⁶ However, the relationship between inflation and wage flexibility should be highly dependent on the rigidity of nominal wages, which, in turn, may depend on the strictness of labor market regulations. The lack of success in identifying the grease effect of inflation may thus be due to the focus on the U.S. labor market, which, being among the most flexible in the world, does not need much grease. It would be expected that the grease effect should be more important in the highly regulated European and Latin American labor markets than in the fairly flexible U.S. market.

Figure 4.12 looks at whether the interaction between inflation and labor market regulations affects how employment responds to changes in output (the employment Okun coefficient). It shows that in developed countries with highly regulated labor markets, inflation reduces the sensitivity of employment to changes in output (labor market regulations are measured with the Heckman and Pagés [2000] index of job security).¹⁷

The figure shows that in unregulated labor markets, inflation increases the elasticity of employment to output shocks. When the index of labor market regulations is 0.25 (the mean value in the sample), inflation becomes neutral, and when labor market regulations are high (the index is

Figure 4.12 Employment Elasticity, Labor Market Regulations, and Inflation in Developed Countries



Source: Loboguerrero and Panizza (2003).

above 0.4), inflation starts greasing the wheels of the labor markets by substantially reducing employment elasticity. In particular, when the index of labor market regulations is 0.5, moving from 0 to 5 percent inflation reduces the employment Okun coefficient by 50 percent. Therefore, in developed countries with highly regulated labor markets, the grease effect of inflation dominates the sand effect. The opposite is true for developed countries that are characterized by more flexible

¹⁵ For details on the “grease” view of inflation, see Tobin’s (1972) presidential address to the American Economic Association. The grease hypothesis suggests that inflation can speed the adjustment to long-run equilibrium but is consistent with the idea of a vertical long-run Phillips curve. A second class of models rejects the idea of a vertical long-run Phillips curve and, by using near-rational wage-setting behavior, shows that at low levels of inflation, there is a long-run trade-off between inflation and unemployment (Akerlof, Dickens, and Perry 2000). For details on the “sand” view of inflation, see Friedman’s (1977) Nobel Lecture.

¹⁶ See Card and Hyslop (1996) and Groshen and Schweitzer (1996).

¹⁷ It is important to note that the empirical strategy assumes that the index of labor market regulations affects both firing costs and wage flexibility. Bertola and Rogerson (1997) provide a rationale for that assumption. They point out that without wage rigidities, job protection makes little sense because entrepreneurs would have the option to drive real wages close to zero and thus make job protection irrelevant. The same would apply to a situation in which entrepreneurs cannot touch real wages but can fire at will. It is therefore natural that the political and economic institutions that lead to a high level of job protection will also lead to wage rigidity. The results are robust to using alternative measures of labor market regulations (for details, see Loboguerrero and Panizza [2003]).

labor markets. In this set of countries (including the United States), inflation increases the elasticity of employment and, thus, the sand effect of inflation dominates the grease effect. This suggests that inflation greases the wheels of the labor market, but only for those that squeak the most (Loboguerrero and Panizza 2003).

In Latin America, it is more difficult to find a statistically significant correlation between employment elasticity, inflation, and labor market regulations. There are four possible reasons why it is hard to find such a correlation. First, the lack of results may be due to the fact that the explanatory variables are measured with less precision in developing countries (see the section on data quality in chapter 1). In this case, the lack of a statistically significant result could be purely due to what econometricians call attenuation bias. Second, it may be due to the presence of widespread indexation mechanisms that offset the grease effect of inflation (Argentina and Brazil had wage indexation mechanisms until the early 1990s and Chile still has one). Third, because of lack of enforcement, labor market regulations may not be binding. In this case, de jure regulations would be very different from de facto regulations, which would explain the lack of a statistically significant relationship among inflation, de jure labor market regulations, and employment elasticity. A fourth and related explanation has to do with the presence of many firms that do not abide by labor laws. As a result, developing countries may end up having high levels of labor market flexibility even in the presence of strict regulations (see, for instance, the discussion in Calvo and Mishkin [2003]).¹⁸

In fact, Latin American economies are likely to have maintained a high degree of flexibility, with workers moving from the manufacturing sector to other sectors characterized by lower wage rigidity. Box 4.3 provides some evidence in this direction. To control for the fact that de jure labor market regulations may differ from de facto labor market regulations,¹⁹ it is possible to divide the sample of Latin American countries into two groups. The first group contains all the observations where an index that measures the quality of the rule of law takes a value that is higher than the minimum value observed in the sample of developed countries.

This is the group where de jure regulations are likely to coincide with de facto regulations. The second group includes countries with low rule of law. In this group, labor market regulations are likely to be less stringent (either because they are not enforced or because there is a large informal sector) than what would be predicted by their de jure value. Figure 4.13 suggests that inflation does grease the wheels of the labor market in developing countries with large and effective labor market regulations.

This finding has important implications for Latin America because it indicates that the disinflation process of the 1990s may have increased labor market rigidities and hence increased the negative effect of output shocks on employment. The policy implication is not to return to high inflation or a system that, by having low respect for the rule of law, makes labor market regulations ineffective. Inflation and poor institutional quality are likely to have costs that more than outweigh the increase in labor market flexibility they may bring. The clear policy prescription is that the disinflation process should have been accompanied by labor market reforms that, by reducing wage rigidity, reduce the employment costs of recessions, especially when no widespread social insurance mechanisms are provided for the unemployed (see chapter 8).

EXTERNAL SHOCKS

This section discusses the importance of external shocks for employment outcomes in Latin America, emphasizing how these shocks interact with each other and domestic variables.

Capital Flows Volatility

Table 4.1 shows that Latin America is subject to high capital flows volatility. Box 4.4 discusses the sudden stop in capital flows that followed the Russ-

¹⁸ It is also possible that the Latin American result is driven by the fact that the assumption of a strong correlation between employment protection and wage rigidity does not hold for this region.

¹⁹ Chapter 1 presents data on social security coverage (lack of it is a proxy for informality).

Box 4.3. Employment Reallocation across Sectors

Compared with developed countries, Latin American countries have low employment and unemployment elasticity. This may be because, in the absence of social protection programs and unemployment benefits, during recessions workers move from well-paid jobs in large firms to poorly paid jobs in small firms or become self-employed. It is therefore interesting to look at which sectors of the economy bear the largest burden of a given output shock. The table below uses data on employment shares from the International Labour Organization to look at the correlation between the business cycle and employment across sectors.

It is important to note that the estimations suffer from two fallacies of composition. First, the data are expressed as shares of total employment. The shares need to add to one so that if the employment share drops in one sector, by construction it has to increase in at least one other sector. This does not necessarily mean that employment has increased in the latter sector. It only means that employment decreased less than in other sectors. Second, firms tend to shrink during recessions and hence an increase in the employment share of small firms may just capture firms that used to be large and now are small.

With these caveats in mind, the table below shows that there is always a positive correlation between the output gap and the share of workers employed in large firms (indicating that the share of workers employed in large firms contracts during recessions). This correlation is particularly strong for Chile, Costa Rica, Mexico, and Venezuela. There are large cross-country differences in the correlation between the output gap and the share of workers employed in small firms. Peru, Colombia, and Brazil have positive values, and Chile, Paraguay, and Venezuela have negative values. However, the correlation between output gap and employment share in small firms is never statistically significant. Public employment appears to be countercyclical (or less procyclical than other types of employment), except in Brazil and Colombia, but, again, the correlation is never statistically significant. The same holds for self-employment (the exception is Argentina) and domestic services. In fact, domestic services is the only sector that is significantly countercyclical in at least five countries (Argentina, Chile, Colombia, Costa Rica, and Venezuela).

How the Share of Employment Responds to an Output Shock, Selected Countries, 1980-97

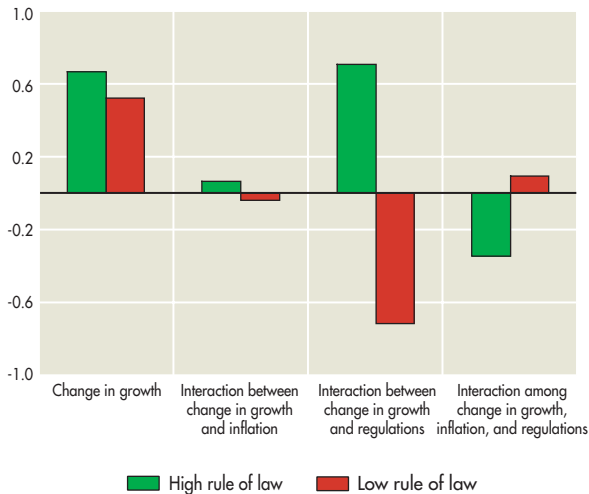
Country	Large firms	Small firms	Public sector	Self-employed	Domestic services	Wage employment
Argentina	0.313	0.162	-0.392	0.09	-0.518**	0.077
Brazil	0.319	0.199	0.30	-0.542**	-0.233	0.48**
Chile	0.628**	-0.208	-0.354	-0.362	-0.676**	0.58**
Colombia	0.156	0.209	0.043	-0.296	-0.422**	0.351
Costa Rica	0.571**	0.002	-0.409	-0.11	-0.537**	0.30
Mexico	0.572**	-0.004	-0.261	-0.197	-0.004	0.22
Paraguay	0.096	-0.18	-0.32	0.374	-0.286	-0.28
Peru	0.466	0.378	-0.343	-0.459	-0.002	0.53
Venezuela	0.496**	-0.127	-0.646	-0.466	-0.417**	0.55**

** Significant at 5 percent.

Note: The figures were obtained by regressing the output gap (calculated as the deviation from a Hodrick-Prescott trend) on the deviation of employment shares over their long-run trends.

Source: IDB calculations.

Figure 4.13 Employment Elasticity in Latin America: The Role of Effective Labor Market Regulations, 1990s



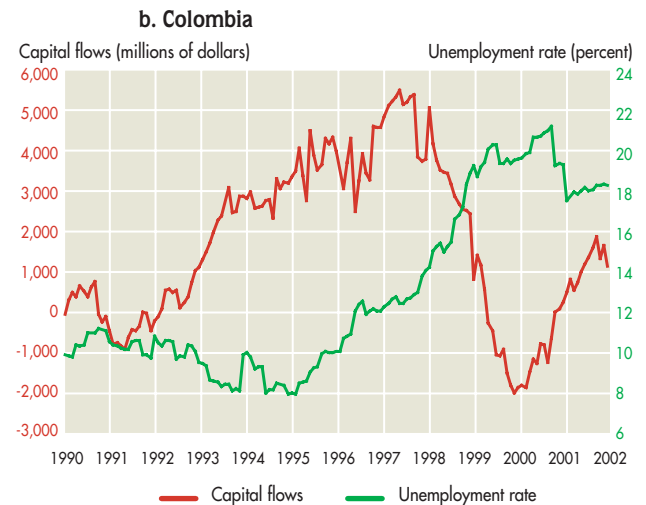
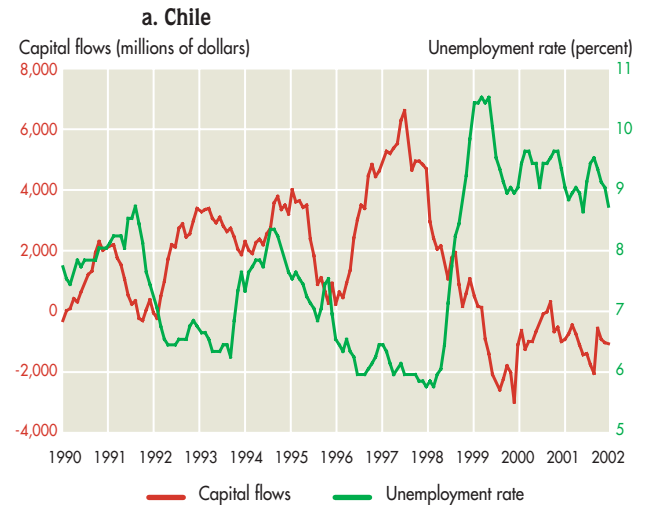
Source: Loboguerrero and Panizza (2003).

ian crisis of 1998.²⁰ But why is capital flows volatility so important? The direct link between access to finance and unemployment is fairly obvious. Without funding, capital goods cannot be purchased, production cannot be undertaken, and, hence, other factors of production (such as labor) are not hired. Even if a particular industry does not use capital intensively, lack of access to credit may restrict working capital and impact employment decisions. This strong link between capital flows and unemployment is particularly clear in Chile and Colombia (Figure 4.14). The link has been especially strong following the 1998 sudden stop.

Capital Flows and Terms of Trade

Financing restrictions can affect output and employment indirectly in the presence of other external shocks, such as terms of trade shocks, contributing to the magnification of negative shocks and preventing countries from exploiting positive ones. Recent empirical work has shown that developing countries respond differently to terms of trade shocks under different conditions in international capital markets. Under “normal” conditions, positive and negative terms of trade shocks tend to have a similar impact. Galindo and Izquierdo

Figure 4.14 Capital Flows and the Unemployment Rate



Source: Galindo and Izquierdo (2003).

(2003) estimate that for the average emerging country, a 12 percent fluctuation in the terms of trade²¹ increases (or decreases, depending on the sign of the shock) the rate of employment growth by nearly 0.84 percentage points. This is a sizable impact, given that the average growth rate of employment in the sample is nearly 2 percent a year. However, in periods of sudden stops in capital flows, the same shocks have very different effects.

²⁰ For a discussion of capital flows volatility in Latin America, see Mogueillansky (2002).

²¹ This corresponds with the standard deviation of terms of trade fluctuations in the 1990s for their sample of emerging countries.

Box 4.4. Sudden Stops and the Russian Crisis

The Russian crisis of 1998 is a striking example of the destructive power of sudden swings in capital flows. Massive capital inflows that set sail to Latin America in the early 1990s, financing high growth rates and large current account deficits, came all of a sudden to a standstill following Russia's partial foreign debt repudiation in August 1998. It was a real challenge for analysts to imagine how a crisis in a country with little if any financial or trade ties to Latin America could have such profound effects on the region. This puzzle brought into question traditional explanations for financial crises (based on current account and fiscal deficits) and led to studies that focused on the intrinsic behavior of capital markets.¹

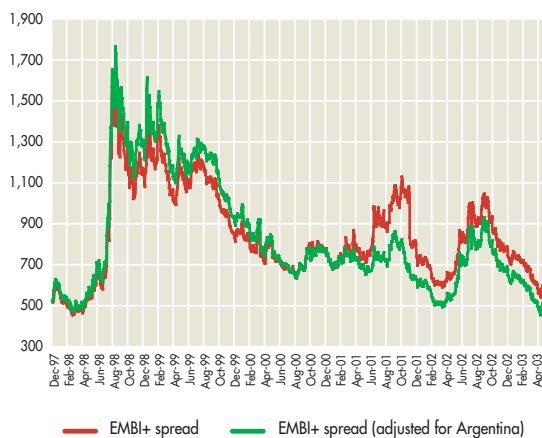
In Figure 1 below, bond spreads for emerging markets display a dramatic increase following the Russian crisis.² For most emerging markets, higher interest rates were accompanied by a large reduction in capital inflows. Latin

American markets were no exception. Figure 2 shows that the decline was sharp, particularly for portfolio flows, mimicking the sharp interest rate hike. As this phenomenon originated in Russia's crisis, the slowdown of capital inflows contained a large unexpected and exogenous component. "Large" and "unexpected" are the two defining characteristics of what the literature calls a "sudden stop" (Calvo and Reinhart 2000).

¹ In this respect, it was argued that prevailing rules for transactions at the heart of capital markets, such as margin credit, might have been responsible for the spread of shocks from one country to other regions (see, for example, Calvo [1999]).

² Emerging market spreads measure the difference between the interest paid by emerging market bonds and the interest rate paid by risk-free U.S. Treasury bonds.

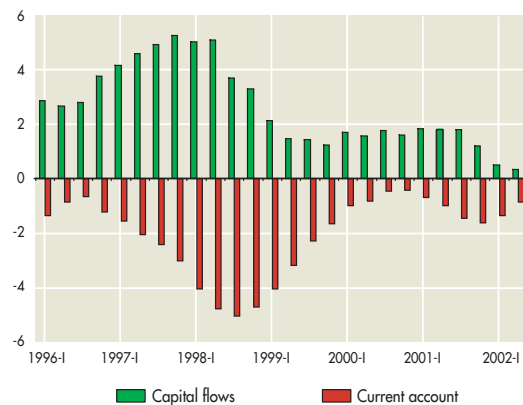
1. Emerging Market Spreads, 1997-2003



Source: Bloomberg.

2. Capital Flows and the Current Account in Latin America, 1996-2002

(Percentage of GDP)

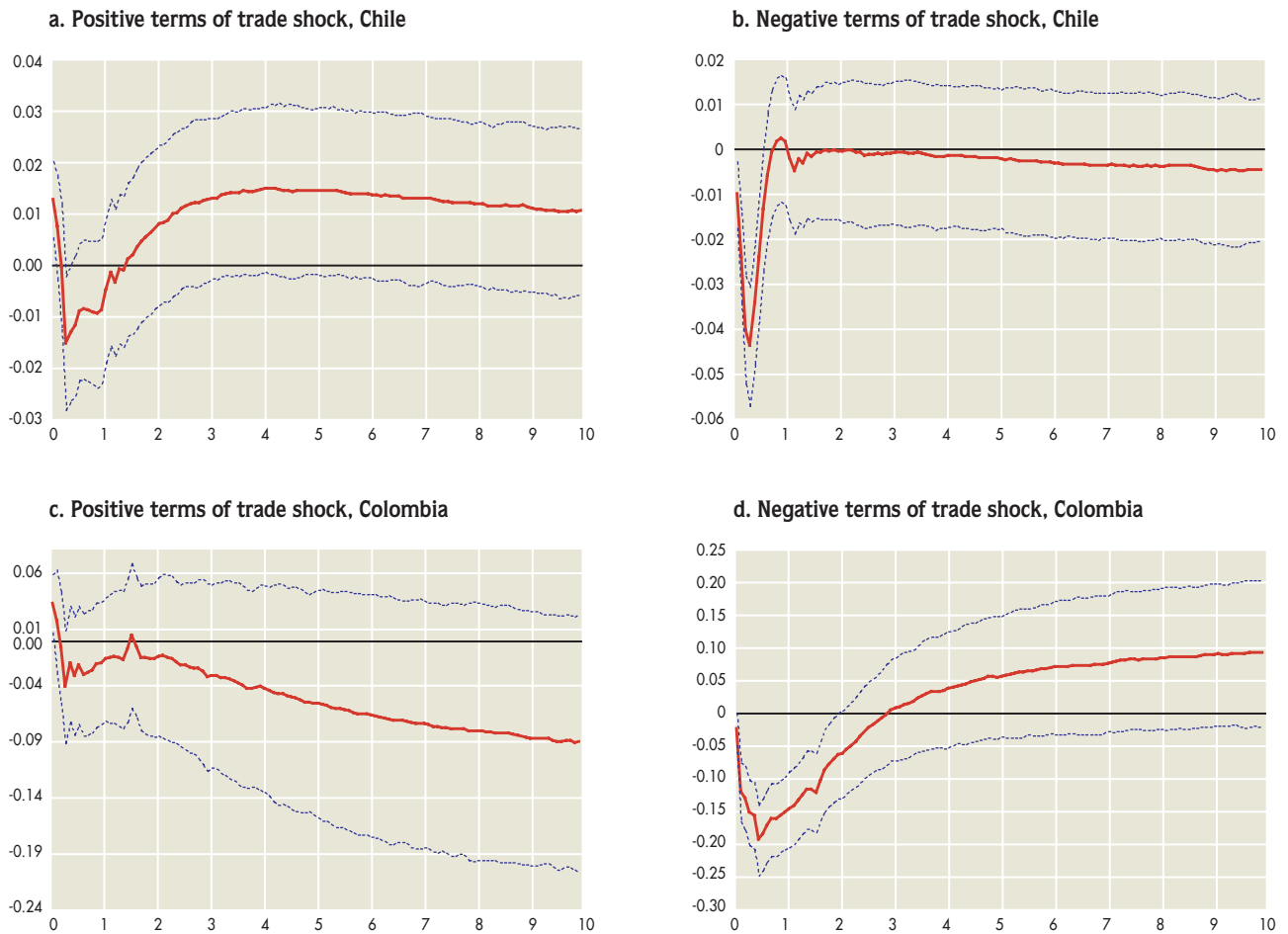


Note: The countries included are Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.
Source: Latin Macro Watch.

A 12 percent fall in the terms of trade reduces employment growth by nearly 1.4 percentage points, while a positive shock of similar size has almost no impact on employment. In this sense, capital flows help countries smooth out negative shocks, whereas when capital is not available, firms cannot expand to take advantage of favorable demand conditions.

The cases of Chile and Colombia are illustrated in Figure 4.15, which shows the response of employment to positive and negative terms of trade shocks in an environment such as the sudden stop in capital flows that followed the Russian crisis of 1998. Lack of access to financing magnifies the effects of a negative shock and neutralizes the effects of a positive one, once again confirming the

Figure 4.15 Effects of Terms of Trade Shocks on Employment under Sudden Stops in Capital Flows, Chile and Colombia



Note: Values are impulse responses to terms of trade shocks in a VAR system that includes employment, industrial output, capital flows, the real exchange rate, and wages. Data are in logs.
Source: Galindo and Izquierdo (2003).

relevance of the credit channel in determining responses to shocks, which are thus asymmetric under credit constraints.

These findings are particularly relevant for understanding the situation of many Latin American countries during the late 1990s. Not only were they exposed to a standstill in capital flows, which generated a contraction in output and employment, but they also experienced a sharp deterioration in their terms of trade, much of which may have been unexpected.

Real Exchange Rate Volatility

Sudden stops are typically accompanied by large contractions in international reserves and declines in the relative price of nontradables with respect to tradables (that is, a depreciation of the real exchange rate).²² Fluctuations of the real exchange

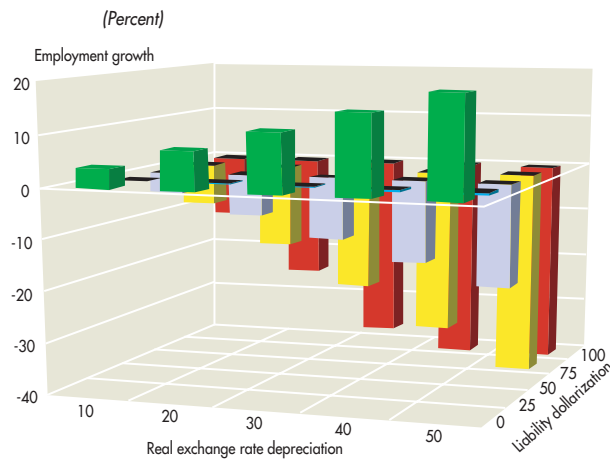
²² Calvo, Izquierdo, and Talvi (2002) show that economies with currency mismatches, as well as relatively closed and highly indebted economies, are more vulnerable to sharp relative price swings following a sudden stop.

rate can impact real activity and employment through different channels. Tradable sectors, especially firms that export, can benefit from the relative price adjustment, increasing their production and employing more labor. The opposite is true for sectors that produce nontradable goods and import most of their inputs. If output and factor markets have no friction and are characterized by perfect competition, real exchange rate fluctuations will only lead to employment reallocation: some sectors will increase production and employment and others will reduce production and employment, with zero net effect on total employment. However, the presence of imperfect competition, labor market frictions, and uncertainty about the duration of the shock can slow down the reallocation process and lead to changes in aggregate employment.

What is the international evidence on the effects of real exchange rates on employment? Burgess and Knetter (1998) find that in Canada, Italy, Japan, the United Kingdom, and the United States, there is a positive and significant correlation between a depreciation of the real exchange rate and employment; the correlation between the real exchange rate and employment is weaker in France and Germany. Márquez and Pagés (1998b) study the correlation between real depreciation and employment in a sample of 18 Latin American countries and find that depreciations are positively correlated with employment growth. Klein, Schuh, and Treist (2000) and Campa and Goldberg (2001) show that the impact of real exchange rate fluctuations on sector employment depends on both firm and country characteristics. Firms that export or that face competition from imported products tend to benefit from real exchange rate depreciation, while firms that have a high component of imported inputs are hurt by it.²³

Most of the existing studies focus on developed countries and do not consider some of the peculiar characteristics of emerging market countries. One transmission channel that may be irrelevant in developed countries but important in developing countries is the impact of depreciation on firms' balance sheets. The main idea is that, in the presence of foreign currency debt, a real

Figure 4.16 Employment Growth, Real Exchange Rate Depreciation, and Liability Dollarization in Five Latin American Countries



Note: Results control for lagged value added growth, the level of liability dollarization, country, industry, and year fixed effects. Countries included are: Argentina, Brazil, Chile, Colombia, and Peru.
Source: Appendix Table 4.1.

devaluation increases the domestic currency value of debt and, by weakening firms' balance sheets, prevents them from having access to finance, thus reducing investment, labor hiring, and output.²⁴

The empirical evidence on balance sheet effects is not clear-cut. Although Bleakley and Cowan (2002) find no significant effect of liability dollarization, other studies find that the impact of real exchange rate fluctuations on employment

²³ Klein, Schuh, and Treist (2000) analyze job flows in U.S. manufacturing industries and find that the degree of openness to international trade explains the differences in responses across firms. In addition, they find evidence of asymmetries in the response to negative and positive shocks. Appreciations play a significant role in job destruction, but job flows do not respond to real exchange rate depreciations. Campa and Goldberg (2001) find that in the United States, responses of employment to real exchange rate changes are small but significant and vary depending on the competitive structure of industries and net exposure to trade. Firms in lower markup industries are more sensitive to exchange rate fluctuations. Gourinchas (1999) finds that employment in the tradable sector is highly sensitive to real exchange rate fluctuations in France. Reif (2001) discusses the channel through which devaluations may have contractionary effects via the cost of imported inputs.

²⁴ See Aguiar (2002), Bleakley and Cowan (2002), Forbes (2002), and Nucci and Pozzolo (2001).

varies substantially depending on the degree of liability dollarization. In particular, Figure 4.16 shows that the net effect of devaluation on employment growth can turn from positive to negative for liability dollarization exceeding 25 percent.²⁵ This finding may be quite relevant, given that the average degree of liability dollarization in the sample is around 40 percent.

CONCLUSION

Latin America suffers from an extremely volatile macroeconomic environment. Although output volatility explains a share of the variance in unemployment in the region, thanks to high levels of real wage flexibility, the responses of employment to output shocks are smaller in Latin America than in developed countries. This is likely to be a good thing because, while real wage volatility distributes the cost of a recession over a large share of the population (the effect is not completely uniform because less-skilled workers are likely to suffer larger wage cuts during recessions), employment and unemployment volatility have unequal effects. They leave unscathed those who do not lose their jobs, but cause large losses for those who become unemployed.²⁶

However, there are indications that things may be changing. The chapter suggests that the high level of wage flexibility that characterized

Latin America during 1980-2000 was due to high levels of inflation and poor enforcement of labor regulations. The disinflation process that characterized the region during the 1990s, together with a process of institutional reforms aimed at increasing institutional quality and improving respect for the rule of law, are likely to remove the margins of flexibility described above and, hence, may increase the unemployment cost of recessions.

This points to the need for Latin American countries to pursue two lines of action in order to reduce workers' vulnerability to adverse macroeconomic conditions. First, they should reduce macroeconomic volatility (see Box 4.1). Second, they should recognize that, even in the best-case scenario, they would not be able to fully isolate themselves from shocks. As macroeconomic volatility tends to have a strong impact on poverty and disproportionately affects individuals with low levels of wealth and skills (see Braun 2003), it is important to develop policies that protect the most vulnerable segments of the population. Clearly, social programs and unemployment insurance are important, but, given the weak fiscal situation of most countries in the region, they are unlikely to fully isolate the poor from the negative consequences of economic crises.²⁷ In this sense, labor reforms that maintain the high degree of wage flexibility that has characterized the region in the past are necessary to spread the burden of adjustment.

²⁵ See Appendix 4.1 for details on the estimation of the effect of real exchange rate fluctuations on employment. These results contrast with the findings of Bleakley and Cowan (2002), who find no significant effect of liability dollarization.

²⁶ Although social protection programs could make the two effects equivalent by compensating those who lose their jobs during recessions, the highly procyclical government budgets in Latin America are unlikely to allow the creation of widespread social protection programs.

²⁷ Unemployment insurance could be viable if it were privately financed from an accumulated fund.

APPENDIX 4.1 EMPLOYMENT AND REAL EXCHANGE RATE FLUCTUATIONS

Fluctuations in the real exchange rate can impact real activity and employment through different channels. On the one hand, sectors that export can benefit from the relative price adjustment, increasing their production and employing more labor. In economics jargon, this is known as a competitiveness effect and is derived from standard Mundell-Fleming types of models. However, there is a large and growing literature on how currency and maturity mismatches affect firms' balance sheets and the overall level of economic activity.²⁸ The main point in the literature is that a real devaluation increases the domestic currency value of dollar

debt and, by weakening firms' balance sheets, prevents firms from having access to finance, thus reducing investment, labor hiring, and output.

Empirical results suggest that the impact of real exchange rate fluctuations on employment varies substantially depending on the degree of liability dollarization. Using various econometric techniques and measures of liability dollarization, Appendix Table 4.1 shows the net effect of devaluation on employment growth for a sample of five Latin American countries for which data are available (Argentina, Brazil, Chile, Colombia, and Peru).²⁹ The effect can turn from positive to negative once liability dollarization exceeds 25 percent. This finding may be quite relevant, given that the average degree of liability dollarization in the sample is around 40 percent.

Appendix Table 4.1 The Effects of Real Exchange Rate Fluctuations on Employment Growth

Variable	Fixed effects		GMM-difference		GMM-system	
	(1)	(2)	(3)	(4)	(5)	(6)
Change in employment lagged			0.317 (0.135)**	0.319 (0.132)**	0.327 (0.112)***	0.350 (0.111)***
Change in real exchange rate (RER^{it})	0.400 (0.227)*	0.447 (0.251)*	0.467 (0.288)*	0.413 (0.278)	0.428 (0.243)*	0.444 (0.276)*
Change in real exchange rate $(RER^{it}) * DEBT-US^{it}$	-1.680 (0.584)***	-1.888 (0.687)***	-1.334 (0.637)**	-1.303 (0.714)*	-1.041 (0.486)**	-1.137 (0.627)*
$DEBT-US^{it}$	0.104 (0.039)***	0.065 (0.049)	0.077 (0.061)	0.089 (0.063)	0.003 (0.036)	-0.020 (0.035)
$\log VA^{it-1}$	-0.035 (0.049)	-0.029 (0.049)	-0.094 (0.057)*	-0.089 (0.075)	-0.016 (0.004)***	-0.013 (0.005)**
Observations	571	571	447	447	447	447
R^2	0.44	0.45				
Sargan test (P-value)			0.996	0.990	0.591	0.516
First-order autocorrelation (P-value)			0.052	0.044	0.042	0.036
Second-order autocorrelation (P-value)			0.235	0.217	0.245	0.369
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry effects	Yes	Yes	Yes	Yes	Yes	Yes

* Significant at 10 percent.

** Significant at 5 percent.

*** Significant at 1 percent.

Note: Columns 1, 3, and 5 use the industry's average value of debt dollarization for a sample of firms. Columns 2, 4, and 6 use the industry's median value. The dependent variable is the change in the log of employment in industry i in country j . RER is the bilateral real exchange rate of each country with the United States. $DEBT-US$ is the mean or average of the ratio of foreign to total debt of industry i in country j . VA is the value added of industry i in country j . Robust standard errors are in parentheses.

Source: IDB calculations.

²⁸ See, for example, Aguiar (2002), Bleakley and Cowan (2002), Forbes (2002), and Nucci and Pozzolo (2001).

²⁹ Additional specifications included the interaction between a measure of openness and the real exchange fluctuation as a regressor. This interaction is not significant and results regarding the dollar debt interaction hold when it is included.