

## Taxation of Labor

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**with contributions from Mateusz Walewski**

**E**conomic growth results from both a higher quantity of factors of production—labor and capital—and higher productivity in the use of those factors of production. Because labor is an important economic input, higher employment rates will lead to higher GDP, other things being equal. Yet employment has declined markedly in countries of the Europe and Central Asia (ECA) region since the start of transition. The share of the working-age population employed in most ECA countries is now well below the European Union's (EU's) average and in most cases below the Lisbon target of 70 percent (World Bank 2005a). Unemployment rates are high, in many cases well over 10 percent of the labor force.

These poor employment outcomes in ECA—including low labor force participation, high unemployment, and substantial informal employment—are often blamed on high taxes on labor. These taxes discourage both labor demand (by raising labor costs to employers) and labor supply (by lowering the real consumption wage of workers). They create a “tax wedge” between labor cost to the employer and the worker's take-home pay (see box 9.1) and thereby reduce both employment and economic growth.<sup>1</sup> Is this conventional wisdom justified? Are labor taxes in ECA higher than in countries with comparable income levels? If so, why? Do they have a discernible

impact on employment outcomes and, if so, how can their negative impact be limited?

This chapter addresses these questions.<sup>2</sup> It finds that the tax wedge on labor in ECA is indeed relatively high from an international perspective, mainly because of expensive social security systems.<sup>3</sup> It confirms that high labor taxes have a negative impact on employment. Those ECA countries where the tax wedge on labor is high tend to have worse employment outcomes than those where it is low, and regression analysis confirms the significant relationship between tax rates and employment.<sup>4</sup> Finally, the study recommends two main ways to limit the negative impact of the tax wedge on employment. The first is to lower social security contributions, which account for the bulk of the tax wedge, by rationalizing the social security system (for example, limiting early retirement options and the abuse of disability and sickness benefits) and perhaps by switching the financing of some social benefits away from labor contributions to general taxation. The second is to use tax reductions targeted at low-skilled workers and youth, the two groups whose employment is most negatively affected by high labor taxes. However, expectations should be realistic. Reductions in social security contribution rates that are feasible from a fiscal perspective are likely to bring about a rather modest employment effect.

## Labor Taxes in ECA

Labor taxes are high in ECA countries, accounting for about 40 percent of total labor cost on average.<sup>5</sup> If a worker receives the equivalent of US\$100 in net wage, the employer incurs a labor cost on average of US\$167. There is significant variation among countries, however (figure 9.1), with the tax wedge being highest in Hungary (45.8 percent) and lowest in Georgia (26.7 percent). Among country groups (figure 9.2), the tax wedge ranges from 33 percent in low-income CIS to close to 43 percent in the EU-11<sup>6</sup> and Turkey. It increases with income levels, indicating that the generosity of the social security system tends to increase more sharply than the tax base in ECA.

In virtually all ECA countries the tax wedge on labor is higher than in countries at similar income levels in other regions of the world (figure 9.2). The average tax wedge for EU-11 is somewhat lower than that for EU-15,<sup>7</sup> but there is an enormous gap in GDP per capita between these two groups of countries. The high relative labor tax burden is clearest if one compares ECA and non-ECA focus countries selected for this study (table 9.1). In the middle-income ECA coun-

**BOX 9.1****Taxes on Labor: Concepts and Definitions**

*Labor taxes* include personal income tax, social security contributions paid by employees, and payroll taxes—that is, social security contributions and other taxes paid by the employer. Consumption taxes are not considered a component of labor taxes in this chapter.

*Social security contributions* finance social security benefits such as old-age pensions, disability pensions, survivors' pensions, sickness benefits, and unemployment benefits. Strictly speaking, they should not be regarded as taxes if employees value the benefits they finance and would demand a compensating wage increase if the benefits were abolished. Thus, the term labor taxes should be regarded as short for "labor taxes and contributions."

*Total labor cost* is a sum of gross wage earnings of employees and payroll taxes paid by the employer.

*Net take-home pay* (net wage) is the difference between gross earnings and personal income tax and social security contributions paid by the employee.

*Tax wedge* is the difference between total labor cost to the employer and the net take-home pay of the employee, expressed as a percentage of the total labor cost.

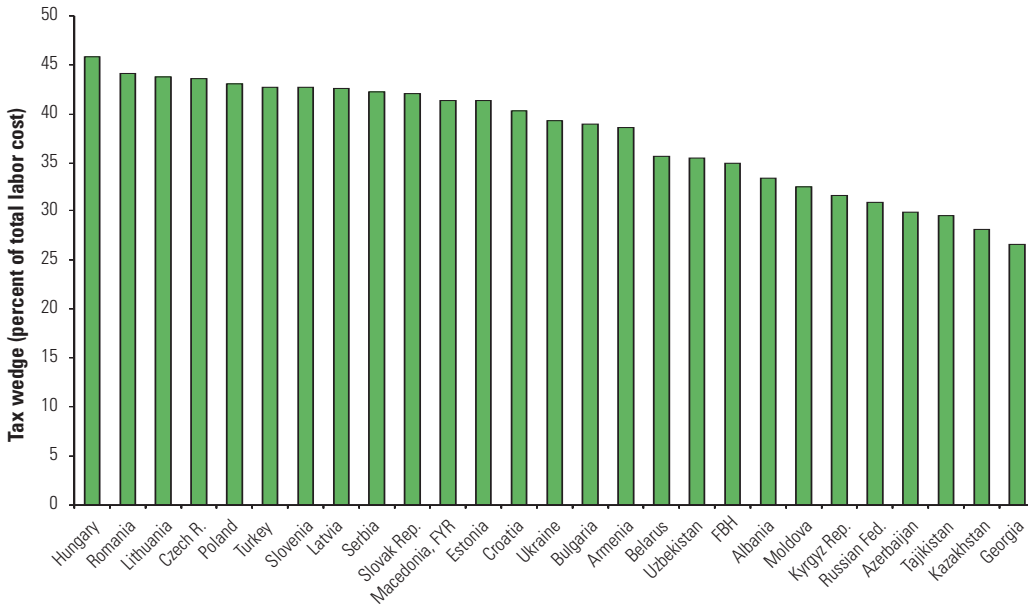
Annex 9A presents details on the components of the tax wedge in ECA countries.

*Source:* Author.

tries, represented by Poland, Romania, and the Slovak Republic, social security contributions account for 45 to 49 percent of the gross wage—far higher than in Chile and the Republic of Korea, where they account for 13 and 16 percent, respectively. This substantial gap reflects the fact that middle-income ECA countries have developed expensive social security systems that resemble those in high-income Western Europe. However, even a comparison with Spain, another non-ECA comparator country, points to a marked disproportion between the high social security contribution rates in the middle-income ECA countries and their levels of income. Spain's GNI per capita is about three times as high as in Poland and the Slovak Republic and seven times as high as in Romania. Still, social security contributions in Spain account for 37 percent of the gross wage, some 10 percentage points lower than in the middle-income ECA countries.

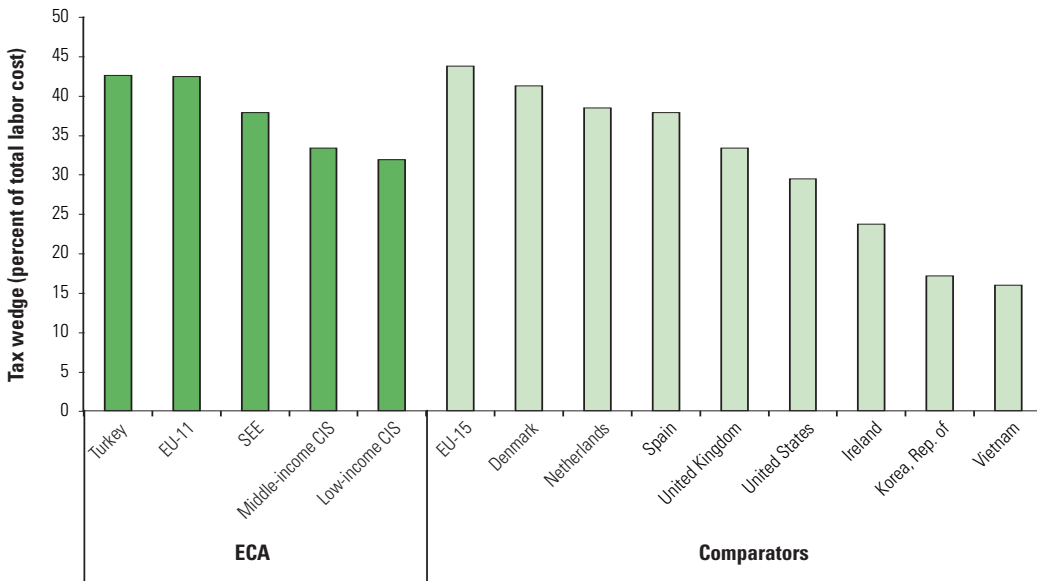
A similar picture emerges when one looks at low-income ECA countries. In Albania, Armenia, and the Kyrgyz Republic, social secu-

**FIGURE 9.1**  
**Tax Wedge on Labor, 2006**



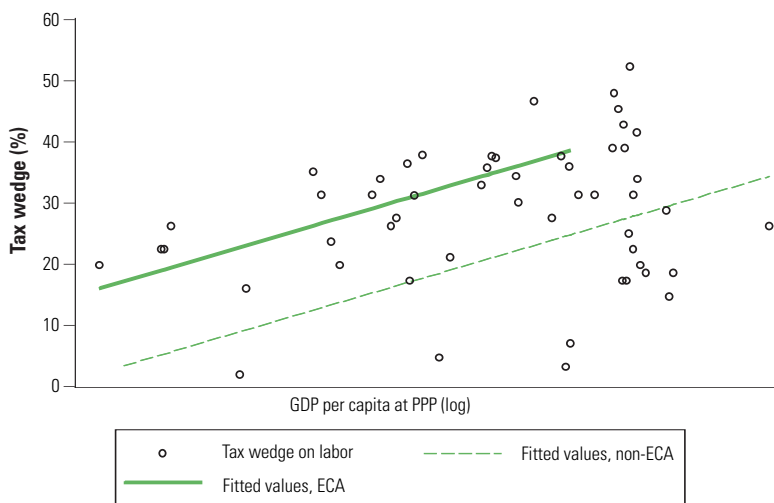
Source: World Bank.

**FIGURE 9.2**  
**Tax Wedge on Labor: ECA and Selected Comparator Countries, 2006**



Source: World Bank, Eurostat, and OECD data; Bank staff calculations.

FIGURE 9.3

**Tax Wedge and GDP per Capita, 2006 or Latest Available Year**

Source: World Bank for ECA; Eurostat, OECD, and World Bank for comparator countries; Bank staff calculations.

Note: PPP = Purchasing power parity.

rity contributions account for 29 to 37 percent of the gross wage. In contrast, in Thailand and Uganda they account for 11 percent and 15 percent, respectively.<sup>8</sup> Social security contributions in low-income ECA countries are two to three times as high (as a percentage of gross wages) as in comparator low-income countries.

More systematic confirmation that labor taxes are disproportionately high in ECA comes from regression analysis. In a simple regression of the tax wedge on log GDP per capita (at purchasing power parity), the ECA dummy variable, which represents ECA specificity, is highly significant (figure 9.3), and the mean difference in the labor tax rate is estimated at 10.9 percentage points. If one uses the typical range of estimates of employment-to-tax wedge elasticities obtained for Organisation for Economic Co-operation and Development (OECD) countries (Nickell 2003), this would correspond to a 1 to 3 percent lower rate of employment.

Several reasons could hypothetically explain a high level of labor taxes, including (a) high social security contributions to finance generous social benefits (pensions, health care, unemployment); (b) high

TABLE 9.1

## Labor Taxes and Employment Outcomes in Focus Countries, 2005 or Latest Available Year

Country	Tax wedge <sup>a</sup>	Social security contributions rate <sup>b</sup>		Personal income tax rate <sup>c</sup> (%)	Labor force participation rate (%)	Employment/population ratio <sup>d</sup>	Unemployment rate (%)	Memorandum	
		Employer's part (%)	Employee's part (%)					Shadow economy (% of value added)	GNI per capita (US\$ at PPP)
<b>ECA countries</b>									
Albania	33.4	30.4	11.5	1.6	65.7	48.8	14.4	35.3	2,120
Armenia	38.5	22.0	15.0	10.0	61.0	52.3	9.4	49.1	1,060
Croatia	40.3	17.2	20.0	10.0	64.4	56.5	13.8	35.4	6,820
Georgia	26.7	20.0		12.0	65.0	65.1	12.6	68.0	1,060
Kyrgyz Rep.	31.6	21.0	8.0	9.2	68.8	60.9	9.9	41.2	400
Poland	43.1	20.4	25.4	6.1	63.5	54.8	19.0	28.9	6,100
Romania	44.1	32.5	17.0	8.9	62.2	65.4	8.0	37.4	2,960
Slovak Rep.	42.0	35.6	13.4	7.9	69.5	60.4	18.1	20.2	6,480
Turkey	42.7	21.5	15.0	15.4	54.7	47.6	10.3	34.3	3,750
Ukraine	39.2	38.0	3.5	12.5	67.7	59.7	8.6	54.7	1,270
<b>Comparator countries</b>									
Chile	30.0	0.0	12.6	—	58.7	57.4	8.0	20.9	5,220
Ireland	23.8	10.8	5.0	10.6	70.4	57.1	4.4	15.3	34,310
Korea, Rep of	17.3	9.0	7.1	2.7	65.7	64.0	3.7	28.8	14,000
Spain	38.0	30.6	6.3	12.7	69.7	62.0	11.4	22.0	21,530
Thailand	14.3	5.6	5.0	—	77.7	72.2	1.5	54.1	2,490
Uganda	13.6	10.0	5.0	—	84.5	—	3.2	45.4	250
Vietnam	16.1	12.0	6.0	0.0	80.1	—	2.1	17.9	540

Sources: EUROSTAT, ILO Laborsta, Social Security Programs Throughout the World at <http://www.socialsecurity.gov/policy/docs/progdesc/ssptw/>; UNICEF Trans-MONEE; World Bank WDI databases.

Note: — = not available.

a. The sum of social security contributions and personal income tax (effective) as percentage of total labor cost.

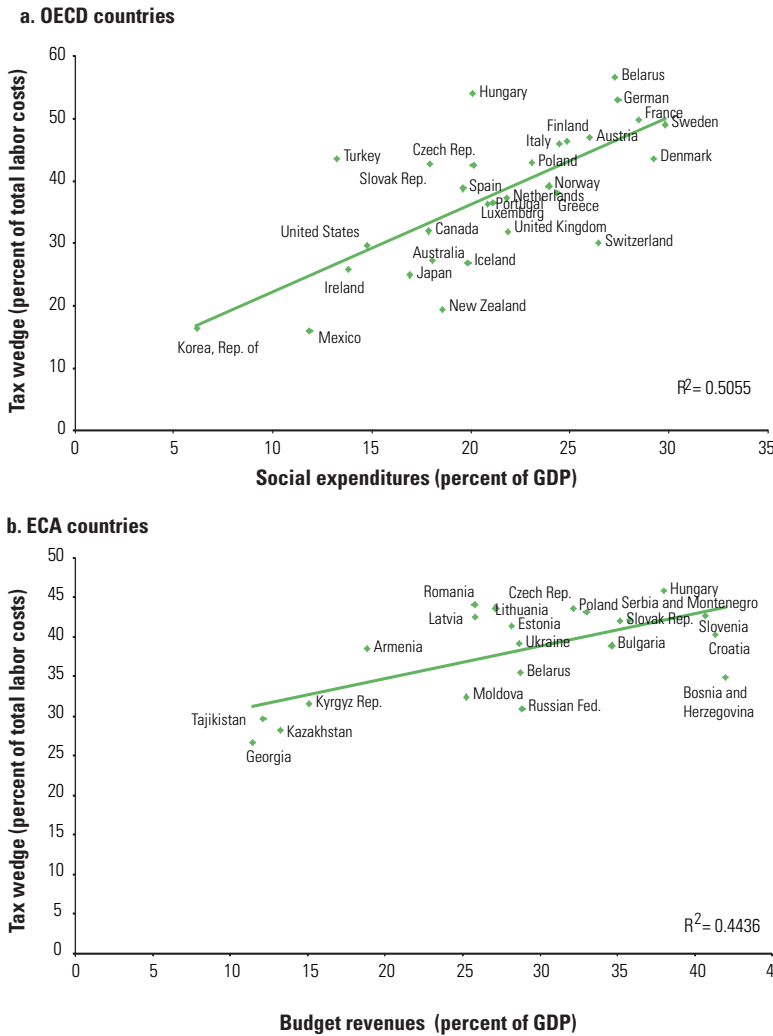
b. Social security contributions as percentage of gross wage.

c. Effective rate for an average worker.

d. Population of working age.

reliance on labor taxes (particularly personal income taxes) to finance overall public spending; or (c) a narrow tax base (resulting from relatively low levels of formal employment), which requires high taxes even if benefits or overall spending are more modest. Of these, high labor taxes in ECA primarily reflect the first—high levels of public spending, particularly on social security.<sup>9</sup> As shown in figure 9.4a, a close relationship exists between the tax wedge on labor and social expenditures as a share of GDP across a sample of OECD countries. The tax wedge on labor in ECA OECD member countries (Czech Republic, Hungary, Poland, and the Slovak Republic as well as Turkey) is even higher than the one predicted based on the level of social expenditures alone and, indeed, ECA's high tax wedge is associated with high spending overall in ECA countries (figure 9.4b). Given that the share of labor taxes in total tax revenues in EU-8 coun-

**FIGURE 9.4**  
**High Labor Taxes Driven by High Government Spending, Especially Social Expenditures**

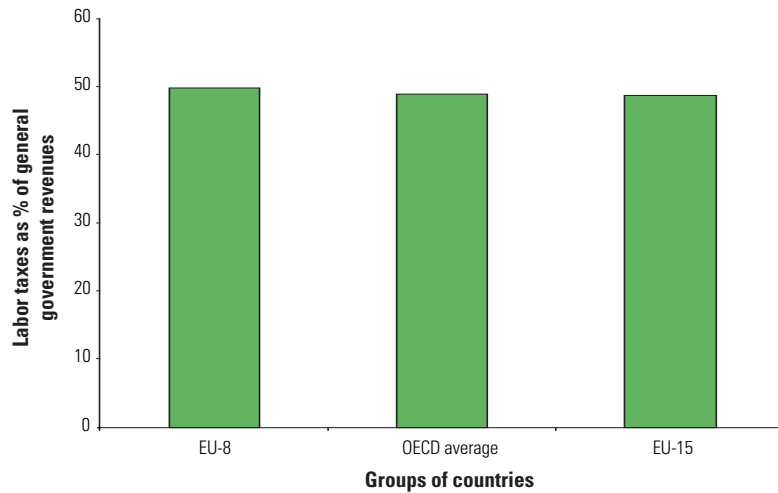


Sources: OECD data on social expenditures, [www.oecd.org](http://www.oecd.org); Bank staff calculations

tries is not significantly higher than in the OECD overall or in the EU-15 (figure 9.5), it is likely that the high tax wedge in ECA countries is also due in part to the narrowness of the tax base (and its flip side, the significant size of the informal economy).

Social security contributions are the dominant component of labor taxes in ECA. Social security contributions (paid by both the employer

FIGURE 9.5

**Reliance on Labor Taxation in EU-8, EU-15, and OECD**

Sources: Eurostat database on Government Finance Statistics at <http://epp.eurostat.ec.europa.eu> for EU-8 and EU-15 countries; data are for 2004. OECD Web site for OECD countries; data are for 2005. Bank staff calculations.

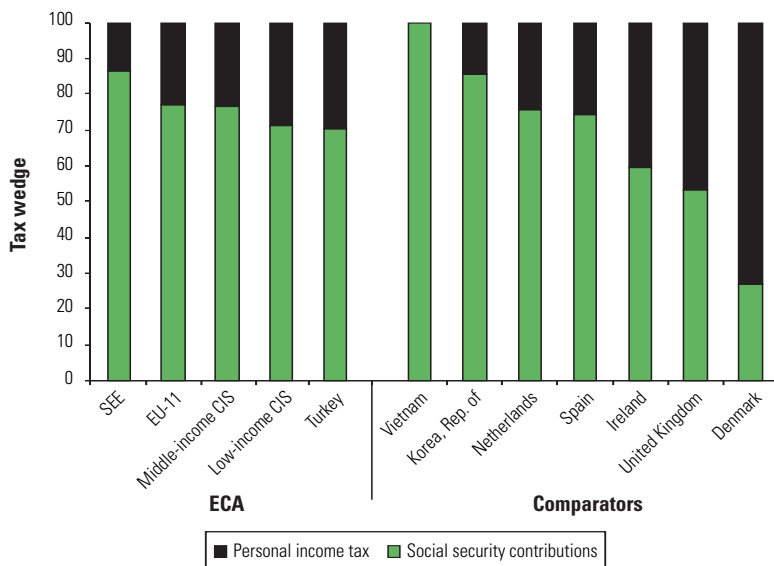
Note: General government comprises central, state, and local governments, and social security funds.

and the employee) account for 77 percent of the tax wedge (figure 9.6) on average, on par with Spain and the Netherlands and significantly higher than in Ireland, the United Kingdom, and Denmark. Indeed, high personal income tax rates do not appear to be a factor behind the high tax wedge in ECA because in most ECA countries the effective personal income tax (PIT) rates are relatively low (figure 9.7).<sup>10</sup> In EU-11 countries, the average effective PIT rate is about 13 percent, which is 4 percentage points lower than the EU-15 average (figure 9.8). Still, the EU-11 average is higher than the PIT rate in some of the EU-15 countries, such as Ireland and the Netherlands. And the PIT rate in Korea, at about 3 percent of income, is significantly lower than in virtually all ECA countries.

Social security contributions are paid largely by the employer in ECA. Employers pay 60–70 percent of social security contributions in EU-11, Southeastern Europe (SEE) and Turkey, and 80–90 percent in low- and middle-income CIS (figure 9.9). Accordingly, employees pay only a minor part.<sup>11</sup> Among the comparator countries there is no clear pattern as to which party is responsible for paying social security contributions. In Ireland, Spain, and Vietnam, as in ECA, the employer pays the bulk of social security contributions. In the United

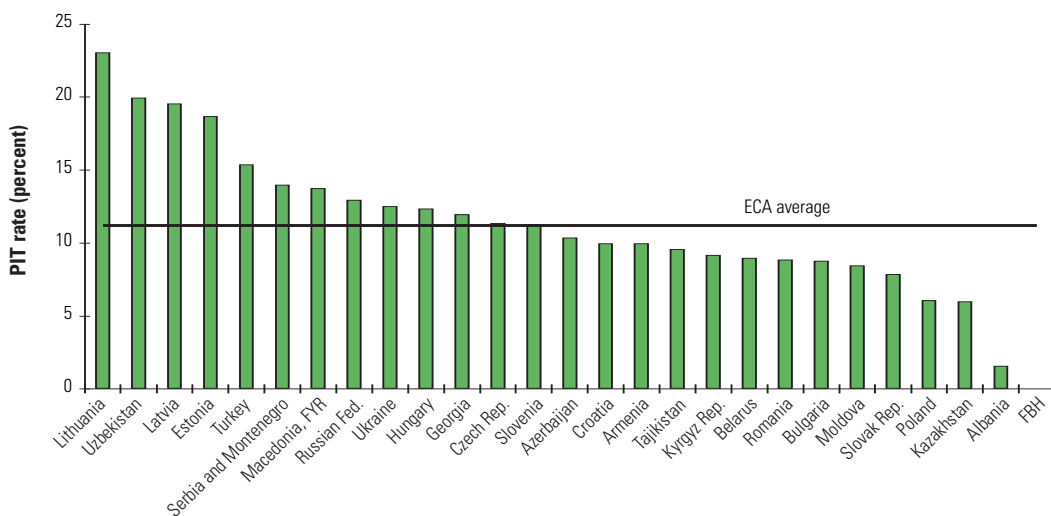


**FIGURE 9.6**  
**Share of Social Security Contributions in the Tax Wedge in ECA, 2006**  
**or Latest Available Year**



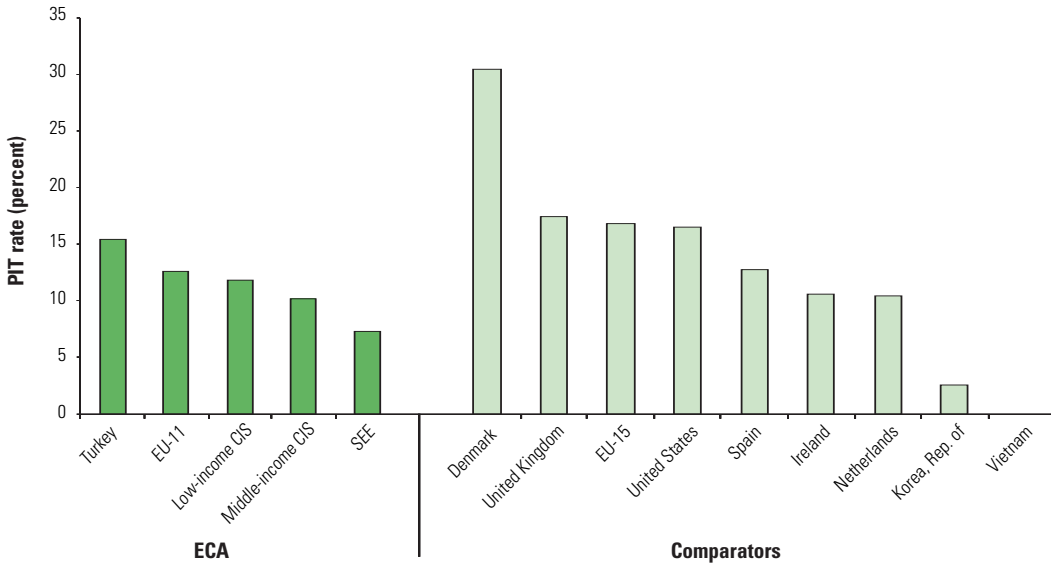
Sources: Eurostat, OECD, World Bank; Bank staff calculations.

**FIGURE 9.7**  
**Effective Personal Income Tax Rates, ECA Countries, 2006 or Latest Available Year**



Source: World Bank.

FIGURE 9.8

**Effective Personal Income Tax Rate, ECA and Comparators, 2006 or Latest Available Year**

Sources: Eurostat; OECD; World Bank; Bank staff calculations.

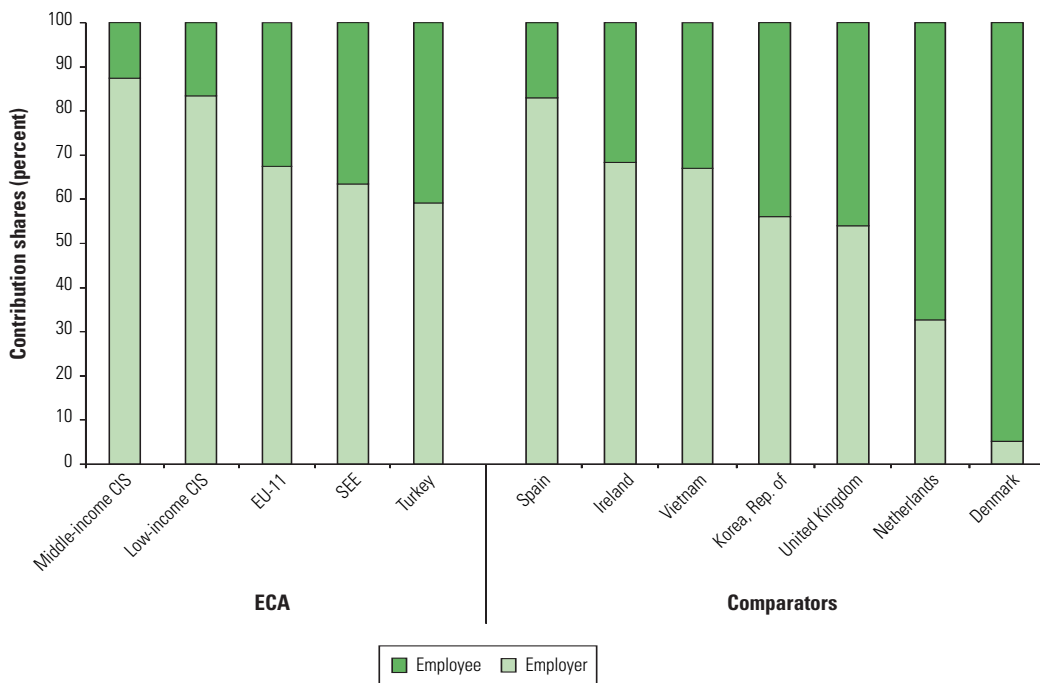
Kingdom and Korea, the responsibility is divided approximately equally between both parties. And in the Netherlands and Denmark, the bulk of social security contributions are paid by employees.

This bias toward taxing the employer rather than the employee reflects historical legacy and political economy considerations. Under communism, state-owned enterprises paid social security contributions on behalf of their workers. The state paid for and provided all social security. This pattern has been largely preserved because it is politically difficult to shift the responsibility for paying taxes from the employer to the employee. Trade unions in the region, which often continue to have stronger political clout than employers, have tended to oppose such shifts on the belief that it will raise firms' profits at the expense of workers' earnings.

This bias toward taxation of the employer results in extremely high rates of payroll tax (that is, social security contributions paid by the employer), as shown in figure 9.10. On average, employers in ECA must add 27 percent to gross wages as social security payments. The variation across the region is substantial. Payroll taxes are particularly high in middle-income CIS and in EU-11, where they approach 30

FIGURE 9.9

### Employers' and Employees' Shares in Social Security Contributions in ECA, 2006 or Latest Available Year

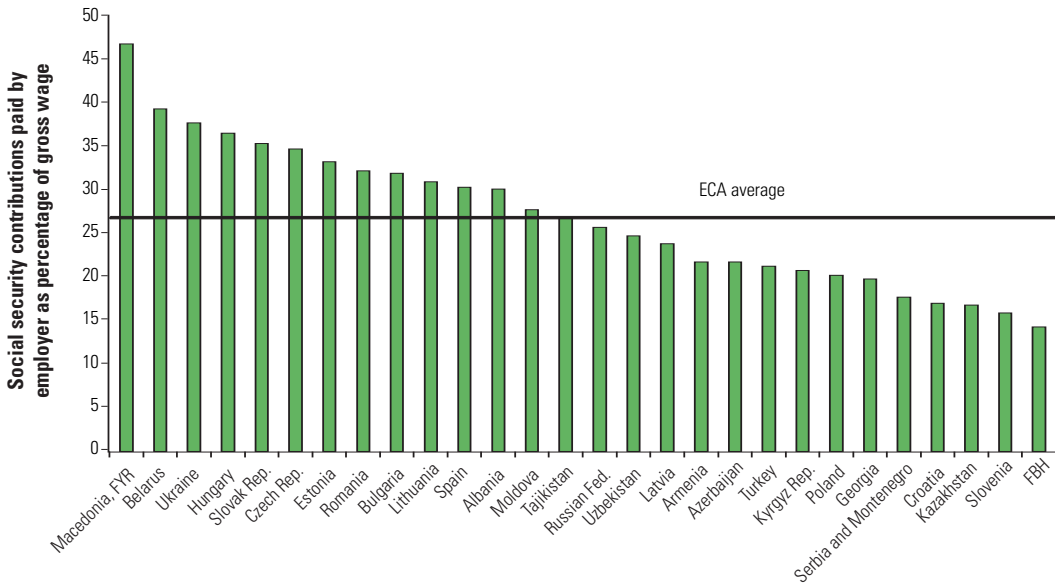


Sources: Eurostat, OECD, World Bank; Bank staff calculations.

percent. They are somewhat lower—less than 25 percent—in low-income CIS and in Turkey (figure 9.11). In Slovenia and Bosnia and Herzegovina the payroll tax rate is only about 15 percent, while in the former Yugoslav Republic of Macedonia it is as high as 45 percent (figure 9.10).<sup>12</sup> Among the comparator countries, only Spain's payroll tax rate is comparable to that in EU-11 and middle-income CIS, while in countries as diverse as Vietnam, Korea, the Netherlands, and Ireland it is around 10 percent (figure 9.11). Thus, the payroll tax rates in ECA are some two to three times higher than in other countries.

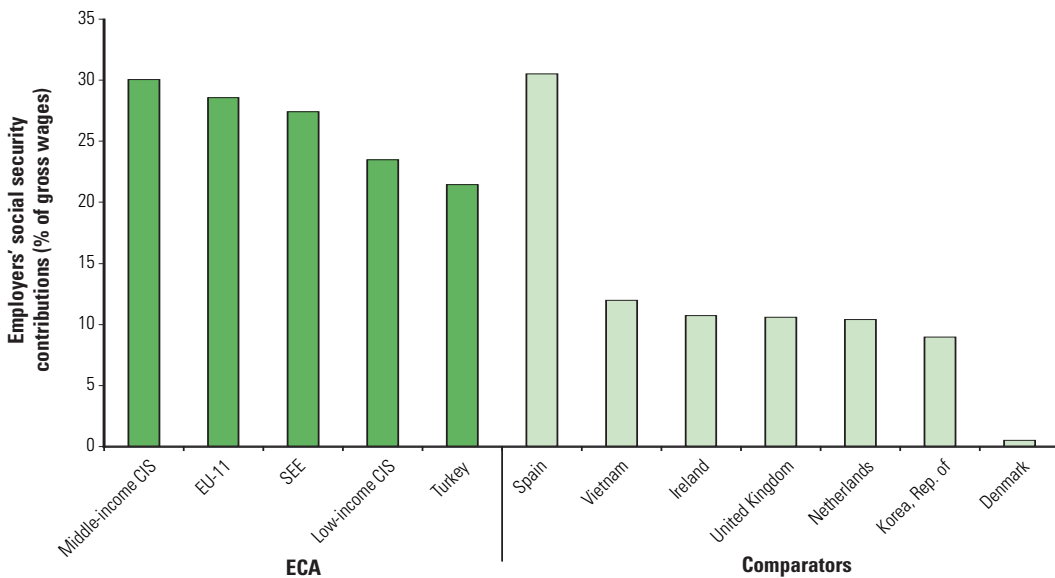
The three most important programs financed out of social security contributions in ECA are pension insurance, health insurance, and unemployment insurance. On average, pension contributions account for some 70 percent of all social security contributions (paid by both employers and employees), health care contributions account for slightly above 20 percent, and unemployment insurance accounts for about 7 percent (figure 9.12). Of course, the structure of social

**FIGURE 9.10**  
**Social Security Contributions Paid by Employer**



Source: World Bank.

**FIGURE 9.11**  
**Social Security Contributions Paid by Employers, ECA and Selected Comparators, 2006 or Latest Available Year**



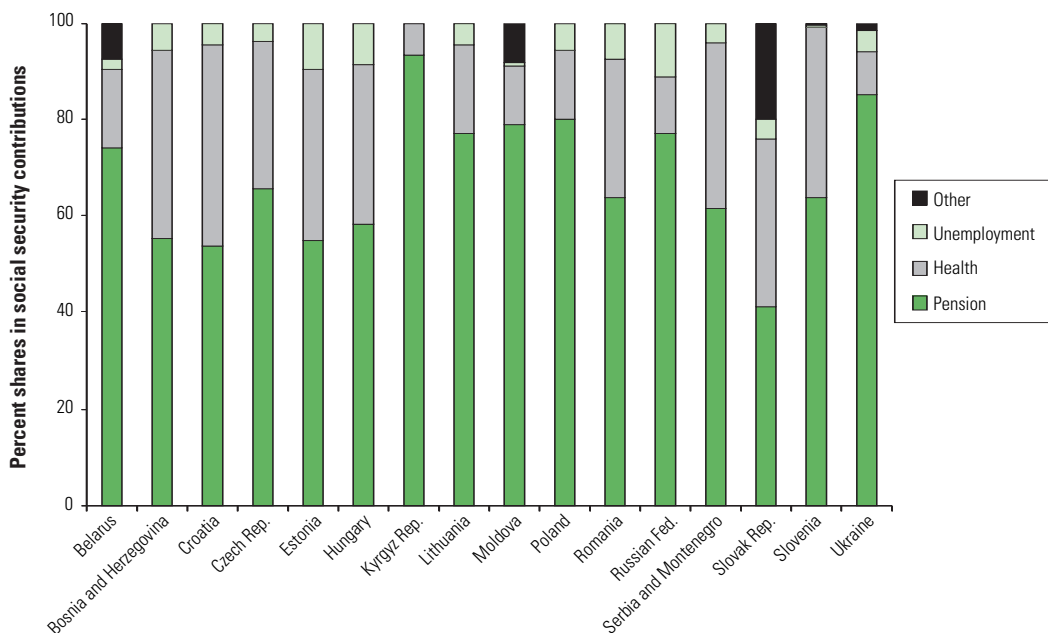
Sources: Eurostat, OECD, World Bank; Bank staff calculations.

security contributions varies substantially across countries because of demographic and systemic differences. One important factor affecting the structure of contributions is whether health care is insurance based (and thus financed out of contributions) or universal (and thus financed out of general taxation), as discussed in chapter 6.xiii

## Labor Taxation, Employment, and Economic Growth: Theory and Evidence

Labor taxes affect both the demand and the supply sides of the labor market. Labor demand falls if the tax results in higher labor costs<sup>14</sup>—because the tax is levied on employers and they are unable to pass the increase onto workers, or because the tax is levied on workers and they are able to pass the tax on to employers and protect their real consumption wage. Labor supply falls if the tax results in a lower real consumption wage—because the tax is levied on workers and they are unable to offset it with commensurately higher wages, or it is

**FIGURE 9.12**  
**Structure of Social Security Contributions, 2006**



levied on employers and they are able to shift it to workers through lower wages. The effect of the combination of the fall in labor demand and in labor supply is lower employment.

### **What Determines the Impact of Labor Taxes on Employment?**

The employment and wage effects of labor taxes depend on two important factors: labor market conditions and labor market institutions. If job opportunities are scarce and unemployment is high, as in most ECA countries, employers' bargaining power tends to be strong, while employees' bargaining power tends to be weak. Under such conditions workers bear the burden of taxation in the form of lower wages. Even if the tax is levied on employers, they are able to shift it backward onto wages, without an increase in labor costs. The resulting fall in wages discourages labor supply and may lead to a fall in labor force participation. In contrast, when the labor market is buoyant and employers find it difficult to fill job vacancies, the bargaining power of workers is strong. Under such a scenario, employers tend to bear the burden of taxation. Even if the tax is levied on workers, they are able to pass it onto employers by claiming an offsetting pay rise. The resulting increase in the labor cost inhibits labor demand and may also cause a fall in employment.

Labor market institutions matter because they influence the relative bargaining power of employers and workers. For example, strong trade unions, strict employment protection legislation, a binding minimum wage, and the availability of unemployment benefits all increase workers' bargaining power and thus their ability to pass a tax increase onto employers. These labor market institutions tend to increase labor costs, protecting wages at the cost of employment.

In more general terms, the more elastic labor demand<sup>15</sup> is the smaller the impact, all else being equal, of a payroll tax on total labor cost and the larger its impact on either wages or employment. The latter depends on the elasticity of labor supply, with greater elasticity leading to a larger effect on employment but less effect on wages. To sum up the implications of this analysis,

- An increase in the tax wedge can give rise to *unemployment* as a *temporary* disequilibrium phenomenon (until wages adjust to lower demand). In contrast, it will cause a *permanent* fall in *employment* for as long as the negative labor demand shift caused by the tax increase is not offset by a commensurate positive demand shift

- (reflecting, for example, higher labor productivity and thus a fall in unit labor cost).
- Given that labor demand and labor supply tend to be inelastic in the short run, the employment impact of an increase in the tax wedge is likely to be limited. Most of the impact is likely to be on wage rates, and whether employers or workers will bear the brunt of wage shifts depends on the relative elasticity of labor demand and labor supply (see below). But the negative employment effect of an increase in labor tax will be larger in the longer run as firms find ways to substitute capital for (more expensive) labor.
  - An increase in labor taxes will have the strongest effect on employment of worker groups for whom labor demand is most elastic. These include low-skilled workers, youth, older workers, and women. The negative employment effect will be amplified if the elasticity of labor supply of those groups is high.
  - The negative employment effect of payroll taxes will be stronger if labor market regulations (such as minimum wage or unemployment benefits) or strong trade unions limit the downward wage adjustment and the tax cannot be absorbed by a commensurate fall in wages.
  - In addition, an increase in labor taxes also raises the costs of formal employment relative to informal (that is, untaxed) employment, and as such may contribute to a fall in formal and an increase in informal employment. This may have important fiscal implications because larger informal employment means lower tax revenues. It may also affect economic growth because informal firms may remain suboptimally small and continue to lack access to infrastructure, credit markets, and legal institutions (de Soto 1989; Loayza, Oviedo, and Servén 2005).

### **What Is the Evidence?**

The evidence provided by empirical studies carried out to date<sup>16</sup> supports the view that the size of the tax wedge has a significant effect on labor costs and employment, but evidence that labor market flexibility reduces tax wedge effects is not as strong. Nickell's review of existing studies on OECD countries concludes that "tax rates are a significant factor in explaining differences in the amount of market work undertaken by the working age population in different countries... a 10 percentage point rise in the tax wedge reduces labor input by somewhere between one and three percent of the population of working age" (Nickell 2003: 8). This is a significant although rela-

tively small effect. For example, the difference in the tax wedge would explain around one-quarter of the overall difference in the employment rate between the United States and the big three countries of continental Europe—France, Germany, and Italy.

A recent comprehensive study by Bassanini and Duval (2006) using pooled cross-section/time series data for OECD countries over the period 1982–2003 found that a 10 percentage point reduction in the tax wedge would be associated with a drop in the unemployment rate of 2.8 percentage points. The unemployment effects of high tax wedges are found to be largest in those countries where binding minimum wage floors prevent tax shifting to workers.

The literature blames higher labor taxes not only for an increase in European unemployment but also for a slowdown in economic growth. This strong message emerges from an influential article by Daveri and Tabellini, who argue that “if wages are set by strong and decentralized trade unions, an increase in labor taxes is shifted onto higher real wages. This has two effects: First, it reduces labor demand, and thus creates unemployment. Secondly, as firms substitute capital for labor, the marginal product of capital falls; over long periods of time this in turn diminishes the incentive to invest and growth” (Daveri and Tabellini 2000: 48). According to their estimates, the observed rise of 14 percentage points in labor taxes between 1965 and 1995 in the EU could account for a rise in EU unemployment of roughly 4 percentage points, a reduction of the investment share of output of about 3 percentage points, and a growth slowdown of about 0.4 percentage points a year.<sup>17</sup>

The literature for ECA countries is limited. However, a recent World Bank study on Turkey (Betcherman and Pagés 2007) concludes that labor tax cuts would not have a major impact on formal employment. An across-the-board reduction of 5 percentage points in pension contributions paid by employers would bring about a 0.8 percent increase in employment overall and would reduce the unemployment rate by about 0.2–0.3 percentage points. The effect would be stronger—an increase in employment of almost 1.5 percent—if the reduction in pension contributions were targeted at workers younger than 30 years old, who have less bargaining power to capture most of the tax reduction in higher wages. Some studies hint that there may be an asymmetric reaction to changes in labor tax rates, with an increase in the tax wedge leading to employment reduction but a decrease leading more to wage growth because wages may be more rigid downward than upward (World Bank 2005b). In Chile, for example, payroll taxes were reduced dramatically, around 25 percentage points, from 1979 to 1986, but the reduction was fully trans-



**BOX 9.2****Chile: Social Security Reform and the Incidence of Payroll Taxation**

In 1981, Chile began to phase out its “traditional” state-run pay-as-you-go social security system financed by employees and their employers in favor of mandatory individual private accounts. Beginning in 1983, wage earners and salaried employees entering the work force were no longer covered by the old system and were instead required to pay a proportion of their earnings to a private pension fund of their choice. Workers under the old system were given the choice of joining the new system or remaining in the old one. However, if they stayed in the old system they would be responsible for paying the full share of the payroll tax (with no employer contributions).

As part of the transition to the new system, employers were required to increase workers’ wages and salaries by about 18 percent at the time the new system went into effect. The employers’ burden in paying these higher wages and salaries was ameliorated by the elimination of the employer share of the payroll tax, and workers under the old system did not see any reduction in their pay when they picked up the employers’ former share of the payroll tax. The new employee contribution rate, 12.6 percent, was much lower than the combined employer-employee payroll tax it replaced.

However, this sharp reduction in the payroll tax burden on Chilean firms had no effect on employment. The elimination of the employer social security contributions did not lower labor costs but was fully offset by higher wages. As put by Gruber who analyzed a large sample of manufacturing firms in Chile over the 1979–1986 period “the shift in financing of social insurance in Chile in the early 1980s did not have important consequences for labor market efficiency. The reduced costs of payroll taxation to firms appear to have been fully passed on to workers in the form of higher wages, with little effect on employment levels” (Gruber 1995: 26–27).

Source: <http://www.natlaw.com/pubs/spchlb1.htm>; Gruber 1995.

lated into higher wages with no employment effect (box 9.2). In contrast, a 10 percent increase in payroll taxes in Colombia in the late 1980s and early 1990s resulted in a 1.4–2.3 percent decrease in net wages and a 4–5 percent reduction in employment (Kugler and Kugler 2003).<sup>18</sup>

Finally, there is evidence that higher labor taxes are associated with larger shadow economies for countries at similar levels of per capita income. Regressions on a rich country sample (14 countries) in the mid-1990s indicated that a unit standard deviation tax difference of 12.8 percentage points is associated with, among other things, a rise in the shadow economy of 3.8 percent of GDP, which corresponds

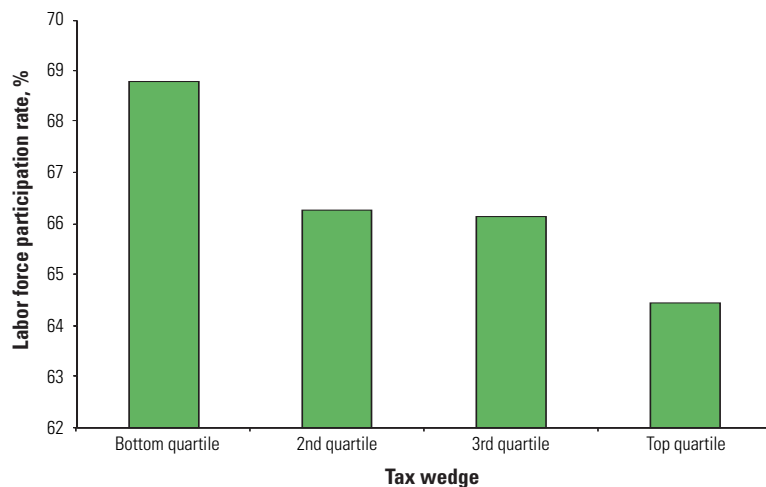
to a 24 percent increase in the size of the shadow economy evaluated at the mean (Davis and Henrekson 2004).

Many factors besides tax rates, including cultural factors, corruption, and enforcement capacity, clearly also affect the level of informality. Economic development has historically involved a gradual shift from informal into formal employment as well as an increase in the size of government coupled with increasing tax rates. Thus, many high-income OECD countries combine high tax rates with a relatively low incidence of undeclared work (OECD 2004). In a sample of 69 developing and developed countries, higher tax rates are associated with lower—not higher—unofficial activity as a percentage of GDP (Friedman et al. 2000). Furthermore, administrative capacity and governance also matter. A comparison of tax rates and the extent of tax evasion between the Czech Republic and the Slovak Republic, for example, led to the conclusion that “the most important determinant of tax evasion ... is not a divergence between tax rates, but rather the difference in opportunities for tax evasion in each country” (Hanousek and Palda 2003).

Empirical analysis undertaken for this study confirms that higher labor taxes have a negative impact on total employment. As seen in figure 9.13, the average labor force participation rate in ECA countries where the tax wedge is highest (top quartile) is almost 5 per-

**FIGURE 9.13**

**Labor Force Participation Rate by Quartiles of Tax Wedge, ECA, 2004**



Source: World Bank.

centage points lower than in those countries where the tax wedge is the lowest (bottom quartile).<sup>19</sup> Holding other relevant variables constant, a higher tax wedge is clearly associated with lower labor force participation rates and lower employment-to-population ratios (annex 9B table 9B.2 A). Specifically, a 1 percentage point increase in the tax wedge is estimated to result in a 0.3–0.6 percentage point drop in both the labor force participation rate and the employment-to-population ratio in ECA.<sup>20</sup> If the tax wedge were reduced by 5 percentage points (roughly one standard deviation), say from 44 percent (as in Romania) to 39 percent (as in Bulgaria), this would be expected to result in a 2.3 percentage point increase in the labor force participation rate.<sup>21</sup> This result is in line with those obtained for the OECD countries using better data and more advanced econometric techniques (Nickell 2003). Box 9.3 discusses measurement issues associated with identifying the relationship between the tax wedge and employment in transition economies.

Furthermore, the analysis provides evidence that labor market flexibility may mitigate the negative employment effect of labor taxes. As indicated earlier, the tax wedge is expected to have a stronger negative impact on employment in more rigid labor markets, where wages are slow to adjust to downward shifts in labor demand because of, for example, strict employment protection or a high minimum wage. The results suggest that high firing costs may aggravate the effect of the tax wedge on the labor force participation rate, while a high minimum wage may amplify the negative impact of the tax wedge on the employment-to-population ratio in ECA. However, these results should be subject to further verification using better data and more advanced techniques, especially because a more thorough analysis for a larger sample of OECD countries failed to produce strong evidence in favor of the hypothesis that flexibility reduces tax wedge effects (Nickell 2003).

Additional evidence on a detrimental effect of the tax wedge on employment comes from a pooled cross-section time-series regression for the eight new EU member states (annex 9B, table 9B.1).<sup>22</sup> The results suggest that an increase in the tax wedge has slowed down employment growth from what it otherwise might be given prevailing GDP growth. The effect is significant and its magnitude quite large: a 1 percentage point increase in the tax wedge led to a 0.5 percentage point decrease in the employment growth rate. Several caveats are in order, however. First, this result may be somewhat biased because other potentially important determinants of employment growth were not included in the regression equation (such as labor saving technological progress and other sources of

**BOX 9.3****Tax Wedge and Employment Measurement Problems**

Correct identification of the relationship between the tax wedge and employment outcomes assumes that the latter are properly measured. However, constructing an accurate employment measure is difficult, especially in the context of transition. The first issue involves data. Ideally, a measure of formal employment would be used because this is the type of employment that is affected by taxes on labor. However, available data as a rule refer to total (formal and informal) employment because employment data published by the International Labour Organization (the only source of consistent labor market information) come from Labor Force Surveys, which by design measure total employment. To the extent that the tax wedge affects the distribution of employment between the formal and informal sectors rather than total employment, using the total employment measure as a dependent variable will bias the results toward insignificance.

The transitional nature of labor markets in ECA also complicates the analysis. Apparently favorable employment outcomes in some CIS countries, such as Moldova or Ukraine, may instead be a symptom of delayed enterprise restructuring. While open unemployment may be low, hidden unemployment is large because labor is underutilized in unprofitable enterprises. More open unemployment will emerge once enterprise restructuring accelerates. However, high open unemployment in some EU-8 countries, such as Poland or the Slovak Republic, may be a sign of intensive enterprise restructuring and associated gains in labor productivity. Eventually firms will translate these gains in productivity into investment and employment growth; the first signs of this process are already noticeable. Because labor markets are in transition, regressions using outcomes to date as a dependent variable may produce biased results.

Source: Author.

productivity gains). Second, the analysis covers a period of intensive enterprise restructuring and shedding of redundant labor, and it is uncertain to what extent the results would carry over to a more steady-state situation.<sup>23</sup> Finally, it is uncertain to what extent the results are valid for the whole ECA region given its heterogeneity. Results obtained for the developed, mostly urban, and formal economies of EU-8 countries may not hold for the significantly less developed, largely rural, and informal economies of low-income CIS countries.

Past studies have shown that the employment of less skilled workers appears to be more sensitive to changes in the tax wedge than that of more skilled workers. Góra et al. (2006), using panel

regressions for a sample of 27 OECD countries (including EU-8 countries) for two years (1997 and 2003), found that the tax wedge has a statistically significant and strong negative effect on the employment rate of unskilled prime-age male workers, but no effect on that of skilled workers. Data were not sufficient to test this hypothesis ECA-wide.<sup>24</sup>

Finally, the regression analysis does not support the notion that payroll taxes paid by the employer are more detrimental to employment than taxes paid by the employee. In both cases the effect on labor force participation is negative (with regression coefficients around -0.2), although not always statistically significant. The impact and true incidence of the tax does not appear to depend on who is formally liable to pay it, which is in line with theoretical expectations.<sup>25</sup>

## Policy Options

How can countries limit the negative impact of labor taxes on employment? Focus should be placed on reducing social security contributions because they represent the dominant part of the tax wedge. There are three main ways to lower social security contributions:

- *Improve the efficiency of the social security system by tightening eligibility, limiting system abuse, strengthening revenue collection, and curbing informality.* In most ECA countries there is substantial room to improve the efficiency of the social security systems by limiting leakages. Areas where significant economies are possible include early retirement programs, disability pensions, and sickness benefits.<sup>26</sup> There is less room to reform unemployment benefit programs (World Bank 2005a).<sup>27</sup> According to some estimates, if there were no early retirement schemes in Poland, social security contributions could be reduced by one-third (Góra 2006), and if expenditures on disability pensions were reduced to the average OECD level, the rate of social security contributions could be reduced by an additional percentage point
- *Limit the insurance-based portion of the social protection system by moving more to tax-financed universal benefits.* The principal way of doing so is to move some benefits from the insurance system to the universal system and, accordingly, to fund them with general revenues rather than payroll taxes. Examples include family and maternity benefits, health care (as discussed in chapter 6), flat rate

social pensions (as discussed in chapter 7), flat rate unemployment benefits, and services to the unemployed.

- *Reduce social security contributions, particularly for workers for whom the elasticity of labor demand is relatively high and the pass-through effect (whereby lower contributions are captured through higher wages) is limited.* Payroll tax reductions (or hiring subsidies) targeted at low-skilled workers and youth, who are most hit by unemployment, might improve their employment chances by lowering their cost to employers. Such targeted reductions (or subsidies) may also be efficient in terms of how much fiscal “cost” is required to achieve a desired increase in employment. Because both the elasticity of labor demand (Hamermesh 1993) and the elasticity of labor supply (Davis and Henrekson 2004) are higher for less skilled than for more skilled workers, a change in the after-tax wage will elicit a stronger demand or supply response (depending on whether the employer or the employee benefits from the tax rate reduction). Evidence suggests that low-skilled workers are less likely to capture the tax cut through higher wages (Betcherman and Pagés 2007), implying that the primary impact is likely to be through greater labor demand.

Targeted tax reductions have been implemented in a number of countries, including Belgium, France, and the Netherlands. France introduced payroll tax subsidies in 1993 and the system is still in place in a modified form. The program provides payroll tax exemptions for low-wage workers according to a sliding scale up to a threshold of 1.33 times the minimum wage, when the subsidy is stopped. The maximum exemption is 18.2 percentage points in employer’s payroll tax for minimum wage workers. Crépon and Desplatz (2002) estimated that each reduction in labor cost of 1 percentage point led to a rise in employment of 1.6 percent in manufacturing and 1.8 percent in non-manufacturing, and the unskilled labor content increased substantially. These changes in employment were due to two effects: substitution between factors of production—as less skilled labor was substituted for more skilled labor and capital—and expanded profitability and output (because reduced labor costs enabled firms to lower prices and thus boost demand). More generally, evaluations of different payroll tax reduction programs show that they can have a significant positive effect on the employment of unskilled workers, but often at a high fiscal cost (see OECD, 2004, table 3.2, p. 124 for examples of reductions in social insurance contributions for low-paid jobs).

Such programs also have weaknesses, however. First, they generate significant deadweight losses when subsidies are received by firms

that would hire additional workers anyway without the subsidy (OECD 2003b).<sup>28</sup> Moreover, targeted employment subsidies tend to help targeted groups find jobs largely at the expense of other groups of workers. Such substitution effects significantly limit the impact of targeted subsidy programs on overall employment (OECD 2003b). In addition, these programs can create low-pay “traps” as payroll tax reductions for low-paid jobs make the tax system more progressive and it becomes more expensive for companies to award wage increases at the bottom of the wage ladder (OECD 2003b). Indeed, the programs may carry a stigma or additional administrative restrictions that lead to a low take-up rate among employers.<sup>29</sup> Finally, tax cuts targeted at low-paid workers may entail implementation difficulties because they encourage underreporting of wages so as to benefit from the tax credit. This underreporting may increase the fiscal cost of the subsidies still further.

Despite these disadvantages, a narrowly targeted scheme may prove to be an efficient way of improving employment chances of disadvantaged worker groups in some ECA settings. High unemployment and high labor demand and supply elasticities among the youth and the low-skilled makes these two groups obvious targets. Thus, one option is to target a reduction in social security contributions to low-paid workers, for example, those earning up to 1.3 times the minimum wage (possibly using a sliding scale). Another option is to target it to workers below a certain age limit, such as 25 years old. However, the programs need to be carefully designed and provide for both ex ante assessment of associated fiscal costs and ex post evaluation of their effects on employment among the target groups.

Many ECA countries have adopted the options outlined above. For example, in Poland in the early 2000s, the family benefit was moved out of the social insurance system and began to be financed out of general taxation rather than social insurance contributions. Similarly, Bulgaria began to finance active labor market policies from the general budget rather than the contribution-financed Employment Fund. Further examples of social security reforms for ECA focus countries are contained in box 9.4.

In closing, it is important to point out that changes in the structure of taxation, if not accompanied by a reduction in the overall tax burden, can be expected to bring about only modest improvement in employment outcomes. As the OECD *Jobs Study* (1994: 275) remarks, “Changes in the mix of taxes by which government raises revenues can be expected, at most, to have a limited effect on unemployment”.<sup>30</sup> A similar view is presented in the recent survey of evidence

on labor taxes and unemployment by Daveri (2002) who writes, “we should not expect much employment gain from reductions in labor taxation when the overall tax burden stays unchanged. In other words ... the structure of taxation does not appear to matter very much” (p. 14).<sup>31</sup> This takes us back full circle to chapters 2 and 3, which discuss the impact of the overall size of government on economic growth. To achieve and sustain long-term growth, the basic message of this chapter—and of this study overall—is that governments need to strive for a reasonable role for government, reflected in a modest tax take and structures of public spending in general, and social benefits in particular, that are compatible with that level of taxation.

#### BOX 9.4

##### Reduction of the Tax Wedge in ECA

In recent years many ECA countries have undertaken reforms of their social security systems with an explicit aim of reducing the tax wedge on labor and improving labor market incentives. Examples of reforms in selected ECA focus countries are presented below.

**Albania.** In 2006, Albania reduced social security contributions by 9 percentage points, including a 6 percentage point reduction in pension contributions (to 23.5 percent) and a 3 percentage point reduction in unemployment insurance (to 2 percent). If the impact of these reforms—an increase in formal employment—proves positive, the government also plans to reduce health insurance contributions (currently at 3.4 percent). The cut in contributions was coupled with a substantial rise in pensions (20 percent for rural and 5 percent for urban pensions). The government is prepared to cover any emerging deficit, which will mean a partial switch from a contribution-financed to a general revenue-financed system.

**Armenia.** A major problem of the social security system in Armenia, as in many low-income countries, is ineffective revenue collection due to poor administrative capacity. To address this problem the administration of social security contributions was moved from the social security system to general tax administration, whose tax collection capacity is better developed. The effect of this administrative change was significant: in 2005, when the reform was implemented, social security payments increased by 34 percent (compared with nominal GDP growth of 18 percent). This example demonstrates that the efficiency of the social security system can be greatly enhanced by improvements in administration, in particular more effective collection of contributions.

(continued)



**BOX 9.4 (continued)**

**Croatia.** Croatia has gradually reduced the tax wedge on labor from an extremely high to a more moderate level through a substantial reduction in both social security contributions and PIT rates. In 1994 the tax wedge accounted for almost 53 percent of total labor costs—much above the already high ECA average. At the same time labor force participation was low and unemployment high. To improve both labor demand and labor supply, the government initiated a gradual reduction in labor taxes. Over time the wedge was reduced to about 40 percent, still high but much lower than 10 years earlier. Social security contributions paid by the employer were reduced by 5.8 percentage points over 10 years (from 23 percent of gross wage in 1994 to 17.2 percent in 2004), whereas those paid by the employee were reduced by 4.4 percentage points (from 24.4 percent in 1994 to 20 percent in 2004). Simultaneously, the effective PIT rate (for a worker at the average wage) was cut by 7.8 percentage points (from 17.8 percent in 1994 to 10 percent in 2004). In 2004 the pension contribution accounted for 20 percent of worker gross wage and was paid only by the employee, whereas in 1994 it had accounted for 27 percent of gross wage and was split evenly between the employer and the employee. The benefit replacement rate for pensions fell from 75 percent in 1990 to 46 percent in 2005 through stricter eligibility conditions (extended retirement age, increased decrement for early retirement, extension of the calculation period), and health insurance for pensioners was moved from payroll to general taxation. Moreover, the reduction in the contribution rates was financed by the widening of the contribution base and by improving compliance (Anusic, O’Keefe, and Madzarevic-Sujster 2003). A further 2.5 percentage point reduction in social security contributions was achieved by moving the child benefit out of the social insurance system and switching to general tax financing. There has been no reduction in the health insurance contribution rate (15 percent of gross wage), although currently it is paid only by the employer, whereas in 1994 it was split evenly between both parties. Similarly, unemployment insurance (1.7 percent) was not reduced, but it is currently paid only by the employer, with the total rate unchanged. Overall, Croatia has maintained a roughly even split between the employer and employee share in social security contributions, in contrast to most ECA countries where social security contributions are still largely paid by the employer.

**Georgia.** In 2004, Georgia simplified and consolidated its social security system and introduced a unified 20 percent social security contribution paid only by the employer. The reform entailed a 3 percentage point reduction in the total social security contribution rate (including the elimination of 1 percent unemployment insurance contribution paid by the employee) and the replacement of a range of different contributions (pension, health, unemployment) by a single one. The reduction in the social security contribution rate was coupled with measures to improve the efficiency of the system. Nonetheless, the social security system requires budgetary transfers to cover the gap between expenditures and revenues. In addition to lower tax rates, a substantial liberalization of the labor code, which went into effect in 2006, enticed many firms to move from the informal to the formal sector. As a result social security revenues have increased.

(continued)

**BOX 9.4 (continued)**

**Kyrgyz Republic.** In 2005, the Kyrgyz Republic moved away from contribution financing to general tax financing of unemployment and other social security benefits (but not pensions). The Employment Fund and the Social Insurance Fund were eliminated, and the responsibility for paying the relevant benefits was taken over by the government budget. This allowed the government to lower the rate of social security contributions paid by the employer from 25 to 23 percent. The rate paid by the employee remained unchanged at 8 percent.

**Romania.** Recently initiated reforms of the social security system in Romania consist of two elements: reducing payroll tax rates (social security contribution paid by employers) and switching to financing of some benefits by general taxation rather than by payroll taxes. Given that reductions refer only to contributions paid by the employer, an additional effect of the reform will be a somewhat more balanced distribution of contributions between the employer and the employee. Specifically, the payroll tax rate in 2007 is expected to be 3.25 percentage points lower than in 2005. This reduction consists of a 2.25 percentage point cut in pension contributions, a 0.25 percentage point cut in health insurance, and a 0.75 percentage point cut in unemployment insurance. As a result, the employer social security contribution rate will be lowered to 28.5 percent, whereas that of the employee will remain at 17 percent of the gross wage.

Source: World Bank.

## Annex 9A Labor Taxes in ECA, 2006

TABLE 9A.1

### Labor Taxes in ECA, 2006

	Tax wedge <sup>a</sup>	Social security contributions		Personal income tax <sup>b</sup>
		Employer's part	Employee's part	
Albania	33.4	30.4	11.5	1.6
Armenia	38.5	22.0	15.0	10.0
Azerbaijan	29.8	22.0	4.0	10.4
Belarus	35.5	39.6	1.0	9.0
Bosnia and Herzegovina (FBH)	34.9	14.5	25.5	0
Bulgaria	39.0	32.2	10.5	8.8
Croatia	40.3	17.2	20.0	10.0
Czech Republic	43.6	35.0	12.5	11.4
Estonia	41.4	33.5	3.0	18.7
Georgia	26.7	20.0	0	12.0
Hungary	45.8	36.8	13.5	12.4
Kazakhstan	28.2	17.0	10.0	6.0
Kyrgyz Republic	31.6	21.0	8.0	9.2
Latvia	42.5	24.1	9.0	19.6
Lithuania	43.7	31.2	3.0	23.1
Macedonia, FYR	41.4	47.1	0	13.8
Moldova	32.4	28.0	5.0	8.5
Poland	43.1	20.4	25.4	6.1
Romania	44.1	32.5	17.0	8.9
Russian Federation	31.0	26.0	0	13.0
Serbia and Montenegro (Serbia)	42.2	17.9	17.9	14.0
Slovak Republic	42.0	35.6	13.4	7.9
Slovenia	42.6	16.1	22.1	11.3
Tajikistan	29.6	27.0	1.0	9.6
Turkey	42.7	21.5	15.0	15.4
Ukraine	39.2	38.0	3.5	12.5
Uzbekistan	38.0	25.0	2.5	20.0

Source: World Bank and Eurostat for EU-8 countries. Bank staff calculations.

Note: FBH = Federation of Bosnia and Herzegovina, which is one of two entities that constitute Bosnia and Herzegovina. The other entity, Republika Srpska, is not covered in this table b/c data are not available.

a. The tax wedge is calculated as a sum of social security contributions paid by the employer and the employee and the personal income tax expressed as a percentage of total labor cost. Total labor cost is gross wage plus employers' social security contributions. Gross wage is net wage plus employee's social security contributions and the personal income tax.

b. Data refer to effective rates on average wage. [[AU: What is this note supposed to be attached to?]] [note b) added to "personal income tax" in last column]

TABLE 9A.2

**Panel Regression Results (Fixed Effects): Tax Wedge on Labor Slows Down Employment Growth in EU-8 Countries, 1996–2003**

Variable	Coefficient	Standard error	t-Statistic	Prob.
GDP growth rate	0.425504	0.154645	2.751481	0.0076
Tax wedge	-0.531383	0.290770	-1.827498	0.0719
Fixed effects				
R-squared	0.238370	Mean dependent variable		-0.002334
Adjusted R-squared	0.109037	S.D. dependent variable		0.026545
S.E. of regression	0.025056	Sum squared resid		0.033275
F-statistic	16.58761	Durbin-Watson stat		1.886317

Source: Góra et al. 2006.

Note: The sample covers EU-8 countries during the period 1996–2003 resulting in 63 total panel observations.

### Annex 9B Results of Regression Analysis

Regression analysis allows one to determine a separate impact of an independent, or “focus,” variable (here the tax wedge) on the dependent variable (here different measures of employment outcomes), controlling for the effects of other independent or “conditioning” variables. For this exercise two sets of independent variables were chosen based on economic theory and earlier studies on the employment effects of labor taxes (Nickell [2003] contains a summary). The first set concerns economic structure and growth, including GDP growth, GDP per capita, share of agriculture, size of shadow economy, and quality of governance as measured by a corruption index. The second concerns labor market institutions, including employment rigidity, firing costs, and the minimum wage. One key question is whether the relationship between employment outcomes and the tax wedge is robust or fragile to alterations in the independent variables (Levine and Renelt 1991). We found that the relationship is reasonably robust in that it remains with the theoretically predicted sign and is statistically significant in most specifications. Moreover, the coefficient on the dependent variable—the tax wedge—changes within reasonable limits across specifications.

As a rule, a theoretical variable (for example, labor market flexibility) can be measured in many different ways and can be proxied by an array of indicators. In such cases we experimented with different available indicators (employment rigidity index, firing costs index, severance pay from the Doing Business database, for instance) and chose the one that performed best in the regression analysis (was of the theoretically predicted sign and most significant). Specification 1 uses the full set of available control variables, while specification 2

TABLE 9B.1

### Regression Results: All Else Equal, High Tax Wedge is Associated with Worse Employment Outcomes in ECA Countries

A. Dependent variable: labor force participation rate

Explanatory variables	Specification			
	(1)	(2)	(3)	(4)
Tax wedge on labor	-0.573 *	-0.563 **	-0.325	-0.274
	0.075	0.017	0.554	0.267
<i>Economic structure and growth</i>				
GDP per capita	0.001	0.001 **	0.001 **	0.001 **
	0.331	0.044	0.036	0.027
Agriculture (share in value added)	-0.041	-0.042	-0.088	-0.090
	0.776	0.754	0.602	0.561
Informal economy (share in value added)	-0.001			
	0.998			
Corruption index	0.108			
	0.949			
GDP growth rate	0.195	0.183	0.235	0.203
	0.804	0.699	0.645	0.655
<i>Labor market flexibility</i>				
Firing cost (weeks of wages)	-0.064	-0.063	0.584	0.585
	0.257	0.211	0.134	0.109
Minimum wage (% of average wage)	0.009		-0.033	
	0.907		0.948	
<i>Interactions: tax wedge and labor market flexibility</i>				
Firing cost x tax wedge			-0.016 *	-0.016 *
			0.082	0.063
Minimum wage x tax wedge			0.001	
			0.924	
Constant	85.317	85.518	75.521	74.447
	0.000	0.000	0.000	0.000
Observations	27	27	27	27
F-statistics	2.67	3.92	9.08	12.2
R-squared	0.353	0.352	0.425	0.424

Source: Bank staff calculations.

Note: Regressions with robust standard errors. P-values below coefficients. \* Significant at 10 percent level. \*\* Significant at 5 percent level. \*\*\* Significant at 1 percent level.

omits variables without the correct sign or significance. Specifications 3 and 4 add interaction terms between the tax wedge and labor market variables assumed to mediate the impact of the tax wedge on employment.

Our analysis has a number of limitations, including small sample size and unavailability of data for some potentially important variables, such as union bargaining power (union density, bargaining coverage) and the bargaining structure (centralized versus decentralized bargaining). The use of cross-section data means that we did not control for unobservable country specific characteristics (so-called fixed effects) that may be behind differences in employment outcomes. Many variables, in particular the more qualitative ones such as the quality of governance or the extent of employment protection, are susceptible to considerable measurement error. Finally, some results, particularly regarding informality, may be affected by reverse causality (endogeneity). A high tax wedge encourages informality, but informality may in turn drive the tax wedge.

To conclude, we found a robust association between the tax wedge and labor force participation rates across ECA countries. Because of data limitations these results should be viewed as tentative and subject to further verification.

## Notes

1. An increase in labor taxes can also affect economic growth through a more indirect channel. To the extent an increase in the tax wedge gives rise to higher labor costs (for example, in the presence of strong unions) firms are induced to substitute capital for labor. This leads to a fall in the marginal product of capital, which over long periods diminishes the incentive to invest and to grow (Daveri and Tabellini 2000).
2. This study on labor taxation is the first one that covers the entire ECA region. Most existing empirical work is limited to OECD countries (Daveri and Tabellini 2000; Nickell 2003; OECD 1995). Studies on labor taxation in ECA are few and are limited to eight new EU member states (EU-8) (World Bank 2005b; Vork et al. 2007). A few studies focus on selected ECA countries: Dolenc and Vodopivec (2005) examine the effects of the tax wedge in Slovenia, Gora et al. (2006) in Poland, and Betcherman and Pagés (2007) in Turkey.
3. Information on various components of labor taxes and contributions is not available on a regular basis for most ECA countries. Data on employment outcomes are also incomplete and not always comparable, as is information on labor market institutions, which condition the impact of the tax wedge on employment outcomes. These data deficiencies limit the scope of the analysis and the conclusions that can be drawn from it.

Accordingly, the findings presented in this chapter should be treated as tentative and subject to further, more thorough tests.

4. The evidence on the correlation between the tax wedge and employment outcomes in ECA provided in the chapter should be regarded as tentative because of the transitional nature of labor markets in ECA (employment outcomes may not be in equilibrium), the short period of observation, and data limitations (for example, lack of information on potentially important control variables reflecting the heterogeneity of ECA's economic structures).
5. The median in ECA is 39.2 percent (Ukraine), and the unweighted arithmetic mean is 37.8 percent. The tax wedge was estimated based on nominal rates of social security contributions. These rates may differ from actual ones if wages are underreported. Informality in wage payments is widespread in some ECA countries, which means that the nominal tax rates overestimate the actual tax rates on wages. However, the underreporting of wages is caused exactly by the high nominal tax rates. Hence, the nominal rates are important for understanding the behavior of firms and workers and thus labor market dynamics.
6. The EU-11 comprise new EU member states, known as EU-10 (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia) and Croatia, which is an EU accession country.
7. The median tax wedge in ECA is higher than the tax wedge in some EU-15 countries such as the Netherlands, a developed welfare state. The EU-15 comprises Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.
8. In Thailand, social security contributions are also paid by the government on behalf of employees (2.5 percent of gross wages).
9. High social security spending in ECA countries results mainly from wide coverage and often lax eligibility criteria, rather than from a high level of benefits. Old-age pensions (the main social security item) are a good example. High pension spending largely reflects the high coverage rate and the low actual (and nominal) retirement age, and not necessarily high pension benefits (see chapter 7).
10. The Baltic states (Estonia, Latvia, and Lithuania) and Uzbekistan are notable exceptions, with the PIT rate close to or above the EU-15 average.
11. Here we are looking at what party (the employer or the employee) is formally responsible for paying the tax. But, as will be explained later, the actual incidence of taxation does not depend on which party (the employer or the employee) the tax is levied on, but on the elasticity of labor demand and labor supply, which in turn determine the ability of each party to shift the tax to the other party.
12. This example shows that vastly different models evolved from the one model prevailing in the former Yugoslavia.
13. In some cases, peculiarities of tax administration obscure the picture. For example, in Poland health insurance is financed out of an earmarked part of PIT. The tax is collected by the Social Insurance Fund along with other social security contributions and then subtracted from PIT liabilities.

14. This assumes that labor productivity and product prices are unchanged. The latter assumption means that employers are not able to shift the tax increase forward in the form of higher product prices.
15. The elasticity of demand for labor (or supply of labor) refers to the percentage change in demand (or supply) given a percentage change in the real wage.
16. See de Haan, Sturm, and Volkerink (2003) and World Bank (2005b) for a more in-depth literature survey.
17. A cautionary note is in order, however. Although recent research with aggregate data has strengthened the case for an empirical link between labor taxes and unemployment, whether the pattern of detected partial correlation is to be interpreted in a causal sense remains highly controversial (Daveri 2002). Thus some skepticism remains. "... we still don't know whether labor taxes have statistically significant and economically important effects on labor costs and employment" (Daveri 2002: 15).
18. A further question is whether the division of social security contributions between the employer and the employee matter. Empirical evidence on the impact of tax structure is very limited and there is no definite answer to this question. According to conventional wisdom, taxes levied on the employer should have a stronger effect on employment than taxes levied on the employee. Garcia and Sala (2006) found, in contrast, that in continental Europe heavier taxation of the employee relative to that of the employer leads to higher unemployment, although this result does not appear to hold for Anglo-Saxon or Nordic countries. The result for continental Europe is consistent with the model where trade unions have significant power in wage setting and wage bargaining takes place mainly at the sector level (that is, is neither decentralized as in Anglo-Saxon countries nor centralized as in Nordic countries), and workers (unions) do not accept lower wages in return for benefits received as a result of higher taxes. Under such conditions, higher social security contributions paid by employees translate into wage increases, thereby pushing unemployment upward. Further research is necessary to see how, if at all, the tax structure affects employment under different institutional settings. But the result obtained by Garcia and Sala demonstrates that the conventional wisdom is not necessarily correct.
19. Simple correlation analysis also suggests a negative relationship between the tax wedge on labor and employment outcomes. The tax wedge correlates negatively with the total employment-to-working-age-population ratio ( $r = -0.11$ ) and with the labor force participation rate ( $r = -0.30$ ) and positively with the unemployment rate ( $r = 0.17$ ). Data on employment-to-population ratio were calculated using the ILO's Laborsta database, and data on labor force participation and unemployment rates come from the World Bank World Development Indicators.
20. This is in line with the result obtained by Vork et al. (2007) for the eight ECA new EU member states using panel data regression for 1996–2004.
21. Reducing the tax wedge by one standard deviation (5 percentage points) is a massive undertaking given broader fiscal constraints. For example, it would require cutting the employee social security contribution rate by as much as 7 percentage points. But such a reduction is achievable, as exemplified by labor tax cuts and attendant social security reforms in



- some ECA countries (see box 9.). Currently, Poland plans to reduce the employee social security contribution rate by 7 percentage points.
22. The Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia.
  23. In this context it is noteworthy that no statistically significant effect of the tax wedge on employment growth was found using an identical regression equation for a sample of OECD countries (excluding EU-8) during the same period (Gora et al. 2006). This may indicate that the observed relationship, if not spurious, is specific to a period of intensive enterprise restructuring associated with the economic transition.
  24. Regressions conducted for this study found a negative but insignificant correlation between the tax wedge and the female employment rate (-0.33), although the small sample size limited the analysis. Data limitations also prevented an examination of the impact of the tax wedge on youth employment.
  25. The standard result is that for a short period after the tax is imposed (one to five years), employers may bear over 50 percent of the employer tax burden. But over the longer term labor will bear at least two-thirds of the overall employer and employee payroll taxes (Dahlby 1993).
  26. Plans to limit early retirement may be difficult to implement due to political economy reasons. However, a clear vision and determination on the part of the government, and tripartite dialogue can facilitate the process. For example, the Polish government is now discussing ambitious plans to curb early retirement with trade unions and employers' representatives.
  27. In most ECA countries fewer than 20–30 percent of the registered unemployed qualify for benefits. In most CIS countries the registered unemployed are only a fraction of the all (ILO) unemployed, which is explained by low benefits of registration.
  28. For instance, according to employer surveys in the Netherlands, between 20 and 60 percent of new recruits would have been hired without the financial support.
  29. Close monitoring of employers' behavior is necessary to curb abuse.
  30. However, Daveri and Tabellini (2000) claim that the distortionary effects of labor taxes are much bigger than those of capital and consumption taxes. Accordingly, they recommend reducing labor taxes with a compensating increase in consumption taxes.
  31. This represents a reversal of the author's earlier view. In Daveri and Tabellini (2000) the authors were confident of the validity of the prescription of reducing labor taxes with a compensating increase in consumption taxes.