FOSTERING STRUCTURAL REFORMS IN INDUSTRIAL COUNTRIES

With the rebound in the global economy, economic policymakers in industrial countries have increased the attention they devote to structural policy issues. Impediments to competition, labor market and price flexibility, and innovation are a primary concern in this regard, given their adverse effects on growth in investment, employment, productivity, and, therefore, output. Reflecting these concerns, the finance ministers and central bank governors of the Group of Seven (G-7) countries recently launched an "Agenda for Growth," whereby they committed themselves to accelerating structural reforms and international supply-side surveillance.

Policymakers' emphasis on structural reforms is, of course, not new. Reflecting a broad consensus about the substantial benefits of structural reforms, a general, worldwide trend toward more market-friendly regulatory frameworks and policies has prevailed since the early 1980s. The scope and speed of structural reforms has, however, differed widely across countries and sectors. Among industrial countries, the variation is especially large in Europe, where, despite welcome steps, excessive product and labor market regulations continue to be obstacles to growth and employment (e.g., Blanchard and Giavazzi, 2003; or OECD, 2003).

The discrepancy between the widely accepted notion of beneficial structural reforms and the mixed implementation record in industrial countries highlights the importance of understanding the obstacles to reform. The basic conjecture of this chapter is that reforms can lack political viability, which, as the growing literature on the political economy of reforms suggests, arises from the uneven distribution of the aggregate benefits of reforms across the economy and time. In particular, reforms typically involve costs to those who benefited from the pre-reform structural policy regime. As a result, policymakers who would like to pursue structural reforms to advance welfare and improve prospects may be confronted with a status quo bias—a situation where reforms are not supported by a majority or strongly opposed by a key constituency. Nevertheless, the broad trend toward regulatory reform over the past two decades shows that the status quo bias is not insurmountable even when considering the differences in the scope and speed of reforms across countries.

This chapter focuses primarily on how, and under what circumstances, structural reforms are actually undertaken; it does not systematically address the optimality of the timing or sequencing of these reforms. The analysis of industrial countries' experience with structural reforms over the past two decades or so examines three issues in particular.

- What have been the main determinants behind the broad trend toward regulatory reform?
- What explains the cross-country differences in the scope and speed of reform?
- Does the pace and scope of the implementation of reforms matter for their success and their effects?

The status quo bias against reforms is, of course, not confined to industrial countries or structural reforms. Political constraints on reforms have also been encountered in developing countries, in macroeconomic stabilization, or in fiscal adjustment (e.g., Drazen, 2000). The chapter focuses on structural reforms in industrial coun-

tries, in part reflecting data constraints,[1] but also because it is difficult to compare and analyze political and economic constraints on reforms across a wide range of countries with different political systems and institutions, levels of development, and initial regulatory conditions.

An innovative aspect of the chapter is the coverage of political-economy issues in industrial countries for a broad range of reform areas—financial sector, labor markets, product markets, trade, and tax systems. This approach contrasts with, but also complements, most of the existing literature, which focuses on the costs and benefits of specific regulations or reforms. Besides providing a perspective on the overall trend, a general approach also allows for the analysis of complementarities among reforms—that is, the benefits from implementing simultaneous reforms in different areas. Complementarities are frequently seen as an important strategic tool for advancing structural reforms since they may provide better compensation of losers in particular reform areas or undermine the case against reform by those who benefit from the existing regulatory framework (e.g., Blanchard and Giavazzi, 2003).

Analyzing structural reform dynamics requires a measure of structural reforms. To this end, this chapter develops a number of aggregate structural policy indicators based on actual policy instruments to characterize the restrictiveness of policy regimes in various sectors. The development of such indicators—pioneered by the OECD—is relatively recent, in part because broad-based efforts at structural policy surveillance in industrial countries only began in the 1990s. Consequently, only a limited number of time series to construct aggregate policy indicators are available, and their depth in characterizing dimensions of regulatory interventions varies by reform area. This is unlikely to affect the analysis of broad trend and developments, as policy indicators are frequently highly correlated, but it needs to be borne in mind in inter-

preting the econometric results, particularly the effects of reforms on key macroeconomic variables. This further underscores the need to develop better measures of structural policies—in both industrial and emerging market economies—in the future.

The chapter is organized as follows. The first section defines the range of structural reforms to be studied and establishes empirical regularities regarding the reform dynamics. The next section studies the factors shaping the scope, speed, and timing of structural reforms since the early 1980s. Thereafter, differences in the timing with which costs and benefits of reforms materialize are assessed with regard to their role in explaining political viability problems of reforms. The last section synthesizes the experience with structural reforms in industrial countries and explores the implications for reform design.

Two Decades of Structural Reforms in Industrial Countries: An Overview

Structural reforms entail measures that, broadly speaking, change the institutional framework and constraints governing market behavior and outcomes. In general, structural reforms have been associated with the notion of increasing the role of market forces—including competition and price flexibility, and the term is often used interchangeably with deregulation—reducing the extent to which government regulations or ownership of productive capacity affect the decision making of private firms and households.

This perception of structural reforms clearly reflects the broad global trend during the past two to three decades, when an important part of structural reforms has been the replacement of general, across-the-board restrictions on competition and entry by new firms with more targeted, less intrusive restrictions. The latter address market failure and at the same time maintain key advantages of market mecha-

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[1]But see Bates and Krueger (1993) for eight developing country case studies that also cover political and economic interactions for a wide range of reforms.

nisms—e.g., strong incentives for innovation and flexibility in the adjustment after shocks. This broad policy shift mirrored a variety of factors, including growing evidence that not only markets but also governments can fail—that is, governments' regulations can in practice fail to deliver what they are supposed to do in theory, namely to resolve problems related to market failure or inefficiency. Reasons for government failure include problems of asymmetric information, management and incentive problems, and problems related to the capture of government by vested interests, which may seek regulations limiting market entry and competition to advance their own group-specific causes rather than general welfare (rent-seeking behavior).[2]

Since this chapter reviews the experience with structural reforms over the past two to three decades, the broad global trend naturally affects the kind of structural reforms that are considered in the analysis. It would, however, be misleading to equate structural reforms with the goal of abandoning regulation altogether. Fundamentally, structural reforms aim at adapting institutional frameworks and regulations for markets to work properly. As is well known, some markets are prone to market failure or inefficiencies, and government regulations, if appropriately designed to minimize risks of government failure, can prevent less than desirable market outcomes. This may at times lead to a tightening of regulation, as is currently the case with regulations governing corporate governance or some securities markets (areas not covered by the chapter).

Measuring Structural Reforms

Analyzing industrial countries' experience with structural reforms requires measures of structural policies and the changes therein.

Naturally, such measures are difficult to construct since these policies cannot be easily quantified. Nevertheless, some progress has been made with indicators that categorize the degree of restrictiveness of government regulation and policies in key dimensions on the basis of actual policy instruments.[3] Using instruments is important for the analysis of reforms from a political-economy perspective since a change in any of these indicators can then be considered a measure of an actual structural policy change.[4] On this basis, aggregate indicators summarizing the restrictiveness of structural policies in particular sectors can be constructed, with the change in an aggregate indicator providing a picture of the overall sectoral regime change. In line with the recent broad trend noted earlier, policy changes reducing the degree of restrictiveness are usually considered reforms.

Using time series of aggregate structural policy indicators, this chapter considers reforms in five areas in which important changes have taken place over the past two and a half decades: the financial sector, international merchandise trade, labor markets, selected product markets, and the tax system. Since the development of structural policy indicators has only recently begun, many indicators are so far only available for a cross section of countries at one point in time. The chapter's time-series indicators are thus limited in scope but, as the analysis will show, they are helpful to illustrate broad trends and developments (Table 3.1). While the indicator for select product markets covers only seven energy and service industries, it is sometimes also considered a proxy variable for economy-wide regulatory trends in the absence of other indicators (e.g., Blanchard and Philippon, 2003).

While all indicators were rescaled to range between 0 and 1, with increasing values indicating less restrictive policy regimes, the degree of

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[2]See Peltzman (1989) and Noll (1989) for reviews of deregulation and privatization, and Krueger (1974) on trade restrictions and the incentives for rent seeking.

[3]See Nicoletti and Pryor (2001) and Nicoletti and Scarpetta (2003).

[4]Alternatively, one could also consider structural policy indicators that are based on outcome-based measures such as trade openness or sectoral concentration measures. It would, however, generally be difficult to relate changes in these kinds of indicators to actual policy changes, given the lags involved in the transmission of policy changes.

Table 3.1. Aggregate Structural Policy Indicators and Their Components

Financial Sector	Labor Markets	Product Markets	Tax	Trade
Credit controls	Employment protection	Indicator of product market reform over 1975–98 for the nonmanufacturing sector, covering:	Marginal tax rates	Average effective tariffs
Interest rates	Benefits replacement rate		Ratio of indirect tax revenue to total tax revenue	
Restrictions on international financial transactions	Benefits duration	Gas Electricity Postal services Telecommunications Passenger air transport Railways Road freight	Average effective tax rate on labor	
		Indicators for each of these sectors were constructed on the basis of the following dimensions: Barriers to entry Public ownership Market structure Vertical integration Price controls	Average effective tax on capital	
			Index of factor tax distortions	

Source: See Appendix 3.1 for data sources and variable definitions.

restrictiveness cannot be compared across sectors. The indicators only allow for a comparison of the change in the degree of restrictiveness over time in each sector. Finally, the indicators are annual and cover the period 1975–2000 for 20 industrial countries (Appendix 3.1 provides details on these indicators, the underlying rationales, and data sources).[5]

Structural Reforms: Where, When, and How Much?

Comparing cumulative reform efforts—the cumulative change in the aggregate structural policy indicators since 1975 (the base year for most of the empirical analysis in the chapter)—reveals a clear sectoral dichotomy in the effects of the reform efforts on the structural policy regimes (Figure 3.1). During 1975–2000, reform efforts in the financial sector, selected product markets, and international merchandise trade were substantial and changed the overall nature of the structural policy regime (degree of restrictiveness) in these sectors. In the financial sector, reform efforts have included the abolition of

interest rate and credit controls and the liberalization of quantitative investment restrictions for financial institutions (except for prudential reasons). In product markets, reforms have included reductions in barriers to entry in air transportation and telecommunications, and, to a lesser extent, reductions in the public ownership of productive assets. In international merchandise trade, effective tariff rates have been reduced substantially on manufacturing products and many commodities.

In contrast, overall reform efforts have, on average, not been substantial in the labor market or in the tax system domains and, compared with 1975, the overall degree of restrictiveness deteriorated. This general picture masks some reform dynamics within these sectors. In tax systems, for example, some countries reduced some distortions, such as those introduced by high top marginal income tax rates, but these measures were often accompanied or followed by measures securing the overall tax yield (e.g., reductions in depreciation allowances) so that the overall tax distortion, as measured by the indicator, did not fall on average. However, signs

[5]The countries included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.
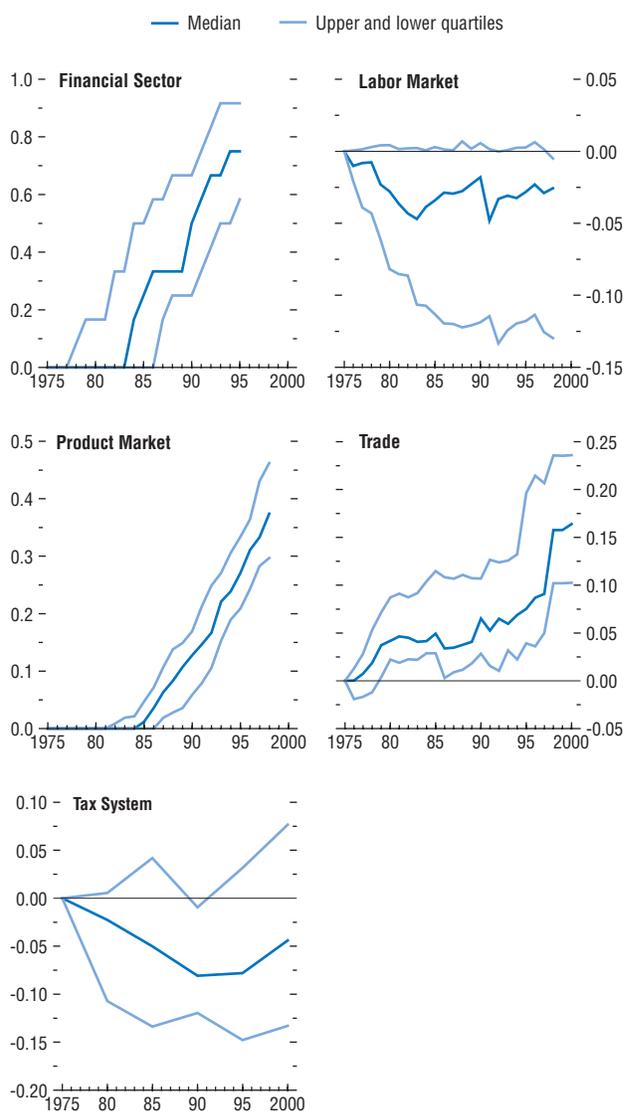
are that reform efforts turned around in the 1990s. In labor markets, for example, some countries, particularly in Europe, started to reduce employment protection to increase labor market flexibility and adjustment in the 1990s, although these reforms were typically minor, with little effect on the overall labor market indicator averaged across countries.[6]

Beyond this, the following points summarize other highlights of the reform dynamics.

• *There are noticeable regional differences.* First, some countries tended to reform earlier than others, including Australia, Canada, New Zealand, the United Kingdom, and the United States. Second, reform efforts in selected product markets and tax systems in these earlier reformers typically exceeded those in other countries despite similar initial conditions. In product markets, the difference in reform efforts reflected differences in the reduction of public ownership—early reformers privatized more rapidly—and the liberalization of entry in energy-related utilities.

• *Differences in regulatory regimes in the financial sector and in international trade have narrowed considerably* between 1975 and 2000, while in product markets and the tax system these differences have widened (Figure 3.2). Countries with less favorable initial regulatory conditions have, therefore, made greater reform efforts in financial markets and international trade than those with more favorable initial conditions. In the areas of selected product markets and the tax system, however, initial regulatory regimes appear to have played a lesser role in influencing reform decisions.

• *The international dimension was important.* Liberalization commitments in the context of multilateral and regional trade negotiations (e.g., under the umbrella of the GATT/World Trade Organization or the European Union) have clearly shaped the convergence to a similar regulatory regime in the area of interna-

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[6]As noted by Boeri (2004), the reductions in employment protection often involved only subsets of employment regulations (e.g., temporary work contracts).

Figure 3.1. Cumulative Reform Efforts Across Sectors
(Cumulative changes in structural policy indicators from 1975; distribution across countries)

Substantial reforms were, on average, recorded in the financial sector, product market, and trade areas, while marginal reforms dominated in the labor market and tax system areas.
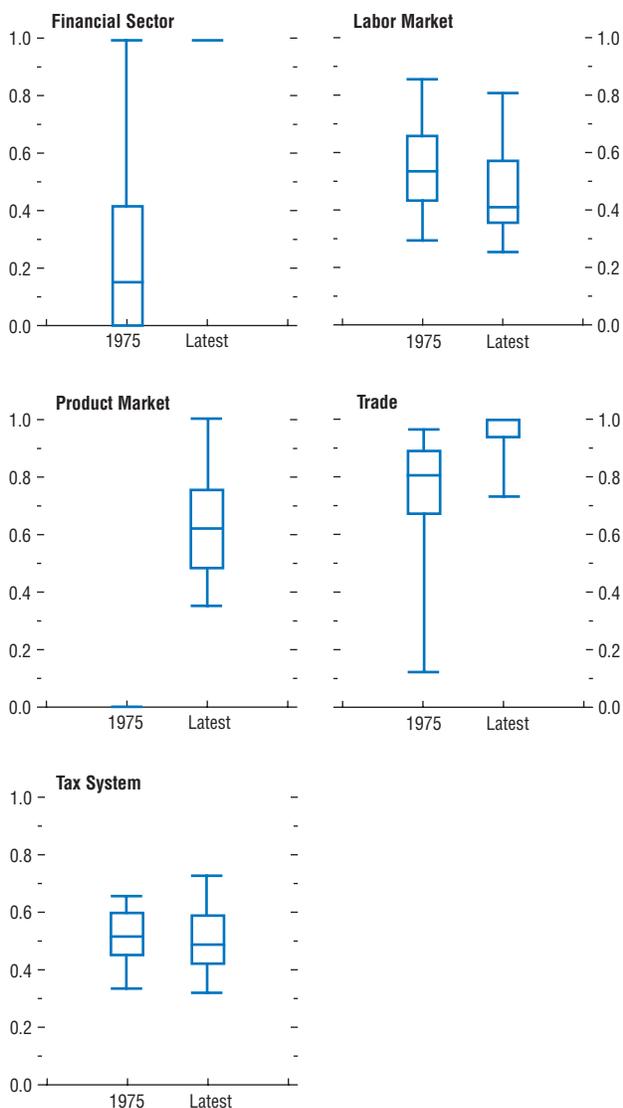

Sources: IMF staff calculations; see Appendix 3.1 for data sources.

Figure 3.2. Regulatory Regimes in 1975 and 2000 Across Countries
(Distribution of structural policy indicators across countries)[1]

Cross-country differences in regulatory regimes narrowed considerably, while in the product market and the tax system they widened.

Source: IMF staff calculations.
[1]The boxplots indicate, from top to bottom, the maximum, the 75th percentile, the median, the 25th percentile, and minimum values. Note that all countries had a value of one for the financial sector index in 2002 and a value of zero for the product market index in 1975.

tional trade. Similarly, the reduction of barriers to cross-border competition under the Single European Act (the "Single Market") and the banking directives in the European Union have shaped product market and financial market reforms in member countries. Entry restrictions in air transportation, for example, were reduced almost simultaneously in all member countries in the early 1990s. Finally, structural reforms took place earlier in sectors that were more exposed to international competition, such as the financial sector or air transportation, than in less exposed ones.

- *There was a tendency for the timing of reform efforts to cluster across countries.* In the financial sector, for example, regulations restricting market-based interest rate determination and credit allocation by commercial banks were typically liberalized during the early 1980s in many countries. A second wave of liberalization followed in the late 1980s and early 1990s when some countries reformed in the context of European economic and financial integration.

- *Reforms were typically sequenced and gradual.* For example, in selected product markets, entry deregulation was gradual and sequenced across industries. The deregulation of air transportation largely took place during the late 1980s to early 1990s and preceded that in telecommunications, while in the electricity and gas sectors, the reform process is still ongoing. Across sectors, finally, there is little evidence of joint reform dynamics in the sense of reforms being implemented simultaneously if analyzed on a year-by-year basis (Table 3.2). However, over longer time periods, there is some evidence of joint reforms. Specifically, considering five-year intervals suggests that labor reforms tended to coincide with both product market and tax reforms.

In sum, there were important variations by country and sectors around a broad trend toward more market-friendly regulatory frameworks and policies since the early 1980s in industrial countries. This indicates that political

Table 3.2. Correlation Matrices for Changes in Structural Policy Indicators

(Marginal significance levels in parentheses)

	Annual Data			
	Financial	Labor	Product	Tariffs
Financial	1.0			
Labor	0.01 (0.86)	1.0		
Product	−0.06 (0.19)	0.12 (0.01)		
Tariffs	−0.03 (0.46)	−0.02 (0.60)	0.01 (0.88)	1.0

	Non-Overlapping 5-Year Intervals				
	Financial	Labor	Product	Tariffs	Tax
Financial	1.0				
Labor	0.18 (0.11)	1.0			
Product	0.01 (0.91)	0.33 (0.00)	1.0		
Tariffs	−0.08 (0.44)	−0.12 (0.29)	−0.03 (0.77)	1.0	
Tax	−0.05 (0.66)	0.25 (0.05)	0.38 (0.002)	−0.08 (0.48)	1.0

Source: IMF staff calculations. See Appendix 3.I for data sources.

or economic constraints on reform must have varied not only across countries, which would explain the important cross-country variations in reforms achievements, but also across sectors.

Determinants of Structural Reforms

Having laid out the main empirical regularities to be explained, the chapter now turns to examining the factors that have shaped the scope, timing, and speed of structural reforms across countries, sectors, and time.

Analytical Framework

From a political-economy perspective, actual structural reforms are determined by the inter-action between policymakers' reform objectives and a set of economic and political constraints that are not directly under their control. Policymakers' objectives depend on the perceived costs and benefits of reforms (this issue will be taken up below). In addition, policymakers may also have their own private objectives, such as maximizing their reelection chances. The constraints are a broad set of economic and political factors that determine whether policymakers succeed in obtaining the political support for implementing the reforms or not.

Problems in obtaining political support arise from the uneven distribution of the costs and benefits of reforms across the economy and over time. While many ultimately gain, some lose from reforms because of lower protection from competition and price flexibility. Losers, even if small in number, often prevail in the political arena because they have strong incentives to secure political support compared with the broad, diffuse majority of beneficiaries (e.g., Olson, 1965). In addition, if a sufficiently large number of producers and employees are uncertain about the reform effects and attach some probability to being among the losers, they may prefer the status quo of no reforms—the so-called status quo bias—even knowing that, overall, reforms would be beneficial (e.g., Fernández and Rodrik, 1991). With uncertainty about who will lose and gain, the natural remedy to resolving the distributional problems associated with reforms—compensatory transfer schemes—may not be feasible because of a lack of sufficient ex ante information (Grüner, 2002), the high costs associated with the broad coverage needed to cover all possible losers, or the difficulty of committing to deals in the political arena (Rajan and Zingales, 2000).[7]

This basic framework maps into a simple dynamic econometric equation relating annual

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[7]Policymakers also face uncertainty about the fundamental determinants of the optimal government intervention in the presence of market failure, including the economy's exposure to shocks and people's attitude toward risk and preferences regarding the sometimes inevitable trade-offs between efficiency and equity (see Blanchard and Tirole, 2003; or Boeri, Conde-Ruiz, and Galasso, 2003, on optimal interventions in labor markets).

Table 3.3. Econometric Analysis: Summary of Results

Effect on Reforms in:	Labor	Product Markets	Tax	Trade	Financial
Domestic and international attitude toward reform					
Initial structural conditions	Negative	Positive	Negative	Negative	Positive
Learning	Negative	Positive	Negative	No	Positive
Demographics (share of 65-year-olds or older					
in the population)	Positive	No	No	Positive	Positive
Cross-border spillovers	Positive	Positive	No	Positive	No
Openness to trade	Positive	No	Negative	n.a.	No
Macroeconomic conditions					
"Bad" year (real GDP growth at or below 1 percent)	Negative	Positive	Positive	No	No
Number of bad years over the past three years	Positive	Positive	No	Positive	No
Primary surplus (cyclically adjusted)	Positive	Positive	No	Positive	No
Fiscal adjustment (increase in cyclically adjusted					
primary surplus)	Negative	No	Negative	No	No
Policymaking process					
Majoritarian electoral rule	Positive	No	Positive	Positive	Positive
Conservative-leaning government	Positive	No	No	Negative	No
Size of government majority	Positive	No	No	Positive	No
Election year (executive)	No	No	No	Positive	No
First year in office (executive)	No	No	No	Positive	No
Design of reforms					
Other reforms (learning, bundling, sequencing)	Positive	No	Positive	No	No
Country/regional effects					
EU member	Positive	Positive	Negative	Positive	No

Note: Details of estimation and specification are provided in Appendix 3.2. The assessment summarizes the results obtained for different specifications. An effect is deemed "positive" or "negative" only if the corresponding coefficient is statistically significant in at least one of the equations reported in Appendix 3.2. "No" means that no statistically significant effect was found in any of the equations.

changes in the structural indicator of a sector to a series of variables likely to affect policymakers' reform decisions (Abiad and Mody, 2003). An important feature of the equation is that, in the absence of political and economic constraints, the reform dynamics in each sector are driven by policymakers' intention to adjust structural policies gradually until they satisfy a certain objective, as discussed above. Thus, the greater the gap between the actual value of the structural indicator and the objective, the stronger is the incentive to implement reforms. Naturally, political and economic constraints also play an important role and, to account for these, the equation includes explanatory variables that have been identified in the literature on the political economy of reforms.

The equation was estimated for each of the five structural indicators for a panel of 20 OECD countries over the period 1975–98.[8] (See Appendix 3.2 for a more detailed exposition of the basic framework, estimation, and results.) In the following discussion, the results are presented for each explanatory variable (Table 3.3) along with the basic underlying rationale and, when possible, with intuitive figures that illustrate the findings.[9]

Initial Structural Conditions

As noted above, initial conditions affect reforms because they determine the gap between actual and desired policies. In addition, initial conditions also proxy some important

[8]Considering annual changes makes the analysis sensitive to the potentially significant lags between the decision on a specific reform and its actual implementation. However, to explore the effect of factors such as elections, the possible switch in the ideological orientation of a new government, or recessions, annual observations are needed. A similar model estimated with five-year averages yields results broadly line with the annual model (see Appendix 3.2).

[9]The figures are only illustrative and no attempt was made to isolate the effects of a few apparent outliers, which largely reflect the use of data points covering 10-year spans. In the multivariate regressions, which are based on annual data, outliers are much less of a problem.

incentives for mobilization for and against structural reforms. On the one hand, government regulation is more likely to be perceived as costly in highly regulated and heavily taxed economies, which, in principle, should favor mobilization for reforms. Hence, countries with more restrictive initial conditions should be more determined reformers than countries with more favorable conditions. On the other hand, as noted earlier, government regulation also create opportunities for rent seeking, whose beneficiaries are likely to oppose reforms strongly and tend to be well organized politically (Olson, 1965). If that effect dominates, countries with more restrictive initial structural conditions should be laggards in the reform process while countries with more market-friendly regimes are more likely among the front runners.

What does the reform experience of industrial countries reveal about initial conditions? The results suggest that with the notable exception of product markets, countries with more restrictive initial conditions tended to reform more. This is illustrated by the generally negatively sloped trend lines in Figure 3.3, where initial levels of structural indicators are compared against cumulative changes over the subsequent 10-year period.[10]

Besides illustrating the importance of initial conditions, the trend lines in Figure 3.3 also point to two other key features about initial conditions and the reform dynamics. First, a shift toward more reform-friendly attitudes apparently occurred in the second half of the sample (1988–98), as indicated by the shift to the right of the trend lines compared with the first half (1978–88). Second, there existed a broad consensus in favor of trade, financial, and product market liberalization, as indicated by the implied average objectives—the values at which the trend

[10]It should be noted that the estimated equations also include the squared initial levels of the structural indicators, which allows for the possibility of a nonlinear response to initial conditions. This can be relevant for countries that are close to the boundaries for the indicator variables. Related econometric issues are discussed in Appendix 3.2.

Figure 3.3. Structural Reforms and Initial Structural Conditions
(Changes in structural policy indicators on y-axis; x-axis as stated; 1978–98)

Negatively sloped trend lines indicate that on average countries with the most restrictive initial structural policy regimes undertook more reforms. Reforms during 1988–98 were more ambitious than in the previous decade.
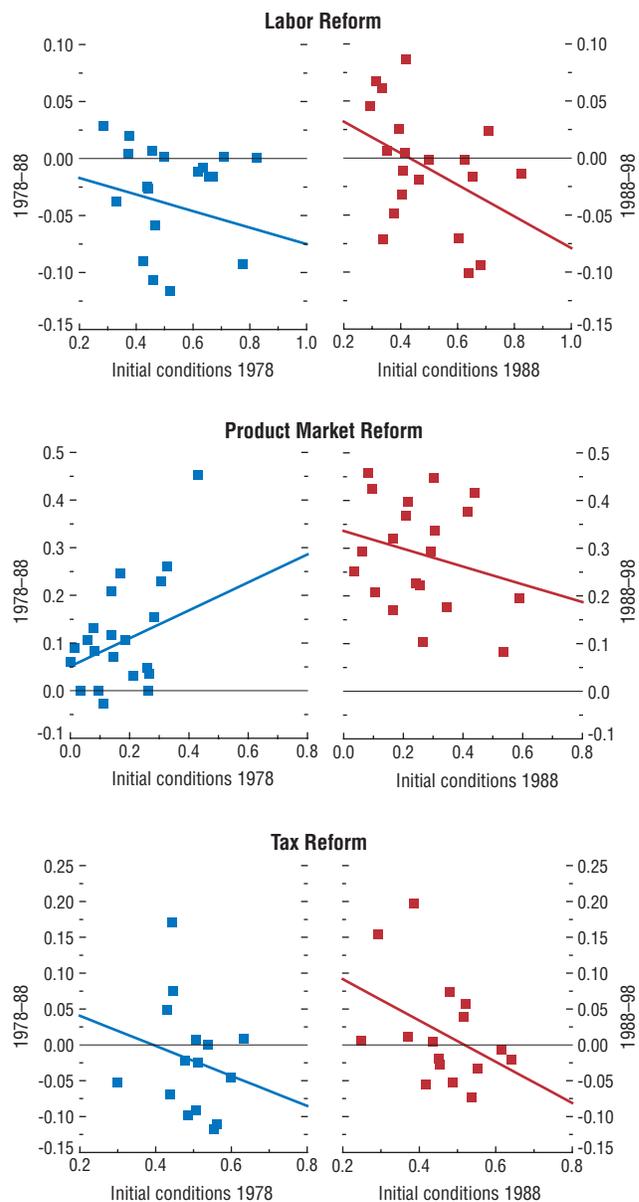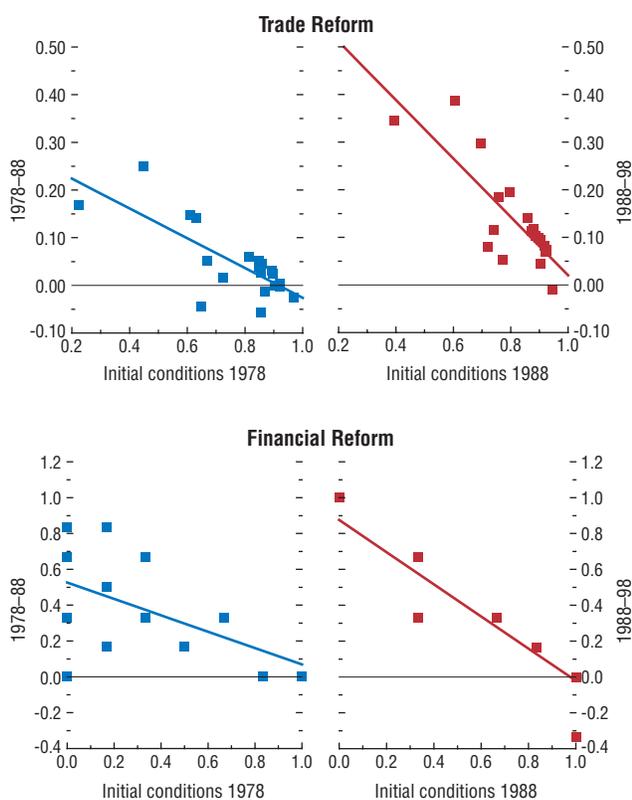

Labor Reform

Product Market Reform

Tax Reform

lines intersect the zero-reform lines (the horizontal axes) in Figure 3.3.[11]

Labor and tax reforms, however, emerge as two "difficult" areas. The implied objectives were close to either average initial conditions (tax reforms) or the more restrictive systems (labor). The implied objectives may reflect both underlying objectives and constraints.[12] Policymakers' underlying objectives in those domains may be highly country specific, possibly reflecting different preferences regarding the trade-off between efficiency and equity or the lesser initial exposure to cross-border competition (which may force policymakers to consider reforms, as discussed below). Regarding constraints, the resistance against reforms in these two areas could be particularly strong for at least two reasons. First, the short-term costs of reforms likely affect a large number of people and have an impact on the distribution of income. Second, incumbents benefiting from the initial regulatory regime could be in a stronger position because the lack of initial cross-border competition provides for particularly large incentives for political mobilization.

International Factors and Openness

Reforms implemented in neighboring countries may affect the domestic reform dynamics through peer pressure in the context of international arrangements (as in the European Union), via cross-border learning spillovers from the experience of more advanced reformers, or through the adverse effect of reforms abroad on domestic international competitiveness.

The evidence indicates that international pressure indeed bolstered the incentives of domestic policymakers to carry out reforms, especially in the areas of product market and financial

Figure 3.3 *(concluded)*

Source: IMF staff calculations.

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[11]As explained in Appendix 3.2, this intersection indicates the common structural policy objectives that drive the adjustment dynamics in the absence of constraints.

[12]Given that the estimated equation is a reduced-form equation, it is impossible to establish how much of the difficulties are attributable to objectives or to constraints.

reforms. Specifically, the econometric analysis and the graphic evidence presented in Figure 3.4 suggest that if the three main industrial country trading partners of a particular country implemented reforms, domestic reform efforts increased as well. The exception to that pattern was found for tax policy, which runs against the view that international tax competition has been a significant force, at least on the basis of the aggregate index used in the present study.[13]

Unsurprisingly, international commitments appear to contribute further to the emulation effect. Evidence that membership in the European Union has fostered reforms is particularly clear in the areas of trade liberalization and product market regulation over the period 1988–98, when the Single European Act of 1986 (which led to the Single Market in 1992) fostered a momentum in member states in favor of more competitive product markets.

One might expect the pressure for reforms on account of reforms elsewhere to increase with the openness of the economy, as the latter should raise the costs of inaction. Figure 3.5 indicates that more open economies, as measured by trade flows in goods and services as a percent of GDP, tend to be more active in the area of labor reforms, a regularity confirmed by the econometric analysis. In contrast, open economies appear on average more reluctant to reform their tax systems, which corroborates earlier evidence about the absence of tax competition. This reluctance may reflect the relatively larger exposure of more open economies to external shocks, which, as conjectured by Rodrik (1998), could lead to a preference for larger government that implies a more important role for fiscal stabilizers and, possibly, less flexibility for reducing the average tax burden.

Macroeconomic Conditions

According to a widely held view, difficult economic conditions, especially full-blown

[13]Griffith and Klemm (2004), among others, reach similar conclusions.

Figure 3.4. Cross-Border Spillovers
(Changes in domestic structural policy indicators on y-axis; x-axis as stated; 1978–98)

With the exception of tax systems, reforms in the three main trade partners have encouraged reforms at home.
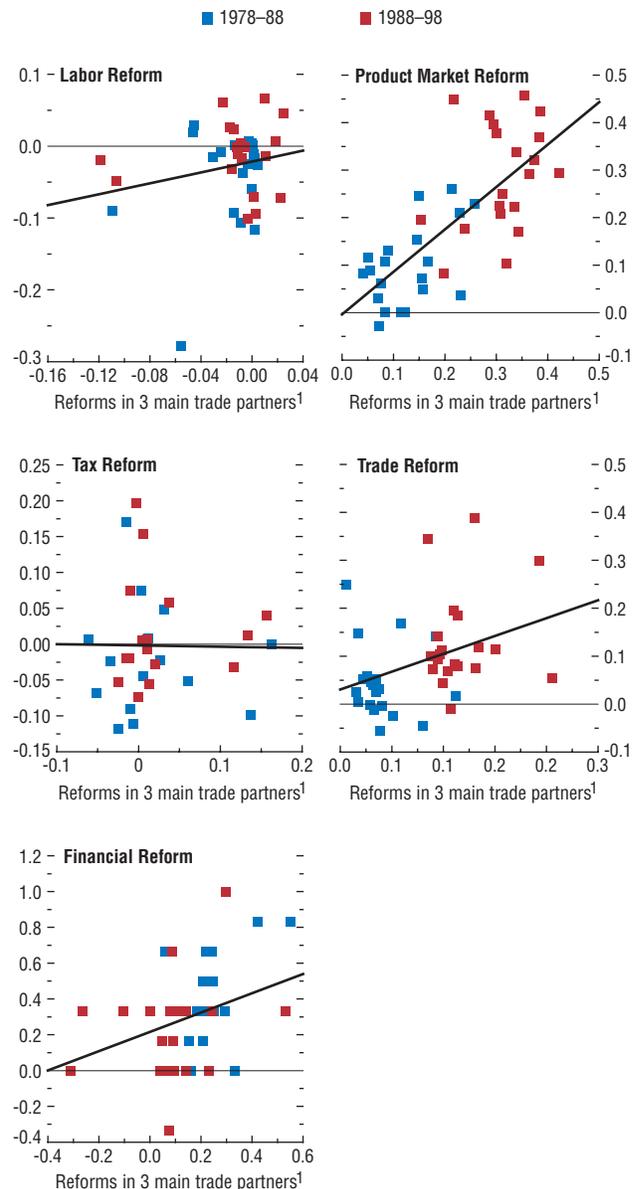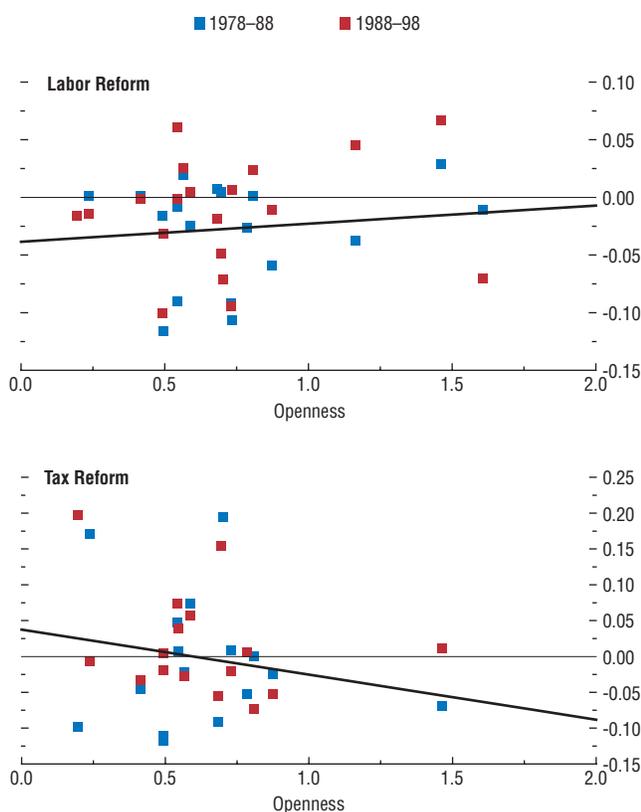

Source: IMF staff calculations.
[1]Changes in structural policy indicators in three main trade partners.

Figure 3.5. Openness to Trade and Reforms[1]
(Changes in structural policy indicators on y-axis; x-axis as stated)

By increasing external competitive pressure, openness to trade contributes to more pro-competitive labor market reforms. In contrast, openness seems to discourage tax reforms.

Source: IMF staff calculations.
[1]Trade openness is defined as the sum of imports and exports of goods and services in percent of GDP.

economic and financial crises or prolonged episodes of slow or negative growth, can foster support for reforms because the costs of the status quo become so obvious that opposition to reforms greatly weakens.[14] This "back-against-the-wall" argument contrasts with the view that reforms are easier to implement with favorable macroeconomic conditions since the costs of reforms are generally less painful, and distributional effects less visible, when aggregate income is growing rapidly.

The evidence suggests that recoveries after a prolonged period of weak or negative growth are indeed conducive to an acceleration in structural reforms (Figure 3.6). In all areas except for financial liberalization,[15] episodes characterized by two or three years of low or negative real GDP growth (growth rate of 1 percent or less) were, on average, followed by more ambitious reforms than in normal or good times. The cases of New Zealand (Box 3.1) and the United Kingdom (Box 3.2), where far-reaching structural reforms were implemented in the 1980s, clearly illustrate how lasting, difficult economic conditions led to political change and reforms. Current weak economic conditions, as measured by low or negative GDP growth, were also associated with greater reform efforts, with the notable exception of labor markets. The latter suggests that governments are reluctant to impose adjustment costs on workers when they already suffer from adverse economic conditions (in fact, the generosity of unemployment benefits tends to be negatively correlated with the cycle in some countries).

The compensation of those who stand to lose from the reforms through government transfers is a frequently prescribed strategy to secure political support. The scope for compensation

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[14]See Krueger (1993); Tommasi and Velasco (1996); Rodrik (1996); Drazen (2000); or Drazen and Easterly (2001) on the role of crises in promoting reforms.
[15]This may be due to the particular difficulty of implementing financial reforms when the domestic financial sector is perceived as too weak to sustain increased competition.

is, of course, greater when fiscal positions are strong, implying that budget balances should matter for the reform dynamics. Figure 3.7 suggests that reforms are more likely when there is room in the budget for accommodation (defined as a reduction in the structural primary balances as a percent of GDP). The econometric results show a particularly strong positive association for labor and tax reforms, which, arguably, are the most difficult reform areas. There are three possible reasons for this. First, fiscal adjustment may use all the "political capital" at policymakers' disposal, leaving no goodwill for structural reforms. Second, as conjectured above, significant labor reforms may require fiscal compensation packages leading to higher—albeit temporary—structural deficits that are at variance with fiscal adjustment goals. The case of labor market reforms in the Netherlands during the 1990s clearly illustrates the importance of supporting fiscal policies in pressing ahead with labor market reforms (Box 3.3). Third, feasible fiscal adjustment may require some tax increases (increasing the level of distortion, as measured by the tax indicators) since the burden of adjustment could otherwise fall entirely on expenditure reduction, which may also face strong political resistance.

Higher structural primary surpluses, however, tend to be associated with greater reforms. If current fiscal positions indicate a low probability of future fiscal adjustment, governments might be less reluctant to spend political capital on unpopular reforms compared with times when significant fiscal adjustment is likely. In addition, comfortable primary surpluses may lower governments' reluctance to offer compensation packages even if they imply a temporary deterioration in the structural fiscal balance.

Policymaking Process

Institutional features of the political decision-making process, such as constitutional provisions establishing the nature of the political system

Figure 3.6. More Reforms in Bad Times?
(Average reforms in bad times minus reforms in good times multiplied by 1,000 on y-axis; x-axis as stated; 1982–98)[1]

Bad years (GDP growth below 1 percent) are often conducive to reforms, except for labor reforms, as are recoveries after periods of prolonged weakness in growth (more than one bad year in the previous three years).
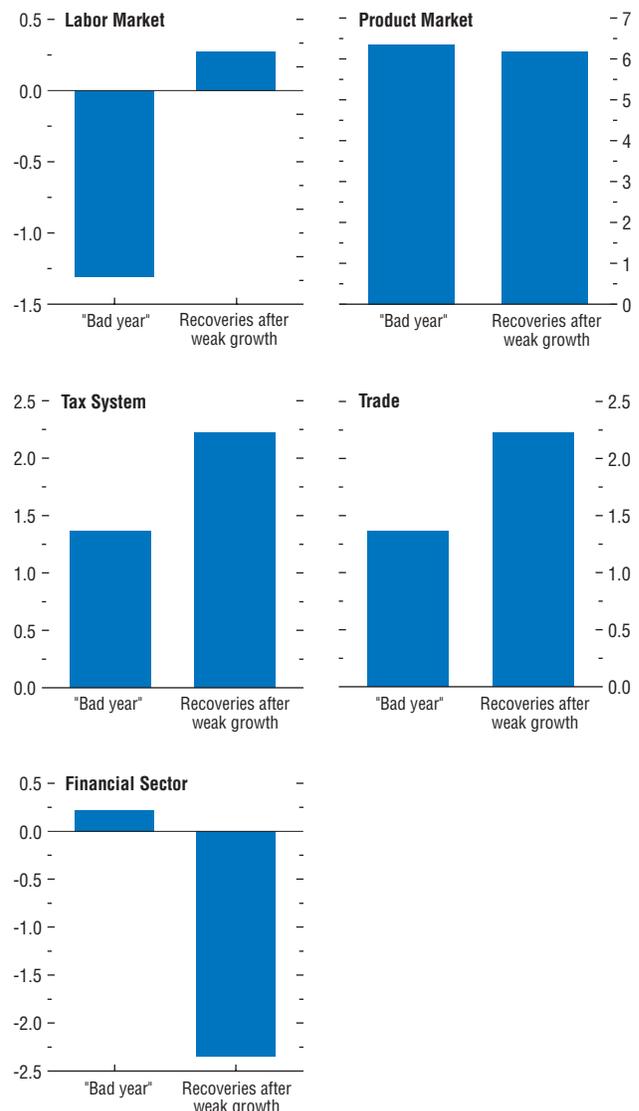
Source: IMF staff calculations.
[1] "Good times" denote years for which real GDP growth was above 1 percent.

Figure 3.7. Fiscal Adjustment and "Difficult" Reforms
(Changes in structural policy indicators on y-axis; x-axis as stated)

On average, structural decreases in the general government primary balance were associated with more ambitious reforms in the labor and tax areas.
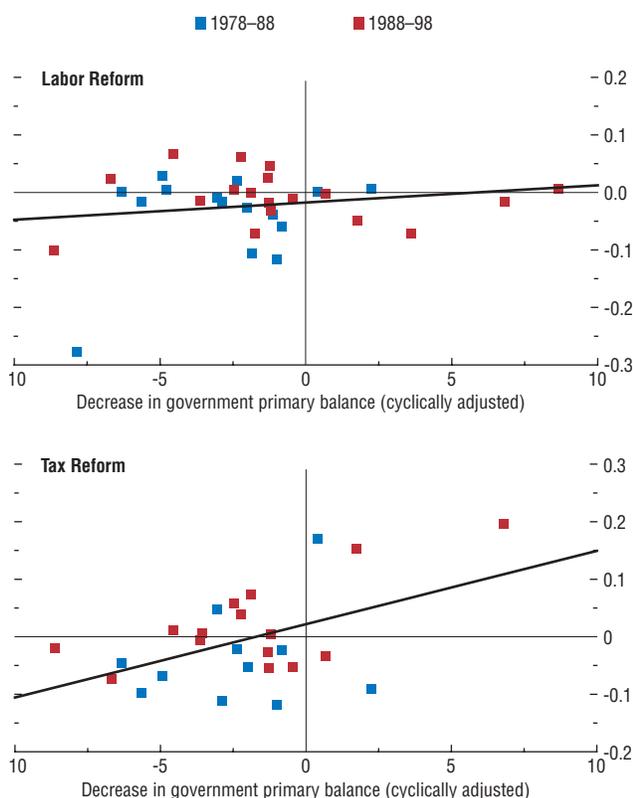
Source: IMF staff calculations.

(parliamentary or presidential) and electoral rules (proportional or majoritarian), can affect policy choices, especially those, like fiscal and structural policies, that involve redistribution. For example, Persson (2003) conjectures that "proportional elections tend to better serve the interest of broad majorities than majoritarian elections," suggesting that proportional voting systems could favor moderate and gradual structural changes with a low risk of reversal whereas majoritarian systems might sustain more ambitious reform agendas but with a greater risk of reversal.

There is some evidence that the institutional features of the political system matter for the reform process (see Table 3.3). In particular, majoritarian electoral systems tend to support reforms better than proportional ones. This corroborates the view that in majoritarian systems, reform-oriented policymakers may more easily overcome the strong opposition of small constituencies opposed to reforms, which may facilitate the advancement of ambitious reform packages in difficult areas. Governments backed by a strong majority in parliament, which occurs more frequently in majoritarian systems, were, on average, more determined reformers, especially in labor and trade reforms.

The political environment may also affect incentives to carry out reforms. The political orientation of the government may play a role since it determines the government's position regarding the trade-off between equity and efficiency. The proximity to elections can hamper the implementation of unpopular reforms—especially if they impose significant short-term costs—whereas the first year in office of a new government is conducive to reforms, as the goodwill—the political capital—is typically highest at that time. Finally, political fragmentation (the number of autonomous entities, such as political parties) and the extent of ideological polarization are likely to exacerbate conflicts of interest, hindering the formation of the broad and stable coalitions needed to support ambitious reforms.

Box 3.1. Structural Reforms and Economic Growth: New Zealand's Experience

New Zealand undertook a comprehensive structural reform of its economy. During the second half of the 1980s and the early 1990s, the economy was transformed from being relatively closed with substantial government intervention to one of the most open and market-oriented economies in the world. At the same time, transparent macroeconomic policy frameworks were established to promote and maintain economic stability.

The impetus for economic reform stemmed from two decades of relative decline in the country's economic performance. In 1965, New Zealand's GDP per capita (on a purchasing-power-parity (PPP) basis) was the sixth highest among industrial countries, but by the early 1980s, the country's ranking had slipped to seventeenth out of 22 industrial countries (see the table).[1] The fall in New Zealand's ranking reflected a terms-of-trade decline, its loss of preferential access to the U.K. market after the latter joined the European Community in 1973, other barriers to its agricultural exports, and the effects of failed policy programs, such as the "Think Big" development strategy, which sought to restructure the economy by promoting taxpayer-supported industries to stimulate growth and employment. Lax fiscal and monetary policies added to the country's economic problems. By the early 1980s, the New Zealand economy was faced with high and variable inflation, rising public debt, growing unemployment, and mounting external pressures. A loss in international confidence in the economy in 1984 triggered a foreign exchange crisis.

It was against this background that the Labor Party government, which took office in 1984, initiated a reorientation of macroeconomic policies and a wide-ranging structural reform of the economy. The succeeding National government expanded the reforms. Overall, the period of intensive reforms lasted about a decade. The first reforms included the floating of the exchange rate in March 1985, the removal of foreign exchange controls, and the liberalization of interest rates, financial markets, and international capital flows. These were followed by successive steps to remove distortions in and deregulate goods markets, to liberalize trade, and to implement an aggressive privatization program. Macroeconomic policies were also tightened; the focus of monetary policy shifted to containing inflation while fiscal policy was strengthened through budget and tax reforms and reforms of the accountability and incentive structures in all parts of the public sector. Labor market reforms followed in the early 1990s.

The reforms were successful in opening the economy up to competitive pressures and market forces, both domestically and internationally, and substantially improved the frameworks for and outcomes of macroeconomic policies. Inflation fell to low and stable levels, from about 8 percent in 1989 to 1½ percent by 1992, and low inflationary expectations gradually became entrenched. Fiscal consolidation took the public sector operating balance from a deficit of 7 percent of GDP in 1982/83 to 1 percent of GDP in 1992/93. At the same time, the growth performance of the economy in the immediate aftermath of the launch of reforms (1984–92) was disappointing—GDP per capita (on a PPP basis) grew by less than 1 percent and the unemployment rate rose from 6.2 percent in 1983 to more than 10 percent in 1992.

The economy's sluggish growth performance during the reform period sparked debate over whether macroeconomic policy changes and structural reforms were "properly" coordinated and sequenced. Critics of the reforms pointed to the fact that policy tightening, in conjunction with structural reforms, added to the burden of economic adjustment. The sequencing of reforms also was seen by some as less than optimal, with particular criticism directed at the fact that reform of the labor market was implemented several years after the opening of product markets to increased competition. Supporters of the reforms noted that the large fiscal and external imbalances and high infla-

Note: The main author of this box is Abdelhak Senhadji.

[1]The industrial country average is based on the following countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, the United Kingdom, and the United States.

Box 3.1 *(concluded)*

New Zealand: Growth Performance in Comparison
(GDP per capita, PPP basis)

	Average Annual Growth				Average Ranking Among OECD Countries (in levels)						
	1973–2002	1973–1983	1984–1992	1993–2002	1965	1970	1975	1985	1990	1995	2002
New Zealand	1.5	1.1	0.8	2.6	6	9	12	16	17	18	18
Australia	1.9	1.1	1.9	2.7	7	6	7	11	15	11	8
Canada	1.9	2.0	1.4	2.4	2	2	2	2	2	4	3
Finland	2.3	2.6	1.1	3.0	15	15	13	14	12	16	13
Ireland	4.4	2.5	3.9	7.0	19	20	20	19	18	17	2
Industrial country average	2.3	2.2	2.4	2.4							

Sources: OECD; and IMF staff calculations.

tion precluded the use of macroeconomic policies to cushion the impact and/or to speed adjustment to structural reforms. Moreover, the sequencing of the structural reforms was determined less by economic considerations and more by the political appetite for reforms and the need to build political consensus to sustain them.

There also has been some debate over whether the costs of reform outweighed the benefits from it, particularly given the nearly decade-long reform period and the substantial adjustments that reforms produced. Such arguments are implicitly based on an assumption that the economy's pre-reform growth rate could have been maintained. However, this seems unlikely, given the severe economic difficulties that the economy faced when the reform process was initiated. Macroeconomic policies, in particular, were unsustainable. In addition, in the absence of the reforms, the economy would have been less flexible and would have encountered significant difficulties in dealing with the challenges that it has faced in recent years.

After the period of intensive reforms, however, the economy's growth performance improved significantly; New Zealand's output growth rate between 1993 and 2002 was slightly higher than the OECD average. Real GDP grew at an average annual rate of 3.6 percent, compared with 1.6 percent during the reform period and 1.4 percent in the decade immediately preceding the initiation of reforms. The acceleration in growth was driven, to a large extent, by growth in total factor productivity (see Conway and Hunt, 1998; and Diewert and Lawrence, 1999). On a per capita basis (in PPP

terms), GDP growth rose to slightly more than 2½ percent a year, roughly comparable to the OECD average, and the gap between per capita income in New Zealand and the average for OECD countries at least remained roughly unchanged, after widening in the previous two decades. Relatively stronger growth in New Zealand than most of the rest of the OECD during the past three years has begun to reduce the gap.

The current New Zealand government has set for itself the objective of returning the country to the upper half of the OECD income per capita rankings. An essential element of the strategy to achieve this objective is to maintain a solid foundation for growth through continued sound macroeconomic policies and preserving a competitive and open market-based economy. The authorities recognize that restrictions on its exports prevent New Zealand from fully exploiting its competitive advantage and remain a major impediment to raising the country's growth potential. Further liberalization of international trade in agricultural products is therefore of particular importance for New Zealand. In addition, the authorities believe that growth prospects could also be enhanced by additional efforts aimed at strengthening innovation, building a more skilled labor force, encouraging greater labor force participation, and improving New Zealand's links to the global economy. Policy initiatives are seen as needed in these areas to help overcome disadvantages stemming from New Zealand's small size and distance from the main centers of global economic activity.

Box 3.2. Structural Reforms in the United Kingdom During the 1980s

In response to disappointing economic performance, the United Kingdom underwent sweeping structural reforms in the 1980s that sought to reduce the state's involvement in economic decision making and achieve a better-functioning market system. These early reforms set the tone for reforms elsewhere (e.g., Keen, 1991, on tax reforms).

Following decades of relative decline in economic performance vis-à-vis other industrialized countries, the United Kingdom went into a recession after the first oil shock in 1973. Inflation became a major problem, partly owing to wage pressures and increasing government spending, and the economic situation deteriorated further. A balance of payments crisis occurred in 1976, following which wage controls and spending cuts were introduced in the context of a Stand-by Arrangement with the IMF. Opposition to these measures was strong, culminating in a wave of strikes during the 1978–79 "Winter of Discontent." Economic problems were the key issue during the 1979 election. The opposition won the election on a platform of structural reforms, and Margaret Thatcher became prime minister in May 1979.

The new government's structural reform program included the following key elements (Keen, 1991; Lawson, 1992; Blanchflower and Freeman, 1993; and Card and Freeman, 2002):

- *Reducing the state's role in the economy.* The key reform in this area was the privatization of state-owned enterprises and public housing, which increased both equity and home ownership. Another reform area was the reduction in government size, and civil service employment was cut substantially. The government also limited its liabilities from the pension system by reducing the relative value of state pension benefits and creating incentives to enroll in private pension schemes. Partly due to these reforms, public investment was significantly lower (as a share of GDP) in the 1980s than in previous decades.

- *Improving work incentives in benefit programs.* A broad-based reform strategy sought to attain this objective. First, net unemployment benefits were reduced by abolishing the earnings-related supplement; their statutory indexation was suspended and their taxation was made less favorable. Second, the government tightened eligibility criteria for receiving unemployment and other benefits, especially for young people. Third, it monitored job-seeking efforts via the 1986 "Restart program" which required six-monthly counseling for all unemployed. Reflecting these reforms, the unemployment benefit replacement ratio declined by about one-fourth during the 1980s.

- *Reforming the tax system.* Reducing the various adverse incentive effects associated with the existing tax system was also a reform priority. The number of bands for marginal rates of personal income tax was reduced while rates were lowered. At the same time, some exemptions were reduced or eliminated, while the taxation of capital income was streamlined. The share of indirect taxes was increased, and corporate profit taxes were lowered while their base was broadened.

- *Reforming trade unions.* The government introduced a series of legislative reforms, including extending the grounds for refusing to join a union; introducing limits on picketing; prohibiting actions that force contracts with union employers; and weakening the closed-shop and union immunities.

- *Liberalizing financial markets.* Restrictions on international financial transactions were removed in late 1979. Later, administrative measures curbing bank lending and lending by building societies were removed. Other reforms in this area included the liberalization of the pricing for financial services (the 1986 "Big Bang").

- *Promoting entrepreneurship and self-employment.* The establishment of a thriving entrepreneurial culture was considered crucial to the

Note: The main author of this box is Petya Koeva.

Box 3.2 *(concluded)*

reform agenda. The government introduced specific measures to foster self-employment, such as offering tax relief, facilitating bank borrowing for small companies, and establishing local agencies to counsel small businesses on planning, marketing, and design. As a result of these initiatives, the self-employment rate rose steadily throughout the 1980s.

The reforms clearly made the U.K. economy more flexible and market oriented. Their impact on economic performance remains the subject of debate. Nevertheless, there is a broad consensus that the reforms contributed to halting the previous trend of relative decline in GDP levels per capita (e.g., Card and Freeman, 2002; and IMF, 2003), as the overall growth performance improved in the 1980s and the 1990s. Compared with the 1970s, average GDP growth (per working-age person) increased by over half a percentage point. Labor market performance also improved. In particular, the employment rate and hours worked did not decline in the 1980s and 1990s, as they did in other major European economies. The unemployment rate increased in the early 1980s and remained relatively high until the latter part of the decade. It fell dramatically in the mid-1990s, with the decline partly attributable to the improved labor market conditions that followed the reforms of the 1980s (Pissarides, 2003).

It has been somewhat of a disappointment, however, that the improved growth performance was largely accounted for by higher labor utilization, with little evidence of improvement in medium-term aggregate productivity growth. In fact, the average growth total factor productivity remained remarkably stable (about 1¾ per-

cent) over the past three decades.[1] However, during the 1980s and 1990s, the United Kingdom's aggregate productivity growth did not decline as in other major European countries. Microeconomic evidence—examining the impact of specific reform efforts on firm-level productivity—suggests that the structural reforms of the 1980s contributed to the United Kingdom's improved relative productivity performance (Card and Freeman, 2002). Another concern is that these reforms may have also contributed to the large increase in earnings inequality (Machin, 1997), significant deterioration in poverty indicators (Osberg, 2002), and widening infrastructure gap (Clark, Elsby, and Love, 2002) observed since 1980.

The comprehensive structural reform program of the 1980s was implemented amid some difficult macroeconomic conditions, such as relatively high unemployment. A number of factors can help explain this. First, the increasingly disappointing economic performance of the 1970s exposed the weakness in the existing economic structure, and its widely dispersed adverse effects created an environment that was conducive to far-reaching reforms. Second, although unemployment was high, other macroeconomic indicators such as growth and inflation began to improve in the early to mid-1980s, enabling the reforms to continue. Third, the rise in equity and home ownership resulting from the implemented privatization schemes created additional support for the reforms.

[1]See HM Treasury (2000); O'Mahony and de Boer (2002); and IMF (2003) for a discussion of productivity developments in the United Kingdom.

In fact, the data indicate a surprisingly small role for the political environment. The ideological orientation of the government appears to affect somewhat the pace of reforms in the labor market and trade areas. Conservative governments appear, on average, more prone to carry out labor reforms than their left-wing counterparts but less

inclined to pursue trade reforms. In the other areas, no consistent role was found for ideology.

The Design of Reforms

Because product, labor, and capital markets are fundamentally interdependent, there are

complementarities between reform areas. On the one hand, reforms in one area may amplify the beneficial effects of reforms in other areas;[16] reforms in one area may also allow for the compensation of losers from reforms in another area and, as a result, a broad reform package may help in securing political support, as noted above. On the other hand, problems in securing support could also be larger since packages may be less transparent and more difficult to explain to the various constituencies affected by the reforms. In addition, the effects of packages may be more difficult to assess at the individual level than simple reforms, which may lead to more uncertainty in the assessment of the cost and benefit incidence and, in turn, to weaker political support.

The empirical evidence indicates that earlier reforms in other areas helped labor and tax reforms, while their effect on reforms in other areas was insignificant. This finding could simply reflect the agendas of reform-oriented governments in the sample, although it also lends some support to the view that policymakers learn from reforms and adopt a more reform-oriented policy stance elsewhere. It is also possible, however, that relatively easier reforms in areas like trade, product markets, and the financial sector increase the pressure to reform more in contentious areas like labor markets and the tax system. In that respect, the finding of a strong interaction between labor and product market reforms is noteworthy (see also Nicoletti and Scarpetta, 2001; and OECD, 2002). Figure 3.8 shows that these reforms tend to go hand in hand.[17] This lends support to the view that the weaker pricing power by firms in more

Figure 3.8. Product and Labor Market Reforms
(Changes in structural policy indicators; 1982–98)

Product and labor market reforms tend to go hand in hand.
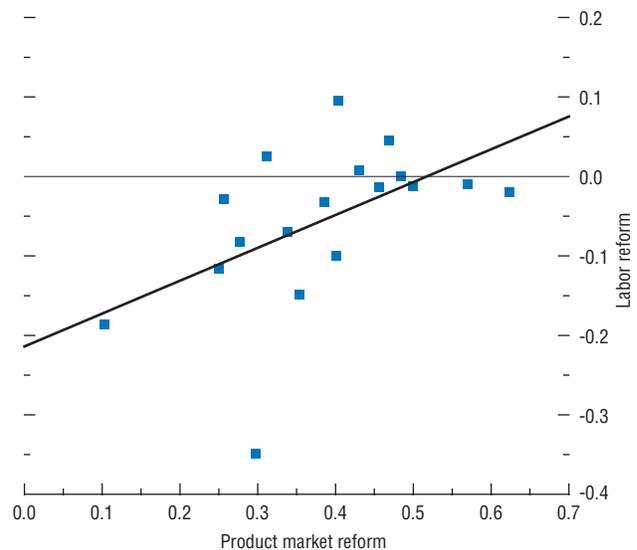
Source: IMF staff calculations.

[16]Previous research on complementarities between reforms has primarily focused on the interactions between various labor market, product market, and tax reforms (e.g., Coe and Snower, 1997; Boeri, Nicoletti, and Scarpetta, 2000; Seldeslachts, 2002; and OECD, 2002).

[17]Moreover, as predicted by recent theoretical analyses (e.g., Blanchard and Giavazzi, 2003; or Boeri, 2004), past product market reforms led to more labor reforms while the possible reverse causation does not appear relevant empirically. In fact, past labor reforms have a negative, albeit insignificant, effect on product market reforms.

Box 3.3. The Netherlands: How the Interaction of Labor Market Reforms and Tax Cuts Led to Strong Employment Growth

In the past two decades, the Netherlands has undertaken a series of labor market reforms, which have resulted in strikingly rapid employment growth (see the figure). Often referred to as the "polder model"—after the lands the Dutch have reclaimed from the sea—these reforms have attracted widespread attention and have at times been seen as a role model for reforms in other countries.

Reforms were triggered by the poor economic performance in the 1970s and early 1980s. During this time, total employment stagnated while private sector employment declined. This phenomenon was increasingly attributed to the rapid wage growth—an assessment that was further bolstered by research at the influential Netherlands Bureau of Economic Policy Analysis that showed that excessive growth of real wage costs affected employment in two ways: it led to accelerated scrapping of old labor-intensive vintages of capital and reduced profitability, which resulted in lower investment, slower growth of the capital stock, and fewer new jobs. When unemployment shot up sharply from 1979 onward, in a recession that was much deeper than elsewhere, a consensus gradually emerged that something had to be done.

Reforms started in earnest in late 1982, when two important events happened. First, a new government came into office, which had both a clear agenda for economic reforms and a large enough majority in parliament to implement them. Second, the emerging consensus on wage moderation was formalized in an agreement between unions and employers to pursue wage moderation in exchange for employment creation (the "Wassenaar" agreement). The agreement abolished automatic price indexation—not only in new wage agreements but also in existing wage agreements.

Subsequent governments implemented a series of labor market and fiscal reforms that complemented and reinforced each other.

Note: The main author of this box is Bas Bakker.

Netherlands: Labor Market Indicators
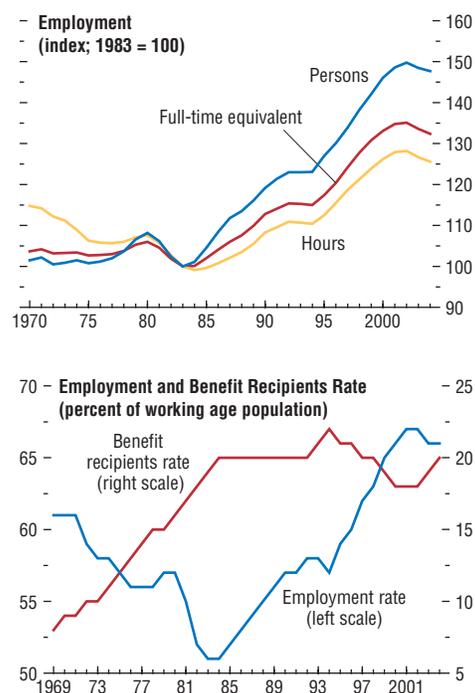
Source: CPB Netherlands Bureau for Economic Policy Analysis.

• The level of the real minimum wage was reduced sharply. It was first cut by 3 percent and subsequently frozen in nominal terms for many years. As a result, by 1997, the real minimum wage had declined by 22 percent from its 1979 peak. The youth minimum wage was reduced even more sharply.

• Civil servants' salaries were subject to the same cuts and freezes as the minimum wage and declined in real terms by about the same percentage.

• The replacement rate was cut significantly. Wage-related unemployment, sickness, and disability benefits were cut from 80 percent of wages to 70 percent; and the duration of unemployment and disability benefits was shortened. The minimum benefit, which is

linked to the minimum wage, fell substantially in real terms.

- To support wage moderation, taxes and social security contributions paid by employees were cut substantially. As a result, disposable incomes rose substantially even in the absence of real wage increases.
- To finance the tax cuts, the government cut primary public expenditure by 14 percentage points of GDP. As a result the government managed to reduce taxes and the budget deficit at the same time—the latter from a deficit of 6.2 percent of GDP in 1982 to a surplus of 2.2 percent in 2000.

The reforms contributed to a rapid increase of employment. Employment grew from 1984 onward, initially at a moderate rate, and accelerated further with the strong economic performance in the 1990s, helped also by substantial financial sector and product market reform. Employment growth largely benefited new entrants to the labor market, including recent graduates and women. The labor force participation of women rose sharply. Most of the women worked part-time, a phenomenon that seems to reflect cultural preferences rather than government policies.

Despite the success, problems remain. While the unemployment rate dropped sharply, to 3.3 percent in 2001, this partly reflected the lifting of job search requirements for the elderly unemployed, who were therefore no longer included in the unemployed even though they continued to receive unemployment benefits, and further increases in the share of the

working-age population receiving sick or disability benefits. More generally, the percentage of the working-age population receiving benefits (unemployment, disability, welfare, and sick leave) has stayed high, at about 20 percent.

Moreover, in the late 1990s wage growth became much less constrained. With an increasingly tight labor market, wage growth and inflation began to accelerate to levels far above the euro area average. Competitiveness was hurt further when in the global recession, Dutch employers, who had only recently been confronted with labor shortages, were initially reluctant to fire workers, and unit labor costs increased sharply. The resulting decline in profits contributed to the severity of the economic downturn, which was deeper than in most other euro area countries. The downturn also led to renewed efforts to restrain wage growth: last year unions and employers' organizations reached an understanding to freeze wages for two years.

What are the lessons from the experiences in the Netherlands? First, poor economic performance led to pressures for structural reforms, including by creating a parliamentary majority supporting a reform-oriented government. Second, fiscal policies supported labor market reforms by reducing the costs of reforms to incumbents (workers under existing wage contracts). Third, fast employment growth alone was not sufficient to reduce incentives for inactivity, and further reforms may be needed to reduce the number of benefits recipients—including a tightening of eligibility criteria.

competitive product markets reduces the rents to be shared between producers and workers and, therefore, the incentives for mobilization against reforms.

Other Factors

The attitude toward reform may also be affected through *learning* from earlier reforms

(Abiad and Mody, 2003). For example, previous reforms can improve understanding of the potential gains, thereby increasing support for further measures in the same area. However, learning effects need not necessarily foster reforms. For example, problems with previous reforms, such as design flaws, may reinforce policymakers' hesitations to tackle further reforms.

With the notable exception of product markets, the estimated dynamics of reforms are consistent with a decreasing speed of convergence toward the implicit target. This means that initial reforms tend to be followed by less ambitious measures, which is inconsistent with significant positive effects arising from learning about reforms.[18] In product markets, however, the economies with more restrictive initial conditions were more reluctant to reform than countries with less restrictive initial conditions, a pattern that is consistent with the presence of learning effects, especially in the first half of the sample (Figure 3.3 suggests the possibility of a change in product market reform dynamics over time).

Some have argued that population structure also affects reform decisions, especially the growing share of elderly in the total population. On the one hand, seniors may discount the future uncertain benefits from reforms more heavily than the rest of the population, discouraging policymakers from implementing difficult reforms if their number is sufficiently large. On the other hand, seniors may have vested interests in pro-competitive labor reforms aimed at boosting employment and labor force participation because the financial viability of the pension and social security systems depends on contributions and taxes by currently active employees. The econometric analysis indicates that a greater share of people aged 65 or more in the total population has a positive effect on labor and trade reforms, suggesting that in practice the second effect dominates.

Cost-Benefit Dynamics of Reforms

The uneven distribution of the costs and benefits of reforms across the economy is a central issue in the political economy of reforms. This section focuses on the timing of the costs and benefits of reforms. The main conjecture is that a status quo bias may arise because of the uneven distribution of costs and benefits over time. Gains from reform take time to materialize, as the progression typically involves the costly reallocation of resources (with temporary unemployment and unused productive capacity) and firm-level restructuring (exits of established firms and creation of new firms). Moreover, the magnitudes of the dynamic gains are often uncertain, as they depend, in a complex way, on other structural features of an economy and as policy mistakes may be made (e.g., financial crises after imprudent financial liberalization). Hence, policymakers may focus primarily on the short-term costs of reforms and heavily discount the long-run benefits, which could accrue to their political successors.

Based on the reform experience in industrial countries over the past two to three decades, this section seeks to provide evidence on the relative magnitudes of the costs and benefits of structural reforms over time and the related uncertainty, focusing particularly on the dynamic effects of reforms on two key macroeconomic targets—growth and unemployment, an issue that has so far found little attention in the literature.[19] On this basis, it will assess the role of the intertemporal distribution of costs and benefits in explaining the stylized facts of reforms established earlier.

Reform Costs and Benefits: An Overview

An extensive literature has examined the benefits of structural reforms with regard to key macroeconomic variables, particularly output or total factor productivity growth. The central hypothesis that this work builds on is that structural reforms lead to a more efficient allocation of resources, increased factor utilization, especially labor, and stronger incentives for innovation, all of which raise average productivity and

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[18]There are no indications of important adverse, learning-related effects either.

[19]It is possible to extend the analysis in this section to the effects of structural reforms on investment, total factor productivity growth, and the employment-population ratio.

boost long-run growth. Typically, the empirical evidence supports the notion of important long-run gains from reforms.[20]

The costs of reforms have been examined with regard to their effects on income inequality, wages, and employment in the context of research on the causes of the increasing wage gap between skilled and unskilled workers, and on the growing unemployment, particularly among the less skilled, in the industrial countries. Overall, little evidence of adverse effects of trade liberalization, financial sector reforms, and product market liberalization on wages and income inequality has been found (e.g., Slaughter and Swagel, 1997; and OECD, 2002). Labor, tax, and product market reforms typically lower unemployment.[21] However, trade reforms tend to shift employment between sectors (e.g., Revenga, 1992; Grossman, 1986, 1987; and Hakura, 1997), supporting the notion that some reforms can have different effects on employment across sectors, as factors of production are reallocated between sectors or firms.

While the costs and benefits of reforms have been researched extensively, much less is known about their relative magnitudes or dynamic profiles, which, from a political-economy perspective, is key to the understanding of the reform dynamics. Relevant studies include Kim (2003), who simulates the dynamic effects on aggregate output of corporate sector reforms leading to resource reallocation from less productive to more productive firms in Japan. He finds that the medium-term output gains substantially outweigh the short-run costs. Salgado (2002) shows that structural reforms in labor and product markets and trade have a weak or negative effect on productivity growth in the short run and significant positive effects in the long run. Fratzscher and Bussiere (2003) report that gains from financial sector reforms tend to materialize primarily in the short term.

Dynamic Effects of Structural Reforms on Growth

For the evaluation of the dynamic effects of structural reforms on growth, the analysis here builds on a widely used standard growth equation (e.g., Barro, 1991; and Barro and Sala-i-Martin, 1995) that also includes the five indicators of structural reform. The other growth determinants included in the equation are the initial levels of per capita income and financial development, the stock of human capital, terms of trade changes, population growth, and the ratio of private investment to GDP. The analysis can trace the dynamic effects of reforms without the statistical biases that could arise from reverse causality from growth to reforms, as macroeconomic conditions do affect the reform dynamics.[22] (Appendix 3.3 provides more details on the specification and estimation of the growth equation.) This exercise is not intended to produce precise estimates of the growth effects of reforms in individual areas, not least because the effects of subcomponents of the reform indicators can operate through different channels, and the magnitudes of the effects of policies estimated with growth equations are often not robust (e.g., Sala-i-Martin, 2002). The main purpose is to provide broad evidence of the relative short- and long-term costs and benefits of reforms in each area. This evidence is generally robust.[23]

[20]Among the many studies, Berg and Krueger (2003) report significant positive output growth effects from trade reforms; Nicoletti and Scarpetta (2003) find positive effects of product market deregulation on productivity growth in OECD countries; Kneller, Bleaney, and Gemmell (1999) show that less distortionary tax systems boost growth; and Levine (2003) documents how financial development lifts growth.

[21]See, among others, Daveri and Tabellini (2000); Boeri, Nicoletti, and Scarpetta (2000); the April 2003 *World Economic Outlook*; Nickell (1997); Blanchard and Wolfers (2000); and Nickell and others (2003).

[22]An instrumental variable estimator was used to address endogeneity problems. For the estimation, the data were averaged over three-year periods. This reduces the impact of short-term cyclical fluctuations on the results while at the same time allowing for short-term effects that are relevant for policymakers, given typical time spans between elections.

[23]Obviously, the limited number of observations also precludes the inclusion of all factors that have been found to affect growth (see Sala-i-Martin, 1997, for a recent overview).

Figure 3.9. Response of Real GDP Per Capita to a One-Standard-Deviation Increase in Reform Indicators[1]
(Percent; cumulative effects; x-axis time units represent three-year periods)

The average gains from structural reforms in the trade, labor, and product market areas predominantly materialize in the long run rather than in the short run. Financial sector and tax reforms appear to have a more immediate payoff.
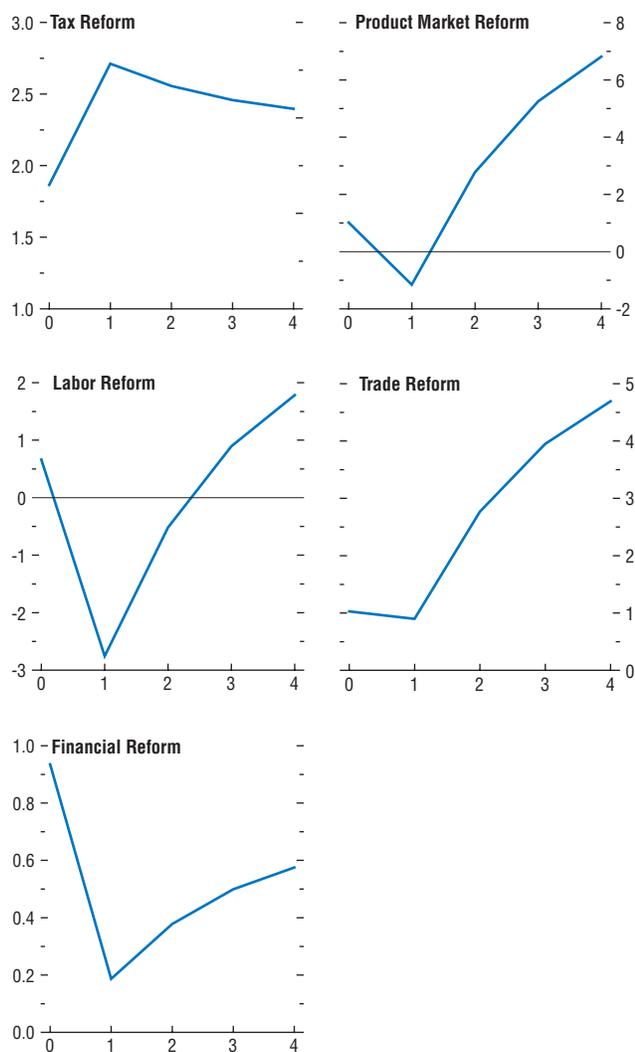
Source: IMF staff calculations.
[1] See Appendix 3.3 for details of the specification and estimation of the growth equation on which the responses are based. One standard deviation of the cross-country distribution reform indices over the 1996–98 period is used, with the exception of the financial index, for which one standard deviation of the index over the entire sample period is used.

Three main findings emerge from the analysis. First, in line with the section's basic conjecture, the cumulative gains from structural reforms in the trade, product market, and labor market areas are positive but they predominantly materialize in the long run (Figure 3.9). In the short term, the estimated output responses are small or even negative. In contrast, reform payoffs in the financial sector and tax system appear more even over time and, in the case of tax reforms, are substantial even in the short term (see also Mendoza, Milesi-Ferretti, and Asea, 1997).[24]

Second, the short-term output effects can be negative, in particular if the associated statistical uncertainty is taken into account. Comparing actual cumulative reform efforts by sector against the dynamic effects suggests that countries have implemented reforms that yield more immediate benefits with the least uncertainty, as in the case of financial or trade reforms. Labor market reforms clearly come with important short- to medium-term growth risks from a policymaker's perspective. The case of product market reforms, where important progress has been made, is more difficult to interpret since these reforms were associated with output declines in the short term. However, the medium-term risks are considerably smaller compared with labor market reforms.

Overall, these findings support the section's basic conjecture that reforms with smaller expected short-term costs are easier from a political perspective. The main exception to this broad conclusion is tax reforms, where progress has generally been limited despite immediate positive and significant output effects. This may reflect the fact that spending cuts, which are often a necessary counterpart to tax reforms, are politically unattractive.[25] Moreover, a large num-

[24]The surprisingly small growth effects of financial reforms may reflect the inclusion of the capital account regime in the sector indicator. Recent studies on the effect of financial openness on growth have frequently failed to find significant positive effects (e.g., Grilli and Milesi-Ferretti, 1995; and Edison and others, 2002).
[25]The favorable short-term effect could also reflect the short-term demand effects of tax cuts rather than just the "pure" structural reform effects. The calculations behind

ber of countries in the sample underwent fiscal adjustment, including the adjustment related to meeting the Maastricht criteria on fiscal deficits during the 1990s. Finally, as Mendoza and Tesar (2003) have argued, tax competition among industrial countries may not, paradoxically, have led to a reduction in overall levels of taxation.[26]

Third, the results also indicate that tax reforms could be a key instrument for taking advantage of reform complementarities because the flat output response could allow for the smoothing of the unfavorable short-term dynamic effects of other reforms.

Dynamic Effects of Structural Reforms on Unemployment

Unemployment is another key dimension when it comes to the political feasibility of reforms. As experience has shown, even temporary increases in actual or expected unemployment can undermine the feasibility and sustainability of reform.[27] To analyze the dynamic effects of the reforms, a widely used specification of an unemployment equation was augmented with the five indicators of structural reform.[28] For the reasons noted

above, the results should again be interpreted with the necessary caution. (Details on the specification and the estimation can again be found in Appendix 3.3).

The main findings regarding the benefit dynamics are as follows (Figure 3.10). First, similar to the findings for growth, the benefits of reforms for unemployment tend to materialize in the long run. The dynamic effects on unemployment vary somewhat across the reforms: tax reforms reduce unemployment in the short run and, to a larger extent, in the long run, while trade liberalization and labor market deregulation increase unemployment in the short run and reduce it in the long run.[29] Financial reforms have had small effects on unemployment. Product market reform appears to raise unemployment rates in both the short and the long run. While surprising, this finding may reflect the fact that the underlying structural policy indicator measures reforms in seven service sectors, where pre-reform employment was sometimes above efficient levels owing to the presence of state ownership.[30]

Second, reforms with the least downside risks for short-term unemployment have generally

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Figure 3.9 do not control for the growth effects of expenditure changes that could be associated with tax reforms, although sensitivity analysis showed that they are robust regarding the inclusion of the contemporaneous ratio of government consumption expenditure to GDP in the growth equation.

[26]Empirical evidence on tax competition has been documented in OECD (1998); Devereux, Griffith, and Klemm (2002); and Devereux, Lockwood, and Redoano (2002). The explanation for the paradox is as follows. With tax competition in corporate income taxes, capital is relocated from the high-tax to the low-tax country. Faced with the possibility of shrinking tax bases, countries may be forced to raise taxes on factors of production that are less mobile internationally (which would lead to substitution between components rather than to an improvement in the overall index used in the chapter). Mendoza and Tesar (2003) provide some evidence for this for the cases of France, Germany, Italy, and the United Kingdom.

[27]See, for example, Gaston and Trefler (1997) on the case of the free trade agreement between Canada and the United States.

[28]See Blanchard and Wolfers (2000); Nickell and others (2003); and the April 2003 *World Economic Outlook* for the specification.

[29]It is important to note that while Nickell and others (2003) and Chapter IV of the April 2003 *World Economic Outlook* provide evidence that reforming labor institutions reduces unemployment in the short term, their evidence is based on the effects on unemployment of more specific labor market reforms such as revisions to employment protection legislation or the duration of benefits. In contrast, the analysis here captures the aggregate effect of labor reforms on unemployment. If countries trade off different types of labor reforms against each other, the overall effect of the reforms on unemployment is ambiguous.

[30]Statistical problems may also play a role. A good part of product market reforms took place toward the end of our sample period, implying that their effects may be less precisely estimated than those of other reforms. This could also reflect the correlation between product and labor market reforms. As noted by Blanchard and Giavazzi (2003); and Blanchard and Philippon (2003), product market reform tends to put pressures on restrictive labor market institutions. Since this effect appears to explain some of the labor market reforms during the 1990s, the estimation may suffer from multicollinearity.

Figure 3.10. Response of Unemployment to a One-Standard-Deviation Increase in Reform Indicators[1]
(Percent; cumulative effects; x-axis time units represent three-year periods)

The beneficial effects of structural reforms on unemployment in the tax, labor, and trade areas materialize, for the most part, in the long run.
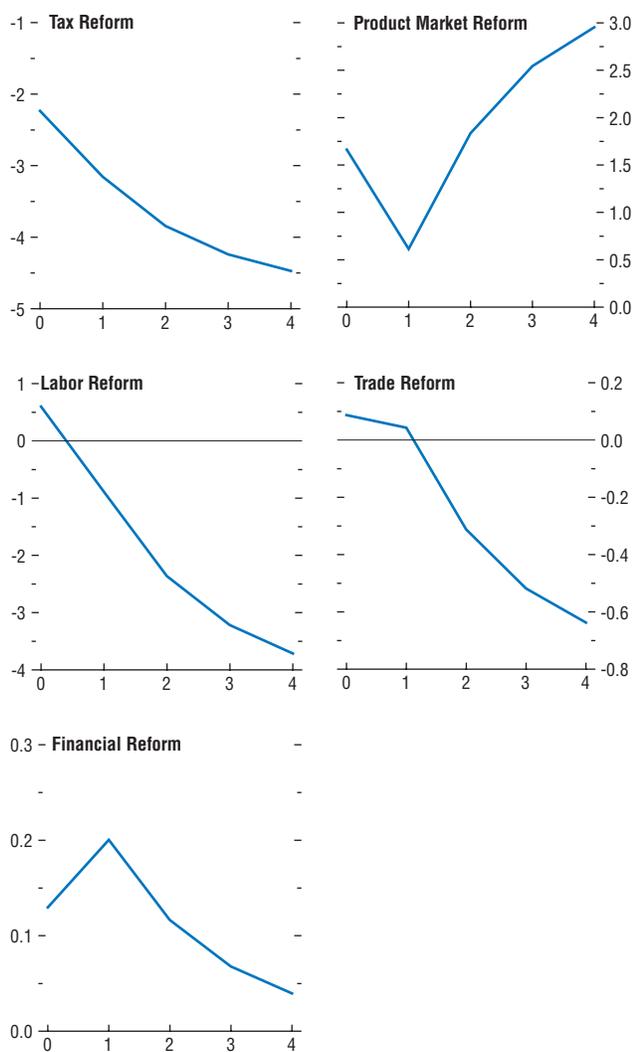
Source: IMF staff calculations.
[1] See Appendix 3.3 for details of the specification and estimation of the unemployment equation on which the responses are based. One standard deviation of the cross-country distribution reform indices over the 1996–98 period is used, with the exception of the financial index, for which one standard deviation of the index over the entire sample period is used.

advanced most, as exemplified by the benign effects of financial reforms. In contrast, labor market reforms have tended to increase unemployment in the short run, which is yet another reason why they are politically difficult reforms. The main exceptions to this finding concern tax reforms, which, given their favorable effects on unemployment, should have advanced more than was generally observed, and product markets, where other considerations must have supported the rapid reforms, given their effects on unemployment.

Third, as in the case of growth, tax reforms seem to be a key instrument to take advantage of complementarities, given the immediate favorable effects on unemployment. In addition, combining product market with labor market reforms could help in advancing the former because labor market reforms could mitigate their adverse unemployment effects in the medium and long term.[31]

Reform Experience and Implications for Reform Design

Industrial countries' experience with structural reforms over the past two to three decades indicates two distinct patterns in the broad sectoral reform dynamics: sustained reforms and more marginal reforms with little aggregate impact so far. The former have been recorded in the financial sector, select product markets, and international merchandise trade, where the overall nature of the structural policy regime has, on average, changed, while the latter has been relevant in the labor market and in the tax system domains.

The distinct patterns in the reform dynamics are partly a reflection of the uneven distribution of costs and benefits over time, with the latter typically materializing only gradually. The reform experience in industrial countries lends

[31]Theoretical work by Blanchard and Giavazzi (2003) suggests that by lowering the price of goods, deregulation of product markets decreases total rents, and can thereby also facilitate labor market reforms.

some support to the conjecture that this can lead to a status quo bias against reforms, as countries appear to have primarily advanced reforms that yielded more immediate benefits with the least uncertainty.

The distinctive patterns in the sectoral reform dynamics also suggest that some reforms are easier in the sense of encountering less political resistance while others are more difficult, with the fault line falling between financial sector, select product markets, and trade reforms on the one hand and labor market and tax reforms on the other. In easy reform areas, a strong dynamics has pushed reforms forward, while this effect has been largely absent in the difficult areas. What explains this difference? The analysis suggests that three factors are particularly relevant.

- First, the scope of the distributional impact of reform costs appears to matter. In the labor market and tax domains, the immediate costs (distributional effects) of reforms potentially affect many households and firms while the set of affected parties is often smaller in other areas. More generally, in the labor and tax areas, structural policy reforms can involve visible redistribution effects, which tend to provoke strong political resistance depending on the preferences regarding the equity-efficiency trade-off by key constituencies. In addition, fiscal sustainability often requires that tax reforms be accompanied by expenditure adjustment, which can be politically difficult for the very same reasons as for structural reforms.
- Second, international spillovers matter. Labor markets and tax systems have so far been less exposed to direct international competition, reflecting the immobility of labor and much of the tax base. This has reduced the outside pressure for reforms. In other areas, international spillovers have been stronger. As a result, international cooperation in the labor and tax domains has been more recent than in other areas, although this could also reflect different perceptions about the costs and ben-

efits of sector-specific regulations. In financial reforms, a long tradition of international cooperation appears to have played a key role in the convergence of perceptions and norms (e.g., the Basel committee on banking supervision and its role in establishing international prudential standard for commercial banks), while trade reforms have been shaped by multilateral and regional trade agreements.
- Third, labor markets and tax systems appear so far to have been less affected by changes in the environment that influence the incentives for mobilization of interest groups. While such changes, partly related to technological developments, were generally outside the scope of this chapter, they have been found to be important in other areas, including financial sector reform.[32] In the context of this chapter, a prominent example of such an environment change is a change in the degree of competition elsewhere that affects rents in particular markets, as evidenced by the impact of product markets on labor market reforms noted earlier.

While all these factors may explain why the political constraints on labor market and tax reform have been greater than in other areas, prospects are that reforms will accelerate also in these domains. First, as noted earlier, indications are that the product market liberalization that has taken place in the 1990s has increased the pressure for labor market reform, and some steps have indeed been taken. Second, with increased mobility for real capital, the scope for tax competition in areas such as corporate taxation has increased. Third, a new mechanism of peer pressure used in the European Union's Lisbon strategy—committing members, among other objectives, to policies promoting competitiveness and job creation—could foster the impetus for further structural reforms in the European Union, including in the area of labor markets (Box 3.4).

What are the lessons for the design of structural reforms in industrial countries? Naturally,

[32]See Peltzman (1989) and Kroszner (2000).

Box 3.4. Economic Integration and Structural Reforms: The European Experience

Even for well-intended governments, structural reforms are inherently difficult because they challenge particular interests for the common good. A classic strategy is to use international agreements to buttress the government's hand when facing organized interest groups. This strategy has been used extensively in European economic integration starting with the Treaty of Rome in 1957. This box argues that the European experience also shows that international agreements are not a panacea to overcoming obstacles to reform and discusses recent developments in applying collective pressure in the European Union.

Initially, the establishment of the European Common Market as a means of establishing an external anchor for supporting trade liberalization proved highly successful. Its aims were easy to understand and there was enough evidence of its growth-enhancing effects to reduce ex ante uncertainty regarding its effectiveness.[1] As integration deepened, alongside a favorable growth performance, it became clear that other obstacles to the free flow of goods, services, and assets had to be addressed, and structural reforms were sought to be implemented at a European level under the Single European Act of 1986 or the first and second banking directives. Yet, despite binding commitments, the success in implementing the reforms has been mixed. In the financial sector and some product markets, the commitments at the European levels clearly resulted in the almost synchronous implementation of important reforms in the countries where reform was needed (as discussed in the main text). This supports the notion that much less progress would have been achieved without the commitment mechanism of the European Union. However, this mechanism did not prevent a widening diver-

Note: The main author of this box is Charles Wyplosz.

[1]It must be noted that many structural reforms raise growth only temporarily (although the level of GDP is permanently higher).

Product Market Policy Regimes by Region
(Structural policy indicators; annual cross-country distribution)
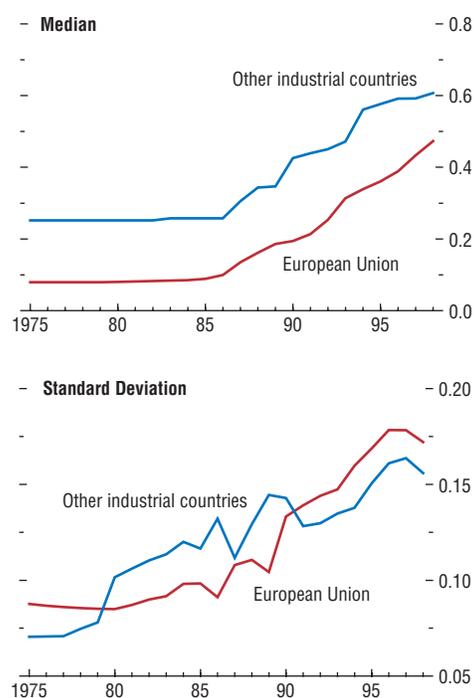
Sources: IMF staff calculations; see Appendix 3.1 for data sources.

gence in product market regulation more generally (see the figure) and did not appear to have resulted in more reforms than in other industrial countries. In addition, liberalization in areas with binding commitments has at times been offset by steps in the opposite direction in other areas, including in labor market regulation.

With growing evidence about Europe's relatively poor growth performance over the past decade, the uneven implementation of reforms at the European level has increasingly been recognized as a problem. In addition, the recent divergence between faster and slower reforming

European countries has further contributed to alleviate policymakers' doubts about reform benefits in terms of growth and unemployment. Against this background, the EU member states adopted the Lisbon Strategy in 2000, which aims to transform the European Union into "the most dynamic, knowledge-based economy in the world by 2010."

The strategy is based on a new mechanism of collective pressure, the so-called open method of coordination.[2] The mechanism is open in the sense that it does not involve formal binding commitments. Inspired by private sector practices, it relies instead on benchmarking reform efforts to generate peer pressure on member countries. Specifically, member countries' reform efforts are evaluated against 102 benchmarks—covering six areas where competences have not been delegated to the supranational level: general economic background, employment, innovation and research, economic reform, social cohesion, and the environment. For some benchmarks, there is also a Europe-wide target that is to be reached by 2010.[3] Each spring, the European Council (bringing together heads of states and governments) is presented with a report from the Commission, which tallies each country's individual performance on each benchmark.

Benchmarking has two major advantages. First, by explicitly distinguishing between reformers and laggards, it stirs competition among countries. Second, it helps in identifying the institutions and reforms that foster growth and employment and those that do not. This contributes to an understanding of how reforms work, thereby reducing the uncertainty that deters action,[4] and provides policymakers useful

best-practice arguments when facing interest groups.

The fact that the open method is not binding could be a strength or a weakness. On the one hand, governments have often reacted to binding external commitments by offsetting some reforms with backsliding in other areas. This is particularly important since the Lisbon strategy deals with structural issues that remain under national sovereignty. Pressure through benchmarking covering many areas may thus be more effective than a limited set of binding commitments. On the other hand, the success of the new open method has so far been limited. The 2003 Spring Council Meeting recognized the need to "translate words into action" and the EU Commission noted that "there is a lack of progress and urgency at the national level in many of the most important areas."[5]

An important, related question is whether peer pressure applies equally to all countries, including the large countries. Several of the latter have been slower in adopting structural reforms, which could suggest that they are less likely to respond to peer pressure. This could deepen the divide between a number of mostly small, reforming countries and other, mostly large, laggard reformers, a trend already under way in the area of product market reforms.

It is too early to assess the success of the Lisbon Strategy. Some of the countries that rank worst on the benchmark scales, including some of the larger countries, have started to make progress. Many reforms have been timid, but it is encouraging that some progress is being made in difficult areas such as labor markets, pensions, and state aid. After a decade of denial about the urgent need for reform, the recent small steps show a welcome change in the internal policy debates in member countries. The need for liberalization is now officially recognized and the Lisbon Strategy rests on a detailed list of desirable structural reforms. The main question on the political agenda is no longer whether to reform or not, but when and how.

[2]For a discussion of the open method of coordination, see Hodson and Maher (2001) and Morelli, Padoan, and Rodano (2002).

[3]In 2004, the Commission only presented a short list of 14 benchmarks to the European Council in order to keep with the streamlining of documents decided during the 2003 Spring Meetings.

[4]See Fernández and Rodrik (1991).

[5]EU Commission (2003).

many of the determinants of reform considered in this chapter are not directly under the control of policymakers. In addition, the need for, or opportunities for, reforms may sometimes dictate the reform agenda, as the country case studies have shown. Nevertheless, the analysis suggests that the following considerations could make a difference in the success of reforms.

- *Reforms can breed their own momentum.* The analysis has highlighted the importance of cross-area spillovers in the reform dynamics. As indicated by the pressure for labor market reforms exerted by product market reforms, reforms can breed their own momentum. Moreover, the empirical evidence supports the notion that combining and adequately sequencing reforms ("packaging") can make some reforms more politically acceptable. Overall, this suggests that launching the reform momentum can be an important first step, for which substantial political capital should be invested.
- *International spillovers help.* First, international competition tends to reduce rents and favor adjustment instead of the status quo. Second, learning from reforms in neighboring countries and international cooperation also helps in shaping the perception of costs and benefits of structural reforms. Finally, as is well known, international arrangements are useful as commitment devices in the face of resistance against reforms, as the experience with trade reforms and product market liberalization in the European Union has shown. Overall, this suggests that policymakers who seek to advance reforms should use these mechanisms to their advantage. For example, if a specific reform area is still relatively sheltered from international forces, it should help to focus first on reforms that increase the potential for spillovers.
- *Fiscal flexibility matters.* While it would ideally be desirable to compensate losers through taxes levied on the beneficiaries of reform, in practice this is not always possible or may take time, and fiscal positions may deteriorate for some time with higher income transfers

(Beetsma and Debrun, 2003). It is thus not surprising that, in practice, it can be difficult to undertake fiscal adjustment and structural reforms simultaneously. It follows that at times of favorable prospects for public finances, structural reforms should be a priority.
- *Take advantage of recoveries.* Taking macroeconomic conditions into account in the timing of reform packages may raise their chances of success. The end of a protracted period of slow or negative growth provides a particularly favorable environment for difficult reform since policymakers and voters are still cognizant of the costs of slow growth, while at the same time economic recovery can mitigate potentially painful short-term adjustment costs.

Appendix 3.1. Structural Policy Indicators

The main author of this appendix is Thomas Helbling.

To summarize and measure the state of structural policies in the five sectors covered in the chapter, IMF staff used five aggregate structural policy indicators, as described in the main text. Four aggregate indicators are unweighted averages of various sector-specific indicators that categorize the degree to which government regulation and policies restrict competition and price flexibility in a sector. Such regulations include, among others, limits on prices, restrictions on market entry or exit by firms, and restrictions on the range of products that can be offered. The types of regulations applied vary widely across sectors, which explains the different components in the aggregate indicators. A fifth indicator measures distortions arising from taxation.

All indicators used in this chapter were normalized to fall into an interval ranging from 0 to 1, with an increase signaling a reduction in the degree of restrictiveness. The series are annual and cover the period 1975–2000 for the 20 industrial countries listed in footnote 5 in the main text (unless noted otherwise).

Financial Sector Reforms

Following the classification of financial sector reforms provided by Edey and Hviding (1995); Williamson and Mahar (1998); and Abiad and Mody (2003), a financial sector policy indicator was constructed on the basis of the following indicators.

- *Credit controls.* The indicator was constructed as a dummy variable taking on the value of 1 if banks' credit growth was broadly restricted across most credit classes or if credit markets were segmented; a value of 2 if bank credit allocation was subject to some restrictions; and a value of 3 if bank credit allocation was only limited by prudential regulations. The coding is based on Bingham (1985); Bröker (1989); Schuijer (1992); and OECD (1999).
- *Interest rate controls.* The indicator was constructed as a dummy variable taking on a value of 1 if lending and deposit rates were subject to direct influence by the authorities; a value of 2 if either lending or deposit rates were subject to direct influence by the authorities or agreed upon by commercial banks; and a value of 3 if interest rate determination was not subject to administrative restrictions or cartel agreements on rates. The coding is based on Bingham (1985); Bröker (1989); Schuijer (1992); and OECD (1999).
- *Restrictions on international financial transactions.* This indicator is a 0-1 dummy variable taking on the value of 1 if transactions were not restricted. The indicator was constructed on the basis of the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions.*

As noted by Abiad and Mody (2003), indicators in these dimensions appear highly correlated with other dimensions of financial sector reform.

Labor Market Reform

The labor market policy indicator was constructed on the basis of the following variables.

- *Employment protection.* Indicator measuring the restrictiveness of *employment protection.*
- *Benefit replacement rates.* Average first-year unemployment benefits as a percentage of average earnings before tax. Higher ratios are considered to be indicators of increased restrictiveness.
- *Benefit duration.* Ratio of the average benefit replacement rates in the second to the fifth year of an unemployment spell to the average benefit replacement rate in the first year of an unemployment spell. Higher ratios are considered to be indicators of increased restrictiveness.

The source of these indicators is the Labor Market Institutions Database developed by Nickel and Nunziata (2001). The data were extended using OECD data that were kindly provided by Giuseppe Nicolleti (see Chapter IV in the April 2003 *World Economic Outlook* for details).

Product Market Reforms

The chapter uses an indicator constructed by Nicoletti and Scarpetta (2003). Their indicator covers product market reforms over the 1975–98 period in the nonmanufacturing sector, including the following industries: gas, electricity, post, telecommunications, passenger air transport, railways, and road freight. Depending on the industry, some of the following dimensions have been included: barriers to entry, public ownership, market structure, vertical integration, and price controls.

Tax Reforms

The tax policy indicator comprises variables measuring relative distortions related to differences in the taxation of different forms of income and consumption and variables capturing the absolute distortions arising from the tax burden. Regarding the latter, the indicator does not only include the tax burden on capital income, as frequently suggested by the recent literature on optimal taxation (e.g., Chamley, 1986; Judd, 1985; and Atkeson, Chari, and Kehoe, 1999), but also taxes on labor income because, depending on the underlying model, it may not be optimal for labor to bear the entire tax burden (e.g., Myles, 2000). In addition, increases in labor taxes have been found to be

an important factor behind increases in unemployment (e.g., Daveri and Tabellini, 2000).

- *Top effective marginal tax rate on income.* Indicator variable that ranks the top effective marginal tax rate on income between 0 and 10, available in five-year intervals. Higher values of this indicator indicate a higher tax distortion. Source: Gwartney and Lawson (2003). Data are available via the Internet: www.freetheworld.com.

- *Ratio of indirect taxes to total tax revenue.* Higher ratios are considered less restrictive than lower ones because the tax burden is borne partly by consumption and not only income. Source: OECD, *Revenue Statistics.*

- *Labor income tax ratio.* Ratio of labor share of household income taxes and taxes levied directly on labor income to labor income. Higher ratios indicate a higher absolute tax burden (distortion). Source: Carey and Rabesona (2002).

- *Capital income tax ratio based on gross operating surplus.* Ratio of share of household income tax pertaining to capital income and taxes paid directly out of capital income or wealth to capital income. Higher ratios indicate a higher absolute tax burden (distortion). Source: Carey and Rabesona (2002).

- *Difference between labor and capital income tax ratios.* The absolute value of the difference was used, as the direction of the distortion is irrelevant for the analysis in this chapter. Higher values indicate a relatively higher tax distortion on the factor input mix in an economy. Source: Carey and Rabesona (2002).

Trade Reforms

A trade policy indicator was constructed by using average effective tariffs as a measure. The latter were calculated as the ratio of customs and import duties (from OECD, *Revenue Statistics*; and IMF, *Government Finance Statistics*) to the value of imports (from IMF, *International Financial Statistics*). Unfortunately, time-series data on non-tariff barriers, which are key trade restrictions in industrial countries, are not available.

Appendix 3.2. Determinants of Reforms: Econometric Methods

The main author of this appendix is Xavier Debrun.

This appendix provides details on the econometric evidence discussed in the main text about the determinants of structural reforms in industrial countries, including the specification of the equations and some additional results.

Specification

The empirical analysis seeks to explain the dynamics of structural reforms, as measured by the variation of the aggregate structural indices. The specification of the econometric equation is a variant of Abiad and Mody (2003), relating annual variations in the structural policy indicators to a series of potential explanatory variables discussed in the main text.

As noted in the main text, the basic framework considers structural reforms to be determined by the interaction between policymakers' objectives and political and economic constraints. This framework maps into a simple dynamic econometric equation. An important feature of the equation is that, in the absence of political and economic constraints, the reform dynamics in each sector are driven by policymakers' intentions to adjust structural policies gradually until they satisfy a certain objective, as discussed above. Accordingly, it is assumed that progress with reforms is directly proportional to the difference between the value of the structural indicator *before* current reforms are decided (or implemented) and an unobservable "target" reflecting the degree of liberalization desired by policymakers. To accommodate the possibility of learning or of nonlinear responses to initial structural conditions, the speed of convergence toward the target itself may also depend on initial structural conditions.

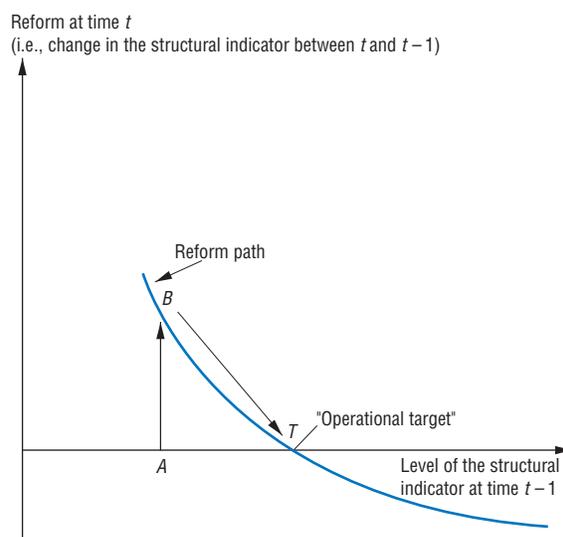With these elements in mind, the following equation is used to explain structural reforms:

$$\Delta Y_{i,t} = \theta_{i,t} Y_{i,t-1} + \sum_{k=1}^{k} \beta_k X_{k,i,t} + \varepsilon_{i,t}, \qquad (1)$$

with $\theta_{i,t} = \beta_0 + \lambda Y_{i,t-1}$, and where i is a country index, and t is a time index; Δ represents the first-difference operator; $Y_{i,t}$ symbolizes the structural indicator; and $\theta_{i,t}$ denotes the speed at which structural conditions change over time (through reforms). The latter depends on initial structural conditions ($Y_{i,t-1}$) and is consequently time varying and country specific. In the case where β_0 and λ are such that $\beta_0 + \lambda Y_{i,t-1}$ is strictly negative (which is generally supported by the data except for product market reforms), then Equation (1) indicates a *convergence* of structural conditions toward an unobservable "operational target" pinned down by the other explanatory variables (X_k), with the absolute value of $\theta_{i,t}$ measuring the speed of convergence. In that scenario, *low* absolute values for $\theta_{i,t}$ are indicative of a *strong status quo bias.*

Formally, Equation (1) is a first-order difference equation whose graphical solution is illustrated in Figure 3.11. The curve depicts one possible convergence path from an overly regulated market (point A) to the desirable operational target of structural policy (point T, the solution of the difference equation). In line with the evidence already discussed in the main text, the slope of the curve indicates that larger deviations from the desired state of structural conditions encourage more ambitious reforms, whereas the curve's convexity suggests a decreasing speed of convergence as structural conditions get closer to the target (that is, in terms of Equation (1), $\beta_0 < 0$, $\lambda > 0$, and $E(\theta_{i,t}) < 0$). The econometric analysis thus helps characterize the shape and the location of a dynamic path consistent with the data. The location of the estimated path (and therefore, the implicit operational target of structural policy) is determined by the X_k variables.

Regarding the explanatory variables subsumed in X_k, IMF staff looked at the effect of a large number of different variables characterizing possible political and economic constraints mentioned in the literature, retaining those variables that yielded consistent results across a variety of robustness checks, including changes in the specification, estimation technique, and sample. To ensure comparability across sectors, the same

Figure 3.11. An Empirical Model of Reforms: Convergence Toward a Target

Reform at time t
(i.e., change in the structural indicator between t and $t-1$)

Reform path

B

"Operational target"

T

A

Level of the structural indicator at time $t-1$

Note: The negatively sloped reform path ensures a convergence of structural conditions toward the targeted level T. A country initially located at point A would carry out pro-competititve reforms, starting at B until it reaches T. A positively sloped reform path would suggest that policymakers want to liberalize (regulate) even beyond the most market-friendly (rigid) regime (no convergence).

specification and panel estimation procedures were used for all structural indices.

In addition to initial conditions (lagged value of the structural indicator), the following set of explanatory variables was ultimately retained.

- Demographics: percentage of the total population over the age of 65 (Source: *World Development Indicators*).
- International spillovers: difference (lagged once) between the value of structural indicator in a specific country and the weighted average of its three main trade partners (on the basis of exports) among the group of 20 OECD countries considered in the study (Source of the trade weights: *World Economic Outlook*).
- Openness to trade: sum of imports and exports of goods and services in percent of GDP (Source: OECD, Analytical Database*).*
- "Bad" year: dummy set equal to 1 when annual real GDP growth is at or below 1 percent.
- Number of bad years over the past three years: sum of the above dummy over the three preceding years.
- Cyclically adjusted primary surplus: primary surplus adjusted for the cycle in percent of potential GDP (Source: OECD, Analytical Database).
- Fiscal adjustment: first difference of the cyclically adjusted primary surplus.
- Majoritarian electoral rule: dummy set equal to 1 if the lower house of parliament is elected under plurality rule (majoritarian) (Source: Persson and Tabellini, 2003; data available via the Internet: http://www.igier.uni-bocconi.it/).
- Ideology (conservatism): simple average of the chief executive's ideology and the average ideology of the two main parties in the coalition (if applicable). Ideological scores were attributed as follows: 2 = right-wing, 1 = center, and 0 = left-wing. (Source: World Bank, Database of Political Institutions.)

- Size of government majority: number of government seats in parliament divided by total number of seats. (Source: World Bank, Database of Political Institutions.)
- Election year: dummy set equal to 1 for executive election years. (Source: World Bank, Database of Political Institutions.)
- First year in office: election year dummy lagged once.

Estimation and Results

In practice, the following equation was estimated:

$$\Delta Y_{i,t} = \alpha_1 Y_{i,t-1} + \alpha_2 Y^2_{i,t-1} + \sum_{k=1}^{k} \beta_k X_{k,i,t} + \varepsilon_{i,t}. \quad (2)$$

The results reflect panel estimates for 17 OECD countries over the period 1975–98.[33] Country fixed effects were rejected, suggesting that the explanatory variables listed above adequately capture cross-country heterogeneity in the panel. To ensure comparability across reform areas, all results are based on a feasible generalized least squares panel estimator (FGLS).[34] This estimator could, in principle, result in a biased estimator as the structural policy indicators are, by construction, bound to fall into the 0-1 intervals, which the FGLS estimator does not ensure. However, in practice, only a small number of observations of the structural policy indicators are close to 0 or 1 in the case of product market reforms and trade, while in the case of labor markets and tax systems, all observations are within the interval (0.2, 0.8). In addition, the possibility of a non-linear response to initial structural conditions could mitigate the bias since it allows for more gradual reforms if the policy indicator is already close to 1 or faster reforms if the indicator is close to 0.

Tables 3.4, 3.5, and 3.6 show the results for specifications of Equation (2) that were found to

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[33]For data availability reasons, Ireland, Norway, and Switzerland are not included in the econometric analysis.

[34]It should be noted that all the structural policy indicators are on a cardinal scale even though some of the variables used to construct the aggregate structural policy indicators (especially in the financial and product market areas) are on an ordinal scale.

Table 3.4. Determinants of Product and Labor Reforms
(Dependent variable: change in the relevant structural index)

Explanatory Variables	Labor Markets			Product Markets		
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged structural index	−0.0782***	−0.0486***	−0.0678***	0.0954***	0.1155***	0.1033***
Lagged structural index (squared)	0.0784***	0.0493***	0.0697***	−0.0728***	−0.0894***	−0.0742***
Cross-border spillovers	0.0233***	0.0133***	0.0204***	0.0412***	0.0580***	0.0421***
Lagged product market reforms	. . .	0.0196***	0.0217***	. . .	. . .	. . .
Lagged labor market reforms	. . .	. . .	. . .	. . .	−0.0296	0.0251
Lagged average reforms in other areas[1]	. . .	0.0021	. . .	. . .	0.0456	. . .
Cyclically adjusted primary surplus	0.0002***	0.0001*	0.0001	0.0019***	0.0016***	0.0018***
Change in the cyclically adjusted primary surplus	−0.0003*	−0.0003**	−0.0003	−0.0004	−0.0002	−0.0004
Bad year	−0.0011**	−0.0006	−0.0006	0.0065**	0.0054*	−0.0073***
Number of bad years over the previous three years	0.0006***	0.0006***	0.0005***	0.0021*	0.0009	0.0025*
Trade openness	0.0017**	0.0040***	0.0015*	−0.0002	0.0094*	−0.0020
Ideology	0.0013***	0.0008***	0.0006***	0.0005	0.0002	−0.0003
Size of government majority in parliament	0.0129***	0.0102***	0.0134***	−0.0139*	−0.0151*	−0.0088
Election year (executive)	−0.0003	−0.0001	−0.0003	−0.0007	0.0017	0.0000
First year in office (executive)	0.0004	0.0002	0.0002	0.0034	0.0016	0.0036
Demographics	0.0003***	0.0000	0.0001	0.0001	−0.0004	−0.0004
Electoral rule (majoritarian)	0.0018***	0.0007	0.0012***	0.0013	0.0016	0.0006
EU membership	. . .	. . .	0.0015*	. . .	. . .	0.0063***
R^2 (weighted)	0.15	0.14	0.12	0.25	0.21	0.26
Number of observations	382	308	369	379	309	377

Note: All equations have been estimated with Generalized Least Squares using a heteroscedasticity-consistent variance-covariance matrix for statistical tests. *, **, and *** indicate that the estimated coefficient is significantly different from zero at the 10, 5, and 1 percent level, respectively.
[1]Excludes those estimated separately and financial reforms.

be robust according to the criteria laid out above. The results have been summarized in Table 3.3 in the main text, where they are extensively discussed. Note that the same specifications were applied to all structural policy indicators with only two exceptions. First, the interaction between labor and product market reforms was found to be strong, as suggested by the theoretical literature and other empirical analyses (for example, Nicoletti and Scarpetta, 2001). The labor and product market equations therefore allow for a specific effect of either labor or product market reforms alone. Second, because of an obvious endogeneity problem, trade openness was replaced by country size in the trade reform equation.

Five-Year Averages

Owing to the nature of the aggregate structural indicators, it is difficult to pin down the exact timing of reforms. Indeed, some components are not observed at annual frequency, making interpolation inevitable. Also, implementation lags disconnect decisions from their actual impact on the economy. One way to overcome the timing issue is to run regressions using multiyear averages. It is obviously impossible to estimate the same equations as in Tables 3.4, 3.5, and 3.6. In particular, the election variables had to be dropped and the "bad times" variable now captures the number of years in which real GDP growth was below 1 percent. Also, to keep the number of observations large enough to obtain statistically meaningful estimates, the equations now consider "contemporaneous" interactions between reforms.

Table 3.7 shows the results using five-year averages for four reform areas.[35] Those estimates broadly confirm the key empirical regularities discussed in the main text. The only noticeable

[35]No sensible result could be obtained for the financial reform variable.

Table 3.5. Determinants of Trade and Tax Reforms
(Dependent variable: change in the relevant structural index)

Explanatory Variables	Tax Reform[1]			Trade Reform		
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged structural index	−0.5168***	−0.4454***	−0.5171***	−0.0125	−0.0242*	−0.0243
Lagged structural index (squared)	0.4366***	0.3663***	0.4187***	. . .	. . .	. . .
Cross-border spillovers	0.0061	−0.0015	−0.0151	0.1101***	0.0747*	0.0926*
Lagged reforms in other areas	. . .	0.1385***	0.1422***	. . .	0.0273	0.0394
Cyclically adjusted primary surplus	0.0000	0.0001	−0.0001	0.0006***	0.0008***	0.0008***
Change in the cyclically adjusted primary surplus	−0.0042***	−0.0045***	−0.0042***	−0.0001	−0.0001	−0.0005
Bad year	0.0032	0.0037*	0.0031	−0.0003	−0.0024	−0.0008
Number of bad years over the previous three years	0.0005	0.0002	0.0000	0.0017***	0.0025***	0.0027***
Trade openness	−0.0110***	−0.0108***	−0.0110***	. . .	. . .	. . .
Ideology	−0.0016*	−0.0012	−0.0007	−0.0022***	−0.0027***	−0.0022**
Size of government majority in parliament	−0.0063	−0.0083	−0.0104	0.0161***	0.0104*	0.0149**
Election year (executive)	−0.0001	0.0002	0.0003	0.0030**	0.0026	0.0021
First year in office (executive)	−0.0020	−0.0016	−0.0015	0.0040***	0.0028*	0.0024
Demographics	0.0003	0.0003	0.0014	0.0005	0.0016**	0.0012
Electoral rule (majoritarian)	0.0056***	0.0048**	0.0057**	−0.0003	0.0027*	0.0004
EU membership	. . .	. . .	−0.0061*	0.0057**	. . .	0.0055***
NAFTA membership	. . .	. . .	. . .	0.0148***	. . .	0.0154***
BENELUX membership	. . .	. . .	. . .	−0.0060***	. . .	−0.0049*
Country size	. . .	. . .	. . .	−0.0010	0.0007	0.0003
R^2 (weighted)	0.25	0.24	0.25	0.13	0.10	0.12
Number of observations	319	312	312	381	309	309

Note: All equations have been estimated with Generalized Least Squares using a heteroscedasticity-consistent variance-covariance matrix for statistical tests. *, **, and *** indicate that the estimated coefficient is significantly different from zero at the 10, 5, and 1 percent level, respectively.

[1]Tax reform equations include a common constant and a dummy variable for Sweden.

Table 3.6. Determinants of Financial Reforms
(Dependent variable: change in the relevant structural index)

Explanatory Variables	Financial Reforms		
	(1)	(2)	(3)
Lagged structural index	0.1964***	0.1552**	0.1751**
Lagged structural index (squared)	−0.2430***	−0.1916***	−0.2059***
Cross-border spillovers	−0.0050	0.0030	0.0073
Lagged reforms in other areas	. . .	0.0115	0.0050
Cyclically adjusted primary surplus	−0.0001	−0.0004	−0.0003
Change in the cyclically adjusted primary surplus	−0.0013	0.0001	0.0000
"Bad" year	0.0015	0.0006	0.0013
Number of bad years over the previous three years	0.0014	0.0000	0.0001
Trade openness	0.0104	0.0072	0.0050
Ideology	−0.0003	−0.0005	−0.0007
Size of government majority in parliament	−0.0137	−0.0073	−0.0062
Election year (executive)	−0.0001	0.0014	0.0016
First year in office (executive)	0.0006	0.0012	0.0018
Demographics	0.0028**	0.0023**	0.0015
Electoral rule (majoritarian)	0.0152**	0.0110**	0.0155*
EU membership	. . .	. . .	0.0086
R^2 (weighted)	0.14	0.11	0.11
Number of observations	379	309	309

Note: All equations have been estimated with Generalized Least Squares allowing for fixed effects and using a heteroscedasticity-consistent variance-covariance matrix for statistical tests. *, **, and *** indicate that the estimated coefficient is significantly different from zero at the 10, 5, and 1 percent level, respectively.

Table 3.7. Determinants of Structural Reforms, Five-Year Averages
(Dependent variable: change in the relevant structural index)

Explanatory Variables	Labor Market	Product Market	Tax Reform[1]	Trade Reform
Lagged structural index	−0.3563***	0.5181***	−2.1414***	−0.1522***
Lagged structural index (squared)	0.3340***	−0.3536**	1.6219***	. . .
Cross-border spillovers	0.0642**	0.3516***	−0.1727	0.0731
Labor reform	. . .	0.4978***	. . .	. . .
Product market reform	0.0294*	. . .	. . .	. . .
Reforms in other areas	0.1814***	0.2753***	0.2149**	0.0704
Cyclically adjusted primary surplus	0.0005	0.0115***	−0.0045**	−0.0007
Change in the cyclically adjusted primary surplus	−0.0002	−0.0035*	−0.0028**	0.0011
Bad time	−0.0150***	0.0299**	−0.0173	0.0058
Trade openness	0.0225*	−0.0014	−0.0416***	. . .
Ideology	0.0117***	0.0004	−0.0028	−0.0040
Size of government majority in parliament	0.0614*	−0.0727**	−0.0091	0.0911***
Demographics	0.0020	−0.0013	0.0189***	0.0075**
Electoral rule (majoritarian)	. . .	0.0219	0.0413***	−0.0012
EU membership	−0.0181**	0.0552***	−0.0724***	−0.0022
NAFTA membership	. . .	. . .	. . .	0.0537***
R^2	0.36	0.58	0.42	0.30
Number of observations	56	56	56	56

Note: All equations have been estimated with Generalized Least Squares using a heteroscedasticity-consistent variance-covariance matrix for statistical tests. *, **, and *** indicate that the estimated coefficient is significantly different from zero at the 10, 5, and 1 percent level, respectively.
[1]Tax reform equations include a common constant and a dummy variable for Sweden.

exceptions concern the role of European Union membership on labor reforms, which now appears negative, and the negative impact of a large government majority on product market reforms.

Appendix 3.3. Cost-Benefit Dynamics of Reforms

The main author of this appendix is Dalia Hakura.

This appendix provides details on the econometric evidence about the cost-benefit dynamics of reforms specified in the main text.

Modeling Strategy for the Dynamic Effects of Reforms on Growth

Specification

The dynamic effects of structural reforms on growth are investigated with a standard growth equation specification (e.g., Barro and Sala-i-Martin, 1995) that is augmented to include the structural reform variables.[36] The specific form of the regression is as follows:

$$y_{i,t} - y_{i,t-1} = (\alpha - 1)\,y_{i,t-1} + \gamma'(L)\,R_{i,t} + \beta'(L)\,X_{i,t} + \eta_i + \varepsilon_{i,t}, \tag{1}$$

where y is the logarithm of real per capita GDP; R represents the set of five structural policy indicators used in the chapter; X is a set of control variables (specifically, average years of schooling, initial level of financial development as measured by stock market capitalization, private investment to GDP ratio, population growth, and average terms of trade changes); L is the lag operator; and η are the country fixed effects. The data in the panel are averaged over three-year periods, so that the subscript t refers to a three-year period.

The definitions and sources of the data for all variables in the regression other than the structural reform variables are described below.

Logarithm of real per capita GDP. (Source: OECD, Analytical Database.)

[36]See Easterly, Loayza, and Montiel (1997); and Edison and others (2002) for similar approaches but with different reform variables.

Terms of trade growth is the average of the annual log change in the terms of trade in each three-year period. (Source: WEO database.)

Stock of human capital is measured as the logarithm of the average number of years of schooling of the population from 25 to 64 years of age in each three-year period. (Source: Bassanini and Scarpetta, 2001.)

Population growth is average annual growth in the population in each three-year period. (Source: OECD, Analytical Database.)

Stock market capitalization is measured as the logarithm of the ratio of the stock market capitalization to GDP in the initial year of each three-year period. (Source: World Bank, Financial Development Database; see Beck, Demirgüç-Kunt, and Levine, 1999.)

Private investment to GDP is measured as the logarithm of average real private nonresidential fixed capital formation as a share of real GDP in each three-year period. (Source: OECD, Analytical Database.)

Estimation and Results

Equation (1) can be rewritten and estimated as

$$y_{i,t} = \alpha y_{i,t-1} + \gamma' R_{i,t} + \beta' X_{i,t} + \eta_i + \varepsilon_{i,t}, \qquad (2)$$

where the variables are as defined above. This equation was estimated with the Generalized-Method-of-Moments (GMM) estimator for dynamic panel data proposed by Arellano and Bond (1991). This estimator uses the first difference of Equation (2) to eliminate country-specific effects and uses instruments to deal with endogeneity problems including those introduced by the first-differencing (correlation between the first difference of $\varepsilon_{i,t}$ and the differenced lagged dependent variable). If the error term is not serially correlated and the explanatory variables are weakly exogenous, lagged values of y, R, and X are valid instruments.

Because of data constraints, the panel regression is estimated for 15 countries with a maximum of five observations per country. The regressions cover five consecutive three-year periods: 1984–86, 1987–89, 1990–92, 1993–95,

Table 3.8. Impact of Structural Reforms on Log Real Per Capita GDP[1]

Explanatory Variables	Current	Lag 1	Lag 2
Structural policy indicators			
Financial	0.04**	−0.05**	0.03*
Product	0.06	−0.16	0.30**
Trade	0.13**	−0.10	0.24**
Labor	0.05	−0.26	0.30*
Tax	0.16*	−0.03	−0.06
Private investment to GDP ratio[2]	0.10**	. . .	. . .
Terms of trade growth	−0.0003	. . .	. . .
Stock of human capital[2]	0.27**	. . .	. . .
Population growth	−0.004**	. . .	. . .
Initial stock market capitalization[2]	0.04**	. . .	. . .
Lagged GDP	. . .	0.63**	. . .
Tests of GMM consistency (*p*-values)			
Sargan test	0.38		
Serial-correlation test[3]	0.45		
Number of observations	74		

[1]The equation has been estimated with the Generalized-Method-of-Moments (GMM) estimator developed by Arellano and Bond (1991). Period dummies and dummies to capture periods with banking crises in Nordic countries are included in the regressions but are not reported here. The symbols * and ** denote significance at the 10 and 5 percent level, respectively. Significances are based on robust standard errors.

[2]In the regression, this variable is included as log (variable).

[3]The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation.

and 1996–98. Given the relatively small sample size and the objective of exploring the dynamic effects of the structural reforms, a parsimonious specification is estimated, which includes contemporaneous as well as two lagged values of the structural policy indicators included in R and contemporaneous values of the other explanatory variables in X. Time dummies are also included in the regressions to capture period-specific effects although they are not reported in the results (Table 3.8).

The consistency of the GMM estimator depends on whether lagged values of income and the other explanatory variables are valid instruments in the growth regression. A necessary condition for the validity of such instruments is for the error term, $\varepsilon_{i,t}$, to be serially uncorrelated. To check whether these conditions are met or not, two specification tests, suggested by Arellano and Bond (1991) are conducted. The first is a Sargan test of overidentifying restrictions, which tests the overall validity of the instruments by analyzing the sample analog of

Table 3.9. Standard Deviations of Cross-Country Distributions of Reform Indicators[1]

Financial	0.26
Product	0.17
Trade	0.08
Labor	0.15
Tax	0.11

[1]The standard deviation is calculated for the 1996–98 period, with the exception of the financial index, for which the standard deviation is calculated using the data for the 1984–98 period given that financial liberalization was largely complete in the 1996–98 period.

the moment conditions used in the estimation process. The second test examines the hypothesis that the first-differenced error term, $\varepsilon_{i,t} - \varepsilon_{i,t-1}$, does not follow a second-order autoregressive process. Both test results fail to reject the econometric specification (see Table 3.8).

The magnitudes of the standard deviations of the cross-country distributions of the structural policy indicators over the 1996–98 period (with the exception of the financial index for which the standard deviation is based on the sample beginning in the 1984–86 period) are reported in Table 3.9. These standard deviations were used in the calculation of the output responses shown in Figure 3.9. For example, the regression results imply that a one-standard-deviation increase in the tax reform index of 0.11 results in a 1.9 percent increase in real per capita GDP in the short run.[37]

Modeling Strategy for the Dynamic Effects of Reforms on Unemployment

Specification

The dynamic panel estimator developed by Arellano and Bond (1991) is also used to examine the effect of changes in structural policy variables on unemployment. The specification of the unemployment equation takes the following form:

$$u_{i,t} = \alpha_i + \beta u_{i,t-1} + \gamma(L)'R_{i,t} + \delta(L)'X_{i,t} + \eta_i + \varepsilon_{i,t}, \qquad (3)$$

where u is the unemployment rate; R represents the set of five structural policy indicators used in the chapter; X is a set of control variables; L is the lag operator; and η_i are the country fixed effects. The data are again averaged over three-year periods so that the t subscript refers to three-year periods. Following Blanchard and Wolfers (2000) and the analysis in Chapter IV of the April 2003 *World Economic Outlook*, total factor productivity growth, the change in inflation, an index of central bank independence, a wage bargaining indicator, and terms-of-trade changes are included as explanatory variables. In addition, time dummies are also included to capture period-specific effects (not reported).

The definitions and sources of the data for all variables in the regression other than the structural reform variables are described below.

Unemployment rate is the average unemployment rate in each three-year period. The data comes from the OECD's Analytical Database.

Total factor productivity growth is the average annual log change in the total factor productivity over each three-year period. The data are obtained from Bosworth and Collins (2003). Bosworth and Collins calculate TFP growth as the difference between the growth rate of output per worker and the growth rate of capital per worker times the capital share. The primary source of the data to measure output per worker and capital per worker is the World Bank's *World Development Indicators*.

Bargaining coordination is an index that ranges from 1 to 3, with 3 being the most coordinated. The source of these data is Nickell and Nunziata (2001).

Central bank independence is a 0–1 index of central bank independence that was put together by Hall and Franzese (1998).

Inflation rate is the average annual log change in the consumer price index over each three-year period.

Terms of trade growth is defined as above.

[37]This is the effect in the three-year period in which the reform takes place.

Table 3.10. Impact of Structural Reforms on Unemployment[1]

Explanatory Variables	Current	Lag 1	Lag 2
Structural policy indicators			
Financial	0.50	−0.02	−0.48
Product	9.56**	−11.56**	10.51**
Trade	1.08	−1.17	−4.09
Labor	4.12	−12.60**	−4.18
Tax	−19.67**	3.30	−1.35
Terms of trade growth	−0.07	. . .	. . .
Total factor productivity growth	−0.89**	−0.67**	−0.05
Bargaining coordination	−2.59**	. . .	. . .
Central bank independence	1.52	. . .	. . .
Change in CPI inflation rate	−0.05	. . .	. . .
Lagged unemployment	. . .	0.58**	. . .
Tests of GMM consistency (*p*-values)			
Sargan test	0.50		
Serial-correlation test[2]	0.09		
Number of observations	75		

[1]The equation has been estimated with the Generalized-Method-of-Moments (GMM) estimator developed by Arellano and Bond (1991). Period dummies are included in the regressions but are not reported here. The symbols * and ** denote significance at the 10 and 5 percent levels, respectively. Significances are based on robust standard errors.

[2]The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation.

Estimation and Results

A parsimonious specification is estimated that includes contemporaneous as well as two lagged values of the structural policy variables defined in R and contemporaneous values of the explanatory variables in X (with the exception of TFP growth, for which two lagged values are also included). Owing to the lack of data for all variables, the regression is estimated for 16 countries with a maximum of five observations per country covering the periods identified above. Both the Sargan test and the test of no second-order serial correlation fail to reject the econometric specification at the 5 percent level (Table 3.10).

The dependent variable in this regression is the unemployment rate. Therefore, a one standard deviation increase in the tax reform index of 0.11 reduces the unemployment rate by 2.2 percent on average during the first three-year period during which the reform takes place, as shown in Figure 3.10.

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