The Determinants of Labor Market Institutions: 
A Panel Data Study

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Abstract

This paper analyzes the argument that labor market institutions can be thought of devices for social insurance. It investigates the hypotheses that a country’s exposure to external risk and ethnic fractionalization are correlated with labor market institutions. Extreme bounds analysis with the panel data of 40 years indicates that there is no robust evidence of positive correlation between external risk and the structure of labor market institutions, while ethnic fractionalization is robust negatively correlated with the institutions.

JEL classification: C23, J08, P48.

Keywords: labor market institutions, external risk, ethnic fractionalization, extreme bounds analysis.

1 Introduction

It is a widespread belief that rigidities imposed by labor market institutions cause long-term high unemployment in Europe. In the middle of the 1990s, the OECD released a series of publications recommending labor market deregulation as a remedy for the high and persistent unemployment problem.1 Since then, a large literature has been developed about the effects of labor market institutions on economic performance. Nickell and Layard (1999) argue that the

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1See inter alia "The OECD Jobs Strategy: Enhancing the Effectiveness of Active Labor Market Policies (1996)" and "Implementing the OECD Jobs Strategy: Member Countries’ Experience (1997)."
existence of strong unions and generous and long-lasting unemployment benefits can raise unemployment and lower economic growth. Similarly, Elmeskov et al. (1998) suggest that strict regulations on firing, high tax wedge, and generous unemployment benefits create structural unemployment in the OECD countries. However, what they overlook is the potential endogeneity of the institutional variables.

This study instead looks at labor market institutions from the opposite direction and explains why such labor market institutions are created in the first place. It investigates two hypotheses for why some countries have so-called "rigid" labor market institutions, while others have developed more flexible labor markets. The first hypothesis is that a country’s exposure to external risk affects the structure of labor market institutions. The idea starts from Rodrik’s (1998) analysis on the correlation between a country’s exposure to international trade and the size of its government. According to Rodrik (1998), since public sector is relatively safe against external risk, more open countries tend to develop larger public sectors. Agell (1999, 2002) also views labor market institutions as devices to reduce external risk. He argues that globalization, on one hand, increases the efficiency costs associated with labor market institutions. On the other hand, it may also lead to an increased demand for labor market institutions to protect workers from increasing external risk. Hence, it is not obvious whether a country’s exposure to international trade leads to more or less rigid labor market institutions.

The second hypothesis is that the degree of ethnic fractionalization is related to the structure of labor market institutions. Both theoretical implications and empirical evidences by Alesina et al. (1999) support that ethnic fragmentation of a society is a determinant of institutions. Different ethnic groups often represent diversified preferences and income levels, which makes it difficult to pool resources together to provide public goods. This paper examines the similar logic for labor market institutions. A country with highly heterogenous ethnic groups tends to develop labor market institutions that follow laissez-faire, while the homogenous counterpart tend to develop labor market institutions that are
organized collectively.

The empirical analysis is based on a novel panel dataset, which is rich in institutional content and in longitude. The dataset of 20 OECD countries over 40 years contains not only the data on government consumption and social security transfers, which are analyzed by Rodrik (1998), but also institutions such as net union density, generosity and duration of unemployment benefits, employment protection. This enables us to extend Rodrik’s (1998) argument to more institutions, and to analyze a more homogenous sample of countries. Furthermore, this study enriches Agell’s (2002) analysis, which uses cross-sectional data of 25 OECD countries, by having a panel data dimension going back to 1960. Another distinctive contribution of this study is the systematic sensitivity analysis. The results of empirical studies with macroeconomic data are often sensitive to the set of conditioning variables. To obtain robust results, I use the extreme bounds analysis (EBA) along the lines of Levine and Renelt (1992).

I found less clear-cut results than those of Rodrik (1998). Exposure to external risk is not always positively correlated with the institutions, and the degree of fragility/robustness varies among different labor market institutions. I obtain a highly robust negative correlation between ethnic fractionalization score and several institutions. The result is consistent with Alesina et al. (1999) and Agell (2002). Ethnic fractionalization is widely accepted as an exogenous variable. Hence, the correlation between ethnic fractionalization and the structure of labor market institutions can be interpreted as causation. However, as is always the case in studies using aggregate data, it is almost impossible to make a conclusion of an indisputable causation.

The remainder of this paper is organized as follows. In the following section, I review a theoretical model by Rodrik (1998) on the relationship between openness to international trade and institutions. The section also discusses the role of ethnic fragmentation in determining the structure of institutions. In section 3, I discuss the econometric methodology and present the data. Section 4 presents the results from the extreme bounds analysis. Section 5 discusses endogeneity issues, and Section 6 concludes. In appendix A, all variables and
their sources are described in detail.²

2 The theoretical background

2.1 Rodrik’s model on the role of openness

The model shows how government spending through final good consumption can provide social insurance in an economy subject to external risk. Assume a small open economy. In this economy a fixed supply of a domestically manufactured good \( x \) is exported at the price \( \pi \), which is the price of the export good in terms of an import good. It is stochastic and distributed with mean \( \pi_m \) and variance \( \pi^2 \). Beside the export good, the economy produces two additional goods: a publicly produced good and a private good, which are perfect substitutes in consumption. The economy’s labor endowment is normalized to unity, with \( \lambda \) the share of the publicly employed workers and \( 1 - \lambda \) employment in the private sector. For simplicity, all imports are assumed to be intermediate goods used to produce private goods. The production function for the private sector is linear in labor. Trade must be balanced continuously. Hence, the economy can afford \( \pi x \) of intermediate goods, and with these intermediate goods the private sector produces \( Q(1-\lambda) \), letting production unit parameter \( Q \equiv \pi x \). The supply of the publicly produced good is \( g(\lambda) \), which is at least twice-differentiable with \( g' > 0 \) and \( g'' < 0 \). The government maximizes the expected utility of a representative household, \( u(.) \), where \( u' > 0 \) and \( u'' < 0 \), by determining the optimal level of public employment \( \lambda^* \), before the terms of trade \( \pi \) is known. The government’s problem is

\[
\max_{\lambda} V(\lambda) \equiv E[u(g(\lambda) + Q(1 - \lambda))].
\]

²Appendix I and II, which are available from the author upon request, provide detailed results from the EBA and summaries the EBA results using data between years 1960 and 1994, and between years 1960 and 1989.
A second-order Taylor expansion around the mean $\pi_m$ and the mathematical expectation give

$$V(\lambda) \equiv E[u(g(\lambda) + Q(1 - \lambda))] \approx u(g(\lambda) + x\pi_m(1 - \lambda)) + \frac{1}{2} x^2 (1 - \lambda)^2 \sigma_\pi^2 u''(g(\lambda) + x\pi_m(1 - \lambda)).$$

The first-order condition is then

$$\left[u(.)' + \frac{1}{2} z^2 (1 - \lambda)^2 u(.)''\right] [g'(\lambda) - x\pi_m] - (1 - \lambda)z^2 u(.)'' = 0, \quad (1)$$

where the term $z \equiv x\sigma_\pi$ is a measure of the country’s exposure to external risk. It is obvious that the last term of the left-hand side of equation (1) is positive. If the household is assumed to be prudent, i.e. $u(.)'' > 0$, the first square bracket of the left-hand side is also positive. Then, it must be that $g'(\lambda) < x\pi_m$ if the first order condition is to hold.

Under full certainty, where $z = 0$, government will find that it is optimal to set the share of public employment $\lambda^*$ at the point where the marginal product of public production equals the marginal product of private production, $g'(\lambda) = x\pi_m$. If the economy is subjected to positive external risk $z > 0$, the public employment should be set at the level where $g'(\lambda) < x\pi_m$. Due to convexity of the public sector production function, this gives an intuitive implication that as external risk increases, it is optimal to increase the size of the public sector.

This simple model provides an important link to the first hypothesis on a correlation between external risk and labor market institutions. In this model, the government’s device to provide social insurances against external risk are limited to public production. In fact, many of the OECD countries can use other social insurance devices such as unemployment benefits and employment protection legislation. Hence, countries exposed to larger external risk due to globalization will have strong incentives to develop comprehensive labor market institutions.\(^{3}\) Lindbeck (1975) acknowledged that through extensive labor

\(^3\text{See Agell (1999).}\)
market policies which include not only unemployment compensation, but also subsidies to firms to retain and retrain workers, as well as through large increase in public employment, governments can smooth out shocks in an open economy.

2.2 The role of ethnic fractionalization

Another possible determinant of the structure of labor market institutions is the degree of ethnic fractionalization. Economists have been arguing that public policy and ethnic fragmentation are strongly correlated. From a model, where an individual can choose between non-excludable public good and private good, Alesina et al. (1999) explain that if there is preference polarization, people would prefer to keep taxes low and devote more resources to private consumption rather than public consumption. Although the model refers to preference polarization from interest group conflict, the authors assure that it is strongly associated with ethnic fragmentation. This happens for two reasons. One is that different ethnic groups have different preferences over which type of public good to produce. The other is that each ethnic group’s utility level for a given public good is reduced if other groups also use it. As a result, more ethnic fragmentation leads to fewer resources pooled together to provide non-excludable public goods or social insurances. Likewise, an ethnically homogenous country is more likely to have stronger support for social insurances through extensive labor market institutions.

From the historical evidence comparing the United States and Sweden in the late 19th century, Agell (2002) points out that it appears to have been more difficult to build up labor market institutions that are organized along collective lines in an environment with largely heterogeneous ethnic groups. While it may turn out to be conflicts of interests among heterogeneous groups of the workforce in polarized countries such as the United States, a country with a largely homogenous population can provide a higher degree of social insurances through labor market institutions. This is why this study explores whether ethnic diversity affects the structure of labor market institutions.
3 Method and Data

There have been a number of empirical studies that identify determinants of institutions. Most studies of this literature have predominantly presented results from simple linear regressions with a few explanatory variables. There is no systematic sensitivity analysis being done. Reporting the estimates from a few specifications often gives misleading inferences, because the estimated coefficients on explanatory variables might depend on the selection of control variables.

Systematic sensitivity analysis is essential, since these results are often fragile, in the sense that they are only valid conditional on a specific set of control variables. Leamer (1985) was the first to develop "global sensitivity analysis". Levine and Renelt (1992) later adopt a particular version of this sensitivity analysis. My empirical investigation follows their method of the extreme bounds analysis (EBA) to identify robust associates of labor market institutions. I first describe the procedure of the EBA, and then turn to discuss the choice of variables.

3.1 Method of Extreme Bounds Analysis

The extreme bounds analysis (EBA) starts from an equation of the form

\[ Y = \beta_I I + \beta_M M + \beta_Z Z + u, \]  

where \( Y \) is the dependent variable, \( M \) is a set of explanatory variables, \( I \) is a set of control variables always included in the regression, and \( Z \) is a subset of conditioning variables taken from the full set of potentially relevant variables.\(^4\) Finally, \( u \) is an error term.

The procedure of the EBA is as follows. First, I run a base regression that

\(^4\) The difference between \( I \)-variables and \( Z \)-variables is that \( I \)-variables are "standard" control variables in aggregate data analysis, while \( Z \)-variables are possible additional economic explanatory variables, which according to the literature may be related to the structure of institutions.
includes only the \( I \)-variables and the variable of interest, \( M \). Then, I re-estimate the model, including all possible linear combinations of up to three \( Z \)-variables.\(^5\) The basic idea of an EBA is to analyze the consequences of changing the set of conditioning variables \( Z \) for the estimated effect of the variable of interest \( M \), on the dependent variable. Hence, I identify the highest and lowest values for the coefficient estimates on the variable of interest, \( \beta_M \).\(^6\) The extreme upper and lower bounds are defined as the maximum value of \( \tilde{\beta}_M + 2\tilde{\sigma}_M \) respective the minimum value of \( \tilde{\beta}_M - 2\tilde{\sigma}_M \).\(^7\) The \( M \)-variable is referred to be "robust," if the coefficient estimates are significant at the 5% level in all regressions and of the same sign at the two extreme bounds.

These criteria of robustness are strict. Sala-i-Martin (1997) argues that almost all hypotheses will be rejected if one applies the strict EBA criteria. He instead considers the entire distribution of the estimated coefficients. Alternatively, Widmalm (2001) simply relaxes the level of significance from 5 to 10 percent level. I assess the robustness as Widmalm (2001).

3.2 Data

This study examines the hypothesis that there exists a correlation between a country’s exposure to external risk and ethnic fractionization, and the structure of labor market institutions, using a panel data set. The panel approach allows us to control for time- and country-specific fixed effects. The equation to estimate is

\[
Y_{it} = c_i + \delta_t + \beta_I I_{it} + \beta_M M_{it} + \beta_Z Z_{it} + u_{it},
\]  

\(^5\) Restricting the total number of RHS variables helps to reduce problems of multicollinearity.

\(^6\) In Appendix I, which is available from the author upon request, I call the highest and lowest values of the beta coefficients as "high" and "low".

\(^7\) \( \tilde{\beta}_M \) and \( \tilde{\sigma}_M \) denote the maximum value of the coefficient estimates and its standard error. \( \beta_M \) and \( \sigma_M \) denote the equivalent for the minimum value.
where $Y_{it}$ is an index of a labor market institution, $\delta_t$ is a time-specific effect, and $c_i$ is a country-specific effect. I let $I_{it}$ and $Z_{it}$ denote a vector of the control variables that are always included and a vector of the conditioning variables that are selectively included as potential explanatory variables, respectively. $M_{it}$ is a vector of the variables of my primary interest. All three sets of variables are country-specific and time-varying. The term $u_{it}$ is an independent normal random residual.

I choose the fixed effects model. It is generally more appropriate than a random effects model for cross-country aggregated data for two reasons. Firstly, if the individual effect represents omitted variables, it is highly likely that these country-specific characteristics, given by $c_i$, are correlated with the other regressors. The fixed effects estimator is consistent in the presence of time-constant omitted variables that can be arbitrarily correlated with the observable covariates. Secondly, it is also fairly likely that a macro panel will contain most of the countries of interest and, thus, will be less likely to be a random sample from a much larger universe of countries.

My panel dataset consists of 20 OECD countries over the periods between 1960 and 1999. Among them are 15 European countries, and the rest are Australia, Canada, Japan, New Zealand, and the United States. Since I focus on the long-term factors that are associated with labor market institutions, all observations are compiled averages starting from year 1960-1964 and ending with 1995-1999, which makes 8 time periods.

In this paper, a number of labor market institutions are analyzed. The dependent variables are duration and replacement ratio of unemployment benefits ($bd$ and $brr$), employment protection ($ep$), tax wedge ($tw$), net union density

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8I ran the Hausman specification test including all control and explanatory variables. For indices of benefit durations, employment protection, government consumption, government employment, and net union density, $\chi^2$ exceeds 20 and there is evidence that supports a fixed effects model above a random effects model. For the rest of the institutional indices, no significant differences of the zero-correlation of the unobserved heterogeneity $c_i$ and the covariates assumption are observed.

9The 15 European countries are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. Up until 1989, Germany refers to West Germany.
(udnet), and civilian government employment as a percentage of the working age population (govemp). Indices for the first five institutional variables are taken from "Labor Market Institutions Database" by Nickell and Nunziata (2001). Figures 1-5 show the development of labor market institutions of selected countries.\textsuperscript{10}

Figure 1 shows the benefit duration. Benefit duration is constructed as a weighted average of the replacement received during the first five years of unemployment. If the benefit provision stops after one year, then the $bd$ index is 0. If the benefit provision does not depend on unemployment duration, $bd$ is 1. The development of $bd$ index is notably different from the stylized facts on labor market institutions. For example, Sweden, which is a representative country with extensive labor market institutions, has one of the lowest benefit durations after Japan in practice.\textsuperscript{11}

The benefit replacement ratio attributes to first year of before tax unemployment benefits averaged over family types of recipients. The benefits are a percentage of average earnings before tax. Since 1970, there has been a great gap in the development of benefit replacement ratio between the European countries and the non-European countries as is shown in Figure 2.

Figure 3 shows development of employment protection. The index is primarily constructed by Blanchard and Wolfers (1999) following the OECD practice. They take a weighted average of indices for notice period and severance pay measured by months putting a weight of one on the severance pay and a weight of 0.75 on notice.\textsuperscript{12} The range of the index for employment protection is [0, 2] increasing with strictness of employment protection. Southern European countries such as Italy, Portugal, and Spain have typically the strictest employment protection, while the United States, the United Kingdom, and Canada have less extensive regulations.

\textsuperscript{10}"Europe 14" is unweighed averages of 14 European countries excluding the United Kingdom.

\textsuperscript{11}This is due to the fact that duration of unemployment benefit in Sweden is formally maximum 300 days.

\textsuperscript{12}See "Data Appendix" of Blanchard and Wolfers (1999) for more detail.
Figure 1: Development of benefit duration. Note: The index is increasing in received duration of unemployment benefits. "Europe 14" is unweighted averages of 14 European countries excluding the United Kingdom. Source: "Labour Market Institutions Database" by Nickell and Nunziata (2001).

Figure 2: Development of benefit replacement ratio. Note: The index is a percentage of average earnings before tax. Source: "Labour Market Institutions Database" by Nickell and Nunziata (2001).
The tax wedge is equal to the sum of employment tax rate, direct tax rate, and indirect tax rate. The \textit{tw} index is highest in Sweden over all periods; see Figure 4.

The net union density is constructed as the ratio of total reported union members to the number of wage and salary earners. It is highest in Sweden and lowest in the United States over all periods; see Figure 5.

I also analyze civilian government employment as a percentage of the working age population between 15 and 64. The data is from "Comparative Welfare States Data Set" by Luxembourg Income Study. Rodrik (1997) shows that countries that are greatly exposed to external risk have higher level of government employment.\textsuperscript{13}

Beside these labor market institutions, government consumption (\textit{gove}) and social security transfer (\textit{sstran}) as percentages of GDP are also investigated. The relation between openness and these two variables is previously analyzed\textsuperscript{13}\textsuperscript{13}.

\textsuperscript{13}His analysis is based on the cross-sectional data for 138 countries in early 1980s.
Figure 4: Development of tax wedge. *Note:* It is the sum of employment tax rate, direct tax rate, and indirect tax rate. The range is [0,1]. *Source:* "Labour Market Institutions Database" by Nickell and Nunziata (2001).

Figure 5: Development of net union density. *Note:* It is the ratio of total reported union members to the number of wage and salary earners. *Source:* "Labour Market Institutions Database" by Nickell and Nunziata (2001).
Table 1: Descriptive statistics for the dependent variables.

<table>
<thead>
<tr>
<th>Y</th>
<th>Description</th>
<th># Obs</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>bd</td>
<td>Benefit duration index.</td>
<td>157</td>
<td>0.425</td>
<td>0</td>
<td>1.041</td>
<td>0.347</td>
</tr>
<tr>
<td>brr</td>
<td>Benefit replacement ratio.</td>
<td>157</td>
<td>0.392</td>
<td>0.016</td>
<td>0.769</td>
<td>0.187</td>
</tr>
<tr>
<td>ep</td>
<td>Employment protection index.</td>
<td>157</td>
<td>1.026</td>
<td>0</td>
<td>2</td>
<td>0.586</td>
</tr>
<tr>
<td>govc</td>
<td>Government consumption.</td>
<td>160</td>
<td>18.279</td>
<td>8.838</td>
<td>30.673</td>
<td>4.458</td>
</tr>
<tr>
<td>govemp</td>
<td>Civilian government employment.</td>
<td>139</td>
<td>10.094</td>
<td>4.514</td>
<td>24.728</td>
<td>4.589</td>
</tr>
<tr>
<td>sstran</td>
<td>Social security transfers.</td>
<td>160</td>
<td>13.084</td>
<td>2.26</td>
<td>27.5</td>
<td>5.020</td>
</tr>
<tr>
<td>tw</td>
<td>Tax wedge.</td>
<td>149</td>
<td>0.465</td>
<td>0.190</td>
<td>0.805</td>
<td>0.129</td>
</tr>
<tr>
<td>udnet</td>
<td>Net union density.</td>
<td>157</td>
<td>0.416</td>
<td>0.09</td>
<td>0.900</td>
<td>0.180</td>
</tr>
</tbody>
</table>

by Rodrik (1998) over a shorter time period. I include these institutions, since they might provide contrasting results compared to labor market institutions. Table 1 describes the descriptive statistics for the dependent variables.

The $M$-variables, the factors of my primary interest, are variables measuring a country’s exposure to external risk and ethnic heterogeneity. To capture external risk, I use two variables $exrisk$ and $lnopen$. The interaction variable $exrisk$ is a product of openness and volatility in terms of trade. The variable $lnopen$ is natural logarithm of openness. Cameron (1978) was the first one to suggest that the openness of an economy is the best single predictor of the growth of public economy. Rodrik (1998) finds a positive relationship between spending on social security and welfare and exposure to external risk for the OECD countries. With the cross-country data of a large sample, Rodrik (1997) reports evidence that exposure to external risk is closely associated with levels of government employment. Figure 6 shows development of openness. All 20 countries become more open over time. Small countries such as Denmark, Belgium, and Netherlands tend to be more open than large countries. The least open economy is the United States.

Another $M$-variable is a measure of ethnic fractionalization $ethkra$, taken from Krain (1997). This index is constructed by calculating the proportion of the population of each ethnic group to the total population of the country, and then squaring it. The squared proportions for all groups are summed, and

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14 His analysis was based on data for the 18 countries over the period 1960-75. He defined the size of public economy as the ratio of governmental revenues to GDP.
that number is then subtracted from 1 (Krain, 1997). A high score, such as Canada’s 0.75, indicates many groups with small or relatively equal percentage of the population. A low score, such as Japan’s 0.01, indicates that population is very homogenous. In empirical literature, an ethno-linguistic fractionalization index is widely used in cross-sectional analyses. I use the new ethnic fractionalization index by Krain (1997) for my panel data application, since linguistic cleavages do not always correspond to ethnic ones, and the index is available over a longer time period. However, there are some properties of the ethnic fractionalization data that are doubtful. One of the most significant problems is that the last observation for data collection ends in year 1978. Krain (1997) simply continued the observation until year 1990, which corresponds to the period 1995-1999 in my panel data set, since I use lagged values on this variable. Furthermore, since it is observed in every 10 years, it fails to describe short-term variation of ethnic fractionalization. For example, the data describes that Sweden becomes more homogenous over time, which does not reflect the picture.
of the latest 10 years.\footnote{According to information from the Swedish Migration Board, the number of foreign nationals in Sweden has been the highest during years 1990 and 1995.} Despite such weaknesses, the data has been widely used in political science literature. To avoid problems with missing observations and to increase robustness of the results, I conduct two additional sets of extreme bounds analysis (EBA), one with the data of 35 years, which gives observations of 7 time periods, and the other with the data of the first 30 years, which makes 6 time periods. The overall results of this study is unaffected by the problems of the ethnic fractionalization data.\footnote{I call these additional sets of EBA test as EBA1 and EBA2. The summary of EBA1 and EBA2 results are reported in Appendix II. Using shorter time periods do not change my results significantly, except that ethnic fractionalisation is no longer robust in the equation of benefit replacement ratio and tax wedge.}

Agell (2002) finds significant negative correlations between ethno-linguistic fractionalization and some of the labor market institutions. This supports the hypothesis that countries with homogenous populations are more prone to develop extensive labor market institutions. Figure 7 shows the changes of ethnic fractionalization scores of selected countries over 40 years. There is very little variation on the ethnic fractionalization score, since a large-scaled migration that change ethnic proportion is a phenomenon that happens over a much longer period of time than 40 years.

The $I$-variables that are always included in the regressions should be undoubtedly argued as basic underpinnings of institutions. I choose natural logarithms of GDP per capita $\ln gdpc$ and total population $\ln popul$.\footnote{In many empirical studies in political economy and economic growth literature, GDP per capita and population are often chosen as control variables. See Levine and Renelt (1992), and Wildmalm (2001)} The variable $\ln gdpc$ measures economic affluence of citizen of a country. According to Wagner’s (1883) law, one can expect that citizen’s demands for public services are increasing in economic affluence. However, Cameron’s (1978) analysis points out that the rate of growth in the economic affluence of a country does not contribute to the expansion of the public economy. Whereas one cannot expect whether GDP per capita is positively or negatively associated with labor market institutions, it is necessary to control for the degree of economic affluence of a
The base variable \textit{lnpopul} is a proxy to the size of the country or the size of total labor force. Alesina and Wacziarg (1998) argue that smaller countries have a larger share of public consumption in GDP, and are also more open to trade. Instead of the direct link between openness and government size, they argue that the link is mediated by country size. Large countries can afford to have smaller government and get benefits from a sizable domestic market. Moreover, Wallerstein’s (1989) cross-national analysis with the data for the period of the late 1970s finds a negative relationship between the size of the labor force and unionization rates. Controlling for country size is therefore necessary in order to extract the effect of openness on labor market institutions. In my dataset, the smallest country in terms of population is New Zealand, and the largest one is the United States.

The potential conditioning variables, \textit{Z}-variables, are drawn from those acknowledged by other studies as potential determinants of the labor market insti-
tutions. They should be reasonably argued to be exogenous to the base control variables. Also, one should avoid including variables that might measure the same factor. I first choose the dependency ratio, which is equal to the number of persons younger than age 15 and older than age 65 divided by the number of persons of working age. Intuitively, government consumption and social security transfer necessarily increase in dependency, since the recipients of social welfare increase. Rodrik (1998) obtains a positive and significant at the 99 percent level correlation between the dependency ratio and the share of government consumption in GDP.

Labor market institutions may also reflect changes in the economic structure. In order to capture the changes in industrial structure, I include civilian employment in industrial sector as a percentage of total civilian employment. Blaschke (2000) observes that unionization rates are usually higher in industry and the public sector, and lower in agriculture and private sectors.

Political attitude is controlled by the variable right. This is the cabinet composition of right-wing parties in percentage of total cabinet posts weighted by days. Intuitively, right-wing parties are commonly thought of as being biased against 'labor,' favoring flexibility in a labor market, while left-wing parties are commonly thought of as being in favor of 'labor,' favoring more regulation. Cameron (1978) finds that whether a nation’s government was generally by leftist parties or by non-leftist parties provides a strong clue to the relative degree of change in the scope of the public economy. Saint-Paul (1996) also reports results indicating that the existence of a right-wing government slows down the growth rate of minimum wage.

In addition, I include the financial openness index \( \text{ln\open} \) in the set of \( Z \)-variables. The range of the index is \([0, 14]\) increasing with the degree of openness in financial institutions. Svaleryd and Vlachos (2002) find that there exists a significant relationship between financial development and openness to trade. Financial openness might affect labor market institutions due to its risk-sharing feature. Other things being equal, a country with highly open financial institutions has a better chance of risk-sharing. It may, therefore, have relatively
less incentive to use labor market institutions as a device of risk-sharing. In other words, financial institutions might work as a substitute to labor market institutions.

Finally, I choose unemployment rate as a potential factor that is associated with labor market institutions. Agell (2002) argues that risks of being unemployed call for social insurances via labor market institutions. Then, institutions such as generosity and duration of unemployment benefits might increase in unemployment rate. Elmeskov et al. (1998) find a highly significant evidence of Granger causality from high unemployment to high unemployment benefits and tax wedge.\textsuperscript{18} Saint-Paul (1996) remarks that higher exposure to unemployment facilitates a reduction in the level of employment protection. On the other direction of causality, Blanchard and Wolfers (1999) find that the interaction between shocks and institutions is crucial to explaining unemployment. Nickell (1997) argues that generous unemployment benefits increase the equilibrium unemployment rate, while employment protection both decreases the flows of workers through the labor market, and increase the duration of unemployment. To reduce the obvious problem of reverse causality, I use lagged values of the unemployment rate. Moreover, the unemployment rate is used only as a conditioning variable, rather than as a primary explanatory variable. In other words, I am interested in whether including or excluding the unemployment rate changes the relationship between the $M$-variables and the indices of labor market institutions. The direct effect of unemployment rates on labor market institutions is beyond the scope of this study. Table 2 shows the descriptive statistics for the right-hand side variables.

\textsuperscript{18}The analysis is based on 19 OECD countries during the period 1970-1995.
Table 2: Descriptive statistics for the explanatory and control variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th># Obs</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>Std. dev.</th>
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<tr>
<td>open</td>
<td>Openness</td>
<td>160</td>
<td>40.873</td>
<td>5.382</td>
<td>124.192</td>
<td>22.315</td>
</tr>
<tr>
<td>exrisk</td>
<td>Openness * terms of trade</td>
<td>157</td>
<td>1.601</td>
<td>0.086</td>
<td>8.230</td>
<td>1.302</td>
</tr>
<tr>
<td>ethkraun</td>
<td>Ethnic fractionalization</td>
<td>160</td>
<td>0.157</td>
<td>0.01</td>
<td>0.75</td>
<td>0.200</td>
</tr>
<tr>
<td>gdp</td>
<td>GDP per capita</td>
<td>160</td>
<td>15609.38</td>
<td>3851.96</td>
<td>30203.75</td>
<td>5122.39</td>
</tr>
<tr>
<td>popul</td>
<td>Population</td>
<td>160</td>
<td>36083.7</td>
<td>2483</td>
<td>271433</td>
<td>51810.8</td>
</tr>
<tr>
<td>depend</td>
<td>Dependency ratio</td>
<td>160</td>
<td>35.149</td>
<td>30.404</td>
<td>42.259</td>
<td>2.625</td>
</tr>
<tr>
<td>empind</td>
<td>Employment in industrial sector.</td>
<td>160</td>
<td>33.870</td>
<td>22.14</td>
<td>50.18</td>
<td>6.320</td>
</tr>
<tr>
<td>right</td>
<td>Right-wing cabinet composition.</td>
<td>152</td>
<td>39.116</td>
<td>0</td>
<td>100</td>
<td>34.715</td>
</tr>
<tr>
<td>finopen</td>
<td>Financial openness index</td>
<td>140</td>
<td>10.280</td>
<td>3</td>
<td>14</td>
<td>2.716</td>
</tr>
<tr>
<td>unemploy</td>
<td>Unemployment rate</td>
<td>152</td>
<td>4.882</td>
<td>0.022</td>
<td>19.6</td>
<td>3.725</td>
</tr>
</tbody>
</table>

4 Results

This section presents the results of extreme bounds analysis (EBA). First, I estimate base regressions with the I- and the M-variables; see Table 3. Natural logarithm of openness, lnopen, is positively correlated with the indices of benefit replacement ratio, government consumption, social security transfer, and tax wedge. Another measures of a country’s exposure to external risk, exrisk, is also positively correlated with the indices of benefit replacement ratio, government consumption, government employment, and tax wedge. The degree of ethnic fractionalization is negatively correlated with all institutions except benefit duration. The base regressions estimation suggests that GDP per capita is positively associated with all institutions except net union density, while the size of population does not have a clear relation with any institution except benefit duration.

To obtain robust determinants of labor market institutions sensitivity analysis is performed. I conduct three versions of the sensitivity tests according to different specifications of variables describing a country’s exposure to external risk. In version 1, a country’s exposure to external risk is assessed with the interaction term between openness and annual terms of trade volatility exrisk.

19The fully detailed results of the EBA is displayed in Appendix I, which is available from the author upon request.
<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Dependent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Benefit duration</td>
</tr>
<tr>
<td>lnopen</td>
<td>0.057</td>
</tr>
<tr>
<td>exrisk</td>
<td>-0.017</td>
</tr>
<tr>
<td>ethkrain</td>
<td>1.569*</td>
</tr>
<tr>
<td>lngdpc</td>
<td>0.405*</td>
</tr>
<tr>
<td>lnpopul</td>
<td>-0.620*</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.872</td>
</tr>
<tr>
<td>Explanatory variables</td>
<td>Government employment</td>
</tr>
<tr>
<td>lnopen</td>
<td>0.267</td>
</tr>
<tr>
<td>exrisk</td>
<td>0.329*</td>
</tr>
<tr>
<td>ethkrain</td>
<td>-80.397*</td>
</tr>
<tr>
<td>lngdpc</td>
<td>4.451*</td>
</tr>
<tr>
<td>lnpopul</td>
<td>-1.054</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.806</td>
</tr>
</tbody>
</table>

* The estimated coefficient is significant at the 5. ** equivalent at the 10 percent level.
Version 2 takes natural logarithm of openness \( \ln open \). In version 3, I use both variables \( exrisk \) and \( \ln open \).

- Version 1

\( M \)-variables: \( exrisk \), \( ethkrain \)

\( I \)-variables: \( \ln gdpc \), \( \ln popul \)

\( Z \)-variables: \( \text{depend, empind, right, lninopen, lnopen, unemploy} \)

Table 4: Sensitivity Result, Summary of Version 1.

<table>
<thead>
<tr>
<th></th>
<th>Ver. 1</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( exrisk )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fragile (0)</td>
<td>Fragile (3)</td>
<td>Fragile (0)</td>
<td>Fragile (3)</td>
</tr>
<tr>
<td>( ethkrain )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fragile (1)</td>
<td>Fragile (0)</td>
<td>Fragile (1)</td>
<td>Robust (-)*</td>
</tr>
</tbody>
</table>

**Note**: This table summarizes the EBA results in Table 1-8, Appendix I. Fragile/robust indicates whether the \( M \)-variable is a robust or fragile regressor for the institutional variables according to Levine and Renelt’s (1992) criteria. If fragile, the number in the parenthesis indicates how many additional \( Z \)-variables need to be added before the \( M \)-variable is insignificant or of the wrong sign.

* All the estimated coefficients of the \( M \)-variable are significant at the 5 percent level, and of the same sign.

** Equivalent at the 10 percent level.

When exposure to external risk is assessed as the variable \( exrisk \), it turns out to be fragile for all institutions including government consumption and social security transfers as percentages of GDP; see Table 4. However, the degree of fragility differs. Duration of unemployment benefits, employment protection, social security transfer, and net union density are not correlated with \( exrisk \) from the base equation.\(^{21}\) Benefit replacement ratio \( brr \) is fragile, since it fails to be significant at 10 percent level in one out of 41 specifications. All coefficient estimates of \( exrisk \) for the variable \( brr \) are positive, which means that

\(^{20}\) I also performed the OLS with robust standard errors. The base regression of version 1 indicates that \( ethkrain \) is negatively correlated with the institutions, \( ep, govc, ssstran, tw, \) and \( udnet \).

\(^{21}\) It is denoted as "Fragile (0)".
the level of benefit replacement rate tends to increase in exposure to external risk. Government consumption as a percentage of GDP \( \text{govc} \), which is analyzed by Rodrik (1998), is also positively correlated with \( \text{exrisk} \) in all regressions but fragile, since two estimates turn out to be insignificant at 10 percent level.

The measure of ethnic fractionalization is negatively correlated with government consumption, government employment, tax wedges, and net union density. The correlations are robust in the strict definition of robustness. This supports the second hypothesis that countries with ethnically heterogeneous population have less encompassing institutions compared to those with homogeneous population. This robust negative correlation between ethnic fractionalization score and labor market institutions further confirms findings by Agell (2002).

- **Version 2**

  \( M \)-variables: \( \ln\text{open}, \text{ethkrain} \)

  \( I \)-variables: \( \ln\text{gdpc}, \ln\text{popul} \)

  \( Z \)-variables: \( \text{depend, empind, right, lninopen, exrisk, unemploy} \)

<table>
<thead>
<tr>
<th>Table 5: Sensitivity Result, Summary of Version 2.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ver. 2</strong></td>
</tr>
<tr>
<td>( \ln\text{open} )</td>
</tr>
<tr>
<td>( \text{ethkrain} )</td>
</tr>
<tr>
<td><strong>Ver. 2</strong></td>
</tr>
<tr>
<td>( \ln\text{open} )</td>
</tr>
<tr>
<td>( \text{ethkrain} )</td>
</tr>
</tbody>
</table>

*Note* This table summarizes the EBA results in Table 9-16, Appendix I.
See *Note* in Table 4.

In version 2, exposure to external risk is captured by \( \ln\text{open} \). The \( M \)-variable \( \ln\text{open} \) is positively correlated with government consumption and social security transfers as percentages of GDP, and the relation is robust with different...
degree of robustness; see Table 5. This verifies robustness of Rodrik’s (1998) study. Except these two variables, no labor market institutions are robustly correlated with $\lnopen$. Especially, indices of benefit duration, employment protection, government employment, and net union density are insignificant from the base regressions. For unemployment benefit replacement ratio $\textit{brr}$, only 7 coefficient estimates of $\lnopen$ out of 41 are significant at the 5 percent level and 24 estimates are positive and significant at the 10 percent. In the test for tax wedges, 35 specifications result in positive and significant estimates for $\lnopen$ at 10 percent level.

Ethnic fractionalization is negatively correlated and robust in benefit replacement rate, government consumption, government employment, tax wedges, and net union density. This $M$-variable is robust in the strict definition of robustness in these five institutions.

- Version 323

$M$-variables: exrisk, $\lnopen$, ethkrain

$I$-variables: lngdpc, lnpopul

$Z$-variables: depend, empind, right, lninopen, unemploy

<table>
<thead>
<tr>
<th>Table 6: Sensitivity Result, Summary of Version 3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ver. 3</td>
</tr>
<tr>
<td>exrisk</td>
</tr>
<tr>
<td>$\lnopen$</td>
</tr>
<tr>
<td>ethkrain</td>
</tr>
<tr>
<td>Ver. 3</td>
</tr>
<tr>
<td>exrisk</td>
</tr>
<tr>
<td>$\lnopen$</td>
</tr>
<tr>
<td>ethkrain</td>
</tr>
</tbody>
</table>

*Note* This table summarizes the EBA results in Table 17-24, Appendix I. See *Note* in Table 4.

23The OLS analysis with robust standard errors on base regressions of version 3 indicates that $\lnopen$ is positively correlated all institutions except $\textit{govemp}$ at different significance levels. The variable $\textit{ethkrain}$ is negatively correlated with $\textit{ep}$, $\textit{govc}$, $\textit{sstran}$, $\textit{tw}$, and $\textit{udnet}$ at the 5% significance level.
The results of version 3 are consistent with the results from versions 1 and 2. Ethnic fractionalization remains negative and robust in the regressions for benefit replacement rate, government consumption, government employment, tax wedge, and net union density. For benefit duration, employment protection, and union density, the $M$-variable $exrisk$ is insignificant from the base regressions. The variable $lnopen$ is also insignificant from the base specification in the equations for those three institutions and government employment. In regressions for the institutions that are previously analyzed by Rodrik (1998), government consumption and social security transfer as percentages of GDP are robustly correlated with $lnopen$. Also, for government consumption, all except two estimates of $exrisk$ turn out to be positive and significant at 10 percent level. The $M$-variable $exrisk$ fails to be significant at 10 percent level in only one specification in the regressions of benefit replacement ratio.

To examine if the results depend on the range of countries included, I perform the extreme bounds analysis of version 3 to the 15 European countries. The results are summarized in Table 7. The EBA results using only the data of 15 European countries are not notably different from those with the data of 20 OECD countries. The only difference is that the $M$-variable $ethkrai$ is no longer robust in the regressions of benefit replacement ratio but robust in the regressions of employment protection. Still, $lnopen$ is positive and robust only in the institutions, government consumption and social security transfers as percentages of GDP.
Table 7: Sensitivity Result only for the European countries, Summary of Version 3.

<table>
<thead>
<tr>
<th>Ver. 3</th>
<th>bd</th>
<th>brr</th>
<th>ep</th>
<th>govc</th>
</tr>
</thead>
<tbody>
<tr>
<td>exrisk</td>
<td>Fragile (2)</td>
<td>Fragile (3)</td>
<td>Fragile (0)</td>
<td>Fragile (1)</td>
</tr>
<tr>
<td>lnopen</td>
<td>Fragile (0)</td>
<td>Fragile (0)</td>
<td>Fragile (0)</td>
<td>Robust (+)*</td>
</tr>
<tr>
<td>ethkrain</td>
<td>Fragile (1)</td>
<td>Fragile (0)</td>
<td>Robust (-)*</td>
<td>Robust (-)*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ver. 3</th>
<th>govemp</th>
<th>sstran</th>
<th>tw</th>
<th>udnet</th>
</tr>
</thead>
<tbody>
<tr>
<td>exrisk</td>
<td>Fragile (1)</td>
<td>Fragile (0)</td>
<td>Fragile (1)</td>
<td>Fragile (0)</td>
</tr>
<tr>
<td>lnopen</td>
<td>Fragile (0)</td>
<td>Robust (+)*</td>
<td>Fragile (1)</td>
<td>Fragile (0)</td>
</tr>
<tr>
<td>ethkrain</td>
<td>Robust (-)*</td>
<td>Robust (-)*</td>
<td>Robust (-)*</td>
<td>Robust (-)*</td>
</tr>
</tbody>
</table>

*Note* This table summarizes the EBA results in Table 25-32, Appendix I. See *Note* in table 3.

The extreme bounds analysis suggests the following findings. First, in contrast to the institutions government consumption or social security transfer as percentages of GDP, there exist no robust correlations between a country’s exposure to external risk and labor market institutions. Although positive correlations are found in several specifications, they fail to fulfill the definition of robustness. This notable difference may come from the fact that certain institutions serve more as social insurance devices against external risk, while other institutions work against other types of risk that are not explored in this analysis. In addition, some institutions, especially labor market institutions, may entail larger efficiency costs due to the rigidities. Rigidities of labor market institutions involve both benefits by providing security net against external risk and costs from, for instance, slow adjustment to labor demand or lower price-competitiveness in the global economy, as Agell (2002) acknowledged.

Second, indices for benefit replacement ratio, government employment, tax wedges, and net union density are negatively correlated with ethnic fractionalization score. The relationships are often robust in the strict definition of robustness. Countries with ethnically homogenous populations are prone to develop so-called "rigid" labor market institutions. This result is another strong evidence that public policy and ethnic fractionalization are strongly correlated.
Alesina et al. (1999) found a negative relationship between productive public good provision and ethnic fragmentation in the U.S. local levels. Easterly and Levine (1997), who used ethnic diversity data as measured by language, also reported a strong negative correlation across countries between ethnic diversity and indicators of public goods. Extending the previous studies, the result supports the implication that ethnic fragmentation is an important determinant of institutions, not only to the matter of public finances and provision, but also to several features in labor market institutions. Results from the linear regression analysis are often not sufficient enough to point out a causal relationship. However, ethno-linguistic fractionalization score has been frequently used as an instrument in growth and political economy literature. It is considered to be exogenous in a relatively short time period such as 40 years. It would, therefore, be less disputable to conclude that the ethnic fractionalization score is a determinant of labor market institutions.

5 Endogeneity Issues

In the previous section, I obtain the results that openness is strongly correlated with government consumption and social security transfer, while no robust correlations are found with other labor market institutions. Based on this notable difference, can one conclude that labor market institutions are not devices for social insurances against external risk? The empirical results of political economy should be handled with caution. My analysis is based on the assumption that the variables that describe a country’s exposure to external risk are exogenous. However, it might contain endogeneity problems. Endogeneity of the right-hand side variables can arise from three sources.

Firstly, there might be omitted variables. By using fixed effects model of panel data analysis, unobserved time-constant country effects are controlled for. It is nevertheless not able to control for unobserved time-variant effects such as technological change or business cycle that each country encounters
asymmetrically. Another suspect omitted factor is a variable that captures eventual efficiency cost from rigidity imposed by the labor market institutions. If labor market institutions entail not only welfare benefit by providing social insurances but also efficiency cost, as Agell (2002) argues, including a variable that characterizes welfare cost might give different results.

Secondly, the analysis might contain measurement errors. The measurement errors primarily come from proxy variables. In this analysis I used various proxies, for example, GDP per capita and cabinet composition of right-wing parties to describe the effects that are not directly observable such as economic affluence of citizen and tendency of citizen being leftists or rightists. Also, the variable describing the interaction between openness and annual terms of trade volatility may not be a sufficient measure of a country’s exposure to external risk. Measurement errors, especially those of independent variables, can typically give parameters estimates biased toward zero.

Finally, the variables, $\text{exrisk}$ and $\ln\text{open}$, might be determined simultaneously along with the institutions. Some regulations in labor market can distort production and reduce a country’s export. Koeniger (2001) argues that binding minimum wages makes countries produce relatively more in unskilled labor intensive industries. It lowers the comparative advantage in the production of the skill-intensive good, which in turn reduces the countries openness or terms of trade.

6 Conclusion

In the 1990s, there have been bustling discussions on how various institutions of labor market affect a country’s economic performance. The discussions often ended up with comments that deregulation is a panacea to most of the economic problems. Hardly a decade later, some economists started looking at the question how such institutions have been formed in the first place. Agell (1999, 2002) argued that labor market institutions should be understood as social insurance devices against otherwise uninsurable risks.
This study has shed further light on this literature. For the uninsurable risks, I focused on international trade risks, which are measured by an interaction term between openness and volatility in terms of trade and by openness. Several features of labor market institutions are analyzed. In order to control for unobserved heterogeneity and to analyze the long term development of the institutions, this study used a panel data of 40 years. For robust results, I used the extreme bounds analysis.

The statistical evidence is simple and clear. I have not found any robust evidence that shows correlations between labor market institutions and countries’ exposure to external risk. This may be due to the fact that regulations in labor market not only provide social insurances, but also impose efficiency costs. Without further analysis with more sophisticated set-up, it is difficult to disentangle how social benefits determines the structure of labor market institutions, on one hand, and how efficiency costs are associated with those institutions, on the other.

From testing the hypothesis on ethnic fractionalization as a determinant of institutions, I found robust evidence that the degree of ethnic fractionalization is negatively associated with some features of labor market institutions. This negative correlation extends the previous implications about the role of ethnic heterogeneity on public finance and provision further to labor market institutions context.

Finally, I would like to stress on the limitation of the study. The results of this analysis are only limited to external risk measured by openness and volatility of terms of trade and ethnic fractionalization as potential determinants of labor market institutions. It does not cover any other insurance motive. Also, there might be other factors that make "European" labor market institutions so different from those of "non-European" countries such as people’s preference between equity and efficiency. Analyzing the relationship between citizen’s preference and labor market institutions is a topic for the future research.
Appendix A  Descriptions and Sources of Data

The R.H.S. variables

**open** Openness in constant prices. The total trade, *i.e.* exports and imports, as percentage of CGDP. Source: Penn World Tables (PWT) 6.1. Note: Data for West Germany between 1955-1969 are taken from OECD National Accounts & Historical Statistics.

**exrisk** Openness * volatility in terms of trade. Volatility in terms of trade is standard deviations of percentage changes in terms of trade of goods and services, annual data between 1955-1995. Source: International Financial Statistics. Note: Missing data for Belgium, Denmark, France, and Portugal are from Global Development Network Growth Database, which is originally from Global Development Finance & World Development Indicators, World Bank.

**gdpc** GDP per capita in real GDP per capita (constant prices: Laspeyres). Sources: PWT6.1. Note: The missing data for Germany (1960-1969) are estimated by Table 2. Real GDP per CAPITA, 1993 EKS Benchmark (United States = 100) of "Comparative levels of GDP per capita" from United States Bureau of labor Statistics. Prior to 1991, the data refer to West Germany.

**unemploy** Unemployment rate. The percentage of the people classified as unemployed as a share of the total labor force, 1955-2000. Source: Yearbook of labor statistics (ILO) in various years.


**depend** The number of individuals aged below 15 or above 64 divided by the number of individuals aged 15 to 64, 1960-2000. Source: World Development Indicators (WDI) 2004, World Bank.

**empind** Civilian employment in industrial sector as a percentage of total civilian employment, 1960-2000 for all countries except Belgium and Netherlands (1960-1997). Source: labor Force Statistics OECD.

**ethkrain** New Ethnic fractionalization Score by Krain (1997). Krain (1997) improved the accuracy of this variable slightly by recording the variable as strictly an ethnic fractionalization variable (see the paper for details) and by coding it at four years in the study, each separated by a decade: 1948, 1958, 1968, 1978. Note: The data end at year 1990. Source: Krain, Matthew (1997).
Financial openness index. This index is the sum of index for restrictions on payments and receipts of goods and invisible, index for restrictions on payments and receipts of capital, and an index for legal international agreements that constrain a nation’s ability to restrict exchange and capital flows. The result is a 0-14 measure of financial openness. The data are average of the annual financial openness index from Comparative Political Data Set 1960-1993. Source: "Comparative Political Data Set" by Klaus Armingeon, Michelle Beyer, Sarah Menegale.

right Cabinet composition of right-wing parties in percentage of total cabinet posts, weighted by days, 1960-2002. Source: "Comparative Political Data Set" by Klaus Armingeon, Michelle Beyer, Sarah Menegale.

The L.H.S. variables

bd Benefit durations. The index was constructed by Nickell and Nunziata as a weighted average equal to $bd = \alpha \frac{brr_2}{brr_1} + (1 - \alpha) \frac{brr_4}{brr_1}$, where $brr_1$ is the unemployment benefit replacement rate received during the first year, $brr_2$ is during the second and third year, and $brr_4$ is during the fourth and fifth year of unemployment. They give more weight to the first ratio than the second ($\alpha = 0.6$). Source: labor Market Institutions Database (LMIDB) version 2.00, 1960-1995 by S. Nickell and L. Nunziata (2001). Note: The series end at year 1995.

brr Benefit replacement ratio. The data refers to first year of unemployment benefits, averaged over family types of recipients. Source and Note: See bd. The data is originally provided by OECD with one observation every two years.

ep Employment Protection. Range is $[0,2]$ increasing with strictness of employment protection. Source: See bd. The data are originally provided by Blachard and Wolfers (2000), which were built chaining OECD data with data from Lazear (1990). Note: See bd.

gove General government final consumption expenditure in percentage of GDP, 1960-2000. Sources: WDI. Note: Missing data of Canada (1960-1964), New Zealand (1960-1970), and West Germany (1960-1990) are from "European Macroeconomics" by Manfred Gärtner, originally from Historical Statistics, source OECD.


**tw** Tax wedges. It is equal to the sum of the employment tax rate, the direct tax rate, and the indirect tax rate. Source: All data come from London School of Economics CEP - OECD National Accounts, updated by Nickell and Nunziata. Note: See bd.

**udnet** Net Union Density. It is constructed as the ratio of total reported union members (gross minus retired and unemployed members). Source: Nickell and Nunziata obtained the data from inter alia Visser (1996), Huber et al. (1997), Ebbinghaus and Visser (2000). Note: See bd.

**References**


