

The Quality of the Legal System and Labor Market Performance
around the World

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Abstract

Using data on 75 countries for six years in the period 1995 to 2003, this paper analyzes empirically whether and to what extent the quality of the legal system affects the performance of the labor market. According to the regression results, a legal system characterized by a dependent judiciary, biased courts, a lack of intellectual property protection and a lack of integrity increases unemployment and lowers the employment level. The magnitude of the effect seems to be substantial, particularly among young people.

JEL classification: E24, J23, J64, K00, K40

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1. Introduction

The quality of the legal system is of fundamental importance for allocative efficiency and long-term economic development. Using data on 75 countries, this paper analyzes empirically whether and to what extent it affects the performance of the labor market. Do an independent judiciary, impartial courts and effective protection of property rights result in lower unemployment and higher employment? What is the impact of the quality of the legal system on those demographic groups that usually have above-average unemployment rates? Which aspects of the legal system's quality have the strongest effects?

Whereas numerous previous studies have studied the economic effects of various individual legal norms, the issue mentioned above has so far been neglected. This paper is the first to analyze it. The following section develops working hypotheses. Section 3 briefly summarizes the results of those empirical studies that are relevant for this paper. Section 4 describes our data and estimation method. Section 5 presents and discusses the regression results. Section 6 concludes.

2. Hypotheses

So far there are no theories on how the quality of the legal system affects labor market performance. However, there has been theorizing on its significance to long-term economic development for a long time. Important contributions originated from classical economics (Hume 1740, Smith 1776), the Austrian School (Mises 1927, Hayek 1960, 1973-79, 1989) as well as from the property rights approach (Alchian and Demsetz 1973, North and Thomas 1973). Based on these theories, we may at least develop some working hypotheses on the labor market effects.¹

According to these theoretical approaches, a legal system characterized by judicial independence, impartial courts and an effective protection of private property rights – i.e., by a strong rule of law defined in a comprehensive and substantive manner – means that the legal system does not deliberately discriminate against or favor any social group; that it does not unnecessarily restrict citizens and businesses' scope of action; that each individual has some assured private sphere where he may effectively use his knowledge and collect the fruits of his productive efforts; that the costs

¹ We are aware that there are differences between the theories mentioned, e.g., with respect to their assumptions concerning human rationality and transaction costs. However, what is decisive in our context is that there are strong similarities in their views on the quality of the legal system and its consequences for economic performance.

of taking recourse to the legal system are relatively low; and that citizens and businesses may use legal norms to pursue their goals. Consequently, such a legal system results in strong incentives for productive economic activities; the dispersed knowledge of individuals and their other resources being efficiently used for the benefit of society; positive externalities of innovations being internalized, thereby stimulating innovation and promoting economic progress; the plans and actions of economic agents being efficiently coordinated; social conflicts being largely avoided or solved at low cost; and the wasting of resources in the form of rent seeking being minimized. Thus resources tend to be allocated efficiently in such a legal system and economic development tends to be fostered, according to these theories.

By contrast, if property rights are not effectively protected, if contractual claims cannot be legally enforced at all or only at high cost, if the government or other parties interfere with jurisdiction and if court decisions are biased, the incentives for productive economic activities, particularly the incentives to innovate and invest, are undermined. According to those theories, this results in a low innovation rate, modest investment and slow long-term economic growth.

What are the implications for the labor market? In a legal system characterized by a strong rule of law, labor – like other resources – tends to be allocated efficiently so that a high employment level and low unemployment are achieved. Under the rule of law, people have a strong incentive to be gainfully employed – either self-employed or as employees – because the income they earn in their employment is legally secured and in case of a judicial dispute they can expect to push through any claims in court at relatively low cost. Correspondingly, enterprises, under the rule of law, have a strong incentive to hire staff since the proceeds resulting from the employment of workers are legally secured and they, too, can expect to be able to push through any claims in court at relatively low cost in case of a judicial dispute. For these reasons and as economic progress under such a legal regime is constantly driven forward because of the strong incentive to innovate and invest, a high employment level and relatively low unemployment may be anticipated in the long run as well.

Conversely, a weak rule of law undermines both people's incentive to take up a gainful employment and enterprises' incentive to hire workers. Under such circumstances, neither the employed nor the enterprises can expect their claims to be legally recognized and enforceable in court at low cost. This may result in a relatively low level of employment and in relatively high unemployment. Consequently, our first working hypothesis is: the less a legal system is characterized by judicial independence, impartial courts and an effective protection of property

rights – i.e., by a strong rule of law – the higher unemployment tends to be and the lower the employment level, *ceteris paribus*.

Furthermore, a legal system marked by biased courts, high costs for the enforcement of legal claims and arbitrary interference by the government, opposing parties or interest groups is likely to have a disproportionately adverse impact on the employment situation of women and youths. Such a legal system is typically dominated by men. They are usually predominant in trade unions, i.e., in the interest group that often is the most influential in the labor market. Also, most judges and attorneys are male. It is thus likely that in such a system the courts systematically discriminate against women, and possibly against youths as well. Additionally, because of their relatively weak financial position, women and youths in most cases are unlikely to be able to bear the high cost of the enforcement of their formal rights. Thus they are hardly in a position to defend themselves, e.g., against unjustified dismissal. By contrast, men are not only likely to be favored by such a legal system but are probably also able to protect their labor market position with the help of legally secured high market entry barriers, e.g., closed-shop regulation. Furthermore, male workers are likely to be able to relatively well secure their employment situation with the help of legally defined high market exit barriers, e.g., extensive dismissal protection regulation. Such entry and exit barriers have an adverse effect on women and youths; they make it harder for them to find a job (Lindbeck and Snower 1988). Finally, favoritism and nepotism are likely to be widespread under such a legal regime. Once again, men are at an advantage because they usually have the best connections when interesting positions are to be filled. Consequently, our second working hypothesis is: the less a legal system is characterized by a strong rule of law, the higher unemployment and the lower employment among women and youths tend to be, *ceteris paribus*; such a legal system has a disproportionately adverse impact on the employment situation of these demographic groups.

However, our two hypotheses could be challenged by two counterhypotheses deduced from Landes and Posner's (1975) "economic theory of the independent judiciary". This theory is based on the public choice approach, according to which laws are the result of competition between interest groups. All kinds of interest groups try to push laws through government and parliament that benefit them at the expense of the rest of society. In order to improve their prospects of being re-elected, politicians meet the demands of the most important interest groups. According to Landes and Posner (1975), an independent judiciary interprets and applies legislation primarily in accordance with the original intent of the enacting legislature. It thus protects privileges that

influential interest groups have gained in the past and enhances their durability. The more independent the judiciary, the less it has to consider measures that are necessary in the public interest, e.g., in order to lower structural unemployment. For example, trade unions may induce government and parliament to enact labor laws providing far-reaching dismissal protection and high statutory minimum wages. The independent judiciary applies these laws in the long run and interprets them in an especially restrictive manner. As the influence of interest groups may impair allocative efficiency and labor market performance via such laws, we may deduce the following first counterhypothesis from Landes and Posner's (1975) theory: the more independent the judiciary, the higher unemployment and the lower employment tend to be, *ceteris paribus*. As far-reaching dismissal protection, high statutory minimum wages and similar restrictive labor laws especially hurt women and youths and as, according to Landes and Posner (1975), an independent judiciary applies such laws in the long run and interprets them in an especially restrictive manner, we may deduce the following second counterhypothesis from their theory: the more independent the judiciary, the higher unemployment and the lower employment among women and youths tend to be, *ceteris paribus*; an independent judiciary has a disproportionately adverse impact on the employment situation of these demographic groups.

3. Previous empirical results

Numerous empirical studies have found a legal system characterized by a strong rule of law to be of fundamental importance for long-term economic development. For example, a number of in-depth economic history studies have shown that the gradual evolution of such legal systems in Western Europe was a decisive precondition for the economic rise of the Western World.²

More recently, econometric studies have also found such legal systems to exert favorable effects. For example, using a panel of 115 market economies and data for the period 1960 to 1980, Scully (1992) found that in countries that bound themselves to the rule of law and effectively protected private property rights, real GDP per capita grew three times as fast as in other countries. Using a panel of 68 countries and data for the period 1976 to 1985, Torstensson (1994) found a negative correlation between the presence of arbitrary seizure of property and economic growth. Using a panel of 97 countries and data for the period 1960 to 1989, Keefer and Knack (1997) found that the

² See particularly North and Thomas (1973), North and Weingast (1989), Rosenberg and Birdzell (1986), and Landes (1998).

rule of law and the enforceability of contracts had a favorable impact on real GDP per capita growth. For a cross section of 57 countries, Feld and Voigt (2003) found that real GDP per capita grew faster if a country's highest court enjoyed a higher degree of de facto independence.

In a similar vein, recent empirical research into the influence of legal origins on current legal systems and economic outcomes found that countries with a common-law origin tend to have legal systems that enjoy greater independence from the government (La Porta et al. 2004). They also tend to have less burdensome regulation (e.g., Djankov et al. 2002, Botero et al. 2004). Less burdensome regulation is in turn associated with better economic outcomes. For example, using a sample of 85 countries, Botero et al. (2004) found that more flexible labor market regulation is associated with less unemployment, especially of the young.

Up to now, the economic theory of the independent judiciary has been tested empirically in only a few cases and only in some of its implications. One implication is that the legislature will foster judicial independence, for example, by paying independent judges comparatively high salaries. Indeed, Anderson et al. (1989) found that, in the U.S., the salaries of state Supreme Court judges tended to be significantly higher, *ceteris paribus*, in states where the courts exhibited a high degree of independence in their rulings. They hypothesize that the independent judges received financial rewards for enhancing the durability of legislative contracts with interest groups, corroborating the theory. Analyzing decisions by the federal U.S. Supreme Court involving the interpretation of labor laws, Spiller and Gely (1992) found that a pro-union decision was significantly more likely if the share of liberal members in the House of Representatives was higher and if the percentage of judges appointed by Democratic administrations was higher. This corroborates the theory as well. More comprehensive empirical tests of Landes and Posner's (1975) theory, particularly with regard to the importance of judicial independence for the performance of the labor market, are still lacking. In general, the labor market effects of the quality of the legal system as a whole have not yet been analyzed empirically. So far only the effects of individual legal regulations, primarily labor market regulations, have been analyzed. For example, many econometric studies found that strict minimum wage laws lower youth employment (for a survey, see Neumark and Wascher 2007).

4. Data and methodology

4.1 Legal system quality variables

To measure the quality of the legal system, this paper uses ratings from the area ‘legal structure and security of property rights’ of the *Economic Freedom of the World* (EFW) index (Gwartney and Lawson 2005).³ This area consists of five indicators: judicial independence; impartial courts; protection of intellectual property; military interference in rule of law and the political process; and integrity of the legal system. The area ratings were calculated as the arithmetic means of the ratings for the five indicators.

The following regressions measure the quality of the legal system using the area ratings as well as the ratings for the five indicators. This allows us not only to analyze how the quality of the legal system generally affects the labor market; it also allows us to individually determine which characteristics have the strongest effects.

The ratings for the first three indicators were calculated using results from the World Economic Forum’s annual *Executive Opinion Surveys* (EOS). The respondents were a company’s CEO or another member of its senior management. In each country approximately 60 to 70 executives were interviewed. The industry structure of the companies questioned corresponded largely to the industry structure of the relevant economy (excluding the agricultural sector). Also, care was taken to question companies of various size categories and types (e.g., private and state-owned, domestically oriented and internationally active enterprises). The participants were asked to indicate on a numerical scale to which extent they agree or disagree with a specific statement. With regard to ‘judicial independence’, the statement says: “The judiciary is independent and not subject to interference by the government or parties in disputes.” With regard to ‘impartial courts’, the statement says: “A trusted legal framework exists for private businesses to challenge the legality of government actions or regulation.” With regard to ‘protection of intellectual property’, the statement says: “Intellectual property protection in your country is either weak or nonexistent (one end of the scale) or equal to the world’s most stringent (the other end of the scale).” After the questioning, national averages were calculated from the answers to each question.

³ The EFW index measures the degree of economic freedom in five major areas: (1) size of government, (2) legal structure and security of property rights, (3) access to sound money, (4) freedom to trade internationally, (5) regulation of credit, labor and business. Area 5 is divided into three components: (5A) credit market regulations, (5B) labor market regulations, (5C) business regulations.

The ratings for the last two indicators are based mainly on data from the PRS group's *International Country Risk Guide* (ICRG). These data were computed from an in-house panel of experts. Specifically, the indicator 'military interference in rule of law and the political process' is based largely on the ICRG component 'military in politics'. Gaps in the data for this indicator were filled using the 'political stability and absence of violence' ratings from the World Bank's 'governance indicators project'. The indicator 'integrity of the legal system' is based on the ICRG component 'law and order', which assesses the strength and impartiality of the legal system as well as popular observance of the law.

The main advantage of the last two indicators is that they are based on the assessments of experienced analysts. The main advantage of the first three indicators is that the selection of respondents for the EOS was largely representative and that the respondents had practical experience with the legal systems of their countries of residence. Furthermore, the EOS statements are phrased objectively and permit a better coverage of the various characteristics of the legal system than hard data. Indeed, given that the quality of the legal system is determined by both a large number of institutions – organizations, laws, public decrees, court rulings as well as informal norms – and by the way laws, public decrees and court rulings are enforced, it is impossible to develop objective indicators that capture all the relevant aspects. For example, informal norms and the enforcement of formal rules cannot be captured at all by hard data.

Of course, the *Executive Opinion Surveys* have some potential drawbacks. One cause of concern is that each respondent may have used his own yardstick when answering the questions. However, in the planning, implementation and analysis of the surveys, care was taken to ensure the use of a uniform yardstick. For example, the respondents were provided with a written explanation of the numerical scale. Also, the answers were examined for robustness and consistency using various methods. In one of these checks, half of the answers from each country were randomly dropped from the sample. As the national EOS scores remained stable in the process, they have obviously not been distorted by individual peculiarities in responding (e.g., Cornelius and McArthur 2002, pp. 169-173).

Another potential weakness of the EOS data is that the executives were neither legal experts nor country experts. Even worse, their opinions on the quality of the legal system may have been biased. For these reasons, the survey results may not accurately reflect its quality.

In order to check whether the EOS data are biased, we compare the respective EFW ratings with related data from other sources:

- The EFW indicator ‘judicial independence’ was correlated with the index of de facto judicial independence constructed by Feld and Voigt (2003).⁴ For each country, the index measures the de facto independence of the respective highest court on average over the period 1960 to 2000. Higher values on the 0-to-1 scale indicate more independence. Information was acquired via a survey among legal and country experts (law professors, lawyers, judges and activists from organizations such as Transparency International). The survey questions focused on verifiable facts rather than subjective evaluations. Data are available for 59 of our 75 countries. The correlation coefficient between the EFW indicator ‘judicial independence’, for which we used averages over 1995 and 2000⁵, and the Feld-Voigt index is 0.52. Thus in countries with a more independent highest court, more managers thought that the judiciary is independent and not subject to interference by the government or parties in disputes. Indeed, the correlation is remarkably close, given that there are two substantial differences between the two indices. First, whereas the EOS statement refers to the judiciary as a whole, the Feld-Voigt index refers to the highest court only. Second, whereas the EFW data are averages over 1995 and 2000, the Feld-Voigt index refers to the period 1960 to 2000.
- The EFW indicator ‘impartial courts’ was correlated with the EFW indicator ‘integrity of the legal system’. Whereas the former is based on the *Executive Opinion Surveys*, the latter is based on assessments of experts of the PRS group. As explained above, both indicators focus on similar features of the legal system. Based on data for the years 1995 and 2000 to 2003, the correlation coefficient is 0.65. Thus in countries with strong and impartial legal systems and widespread observance of the law (according to the PRS group’s experts), many respondents of the EOS thought that a trusted legal framework exists for private businesses to challenge the legality of government actions or regulation. As with the previous check, the correlation coefficient is remarkably high, given that although both indicators focus on similar characteristics, there are still substantial differences between them.
- The EFW indicator ‘protection of intellectual property’ was correlated with the subindex ‘property rights’ from the Heritage Foundation’s *Index of Economic Freedom* (Holmes et al. 2008). This subindex scores the legal protection of private property rights and the chances of government expropriation of property. It ranges from 0 to 100, where 100 represents the maximum protection of private property rights. Scores were assigned by the authors of the Heritage Foundation’s *Index of Economic Freedom*, based on publications from the Economist

⁴ Stefan Voigt kindly provided us with a revised version of the index.

⁵ Neither data on years prior to 1995 nor data on the years 1996 to 1999 are available for this indicator (see section 4.3).

Intelligence Unit and the U.S. government. Data are available for all 75 countries included in our sample. Using data for the years 2000 to 2003, the correlation coefficient is 0.84, clearly indicating that in countries with well protected private property rights (according to the Heritage Foundation's subindex), many managers believed that intellectual property protection is equal to the world's most stringent.

All in all, the subjective data from the *Executive Opinion Surveys* appear to be well suited for analyzing the impact of the quality of the legal system on labor market performance. To be sure, as pointed out previously, they have certain limitations. However, as also pointed out previously, objective measures have shortcomings of their own. The judgments of high-level business executives, as recorded in the *Executive Opinion Surveys*, provide an alternative characterization that may shed useful light on the labor market effects of the legal system.

The rating scale of the EFW index ranges from 0 to 10, with 0 representing the lowest and 10 the highest degree of economic freedom. In the area 'legal structure and security of property rights', higher ratings always indicate a stronger rule of law (i.e., a more independent judiciary, a better protection of property rights, and so on). In order to avoid small absolute values for the regression coefficients, we divided all EFW ratings by 10.

As higher marks on the scale indicate a higher quality of the legal system, we label the variable that is based on the aggregate 'legal structure and security of property rights' index 'legal system quality'. Similarly, we label the variable that is based on the indicator 'military interference in rule of law and the political process' 'no or little military interference'.

4.2 Dependent and control variables

To measure the effects on the labor market, this paper uses both the unemployment and the employment rate (for definitions and sources of all dependent and control variables, see Appendix A). The unemployment rate is the most important and best-known labor market measure. However, for two reasons it may be insufficient to measure labor market slack. First, many workers in developing countries can simply not afford to be unemployed since many of these countries lack a social safety net. Second, in some, particularly industrial countries, governments try to hide the true extent of unemployment by offering unemployed workers generous disability or early retirement

benefits. Therefore, we additionally use the employment rate. Furthermore, we measure the effects on the percentage share of long-term unemployed in the total number of unemployed; a large share of long-term unemployment clearly indicates that the labor market operates inefficiently.

We use both unemployment and employment rates for the total working-age population as well as for women and young people. This enables us to determine not only whether the quality of the legal system affects the overall level of unemployment and employment but also to what extent it affects women and youths. Thus our dependent variables allow us to test our working hypotheses as well as the counterhypotheses.

Most of our labor market performance data come from the ILO's (2005) *Key Indicators of the Labour Market*. They are based on labor force survey data. Thus the unemployment data, for example, do not refer to registered unemployment. Instead they are based on an international standard which defines the unemployed as all persons above a specific age who, during the reference period, were without work, currently available for work and seeking work. Although national coverage of unemployment can vary with regard to factors such as age limits and criteria for seeking work, the ILO has undertaken great efforts to produce series that are comparable across countries. With regard to age limits, for example, most national series presented in this publication refer to the age group 15 years and older. This applies both to unemployment and employment rates. Furthermore, the ILO has 'cleaned' the national time series to eliminate breaks in series. Thus these data are comparable over time. Although the ILO's labor market performance data are not completely harmonized across countries, they are harmonized to a large extent.

We control for the impact of labor market regulations by using the ratings for the respective component from the *Economic Freedom of the World* (EFW) index (Gwartney and Lawson 2005). As previous empirical studies indicate, certain labor market regulations appear to have a considerable impact on the performance of the labor market.⁶ The EFW variable 'labor market regulations' covers the following regulations: statutory minimum wage, hiring and firing regulations, centralization of collective bargaining, unemployment benefits, and military conscription. As higher marks on the scale indicate more flexible regulation, we label this control 'flexible labor market regulations' (rather than 'labor market regulations').

⁶ In addition to the studies mentioned in section 3, see, e.g., Feldmann (2003, 2005, 2009a), Nickell et al. (2005) and Bassanini and Duval (2006).

We control for the impact of the tax burden by using the EFW indicator ‘top marginal tax rate’. It is based on the top marginal income and payroll tax rate and on the income threshold at which the top marginal income tax rate applies. As higher values on the scale represent lower marginal tax rates and higher income thresholds, we label this variable ‘low top marginal tax rate’. Previous studies have found that a heavy tax burden is likely to lower employment and increase unemployment in industrial countries (e.g., Prescott 2004, Feldmann 2006a).⁷

We use the GDP growth rate plus year dummies to simultaneously control for business cycle fluctuations and shocks that are common across countries (e.g., oil-price shocks).⁸ For two reasons, we additionally control for GDP per capita. First, it is important to account for the effects of the huge cross-country differences in the level of economic development. Second, as richer countries usually enjoy a stronger rule of law, it is also important to ensure that our legal system quality variables do not proxy for the level of economic development.

Furthermore, we use two variables to control for the impact of geographical conditions. In a series of papers, Sachs and coauthors have shown that both levels and growth rates of GDP per capita are lower in countries that are characterized by adverse geographical conditions (e.g., Gallup et al. 1999, Sachs 2001). Our first geographical control is the share of land area in geographical tropics. Sachs and coauthors argue that tropical climates hinder production and development. One may thus hypothesize that they may also worsen labor market performance, particularly lowering employment rates. However, there may be a compensating effect: more people may have a job in order to compensate for the low level of labor productivity, in general, and for frequent illness of members of their families, in particular. While low levels of labor productivity imply low wages, frequent illness of family members renders family income unstable. If the compensation effect dominates, countries with (a larger share of) tropical areas may have higher employment and lower unemployment rates, *ceteris paribus*. Indeed, using data on 76 countries, Feldmann (2009b) found evidence for the latter.

⁷ The tax burden on labor (‘tax wedge’) would have been a preferable indicator. However, data on this indicator are available for industrial countries only. The EFW indicator ‘top marginal tax rate’ can be regarded as a proxy for the tax burden on labor, because countries with a large (small) tax wedge usually also have a high (low) top marginal income and payroll tax rate and a low (high) income threshold at which the top marginal income tax rate applies. Indeed, the correlation coefficient between the ‘tax wedge’ and the EFW indicator ‘top marginal tax rate’ is -0.66 , indicating that larger tax wedges are associated with higher top marginal income and payroll tax rates and lower income thresholds at which top marginal income tax rates apply. [The calculation of the correlation coefficient is based on data for 20 industrial countries and for the years 1995 and 2000 to 2003. The source for the ‘tax wedge’ data is OECD (various issues).]

⁸ The output gap would have been the best indicator to control for the impact of business cycle fluctuations. However, data on this variable are also available for industrial countries only.

Our second geographical control is the mean distance to the nearest ice-free coastline. A long distance is likely to increase transport costs for international trade, thus lowering employment levels and possibly increasing unemployment. Alternatively, one may argue that access to the sea may be almost irrelevant and that road, railway, airline and telecommunications networks may be much more important instead. One may even argue that a long distance to the coast may induce people to compensate for this natural disadvantage by working more, raising employment and lowering unemployment.

We also control for ethnic fractionalization, hypothesizing that it adversely affects labor market performance. For example, members of ethnic minorities may be discriminated against when it comes to hiring and firing. Furthermore, the ruling group may implement policies that discriminate against industries dominated by the losing groups. They may also pursue policies, such as financial repression and overvalued exchange rates, that create rents for themselves at the expense of society at large. All of this is likely to lower employment and increase unemployment. Using data on more than 70 countries, Feldmann (2006b, 2008, 2009b) found evidence corroborating this hypothesis.

Additionally, we employ a control variable for interstate and internal wars because they may severely disrupt the labor markets of the countries in which they take place. We also use a dummy variable for those countries that are in transition from planned to market economy since this process has a major impact on their labor markets. Finally, in the regressions to explain the youth employment rate, we employ the tertiary enrollment rate. As previous studies both on transition and industrial countries indicate, countries with a higher percentage of young people enrolled in tertiary education have a lower percentage of young people in employment (Feldmann 2005, 2006c).

4.3 Sample and methodology

Our estimation sample consists of 75 industrial, developing and transition countries (for a list of countries, see Appendix B). As most previous cross-country labor market studies cover OECD countries only (usually 20 or less), it is exceptionally large.

The EFW index has been calculated from 1970 on for every fifth year plus for the years 2001 to 2003. As the ratings for the individual components of the area ‘legal structure and security of property rights’ were only published for the years from 1995, and as some of our explanatory

variables were lagged by one year (see below), our regressions are based on data for the years 1995, 1996 and 2000 to 2003.

We estimate the following model:

$$Y_{it} = \alpha + \beta_1 X_{it-1} + \beta_2 L_{it-1} + \beta_3 T_{it-1} + \beta_4 G_{it-1} + \beta_5 C_{it} + \beta_6 A_{it} + \beta_7 D_{it} + \beta_8 E_{it} + \beta_9 W_{it} + \beta_{10} P_{it} + \lambda_t + \varepsilon_{it},$$

where Y_{it} is a labor market performance variable of country i at year t , α is a constant, X denotes a legal system quality variable, L is our labor market regulations variable, T denotes the variable ‘low top marginal tax rate’, G is the ‘GDP growth’ variable, C denotes ‘GDP per capita’, A is the ‘tropical area’ variable, D denotes ‘distance to coastline’, E is the ‘ethnic fractionalization’ variable, W denotes the ‘war’ variable, P is our ‘transition country’ dummy, while λ_t denotes year dummies and ε_{it} is the error term.⁹

As there is substantial correlation among the legal system quality variables, we estimate specifications that include these measures one at a time. Furthermore, the legal system quality variables as well as the variables ‘flexible labor market regulations’, ‘low top marginal tax rate’ and ‘GDP growth’ were lagged by one year to allow for slow adjustment and to avoid simultaneity problems. Changes in the quality of the legal system are likely to affect the performance of the labor market only after some time. The same can be expected from changes in labor market regulation and tax policies. Also, labor market performance usually responds to changes in the GDP growth rate only after about one year.

We control for the impact of unobserved country effects since it is impossible to include control variables for all country-specific characteristics resulting in international differences in labor market performance (for example, cultural norms concerning female labor force participation). To control for unobserved country effects, we use the random effects, feasible generalized least squares (FGLS) procedure, specifically, the Swamy-Arora (1972) estimator that is cited most often in textbooks (e.g., Baltagi 2001). Random effects estimates have the advantage of exploiting both the cross-country and the time-series variation included in the sample. By contrast, fixed effects estimates would be very imprecise because they only use the time-series variation within the sample.

⁹ The model to explain the youth employment rate additionally includes the ‘tertiary enrollment rate’ variable.

The error term ε_{it} can be decomposed as

$$\varepsilon_{it} = w_i + u_{it} ,$$

where w_i denotes time-invariant country-specific characteristics and u_{it} is the combined time-series and cross-section error term. The random effects estimation treats the country-specific effects (w_i) as random. However, it requires that they are uncorrelated with the explanatory variables included in the estimated equation. If this condition is violated, the random effects FGLS estimator yields inconsistent estimates. Therefore, a Hausman (1978) test for misspecification of the random effects model has been performed for each regression. As the results from this test indicate, none of our estimates is biased (Tables 1 to 7). Thus, in our case the random effects FGLS method is the appropriate choice. Finally, to correct for heteroskedasticity, we estimate robust t -statistics using the technique developed by White (1980).

5. Results

Tables 1 to 7 present our regressions to explain our labor market performance variables. In each table, the first column reports a regression that was estimated using the ‘legal system quality’ variable, which is based on the aggregate ‘legal structure and security of property rights’ index. Subsequent regressions, reported in columns 2 to 6 of each table, were estimated using the variables that are based on the individual indicators of this index.

Except for the regression to explain the youth employment rate, all estimates for the ‘legal system quality’ variable are statistically insignificant (Tables 1 to 7). According to Table 7, a stronger rule of law, as measured by this variable, is associated with a higher rate of employment among young people.

The estimates for the five variables measuring specific aspects of legal system quality provide differentiated insights into the importance of such characteristics to the labor market. The regression analysis produced the following results:

- Less judicial independence is associated with a lower level of employment among the total working-age population as well as among women and youths (Tables 5 to 7). It is also associated with a larger share of long-term unemployment (Table 4).

- More biased court decisions are correlated with a lower level of employment among the young (Table 7).
- Less protection of intellectual property is associated with higher unemployment among the total labor force as well as among women and youths (Tables 1 to 3). Furthermore, it is associated with lower employment among young people (Table 7).
- Countries that are characterized by more frequent military interference in the rule of law and the political process have lower unemployment rates, both among the total labor force and among the two demographic groups (Tables 1 to 3). They also have less long-term unemployment (Table 4). Furthermore, they have a higher rate of youth employment (Table 7).
- As the legal system loses its integrity, the rate of employment falls among the total working-age population as well as among women and youths (Tables 5 to 7). Additionally, both the youth unemployment rate and long-term unemployment rise (Tables 3 and 4).

Thus judicial independence, intellectual property protection, military interference and the integrity of the legal system most clearly appear to affect labor market performance. The magnitude of the effects seems to be substantial. For example, compare the Netherlands and Ecuador. The Netherlands achieved one of the best results in the area ‘legal structure and security of property rights’. On average over the years 1995 and 2000 to 2002, its area rating was 9.2. Ecuador’s average area rating, at 3.3, was much lower. Ecuador also had much higher unemployment rates and much lower employment rates, both among the total population and among the women and youths. On average over the years 1996 and 2001 to 2003, the Dutch unemployment rate amounted to 4.2% whereas the Ecuadorian unemployment rate was 10.4%. Similarly, while the Dutch employment rate averaged 60.4%, Ecuador’s employment rate averaged 53.9%.

According to our estimates, if the Ecuadorian judiciary had been as independent as the Dutch judiciary, Ecuador might have been able to close 35% of the gap between the two countries’ employment rates, *ceteris paribus*. If protection of intellectual property in Ecuador had been as strict as in the Netherlands, Ecuador might have been able to close 38% of the gap between the two countries’ unemployment rates, *ceteris paribus*. Furthermore, if the Ecuadorian legal system had enjoyed the same degree of integrity as the Dutch legal system, Ecuador might have been able to close 24% of the gap between the two countries’ employment rates, *ceteris paribus*. On the other hand, the Ecuadorian labor market may have benefited from military interference in the rule of law and the political process. Specifically, if Ecuador had achieved the same score for the indicator ‘military interference’ as the Netherlands, its unemployment rate might have been 2.3 percentage

points higher, *ceteris paribus*. Of course, these figures should be interpreted with some caution. However, they illustrate that the quality of the legal system is likely to have a substantial impact on the performance of the labor market.

We also checked the robustness of our regression results. In a first check, we normalized each country's GDP growth rate during the current year for its average growth rate over the previous ten years and substituted this new variable for the lagged GDP growth rate. In a second check, we substituted a dummy variable for developing countries (the latter defined as low and middle income countries according to the World Bank classification) for the 'GDP per capita' variable. In a third check, we additionally controlled for the percentage share of children in the population. In a fourth check, we dropped the two geographical controls, and in a fifth the variables 'ethnic fractionalization' and 'war'. In further robustness checks, we excluded from the sample statistical outliers, or any particular country, or any random draw of 10% of observations. None of these checks had any substantial impact on the coefficients on our variables of interest (results not reported here).

As is obvious from the results of our baseline regressions presented in Tables 1 to 7, most of our estimates corroborate the working hypotheses developed in section 2. They suggest that a legal system characterized by judicial dependence, biased courts, a lack of intellectual property protection and a lack of integrity is likely to adversely affect the performance of the labor market. For the reasons given in section 2, this is probably mainly because such a system weakens the incentives to supply and demand labor, lowers allocative efficiency and reduces long-term economic growth.¹⁰ As far as young people are concerned, the regression results also corroborate our second working hypothesis. The absolute values of the coefficients on 'judicial independence', 'protection of intellectual property' and 'integrity of the legal system' are substantially higher in the regressions to explain unemployment and employment among youths than in the respective regressions to explain unemployment and employment among the overall working-age population (Tables 1, 3, 5, 7). Thus young people indeed appear to be more severely affected by a weak rule of law. By contrast, the absolute values of the respective coefficients in the regressions to explain unemployment and employment among women are not exceptionally high (Tables 1, 2, 5, 6), indicating that there appears to be no above-average effect on this demographic group.

¹⁰ Note that these estimates are also in line with previous empirical studies that have found a strong rule of law to exert a favorable impact on economic development.

Our regression results do not corroborate the two counterhypotheses deduced from the economic theory of the independent judiciary. According to our results, more judicial independence does not deteriorate but improve the performance of the labor market. This is true with respect to the general working-age population as well as with respect to women and youths. Although, as is obvious from both our coefficients on the variable ‘flexible labor market regulations’ (Tables 1 to 7) and previous labor market regulation studies (section 3 and footnote 6), restrictive labor laws are likely to worsen labor market outcomes, an increase in judicial independence does not lead to a further worsening, as stated in the counterhypotheses. On the contrary, it leads to an improvement. The causal connection stated in our working hypotheses is probably decisive here.

Surprisingly, our estimates indicate that more military interference in the rule of law and the political process is correlated with better rather than worse labor market performance. The reason for this may be that, in developing countries, the economy may actually perform better if the military intervenes in the legal and political system to fight corruption, anarchy or arbitrary rule. However, there are not many cases in which military intervention was actually instrumental in this regard.

Finally, let us briefly comment on our estimates for the control variables:

- In line with most previous labor market regulation studies (see section 3 and footnote 6), we find that more flexible regulations appear to lower unemployment, both among the total labor force as well as among female and young workers (Tables 1 to 3), and that they appear to increase employment among the young (Table 7).
- Lower taxes also seem to increase youth employment (Table 7). Additionally, there is some, albeit weak, evidence that they lower unemployment (Tables 1 to 4).
- A higher GDP growth rate in the previous year is strongly correlated with lower unemployment in the current year, both among the overall labor force as well as among the two demographic groups (Tables 1 to 3). Furthermore, it is associated with a higher employment rate (Table 5).
- A higher level of economic development is associated with lower unemployment rates (Tables 1 to 3). Furthermore, it is associated with higher employment rates, particularly among women (Tables 5 and 6).
- The coefficient on ‘tropical area’ indicates that countries with a larger share of tropical area have less unemployment and higher employment rates (Tables 1 to 7). Thus the compensation effect mentioned in section 4.2 seems to dominate.

- A long distance to the coast also seems to exert a compensation effect. According to our results, a longer distance is correlated with lower unemployment rates and less long-term unemployment (Tables 1 to 4). There is also some non-robust evidence that it is associated with higher employment rates (Tables 5 to 7).
- Ethnic fractionalization appears to increase unemployment and lower employment (Tables 1 to 7), corroborating our hypothesis (section 4.2).
- Finally, in line with previous studies (e.g., Feldmann 2003), we find that female employment is comparatively high in transition countries (Table 6).

6. Conclusion

The regression results indicate that the quality of the legal system is likely to affect the performance of the labor market. According to our estimates, a legal system characterized by a dependent judiciary, biased courts, a lack of intellectual property protection and a lack of integrity is likely to raise unemployment and reduce employment. Apparently, it has a particularly adverse impact on young people. The effect on women does not appear to be larger than the effect on the overall population. Furthermore, we find countries that are characterized by more frequent military interference in the rule of law and the political process to have lower unemployment rates and less long-term unemployment, *ceteris paribus*. Our results are robust to variations in specification and sample size. The magnitude of the estimated effects seems to be substantial.

As this is the first study to analyze empirically the labor market effects of legal system quality, more research is clearly warranted. For example, as most of the EFW indicators are based on surveys among managers, future research should use alternative indicators. Furthermore, future studies should cover longer time spans. Additionally, the transmission channels from legal system quality to labor market performance need to be more closely examined, both theoretically and empirically. It also needs to be analyzed in more detail why young people seem to benefit disproportionately from a strong rule of law. The labor market effects of military interference need to be investigated in more detail as well.

Finally, the policy implications of our findings need to be thoroughly discussed. In general, it seems obvious to conclude that parliament and government should strengthen the rule of law as part of their policy-mix to improve labor market performance. However, various aspects of the policy

implications need to be closely scrutinized in order to be able to come up with more specific recommendations. For example, what measures should be implemented to increase the independence and impartiality of the judiciary? What procedures should be in place to challenge the legality of government actions and regulation? How can the protection of intellectual property rights be best secured? What measures are most efficient to reduce the crime rate? In tackling these questions, it is important to take the specific characteristics of the relevant country thoroughly into account, not only with respect to its legal system but also with respect to its political and economic system.

Appendix A. Dependent and control variables – definitions and sources

I. Dependent variables

Unemployment rate: Unemployed as a percentage of the labor force. Labor force survey data.

Source: International Labour Office (2005).

Female unemployment rate: Unemployed women as a percentage of the female labor force. Labor force survey data. Source: International Labour Office (2005).

Youth unemployment rate: Unemployed aged 15 to 24 years as a percentage of the labor force in the same age bracket. Labor force survey data. Source: European Commission (2005), International Labour Office (2005).

Long-term unemployment: Unemployed with an unemployment duration of 12 months and more as a percentage of total unemployment. Labor force survey data. Source: European Commission (2005), International Labour Office (2005), OECD (2005), author's calculations.

Employment rate: Percentage of working-age population in employment. Labor force survey data. Source: International Labour Office (2005).

Female employment rate: Percentage of female working-age population in employment. Labor force survey data. Source: International Labour Office (2005).

Youth employment rate: Employed aged 15 to 24 years as a percentage of the population in the same age bracket. Labor force survey data. Source: European Commission (2005), OECD (2005).

II. Control variables

Flexible labor market regulations: Subindex ‘labor market regulations’ of the *Economic Freedom of the World* index, scaled to take values between 0 and 1. Higher values indicate more flexible regulation. The subindex consists of five indicators. The ratings for the first four indicators are based on results from the World Economic Forum’s annual *Executive Opinion Surveys*. The participants were asked to indicate on a numerical scale to what extent they agree or disagree with a specific statement. The four survey statements are: “The minimum wage, set by law, has little impact on wages because it is too low or not obeyed”; “Hiring and firing practices of companies are determined by private contract”; “The share of labor force whose wages are set by centralized collective bargaining is low”; and “The unemployment benefits system preserves the incentives to work.” The fifth indicator, ‘military conscription’, measures the use of conscripts to obtain military personnel, including duration of military conscription. All indicators carry equal weights. Source: Gwartney and Lawson (2005).

Low top marginal tax rate: Subindex ‘top marginal tax rate’ of the *Economic Freedom of the World* index, scaled to take values between 0 and 1. Higher values indicate lower top marginal income and payroll tax rates and higher income thresholds at which the top marginal income tax rates apply. Source: Gwartney and Lawson (2005).

GDP growth: Annual percentage growth rate of real GDP. Source: World Bank (2006).

GDP per capita: Gross domestic product per capita, converted to constant 2000 international dollars using purchasing power parity rates, divided by 1,000. Source: Directorate-General of Budget, Accounting and Statistics (2005), World Bank (2006).

Tropical area: Share of land area in geographical tropics. Source: Center for International Development (1999, 2001).

Distance to coastline: Mean distance to nearest ice-free coastline, measured in thousands of kilometers. Source: Center for International Development (2001), author’s calculations.

Ethnic fractionalization: One minus the Herfindahl index of ethnic group shares, reflecting the probability that two randomly selected individuals from a population belong to different groups. The definition of ethnicity involves a combination of racial and linguistic characteristics. The classifications reflect the judgments of ethnologists and anthropologists on the appropriate definition of ethnicity. Source: Alesina et al. (2003).

War: Dummy variable that takes the value 1 if, in the respective year, there was an interstate or internal war in the country. Source: Centre for the Study of Civil War (2005).

Transition country: Dummy variable for countries in transition from centrally planned to market economy.

Tertiary enrollment rate: Students enrolled in tertiary education, regardless of age, as a share of the population of the age group that officially corresponds to this level of education. Source: Directorate-General of Budget, Accounting and Statistics (2005), World Bank (2006).

Appendix B. List of countries

Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Germany, Greece, Guatemala, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Latvia, Lithuania, Luxembourg, Malaysia, Malta, Mauritius, Mexico, Morocco, Netherlands, New Zealand, Nicaragua, Norway, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Singapore, Slovak Republic, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Trinidad & Tobago, Turkey, Ukraine, United Kingdom, United States, Uruguay, Venezuela.

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Table 1. Regressions to explain the unemployment rate^{a)}

	(1)	(2)	(3)	(4)	(5)	(6)
Legal system quality	0.88 (0.31)					
Judicial independence		0.90 (0.89)				
Impartial courts			0.90 (0.54)			
Protection of intellectual property				-4.12*** (-4.09)		
No or little military interference					3.75** (2.58)	
Integrity of the legal system						-0.30 (-0.36)
Flexible labor market regulations	-5.56* (-1.68)	-5.37* (-1.86)	-5.68** (-1.99)	-3.66 (-1.39)	-5.98** (-2.28)	-5.29* (-1.95)
Low top marginal tax rate	-2.06 (-1.36)	-2.39 (-1.52)	-1.99 (-1.29)	-2.51* (-1.78)	-2.05 (-1.15)	-2.11 (-1.23)
GDP growth	-0.19*** (-3.48)	-0.19*** (-3.23)	-0.19*** (-3.48)	-0.19*** (-3.96)	-0.20*** (-3.43)	-0.20*** (-3.30)
GDP per capita	-0.28** (-2.52)	-0.27*** (-2.85)	-0.27*** (-2.76)	-0.23*** (-2.83)	-0.30*** (-2.60)	-0.26*** (-2.82)
Tropical area	-4.41*** (-3.13)	-4.67*** (-3.16)	-4.43*** (-2.77)	-5.00*** (-3.19)	-4.00** (-2.38)	-4.50*** (-2.96)
Distance to coastline	-1.74** (-2.12)	-1.39** (-2.04)	-1.78** (-2.25)	-1.86** (-2.28)	-1.39* (-1.71)	-1.71* (-1.81)
Ethnic fractionalization	6.41*** (3.92)	6.16*** (3.34)	6.41*** (3.57)	6.20*** (4.16)	6.62*** (5.88)	6.28*** (3.23)
War	-0.27 (-0.34)	-0.15 (-0.14)	-0.33 (-0.36)	-0.33 (-0.42)	-0.19 (-0.26)	-0.15 (-0.19)
Transition country	0.06 (0.03)	-0.08 (-0.04)	0.16 (0.07)	-0.59 (-0.25)	-0.37 (-0.15)	0.10 (0.05)
Number of observations	249	235	249	249	249	248
Number of countries	74	72	74	74	74	74
R^2	0.25	0.27	0.25	0.26	0.27	0.25
Standard error of regression	1.66	1.67	1.66	1.64	1.64	1.67
F -statistic	6.08***	6.19***	6.10***	6.48***	6.61***	6.12***
Hausman test	7.77	7.83	7.81	8.85	6.33	9.76

^{a)} Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996 and 2000 to 2003. The following variables were lagged by one year: 'legal system quality', 'judicial independence', 'impartial courts', 'protection of intellectual property', 'no or little military interference', 'integrity of the legal system', 'flexible labor market regulations', 'low top marginal tax rate', 'GDP growth'. Heteroskedasticity-consistent t -statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain year dummies and a constant term.

Table 2. Regressions to explain the female unemployment rate^{a)}

	(1)	(2)	(3)	(4)	(5)	(6)
Legal system quality	1.03 (0.30)					
Judicial independence		0.16 (0.24)				
Impartial courts			0.57 (0.43)			
Protection of intellectual property				-3.03** (-2.35)		
No or little military interference					4.87*** (2.70)	
Integrity of the legal system						-0.31 (-0.27)
Flexible labor market regulations	-9.56** (-2.18)	-9.40*** (-2.96)	-9.52** (-2.44)	-7.80** (-2.10)	-10.00*** (-2.94)	-9.30** (-2.53)
Low top marginal tax rate	-2.57 (-1.44)	-2.89 (-1.53)	-2.55 (-1.40)	-2.93* (-1.75)	-2.63 (-1.28)	-2.58 (-1.30)
GDP growth	-0.16** (-2.49)	-0.16** (-2.44)	-0.16** (-2.48)	-0.16*** (-2.73)	-0.17** (-2.57)	-0.18** (-2.40)
GDP per capita	-0.32** (-2.26)	-0.31** (-2.53)	-0.32** (-2.40)	-0.29** (-2.35)	-0.35** (-2.30)	-0.31** (-2.54)
Tropical area	-4.21** (-2.07)	-5.01** (-2.18)	-4.30* (-1.87)	-4.77** (-2.05)	-3.57 (-1.38)	-4.34* (-1.91)
Distance to coastline	-1.79** (-2.31)	-1.31*** (-2.75)	-1.83** (-2.24)	-1.93** (-2.27)	-1.38** (-2.18)	-1.73* (-1.83)
Ethnic fractionalization	7.31*** (4.25)	7.04*** (3.54)	7.26*** (3.79)	7.18*** (4.33)	7.70*** (5.48)	7.15*** (3.23)
War	-0.47 (-0.49)	-0.21 (-0.18)	-0.50 (-0.50)	-0.50 (-0.55)	-0.39 (-0.44)	-0.27 (-0.32)
Transition country	-1.25 (-0.50)	-1.52 (-0.57)	-1.23 (-0.48)	-1.81 (-0.67)	-1.78 (-0.61)	-1.20 (-0.48)
Number of observations	240	227	240	240	240	239
Number of countries	73	71	73	73	73	73
R^2	0.25	0.27	0.25	0.26	0.27	0.26
Standard error of regression	1.79	1.80	1.79	1.79	1.76	1.82
F -statistic	5.88***	6.00***	5.88***	6.04***	6.50***	5.96***
Hausman test	5.92	5.80	5.82	5.33	5.34	8.50

^{a)} Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996 and 2000 to 2003. The following variables were lagged by one year: 'legal system quality', 'judicial independence', 'impartial courts', 'protection of intellectual property', 'no or little military interference', 'integrity of the legal system', 'flexible labor market regulations', 'low top marginal tax rate', 'GDP growth'. Heteroskedasticity-consistent t -statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain year dummies and a constant term.

Table 3. Regressions to explain the youth unemployment rate^{a)}

	(1)	(2)	(3)	(4)	(5)	(6)
Legal system quality	-3.45 (-0.82)					
Judicial independence		0.79 (0.59)				
Impartial courts			0.21 (0.07)			
Protection of intellectual property				-6.76** (-2.56)		
No or little military interference					6.28** (2.29)	
Integrity of the legal system						-4.78** (-2.06)
Flexible labor market regulations	-10.73* (-1.65)	-11.81** (-2.14)	-11.91* (-1.81)	-9.06 (-1.53)	-13.24** (-2.18)	-10.94** (-1.97)
Low top marginal tax rate	-2.65 (-1.05)	-2.43 (-0.86)	-2.48 (-0.99)	-3.14 (-1.41)	-2.39 (-0.79)	-2.25 (-0.85)
GDP growth	-0.40*** (-4.84)	-0.39*** (-4.87)	-0.40*** (-4.86)	-0.40*** (-5.12)	-0.40*** (-5.44)	-0.42*** (-4.99)
GDP per capita	-0.44** (-2.40)	-0.49*** (-3.16)	-0.47*** (-2.68)	-0.42** (-2.46)	-0.52*** (-2.62)	-0.42** (-2.40)
Tropical area	-8.56*** (-3.25)	-7.97** (-2.31)	-7.95*** (-2.94)	-8.82*** (-2.83)	-6.86** (-2.40)	-8.87*** (-3.16)
Distance to coastline	-3.54** (-2.54)	-2.49*** (-3.36)	-3.39** (-2.50)	-3.60*** (-3.12)	-2.67* (-1.91)	-3.69*** (-4.42)
Ethnic fractionalization	10.75*** (3.14)	10.06** (2.20)	11.04*** (3.02)	11.07*** (3.31)	11.58*** (2.98)	10.54*** (2.85)
War	-1.69 (-1.17)	-1.57 (-1.18)	-1.64 (-1.16)	-1.31 (-0.98)	-1.49 (-1.48)	-2.34 (-1.12)
Transition country	1.41 (0.25)	1.37 (0.21)	1.73 (0.31)	0.60 (0.10)	1.10 (0.18)	1.97 (0.37)
Number of observations	205	195	205	205	205	204
Number of countries	66	65	66	66	66	65
R^2	0.32	0.34	0.32	0.33	0.33	0.33
Standard error of regression	3.24	3.23	3.24	3.22	3.22	3.26
F -statistic	7.01***	7.15***	6.96***	7.19***	7.24***	7.25***
Hausman test	3.59	3.29	3.71	3.20	3.24	7.72

^{a)} Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996 and 2000 to 2003. The following variables were lagged by one year: 'legal system quality', 'judicial independence', 'impartial courts', 'protection of intellectual property', 'no or little military interference', 'integrity of the legal system', 'flexible labor market regulations', 'low top marginal tax rate', 'GDP growth'. Heteroskedasticity-consistent t -statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain year dummies and a constant term.

Table 4. Regressions to explain long-term unemployment^{a)}

	(1)	(2)	(3)	(4)	(5)	(6)
Legal system quality	-17.16 (-0.97)					
Judicial independence		-15.44* (-1.72)				
Impartial courts			1.44 (0.10)			
Protection of intellectual property				-5.56 (-0.33)		
No or little military interference					26.95*** (3.94)	
Integrity of the legal system						-14.84*** (-4.24)
Flexible labor market regulations	-12.85 (-1.33)	-8.27 (-1.03)	-17.72 (-1.63)	-14.54 (-1.15)	-19.94*** (-2.88)	-17.46** (-2.47)
Low top marginal tax rate	-6.91 (-1.60)	-8.86** (-2.07)	-6.60* (-1.78)	-7.07 (-1.40)	-7.23* (-1.78)	-4.41 (-1.05)
GDP growth	-0.21 (-1.26)	-0.15 (-0.75)	-0.21 (-1.65)	-0.20 (-1.50)	-0.12 (-1.36)	-0.32** (-2.50)
GDP per capita	-0.42 (-0.80)	-0.47 (-1.03)	-0.49 (-0.96)	-0.47 (-0.95)	-0.57 (-1.14)	-0.36 (-0.73)
Tropical area	-22.19** (-2.22)	-35.99*** (-2.86)	-18.37** (-2.21)	-20.18* (-1.79)	-18.44* (-1.93)	-22.02** (-2.03)
Distance to coastline	-17.61*** (-7.11)	-15.41*** (-6.93)	-17.34*** (-6.91)	-17.37*** (-7.34)	-15.10*** (-5.39)	-16.86** (-2.17)
Ethnic fractionalization	13.56* (1.75)	8.49 (1.50)	15.31** (2.40)	15.10** (2.44)	19.03*** (4.40)	13.14 (1.13)
War	6.49 (1.48)	6.16 (1.26)	6.63 (1.49)	7.01 (1.32)	6.91 (0.88)	4.75 (1.37)
Transition country	14.77 (1.19)	12.93 (0.96)	17.81* (1.78)	16.10 (1.18)	17.19 (1.48)	17.54 (1.48)
Number of observations	143	135	143	143	143	142
Number of countries	43	40	43	43	43	42
R^2	0.40	0.44	0.40	0.40	0.43	0.42
Standard error of regression	5.02	4.92	5.13	5.08	4.99	4.94
F -statistic	6.70***	7.20***	6.67***	6.59***	7.41***	7.08***
Hausman test	6.39	5.14	3.60	3.95	1.78	4.14

^{a)} Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996 and 2000 to 2003. The following variables were lagged by one year: 'legal system quality', 'judicial independence', 'impartial courts', 'protection of intellectual property', 'no or little military interference', 'integrity of the legal system', 'flexible labor market regulations', 'low top marginal tax rate', 'GDP growth'. Heteroskedasticity-consistent t -statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain year dummies and a constant term.

Table 5. Regressions to explain the employment rate^{a)}

	(1)	(2)	(3)	(4)	(5)	(6)
Legal system quality	5.31 (1.38)					
Judicial independence		3.11** (2.42)				
Impartial courts			-1.68 (-0.61)			
Protection of intellectual property				3.36 (0.97)		
No or little military interference					1.32 (0.65)	
Integrity of the legal system						3.01*** (5.01)
Flexible labor market regulations	2.21 (0.45)	2.87 (0.60)	4.37 (0.92)	2.14 (0.40)	3.40 (0.76)	3.92 (0.94)
Low top marginal tax rate	0.59 (0.56)	1.24 (0.99)	0.22 (0.21)	0.64 (0.60)	0.39 (0.30)	0.24 (0.20)
GDP growth	0.13* (1.96)	0.11 (1.52)	0.14** (2.00)	0.13** (2.01)	0.13* (1.93)	0.17** (2.36)
GDP per capita	0.41*** (3.04)	0.42*** (3.27)	0.43*** (3.26)	0.41*** (3.17)	0.43*** (3.21)	0.40*** (3.24)
Tropical area	11.18*** (5.89)	11.35*** (3.97)	9.68*** (4.27)	10.69*** (4.59)	10.31*** (4.65)	10.63*** (4.34)
Distance to coastline	4.43* (1.78)	3.95 (1.20)	4.19 (1.63)	4.34* (1.80)	4.33* (1.71)	4.35 (1.63)
Ethnic fractionalization	-4.10** (-2.12)	-3.79 (-1.22)	-4.87* (-1.97)	-4.56* (-1.73)	-4.52** (-2.37)	-4.42** (-2.14)
War	1.12 (0.67)	1.10 (0.70)	1.31 (0.75)	1.11 (0.72)	1.20 (0.75)	1.09 (0.64)
Transition country	3.06 (1.20)	2.81 (0.90)	2.08 (0.80)	3.05 (1.15)	2.36 (0.75)	2.30 (0.92)
Number of observations	201	191	201	201	201	200
Number of countries	70	66	70	70	70	70
R^2	0.63	0.62	0.62	0.63	0.63	0.64
Standard error of regression	1.69	1.65	1.69	1.68	1.70	1.70
F -statistic	24.63***	22.63***	23.95***	24.09***	24.24***	25.09***
Hausman test	1.92	1.98	2.33	1.28	2.14	2.28

^{a)} Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996 and 2000 to 2003. The following variables were lagged by one year: 'legal system quality', 'judicial independence', 'impartial courts', 'protection of intellectual property', 'no or little military interference', 'integrity of the legal system', 'flexible labor market regulations', 'low top marginal tax rate', 'GDP growth'. Heteroskedasticity-consistent t -statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain year dummies and a constant term.

Table 6. Regressions to explain the female employment rate^{a)}

	(1)	(2)	(3)	(4)	(5)	(6)
Legal system quality	2.99 (0.50)					
Judicial independence		3.13* (1.75)				
Impartial courts			-0.71 (-0.23)			
Protection of intellectual property				2.53 (0.56)		
No or little military interference					-4.12 (-1.04)	
Integrity of the legal system						2.66*** (2.94)
Flexible labor market regulations	2.42 (0.52)	2.22 (0.57)	3.70 (1.07)	2.15 (0.41)	4.49 (1.07)	3.59 (1.14)
Low top marginal tax rate	-0.59 (-0.41)	0.29 (0.25)	-0.61 (-0.47)	-0.39 (-0.33)	-0.22 (-0.12)	-0.87 (-0.57)
GDP growth	0.06 (0.72)	0.04 (0.39)	0.07 (0.77)	0.06 (0.75)	0.07 (0.80)	0.10 (0.98)
GDP per capita	0.54*** (3.44)	0.54*** (3.56)	0.55*** (3.54)	0.54*** (3.64)	0.55*** (3.40)	0.52*** (3.61)
Tropical area	10.26*** (7.95)	10.65*** (7.43)	9.30*** (12.55)	10.01*** (7.00)	8.31*** (10.74)	10.08*** (10.43)
Distance to coastline	6.22 (1.58)	6.05 (1.20)	6.10 (1.58)	6.19 (1.65)	5.78 (1.37)	6.23 (1.44)
Ethnic fractionalization	-4.66 (-1.41)	-4.27 (-0.79)	-5.14 (-1.45)	-4.91 (-1.33)	-5.61 (-1.30)	-4.80 (-1.26)
War	-0.07 (-0.06)	-0.13 (-0.13)	-0.06 (-0.05)	-0.18 (-0.16)	-0.38 (-0.58)	-0.04 (-0.03)
Transition country	8.34*** (4.01)	8.07*** (2.61)	7.78*** (3.10)	8.44*** (3.78)	8.10*** (2.80)	7.79*** (3.45)
Number of observations	197	187	197	197	197	196
Number of countries	69	65	69	69	69	69
R ²	0.49	0.49	0.48	0.48	0.49	0.49
Standard error of regression	1.74	1.68	1.73	1.72	1.70	1.72
F-statistic	13.27***	12.91***	13.15***	13.22***	13.47***	13.43***
Hausman test	5.84	4.40	6.57	4.22	8.97	4.26

^{a)} Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996 and 2000 to 2003. The following variables were lagged by one year: 'legal system quality', 'judicial independence', 'impartial courts', 'protection of intellectual property', 'no or little military interference', 'integrity of the legal system', 'flexible labor market regulations', 'low top marginal tax rate', 'GDP growth'. Heteroskedasticity-consistent *t*-statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain year dummies and a constant term.

Table 7. Regressions to explain the youth employment rate^{a)}

	(1)	(2)	(3)	(4)	(5)	(6)
Legal system quality	24.10*** (2.62)					
Judicial independence		15.11*** (21.33)				
Impartial courts			11.36** (2.32)			
Protection of intellectual property				10.88*** (3.03)		
No or little military interference					-17.45*** (-3.96)	
Integrity of the legal system						9.69** (2.46)
Flexible labor market regulations	24.26*** (5.89)	24.84*** (5.97)	25.57*** (6.48)	23.09*** (6.60)	28.39*** (11.29)	28.97*** (9.41)
Low top marginal tax rate	6.52** (2.59)	7.16** (2.01)	7.03*** (2.68)	6.38** (2.49)	6.30* (1.97)	4.54 (1.40)
GDP growth	0.17 (0.98)	0.09 (0.47)	0.13 (0.79)	0.17 (0.94)	0.10 (0.64)	0.23 (1.46)
GDP per capita	0.16 (0.39)	0.22 (0.60)	0.23 (0.57)	0.21 (0.54)	0.23 (0.60)	0.17 (0.41)
Tropical area	28.99*** (4.07)	26.59** (2.40)	24.86*** (3.31)	24.06** (2.47)	14.66* (1.74)	26.87*** (4.39)
Distance to coastline	3.78 (1.60)	4.54 (1.51)	5.57* (1.91)	5.89** (2.24)	9.80*** (3.70)	5.76** (2.24)
Ethnic fractionalization	-8.60 (-1.24)	-9.88 (-1.38)	-12.02* (-1.92)	-11.89 (-1.55)	-18.15** (-2.60)	-10.85 (-1.52)
War	3.59* (1.72)	3.90** (2.38)	2.87** (2.24)	2.92** (2.00)	4.14* (1.98)	4.85* (1.83)
Transition country	-9.25 (-1.28)	-9.03 (-1.08)	-9.92 (-1.34)	-10.58 (-1.15)	-13.85 (-1.57)	-12.75 (-1.57)
Tertiary enrollment rate	2.66 (0.59)	1.59 (0.29)	3.36 (0.58)	1.58 (0.33)	3.27 (0.51)	5.33 (0.77)
Number of observations	138	133	138	138	138	138
Number of countries	38	38	38	38	38	38
R^2	0.39	0.35	0.37	0.33	0.32	0.36
Standard error of regression	3.33	3.34	3.40	3.17	3.03	3.22
F -statistic	5.54***	4.61***	5.09***	4.33***	4.13***	4.86***
Hausman test	15.34	10.78	18.11*	6.36	12.45	6.73

^{a)} Feasible generalized least squares estimates with country-specific random effects (Swamy-Arora method). All regressions are based on data for the years 1995, 1996 and 2000 to 2003. The following variables were lagged by one year: 'legal system quality', 'judicial independence', 'impartial courts', 'protection of intellectual property', 'no or little military interference', 'integrity of the legal system', 'flexible labor market regulations', 'low top marginal tax rate', 'GDP growth'. Heteroskedasticity-consistent t -statistics in parentheses (White method). ***(**/*) denotes statistically significant at the 1%(5%/10%) level. All regressions also contain year dummies and a constant term.