

The Impact of Globalization on the Structural Unemployment: An Empirical Reappraisal

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Abstract

This paper analyzes the direct effects of various measures of globalization on the structural unemployment in 87 countries for the period from 1991 to 2014. The model specifications are based on the Ricardian Comparative Advantage and the Heckscher–Ohlin models. It is found that one standard deviation increase in the trade openness approximately leads to 0.6 percentage point lower structural unemployment rate. The effects of economic, social and political aspects of globalization on the structural unemployment are also negative, but they are found as statistically insignificant. The paper also implements various robustness checks and argues potential implications.

Keywords: structural unemployment; long-term unemployment; trade openness; trade policy; globalization outcomes; globalization policy

JEL Classification Codes: F66; F16

1. Introduction

Does globalization level directly affect unemployment in a small-open economy? The answer to this question has a long-lasting theoretical discussion. Some theoretical works show that the effect of globalization on unemployment can be positive, i.e., job destructive (Helpman and Itskhoki, 2010); negative, i.e., job creator (Mitra and Ranjan, 2010); or uncertain (Moore and Ranjan, 2005; Sener, 2001). There are also empirical papers to examine the direct effect of globalization (trade openness) on unemployment. For instance, Dutt et al. (2009) empirically find the robust and the strong evidence in favor of the Ricardian comparative advantage model¹, i.e., the effect of (real) trade openness on the short-term unemployment rate is observed as the negative. They also find that the effect of trade openness on the short-term unemployment rate

¹ The theory of the comparative advantage predicts that different factors of production specialize in different economic activities and this depends on the relative productivity differences, especially the labor as a physical unit (Costinot and Donaldson, 2012).

is not statistically significant for the predictions of the Heckscher–Ohlin model.² Their findings are based on the cross-sectional data estimations for the sample of 89 countries and the data are averaged for the period from 1985 to 2004. Following the related paper, Felbermayr et al. (2011) use the cross-sectional data estimations for 62 countries and the related data are averaged for the period from 1990 to 2007. They also employ the panel data regressions for 20 Organization for Economic Co-operation and Development (OECD) countries. Similarly, they find that a higher (real) trade openness yields to a lower structural (long-term) unemployment.

Our paper combines the empirical models in Dutt et al. (2009) and Felbermayr et al. (2011). What our paper has done is that to use the Ricardian comparative advantage approach and the Heckscher–Ohlin model framework in Dutt et al. (2009) to analyze the long-term (structural) unemployment that is used by Felbermayr et al. (2011). It also uses various control variables in the empirical paper of Dutt et al. (2009) to analyze the effect of international trade on structural unemployment. Furthermore, the impact of not only the (real) trade openness, but also the globalization policy measures (tariff rate, regulatory trade barriers, custom and import duties, trade restrictions index, and capital account restrictions index), as well as the globalization indexes of KOF (actual flows index: nominal trade openness, foreign direct investments, portfolio flows; economic globalization index, political globalization index, social globalization index and overall globalization index) on the structural unemployment are analyzed. Therefore, our paper not only combines the empirical strategies in Dutt et al. (2009) and Felbermayr et al. (2011), but also it enhances and generalizes their empirical models by focusing on various additional globalization policy measures and different aspects of globalization. Following these previous findings, it should be expected that globalization measures yield to a lower structural unemployment, and this hypothesis has been tested by the paper. To this end, the paper uses the cross-sectional data from 87 countries over the period 1991–2014.

The contributions of the paper are as follows. First, to the best of our knowledge, there is no previous paper in the literature to analyze the direct effect of different aspects of globalization on the long-term unemployment.³ Indeed, this is the main contribution of our paper to the existing literature.

² Heckscher–Ohlin model assesses the trade between two countries with varying specialties and the equilibrium of trade depends on the factor endowments. The model indicates that a country produces and exports the goods in which it has the abundant factors and a country imports the goods, in which cannot be produced efficiently.

³ According to the recent literature review of Potrafke (2015), there is no paper that investigates the impact of globalization indexes of KOF on the unemployment rate.

Second, we need to enhance the previous empirical knowledge of the post-global recession period of 2008–9. There is still no empirical paper on the determinants of unemployment for the period of the post-global recession of 2008–9. This is an important phenomenon since the great global recession of 2008–9 had severe negative effects of globalization, related to the collapse in the world's trade volume. In the meantime, the unemployment rates have hiked to the highest levels in many developing and developed countries, and many labor market outcome indicators were negatively affected by the trade collapse in the global recession of 2008–9. In short, the experiences in the great global recession of 2008–9 show that globalization and unemployment can be strongly linked.⁴

Third, according to Rodrik (1997, 2007), the period after the collapse of the Berlin Wall particularly matters in the concepts of globalization and labor market outcomes and he defines this period as the "third wave" of globalization. According to Rodrik (1997), during the third wave of the globalization, the globalization measures have significantly affected the labor-demand elasticity, and there would be a more elastic labor demand during the related period.⁵ This issue is also crucial since our paper uses the "homogeneous" data for the structural unemployment rates, which are constructed by the International Labor Organization (ILO). In other words, we use the structural unemployment are data those are based on the ILO, and this is important for the cross-country regressions to test the main hypothesis in the paper. In addition, our paper focuses on the period of "third wave" of globalization; i.e., for the period from 1991 to 2014.

The remainder of the paper is organized as follows. Section 2 reviews the related literature for the relationship between unemployment and globalization. Section 3 explains our data and empirical model. Section 4 presents the empirical results. Section 5 discusses the robustness of the empirical results, and Section 6 concludes.

2. Literature Review

Analyzing the effects of trade liberalization on the labor market indicators is an active research area in the international economics literature. Before the global crisis of 2008–9, the effects on unemployment through globalization and international trade is mostly considered as uncertain

⁴ In other words, the experience shows that during the crisis we have a reduction of globalization and an increase in unemployment. However, this does not mean that there is necessarily a link between the two concepts; i.e., the behavior of globalization and unemployment can be simply the response to a common negative shock. Therefore, we should analyze the effects of international trade on unemployment.

⁵ The labor demand approach can also be used for analyzing the effects of international trade on labor market outcomes (see, e.g., Gozgor, 2016).

(see e.g., Moore and Ranjan, 2005; Sener, 2001). Davidson et al. (1999) also address the issues that classical trade models cannot show the impact of trade on unemployment. However, according to the findings of Davidson and Matusz (2005) based on the sectoral level data, the exports volume of the United States (U.S.) are negatively correlated with the job destruction.

As we discussed in the introduction, our paper combines the empirical models in Dutt et al. (2009) and Felbermayr et al. (2011). These papers conclude that the effect of globalization on unemployment is job-creating. The similar finding is obtained by Gozgor (2014), who uses the overall globalization index of KOF to examine the impact of globalization on the short run unemployment rate. However, his empirical analysis is only based on the panel data set of G-7 countries. On the other hand, globalization can be job destructive (Helpman and Itskhoki, 2010) or job creator (Mitra and Ranjan, 2010). As discussed in Helpman and Itskhoki (2010) and Helpman et al. (2010), the differences in labor-market regulations can also give rise to both a positive or negative relationship between trade and unemployment.

Indeed, several recently published contributions after the global crisis of 2008–9 on the empirical relationship between trade and unemployment and sectoral reallocations of workers, a mechanism which also motivates our empirical specifications. For example, Egger and Kreckemeier (2009) construct a model to analyze the effects of globalization on the average profits and the involuntary unemployment. Kambourov (2009) investigates the impact of a trade reform on the labor reallocation and the findings show that if the trade liberalization does not follow by a labor market reform (liberalization), the intersectoral reallocation of workers will be much slower, and this leads a decline in the productivity gains from trade liberalization. According to the model in Davis and Harrigan (2011), trade liberalization can destroy the "good jobs", which are defined as the above average wage. Similarly, Autor et al. (2013) show that the import competition with the Chinese products directly distorts the U.S. manufacturing employment (i.e., higher unemployment) over the period 1990–2007 and it negatively affects the other labor market indicators, such as wages. Furthermore, using the worker-level data for the period from 1992 to 2007, Autor et al. (2014) observe that the import competition with China distorts the workers' earnings (wages) in the U.S. manufacturing employment and the negative effect is larger in the low-skilled workers than the high-skilled workers.

Using the data in Brazil, the model in Dix–Carneiro (2014) illustrates that the effects of trade liberalization on labor market indicators are important, but the adjustment to trade shocks take a significant time and this decreases the productivity gains from international trade. The effects of the trade liberalization on the labor market are associated with the demographics of workers; i.e., it depends on the age and the education level. Using the firm-level data in

Colombia, Cosar et al. (2016) also find that trade liberalization and globalization lead to a higher level of unemployment. However, the labor market regulations suppress the job-destroying effects of the trade shocks in the Colombian economy. Nwaka et al. (2015) address the impact of the global crisis of 2008–9 on the unemployment through the channel of international trade. Using the time-series techniques, the paper focuses on the period from 1970 to 2010 in Nigeria and observes that trade liberalization policy has been led to a higher in the unemployment rate in Nigeria. Finally, Heid and Larch (2016) analyze the welfare effects of trade and labor market reforms in 28 OECD countries and observe that trade liberalization reforms lead to a lower unemployment in most of the countries, but the opposite effect is also obtained for a small number of countries.

To conclude the literature review, we observe that the effect of globalization on unemployment can be job destructive, job creator, uncertain, or it depends on specific conditions, such as wages, skills, ages of workers, and labor market regulations. However, the effects of international trade and the globalization measures on the long-term unemployment are neglected by the empirical literature. Using the cross-sectional data from 87 countries over the period 1991–2014, our paper analyzes the direct effect of different aspects of globalization on the long-term unemployment and aims to fill this gap in the empirical literature.

3. Data and Empirical Model

The data set in the paper covers the period from 1991 to 2014 in 87 countries. A list of countries included in the analysis is represented in Appendix I. Our paper focuses on the long-term unemployment in related 87 countries, since those 87 countries merely have the data for the long-term unemployment in the World Development Indicators (WDI) data set for the period from the 1990s to 2010s.⁶ The frequency of the data is annual. The data are averaged over time and the cross-sectional data ordinary least squares (OLS) estimations are applied.⁷ To check the robustness of the benchmark OLS estimations, we also use the two-stage least squares (2SLS) instrumental variable (IV) estimation technique. At this stage, the following empirical models are estimated:

$$LTUNEM_i = \beta_0 + \beta_1 GLOB_i + \beta_2 CONT_i + \varepsilon_i \quad (1)$$

Where $GLOB_i$ is an endogenous variable, we regress the $GLOB_i$ on $CONT_i$ and Z_i to

⁶ In other words, the choice of country is not arbitrary, and there is no selection bias in the sample of the paper.

⁷ At this stage, we decided to use averages over time, instead of taking advantage of the panel structure of data and think this is due to the gaps in the data for structural unemployment. This is also done to clean data from business cycle effects.

obtain the $GLÓB_i$, where Z_i is an instrumental variable. Then, we generate the fitted values of $GLÓB_i$ derived from Eq. (1) into a linear regression as such:

$$LTUNEM_i = \beta_0 + \beta_1 GLÓB_i + \beta_2 CONT_i + v_i \quad (2)$$

Where, $LTUNEM_i$ is the long-term (structural) unemployment in country i , $GLOB_i$ is various measures of globalization policy (applied tariff rate, regulatory trade barriers, import duties, and restrictions index of KOF) and globalization outcomes (real trade openness, the actual flows, the economic, the political, the social, and the overall globalization indexes of KOF of Dreher (2006) and Dreher et al. (2008) country i . The "error term" in the OLS estimation is represented by ε_i and v_i is a composite "error term" that is uncorrelated with $GLÓB_i$ and $CONT_i$.

Following Dutt et al. (2009), various control variables ($CONT_i$) are included in the regressions: the macroeconomic variables (gross domestic product (GDP), population, output volatility, and capital-labor ratio), the labor force participation (including female labor force participation), the labor market regulations (including the power of centralized collective bargaining), and the product market regulations (the civil liberties index and the black exchange rate market premium).⁸

Following the evidence of Dutt et al. (2009), Felbermayr et al. (2011), and Nickell et al. (2005), it should be expected that $\beta_1 < 0$ for one globalization measure at least. The details of the data set and a summary of descriptive statistics are reported in Table 1.

[Insert Table 1 around here]

According to Table 1, the maximum value of the structural unemployment rate is 33.14 and it is observed in Macedonia, FYR. The minimum value of the structural unemployment rate is 0.605 and it is found in Qatar. In addition, the maximum value of the overall globalization index is 90.23 and it is obtained in Belgium. The minimum value of the overall globalization index is 31.67 and it is found in Nepal. Finally, the maximum value of the trade openness is 7.794 (779.4%) and it is obtained in El Salvador. The minimum value of the trade openness index is 0.1018 (10.18%) and it is found in India.

The details and descriptions of globalization indexes of KOF are also illustrated in Table 2. According to Table 2, the social globalization index has a share of 38% and it is followed by the economic globalization index, which has a share of 36%. The weight of the political globalization index in the overall globalization index is 26% in the dataset.

⁸ See, Dutt et al. (2009: 37–38) for a detailed discussion and the expected signs of the control variables in the empirical models.

[Insert Table 2 around here]

Finally, we provide the unemployment data in Figure 1 for the related developed and developing countries (Belgium, El Salvador, India, Macedonia, FYR, and Qatar) in the dataset. The Figure 1 illustrates that the unemployment rates in both developing and developed countries (e.g., Belgium, El Salvador, and India) have not been so much over the period of under concern. Although Macedonia, FYR has decreased its unemployment rate for the period from 2005 to 2016, unemployment is still a huge problem of the economy. Finally, there is almost no unemployment problem in Qatar for the period from 2007 to 2016.

[Insert Figure 1 around here]

4. Empirical Results

The results are reported in Table 3. The labor market participation, the female labor market participation, GDP, and population ages 15–64 are controlled in the regressions. In addition, four globalization policy measures and six globalization outcome measures, which are explained in the previous section, are also used. It is observed that the results of globalization policy indicators are mixed and their coefficients are statistically insignificant. It is also found that although all globalization outcome measures are negatively related to the structural unemployment, only the coefficient of the trade openness is statistically significant.

[Insert Table 3 around here]

The results of the Ricardian model specifications, which are used additional control variables, are reported in Table 4. Now, not only the labor market participation, the female labor market participation, GDP, and the population ages 15–64 are used, but also the labor market regulations, the power of centralized collective bargaining, the civil liberties index, output volatility, and the black exchange rate market premium are controlled in the regressions. It is again observed that there is the mixed evidence for globalization policy indicators and all coefficients are again found as statistically insignificant. In addition, it is observed that all globalization outcome measures are negatively related to the structural unemployment. Furthermore, the coefficient of the trade openness is still statistically significant. It is found that one standard deviation increases in the trade openness lead to approximately a 0.6 percentage point lower structural unemployment.

[Insert Table 4 around here]

The results of the Heckscher–Ohlin model specifications by using all control variables are reported in Table 5. It is again used nine control variables as it is done in the previous estimations. Furthermore, following Moore and Ranjan (2005) and Dutt et al. (2009), the

capital-labor ratio and the interaction between the capital-labor ratios with the globalization policy and the globalization outcome measures are included in the empirical models to capture the effect of the factor endowments in the Heckscher–Ohlin model.⁹

[Insert Table 5 around here]

The results in Table 5 illustrate that the results of globalization policy indicators are still mixed and all coefficients of the globalization policy measures are obtained as statistically insignificant. In addition, it is again observed that all globalization outcome measures are negatively related to the structural unemployment. Similarly, the coefficient of the trade openness is only found as the statistically significant. It is now observed that one standard deviation increase in the trade openness approximately leads to a 0.9 percentage point lower structural unemployment in the Heckscher–Ohlin model. In the next section, we check the robustness of these findings with implementing a 2SLS IV estimation technique.

5. Robustness Checks

The usage of the OLS to implement the empirical analysis may not be the appropriate solution if there are endogeneity issues underlying the estimation of the model defined in Eq. (1). In that case, the OLS estimator can suffer from endogeneity bias and discussion on the evaluation of endogeneity is key in the current setup. Indeed, as explained by Felbermayr et al. (2011), a typical problem of cross-country regressions of unemployment rates on openness measures is the endogeneity problem: high unemployment levels may affect trade policies (and hence trade openness). The literature has proposed different solutions to this endogeneity problem like instrumental variable (IV) estimation techniques, dynamic panel estimators or using regional data, e.g., see Felbermayr et al. (2011), Hasan et al. (2012), and Heid and Larch (2012). In the face of the longitudinal nature of the data, panel data models should be used in the empirical analysis, as they are a possible solution for some of the sources of endogeneity. In that case, it is appropriate to discuss the feasibility of the use of a dynamic model. However, one would not say that the solutions presented in the literature are all too convincing; i.e., they all have their problems. Using the IV estimations, our paper also addresses the endogeneity problem in the literature. Therefore, the results of the IV estimations for the Ricardian model specifications are reported in Table 6.

[Insert Table 6 around here]

⁹ Therefore, the difference between the Heckscher–Ohlin and the Ricardian specifications is that to include the capital-labor ratio and the interaction between the capital-labor ratios with the globalization policy and globalization outcome measures to the empirical model

Table 6 illustrates the results of the IV (2SLS) estimations for the Ricardian model specifications and the additional measures of the quality of the estimated models are provided. For instance, the 2SLS estimation with the robust standard errors and the results of Wooldridge's (1995) robust regression based (F test) are reported. This diagnostic presents the battery of the first stage regression diagnostics when applying IV estimators and indicates the validity of the instrumental variables. More specifically, the null hypothesis of the Wooldridge's test is that the variable under consideration can be treated as exogenous. In other words, if the test statistic is significant, then the variables being tested must be treated as endogenous.

Following Dutt et al. (2009) and Felbermayr et al. (2011), four instrumental variables are controlled in the empirical models: i) Frankel and Romer (1999)'s openness measures, ii) the number of years as a GATT/WTO member, iii) Rose (2004)'s remoteness measures, and iv) the dummy variable for the landlocked countries.¹⁰ It is found that the trade openness yields to a lower structural unemployment; and therefore, the results of the OLS estimations are statistically robust for the Ricardian model specifications.

In addition, the results of the IV estimations for the Heckscher–Ohlin model specifications are reported in Table 7. Following Dutt et al. (2009) and Felbermayr et al. (2011), five instrumental variables are controlled in the empirical models: i) Frankel and Romer (1999)'s openness measures, ii) the number of years as a GATT/WTO member, iii) Rose (2004)'s remoteness measures, iv) the dummy variable for the landlocked countries, v) the capital-labor ratio (in logarithmic form) in the year 1990 in Easterly and Levine (2001).¹¹

[Insert Table 7 around here]

Table 7 illustrates the results of the IV (2SLS) estimations for the Heckscher–Ohlin model specifications are statistically insignificant. Therefore, the results of the OLS estimations are not statistically robust for the Heckscher–Ohlin model specifications.

Indeed, empirical evidence in favor of the Ricardian or the Heckscher–Ohlin based models of international trade is mixed at the best (Altenburg and Anke, 2008; Artuç et al., 2010; Cacciatore, 2014; Dutt et al., 2009; Felbermayr et al., 2011, 2013; Hasan et al., 2012; Heid and Larch, 2012). Especially, recent evidence points towards within industry reallocations of workers between firms, not across sectors, (see, e.g., Helpman et al., 2017). According to these papers, the Heckscher–Ohlin type models may not be the best starting point to look at the

¹⁰ See, Dutt et al. (2009) and Felbermayr et al. (2011) for a detailed discussion and the details of instrumental variables in the empirical models.

¹¹ Rather than adding all these instruments at the same time, we first add the instruments in such a way that our estimating equation becomes efficient, otherwise we try the second instrumental variable, and so on.

relationship between trade and unemployment. However, Artuç et al. (2010) find evidence for switching costs across sectors for workers, more in line with the type of inter-sectoral adjustments, which characterize the Heckscher–Ohlin based models. Our findings are in favor of the Ricardian based model. When the significant variation in the estimates of the effect of trade openness is addressed, it is found that Ricardian based models provide a statistically significant suppressing effect on the structural unemployment. This evidence is in line with the previous findings of Dutt et al. (2009) on the short-run unemployment rates in 89 countries for the period from 1985 to 2004. In addition, the evidence in our paper generalizes the findings of Felbermayr et al. (2011) in 20 OECD countries for the period from 1990 to 2007 by including the period of the great global recession of 2008–9 and focusing on 87 countries.¹² However, panel data models should also be used in the empirical analysis in the face of the longitudinal nature of the data, as they are a possible solution for some of the sources of endogeneity. However, our case it is not appropriate to discuss the feasibility for the use of a dynamic model and this is the main limitation of our paper.

The findings of the paper could be useful for policymakers. Indeed, the empirical findings of the paper are based on both developing and developed economies, in which they have the relative productivity differences, the different factor endowments (capital and labor intensives), different labor market structure, and different capabilities of attracting FDI and portfolio inflows. The main policy implication of our paper is that a higher-level of trade openness (liberalization process) rather than the protectionist policies is important to reduce the unemployment rate across a wide range of 87 developing and developed countries. As discussed in Helpman and Itskhoki (2010) and Helpman et al. (2010), the differences in labor-market regulations can also give rise to both a positive or negative relation between trade and unemployment. Therefore, policymakers should watch the global issues and they should implement necessary implications in labor-market regulations to experience a lower unemployment rate during the times of trade shocks. Our findings give policymakers an insight that unemployment rates will be higher, if they implement protectionist trade policies. Our findings are mixed for other aspects of globalization; and therefore, the policy implications are limited in other aspects of globalization.

¹² Despite the sample declared is composed of 87 countries, we report less than 87 observations in all the specifications reported. This is related to the missing data in the explanatory variables as the sample varies across the specifications.

6. Conclusion

This paper analyzed the direct effects of various measures for globalization policy and globalization outcomes on the structural unemployment in 87 countries for the period from 1991 to 2014. The regression specifications are based on the Ricardian and the Heckscher–Ohlin based models. It is found that one standard deviation increase in the trade openness, approximately leads to a 0.6 percentage point lower structural unemployment in the Ricardian model. The effects of economic, social and political aspects of globalization on the structural unemployment are negative, but they are found as the statistically insignificant. In addition, the results of the IV estimations for the Heckscher–Ohlin models are found as the statistically insignificant. It is also observed that globalization policy measures have mixed effects on the structural unemployment when they are separately considered in the empirical models. When they are considered with the restrictions index of KOF (i.e., the import barriers, tariff rate, taxes on international trade, and capital restrictions), it is observed that a higher restriction leads to a higher level of structural employment. However, these results are also not found as the statistically significant; therefore, the evidence is not statistically robust.

The statistically significant and the robust finding of the paper is that the real trade openness is negatively related to the structural unemployment. This evidence is in line with the previous empirical findings of Dutt et al. (2009) and Felbermayr et al. (2011) as well as the projections in various theoretical models (e.g., Mitra and Ranjan, 2010).

Shortly, our paper has generalized the previous findings of Dutt et al. (2009) and Felbermayr et al. (2011) for the Ricardian comparative advantage by focusing on the periods of the post-great global recession of 2008–9. However, our paper is unsuccessful to enhance their previous findings for the real trade openness with the different aspects of globalization measures. In other words, it is observed that international trade yields to a lower structural employment, but the globalization indexes of KOF cannot. It can be suggested that the findings of the paper could be useful for policymakers and projections of theoretical models in future papers.

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Figure 1
 Unemployment Rates in the Selected Countries (1991–2016)

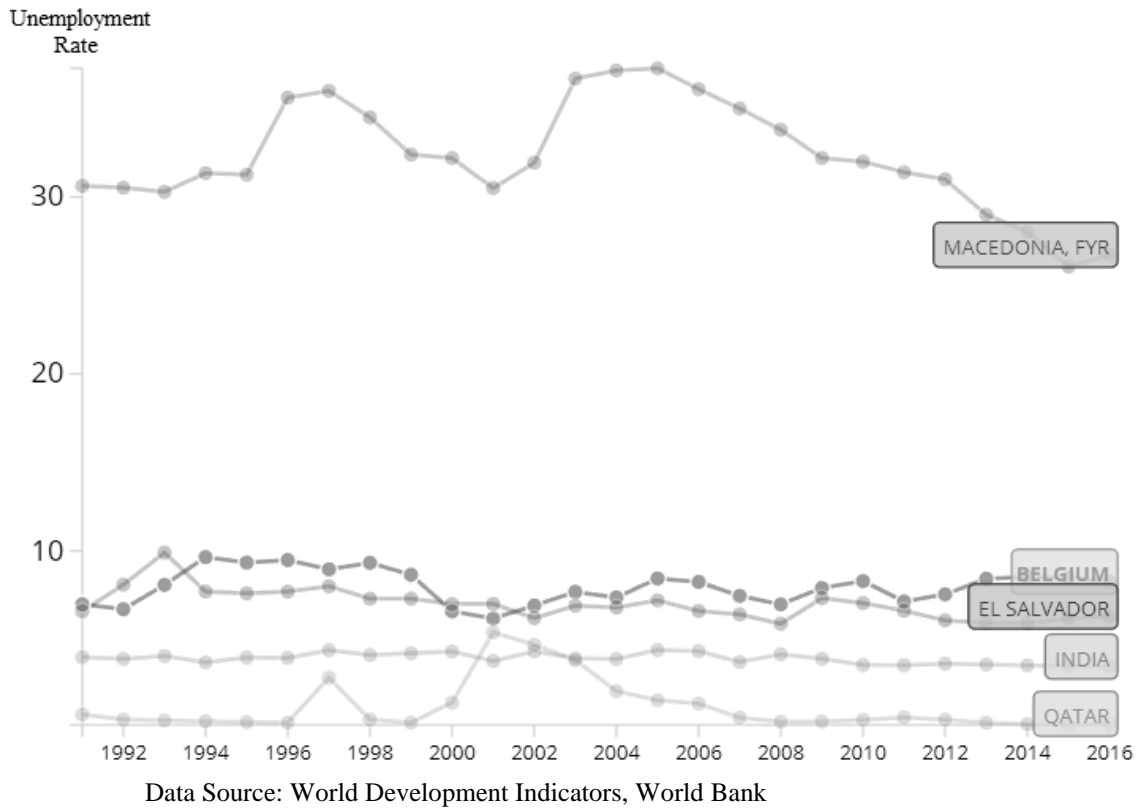


Table 1
Details of Data Set and Summary of Descriptive Statistics

Variables	Units and Definition	Data Source	Mean	Standard Deviation	Minimum	Maximum	Observations
Long-term (Structural) Unemployment	% of Total Labor Force	World Development Indicators (Modeled ILO Estimate)	8.870	5.935	0.605	33.14	87
Labor Force Participation Rate	% of Total Population Ages 15–64	World Development Indicators (Modeled ILO Estimate)	67.82	10.04	40.99	90.48	168
Female Labor Force Participation Rate	% of Female Population Ages 15–64	World Development Indicators (Modeled ILO Estimate)	55.32	17.63	12.56	89.55	168
GDP (PPP, Constant 2011 International \$ Price)	Logarithmic Form	World Development Indicators	24.76	1.987	20.46	30.17	165
Total Population Ages 15–64	Logarithmic Form	World Development Indicators	15.37	1.681	11.82	20.58	168
Labor Market Regulations	Index from 0 to 10	Fraser Institute Economic Freedom Report in 2014	6.126	1.390	3.109	9.244	134
Centralized Collective Bargaining	Index from 0 to 10	Fraser Institute Economic Freedom Report in 2014	6.518	1.312	2.823	8.574	127
Civil Liberties (1 is the Highest Level of Civil Liberty)	Index from 1 to 7	Freedom House, Freedom in the World Database	3.592	1.707	1.000	7.000	165
Output Volatility	Standard Deviation of Log per Capita GDP	Authors' Calculation Based on Penn World Table (version 8.1)	0.253	0.190	0.037	1.679	154
Black Market Premium	Index from 0 to 10	Fraser Institute Economic Freedom Report in 2014	9.765	0.888	2.945	10.00	134
Capital–Labor Ratio	Logarithmic Form	Penn World Table (version 8.1)	–0.108	0.588	–2.272	1.476	121
Applied Tariff Rate	Simple Mean, All Products (%)	World Development Indicators	0.098	0.063	0.000	0.308	163
Regulatory Trade Barriers	Index from 0 to 10	Fraser Institute Economic Freedom Report in 2014	6.267	1.594	1.221	9.141	134
Customs and Other Import Duties	% of Tax Revenue	World Development Indicators	15.13	15.84	–0.010	82.43	137
Restrictions (KOF)	Level, Index	KOF: Dreher (2006) and Dreher et al. (2008)	55.02	20.94	9.640	93.77	145
Trade Openness (Exports plus Imports / PPP GDP)	Level, Ratio	Penn World Table (version 8.1)	0.594	0.730	0.1018	7.794	154
Actual Flows	Level, Index	KOF: Dreher (2006) and Dreher et al. (2008)	55.85	18.43	16.02	99.58	163
Economic Globalization	Level, Index	KOF: Dreher (2006) and Dreher et al. (2008)	55.54	16.79	19.53	95.29	152
Social Globalization	Level, Index	KOF: Dreher (2006) and Dreher et al. (2008)	44.79	21.74	7.071	90.97	168
Political Globalization	Level, Index	KOF: Dreher (2006) and Dreher et al. (2008)	59.75	21.04	3.786	96.90	164
Overall Globalization	Level, Index	KOF: Dreher (2006) and Dreher et al. (2008)	51.79	17.10	31.67	90.23	168
Frankel-Romer Openness Measure	Level, Index	Frankel and Romer (1999)	–2.840	0.645	–4.407	–0.638	190
Remoteness Measure	Level, Index	Rose (2004)	0.470	0.017	0.441	0.521	165
Number of Years as a GATT/WTO Member	Level	World Trade Organization	19.68	21.24	0	67	214
Land Locked Countries	Dummy Variable	World Development Indicators	0.205	0.405	0	1	214
Capital-Labor Ratio for the Year 1990	Logarithmic Form	Easterly and Levine (2001)	9.217	1.582	5.654	11.54	110

Table 2
Details of the KOF Index of Globalization Data Set of Dreher (2006) and Dreher et al. (2008)

Globalization Indexes and Variables	Weights
Economic Globalization	[36%]
<i>i) Actual Flows</i>	50.00%
Trade (percent of GDP)	21.77%
Foreign Direct Investment, Stocks (percent of GDP)	26.62%
Portfolio Investment (percent of GDP)	24.31%
Income Payments to Foreign Nationals (percent of GDP)	27.30%
<i>ii) Restrictions</i>	50.00%
Hidden Import Barriers	23.59%
Mean Tariff Rate	27.80%
Taxes on International Trade (percent of current revenue)	25.90%
Capital Account Restrictions	22.71%
Social Globalization	[38%]
<i>i) Data on Personal Contact</i>	33.03%
Telephone Traffic	25.13%
Transfers (percent of GDP)	2.99%
International Tourism	26.25%
Foreign Population (percent of total population)	20.95%
International Letters (per capita)	24.69%
<i>ii) Data on Information Flows</i>	35.25%
Internet Users (per 1000 people)	36.05%
Television (per 1000 people)	37.63%
Trade in Newspapers (percent of GDP)	26.32%
<i>iii) Data on Cultural Proximity</i>	31.72%
Number of McDonald's Restaurants (per capita)	44.28%
Number of IKEA (per capita)	44.49%
Trade in Books (percent of GDP)	11.23%
Political Globalization	[26%]
Embassies in Country	24.93%
Membership in International Organizations	27.21%
Participation in U.N. Security Council Missions	22.32%
International Treaties	25.55%

Table 3
Results of the OLS Cross-sectional Data Estimations with Control Variables:
The Ricardian Model Specifications (Period Average, 1991–2014)

Regressors	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
Labor Market Participation	−0.420*** (0.136)	−0.420*** (0.136)	−0.488*** (0.154)	−0.452*** (0.133)	−0.455*** (0.136)	−0.447*** (0.130)	−0.471*** (0.135)	−0.448*** (0.130)	−0.470*** (0.132)	−0.472*** (0.137)
Female Labor Market Participation	0.171** (0.076)	0.186*** (0.065)	0.218** (0.092)	0.192** (0.073)	0.214*** (0.073)	0.200*** (0.071)	0.216*** (0.073)	0.202*** (0.071)	0.205*** (0.075)	0.219*** (0.076)
Gross Domestic Product	−1.643** (0.651)	−0.937 (0.577)	−1.063** (0.468)	−1.429* (0.718)	−1.326*** (0.487)	−0.907 (0.760)	−0.534 (0.950)	−0.997 (1.153)	−0.882 (0.677)	−0.481 (1.077)
Population Ages 15–64	0.977* (0.543)	0.414 (0.556)	0.443 (0.379)	0.717 (0.618)	0.532 (0.435)	0.182 (0.939)	0.166 (0.934)	0.429 (1.080)	0.697 (0.448)	0.004 (0.970)
Applied Tariff Rate	−0.055 (0.076)	–	–	–	–	–	–	–	–	–
Regulatory Trade Barriers	–	0.088 (0.433)	–	–	–	–	–	–	–	–
Import Duties	–	–	0.048 (0.045)	–	–	–	–	–	–	–
Restrictions (KOF)	–	–	–	0.002 (0.026)	–	–	–	–	–	–
Trade Openness	–	–	–	–	−0.717*** (0.177)	–	–	–	–	–
Actual Flows	–	–	–	–	–	−0.026 (0.050)	–	–	–	–
Economic Globalization	–	–	–	–	–	–	−0.051 (0.052)	–	–	–
Social Globalization	–	–	–	–	–	–	–	−0.011 (0.050)	–	–
Political Globalization	–	–	–	–	–	–	–	–	−0.057 (0.052)	–
Overall Globalization	–	–	–	–	–	–	–	–	–	−0.053 (0.062)
Observations	84	77	74	83	83	84	84	85	83	85
R-Squared	0.308	0.266	0.299	0.307	0.334	0.267	0.273	0.261	0.328	0.269

Notes: The dependent variable is the long-term (structural) unemployment. The constant term is also estimated, but not reported. The robust standard errors are in the parentheses. ***, ** and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4
Results of the OLS Cross-sectional Data Estimations with Additional Control Variables:
The Ricardian Model Specifications (Period Average, 1991–2014)

Regressors	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
Labor Market Participation	-0.488*** (0.132)	-0.517*** (0.137)	-0.463*** (0.125)	-0.504*** (0.134)	-0.504*** (0.128)	-0.513*** (0.128)	-0.530*** (0.136)	-0.464*** (0.126)	-0.504*** (0.135)	-0.534*** (0.146)
Female Labor Market Participation	0.244*** (0.076)	0.266*** (0.080)	0.229*** (0.072)	0.254*** (0.076)	0.254*** (0.072)	0.256*** (0.073)	0.273*** (0.078)	0.225*** (0.073)	0.254*** (0.079)	0.276*** (0.084)
Gross Domestic Product	-0.611 (0.639)	-0.880* (0.518)	-0.751 (0.495)	-0.564 (0.665)	-0.318 (0.339)	-0.092 (0.469)	-0.273 (0.729)	-1.369 (0.822)	-0.251 (0.679)	-0.259 (0.977)
Population Ages 15–64	0.159 (0.669)	0.413 (0.532)	0.164 (0.481)	0.093 (0.721)	-0.230 (0.395)	-0.821 (0.699)	-0.859 (0.933)	0.925 (0.784)	-0.010 (0.475)	-0.656 (1.033)
Labor Market Regulations	0.433 (0.341)	0.439 (0.314)	0.560 (0.363)	0.416 (0.326)	0.402 (0.318)	0.419 (0.333)	0.372 (0.332)	0.375 (0.304)	0.404 (0.342)	0.409 (0.332)
Centralized Collective Bargaining	-0.149 (0.299)	-0.114 (0.300)	-0.004 (0.327)	-0.125 (0.294)	-0.114 (0.291)	-0.242 (0.280)	-0.189 (0.278)	-0.094 (0.301)	-0.288 (0.269)	-0.187 (0.270)
Civil Liberties	0.581 (0.476)	0.684 (0.543)	0.711 (0.574)	0.594 (0.483)	0.558 (0.434)	0.513 (0.442)	0.535 (0.458)	0.615 (0.515)	0.206 (0.469)	0.498 (0.460)
Output Volatility	4.315 (5.122)	4.544 (4.923)	4.289 (5.174)	4.430 (5.048)	5.378 (5.054)	5.288 (4.780)	5.294 (4.887)	5.528 (4.769)	4.445 (5.264)	4.373 (5.205)
Black Market Premium	-0.281 (1.530)	-0.292 (1.667)	-0.348 (1.631)	-0.168 (1.691)	0.044 (1.592)	0.055 (1.642)	0.320 (1.673)	-0.151 (1.634)	-1.126 (1.512)	-0.106 (1.561)
Applied Tariff Rate	-0.041 (0.099)	–	–	–	–	–	–	–	–	–
Regulatory Trade Barriers	–	0.530 (0.543)	–	–	–	–	–	–	–	–
Import Duties	–	–	-0.048 (0.039)	–	–	–	–	–	–	–
Restrictions (KOF)	–	–	–	0.007 (0.035)	–	–	–	–	–	–
Trade Openness	–	–	–	–	-0.818*** (0.246)	–	–	–	–	–
Actual Flows	–	–	–	–	–	-0.064 (0.039)	–	–	–	–
Economic Globalization	–	–	–	–	–	–	-0.063 (0.054)	–	–	–
Social Globalization	–	–	–	–	–	–	–	-0.052 (0.045)	–	–
Political Globalization	–	–	–	–	–	–	–	–	-0.087 (0.071)	–
Overall Globalization	–	–	–	–	–	–	–	–	–	-0.055 (0.073)
Observations	75	75	68	75	75	75	75	75	74	75
R-Squared	0.327	0.332	0.341	0.326	0.357	0.360	0.342	0.336	0.367	0.334

Notes: The dependent variable is the long-term (structural) unemployment. The constant term is also estimated, but not reported. The robust standard errors are in the parentheses. ***, ** and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5
Results of the OLS Cross-sectional Data Estimations with Additional Control Variables:
The Heckscher–Ohlin Model Specifications (Period Average, 1991–2014)

Regressors	Tariff Rate	Regulatory Trade Barriers	Import Duties	Restrictions (KOF)	Trade Openness	Actual Flows	Economic Globalization	Social Globalization	Political Globalization	Overall Globalization
Labor Market Participation	-0.270** (0.120)	-0.343** (0.133)	-0.213* (0.123)	-0.314** (0.124)	-0.354*** (0.123)	-0.340*** (0.122)	-0.342** (0.121)	-0.316** (0.122)	-0.276** (0.134)	-0.333*** (0.125)
Female Labor Market Participation	0.078 (0.084)	0.130 (0.094)	0.019 (0.088)	0.109 (0.084)	0.137 (0.084)	0.131 (0.083)	0.132 (0.082)	0.115 (0.084)	0.083 (0.095)	0.130 (0.083)
Gross Domestic Product	-1.061 (0.764)	-1.276* (0.659)	-1.755*** (0.629)	-1.178 (0.778)	-0.287 (0.571)	-0.373 (0.552)	-0.429 (0.785)	-0.852 (1.018)	-0.081 (0.850)	-0.091 (1.131)
Population Ages 15–64	0.689 (0.668)	0.895 (0.728)	1.313** (0.565)	0.811 (0.869)	-0.221 (0.647)	-0.239 (0.698)	-0.019 (0.962)	0.479 (1.052)	0.243 (0.715)	-0.203 (1.172)
Labor Market Regulations	0.173 (0.326)	0.140 (0.310)	0.446 (0.314)	0.120 (0.328)	0.132 (0.330)	0.116 (0.342)	0.055 (0.347)	0.082 (0.322)	0.114 (0.344)	0.072 (0.341)
Centralized Collective Bargaining	-0.023 (0.321)	0.032 (0.333)	0.116 (0.353)	0.021 (0.310)	-0.036 (0.316)	-0.099 (0.286)	-0.020 (0.278)	0.022 (0.317)	-0.157 (0.231)	-0.049 (0.265)
Civil Liberties	0.718 (0.512)	0.777 (0.529)	1.113* (0.588)	0.713 (0.508)	0.840 (0.537)	0.541 (0.476)	0.556 (0.495)	0.629 (0.516)	0.462 (0.556)	0.487 (0.499)
Output Volatility	9.101** (3.682)	9.454** (3.589)	9.706*** (3.380)	8.782** (3.953)	9.279** (3.648)	8.858** (3.970)	8.861** (4.198)	9.216** (3.714)	9.669** (3.738)	8.909** (3.872)
Black Market Premium	-0.795 (4.133)	-0.561 (3.674)	0.352 (3.627)	-0.253 (4.507)	0.453 (3.958)	-0.286 (3.777)	0.944 (4.326)	0.576 (4.099)	0.379 (3.851)	0.898 (4.355)
Log Capital–Labor Ratio	-4.300** (1.974)	-5.277 (5.551)	-6.174*** (1.641)	-5.179 (3.719)	-3.564** (1.609)	-6.085 (3.695)	-6.701 (5.427)	-5.446 (3.274)	-7.221** (3.032)	-7.881* (4.257)
Globalization Measure * Log Capital–Labor Ratio	0.077 (0.142)	0.246 (0.834)	0.311*** (0.104)	0.024 (0.048)	0.037 (1.550)	0.047 (0.049)	0.051 (0.076)	0.033 (0.051)	0.052 (0.037)	0.070 (0.059)
Globalization Policy or Outcome Measures	-0.078 (0.092)	0.729 (0.522)	-0.226 (0.172)	0.035 (0.043)	-1.224** (0.517)	-0.043 (0.028)	-0.024 (0.052)	-0.012 (0.051)	-0.051 (0.061)	-0.037 (0.078)
Observations	69	69	62	69	69	69	69	69	68	69
R–Squared	0.450	0.453	0.489	0.448	0.456	0.468	0.451	0.445	0.494	0.458

Notes: The dependent variable is the long-term (structural) unemployment. The constant term is also estimated, but not reported. The robust standard errors are in the parentheses. ***, ** and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6
Results of the IV Estimations with Additional Control Variables:
The Ricardian Model Specifications (Period Average, 1991–2014)

Regressors	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
Labor Market Participation	-1.589** (0.762)	-0.996 (0.992)	-1.565** (0.729)	-1.169** (0.577)	-0.753 (0.750)	-1.150** (0.573)	-1.089** (0.540)	-1.298 (2.196)	-1.752* (1.072)	-1.536 (1.760)
Female Labor Market Participation	0.991* (0.524)	0.642** (0.310)	1.001** (0.476)	0.720 (0.478)	0.738* (0.386)	0.693** (0.355)	0.653* (0.386)	0.821 (1.676)	1.073 (0.693)	0.999 (1.404)
Gross Domestic Product	-1.157 (2.013)	-1.366 (14.23)	-0.486 (3.453)	-2.076 (4.019)	-1.147 (1.717)	-2.693 (1.865)	-2.777 (3.445)	-1.322 (20.41)	-0.387 (4.909)	-0.119 (13.51)
Population Ages 15–64	0.584 (1.876)	0.470 (10.21)	0.144 (2.568)	1.690 (3.613)	0.763 (1.456)	2.593 (2.171)	2.511 (3.618)	1.119 (19.15)	1.940 (1.684)	0.118 (10.51)
Applied Tariff Rate	0.029 (0.029)	–	–	–	–	–	–	–	–	–
Regulatory Trade Barriers	–	0.470 (10.20)	–	–	–	–	–	–	–	–
Import Duties	–	–	0.204 (0.145)	–	–	–	–	–	–	–
Restrictions (KOF)	–	–	–	0.002 (0.166)	–	–	–	–	–	–
Trade Openness	–	–	–	–	-0.113*** (0.037)	–	–	–	–	–
Actual Flows	–	–	–	–	–	-0.061 (0.080)	–	–	–	–
Economic Globalization	–	–	–	–	–	–	-0.051 (0.171)	–	–	–
Social Globalization	–	–	–	–	–	–	–	-0.036 (0.926)	–	–
Political Globalization	–	–	–	–	–	–	–	–	-0.224 (0.319)	–
Overall Globalization	–	–	–	–	–	–	–	–	–	-0.053 (0.062)
Observations	78	72	69	77	77	77	77	78	77	78
Wooldridge's (1995) Regression F Test	2.741 [0.035]	3.591 [0.012]	2.764 [0.036]	2.363 [0.062]	2.313 [0.066]	2.150 [0.084]	2.127 [0.087]	3.032 [0.023]	2.936 [0.027]	2.484 [0.052]
RMSE	6.555	4.777	6.714	5.628	6.534	5.631	5.477	5.984	7.528	6.748

Notes: The dependent variable is the long-term (structural) unemployment. The constant term is also estimated, but not reported. The robust standard errors are in the parentheses. The probability values are in the brackets. Instruments: the openness measure of Frankel and Romer (1999), the number of years as the GATT/WTO member, the remoteness measure of Rose (2004), and the dummy variable for the landlocked countries. The null hypothesis of the Wooldridge's (1995) robust test is that the variable under consideration can be treated as exogenous. ***, ** and * indicate the statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7
Results of the IV Estimations with Additional Control Variables:
The Heckscher–Ohlin Model Specifications (Period Average, 1991–2014)

Regressors	Tariff Rate	Regulatory Trade Barriers	Import Duties	Restrictions (KOF)	Trade Openness	Actual Flows	Economic Globalization	Social Globalization	Political Globalization	Overall Globalization
Labor Market Participation	-1.231 (1.503)	-1.055 (0.756)	-0.787 (0.884)	-1.356 (1.182)	-0.945 (1.126)	-0.888 (1.940)	-1.087 (1.215)	-1.207 (0.749)	-1.790 (1.726)	-1.367 (0.960)
Female Labor Market Participation	0.788 (0.889)	0.490 (0.596)	0.315 (0.533)	0.781 (1.081)	0.686 (0.706)	0.615 (1.499)	0.702 (0.959)	0.852 (0.711)	1.084 (1.101)	0.934 (0.795)
Gross Domestic Product	-1.403 (2.228)	-1.629 (1.676)	-1.057 (1.228)	-2.299 (2.338)	-2.921 (2.606)	-3.356 (2.887)	-3.394 (2.424)	-3.146 (3.061)	-0.672 (6.166)	-2.811 (2.643)
Population Ages 15–64	1.766 (1.223)	2.497 (2.046)	1.706 (1.245)	3.336 (2.554)	4.097 (3.159)	4.575 (3.502)	4.401 (3.591)	3.948 (3.522)	3.177 (2.505)	3.635 (3.118)
Log Capital–Labor Ratio	-15.94 (14.97)	-16.23 (46.01)	-1.834 (11.97)	-21.58 (36.62)	-1.039 (3.539)	-12.31 (42.56)	-14.09 (39.77)	-3.974 (18.41)	-7.060 (13.89)	-13.88 (39.64)
Globalization Measure * Log Capital–Labor Ratio	0.211 (1.545)	1.951 (6.380)	0.352 (0.615)	0.275 (0.455)	1.239 (2.749)	0.164 (0.691)	0.191 (0.573)	0.087 (0.275)	0.123 (2.071)	0.212 (0.600)
Globalization Policy or Outcome Measures	-0.026 (0.037)	1.005 (1.098)	-0.027 (0.233)	-0.054 (0.291)	-1.880 (2.850)	-0.142 (0.141)	-0.119 (0.290)	-0.056 (0.158)	-0.225 (1.147)	-0.062 (0.252)
Observations	52	49	44	52	52	52	52	52	51	52
Wooldridge's (1995) Regression F Test	2.135 [0.081]	2.796 [0.031]	2.983 [0.026]	3.262 [0.015]	2.865 [0.027]	1.556 [0.195]	2.416 [0.053]	2.735 [0.033]	1.025 [0.416]	2.471 [0.049]
RMSE	3.231	2.805	2.801	3.654	3.886	3.469	3.429	3.904	5.401	3.921

Notes: The dependent variable is the long-term (structural) unemployment. The constant term is also estimated, but not reported. The robust standard errors are in the parentheses. The probability values are in the brackets. Instruments: the openness measure of Frankel and Romer (1999), the number of years as the GATT/WTO member, the remoteness measure of Rose (2004), the dummy variable for the landlocked countries, and the log of the capital-labor ratio in the year 1990 in Easterly and Levine (2001). The null hypothesis of the Wooldridge's (1995) robust test is that the variable under consideration can be treated as exogenous.

Appendix I. A List of Countries Included in the Empirical Analysis

Algeria, Argentina, Armenia, Australia, Austria, the Bahamas, Bahrain, Barbados, Belgium, Belize, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Canada, Chile, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Korea Republic, Latvia, Lesotho, Lithuania, Luxembourg, Macao SAR, Macedonia, FYR, Malta, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Norway, Pakistan, Panama, the Philippines, Poland, Portugal, Qatar, Romania, the Russian Federation, Serbia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Tanzania, Thailand, Timor–Leste, Trinidad and Tobago, Turkey, Ukraine, the United Kingdom, the United States, Yemen Republic.