

Trade openness, labour market rigidity and economic growth: A dynamic panel data analysis

The Economic and
Labour Relations Review
2017, Vol. 28(4) 555–564
© The Author(s) 2017
Reprints and permissions:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/1035304617722904
journals.sagepub.com/home/elrr



Burçak Polat

Antalya Science University, Turkey

Antonio Rodríguez Andrés

VŠB – Technical University of Ostrava, Czech Republic

Abstract

The rapid liberalisation of trade policies since the 1990s has brought additional attention to the role of trade as an engine of economic growth. Although an abundant literature addresses the relationship between openness and economic growth, the real effect of trade liberalisation is still ambiguous and undetermined. Most previous studies have ignored the selection effects of strict labour regulations on international trade. The main objective of this study is to measure the role of labour regulations in moderating the contribution of trade to economic growth among 30 Organisation for Economic Co-operation and Development countries for the period 2006–2013. In doing so, we employ a one-step Generalised Method of Moments system estimation method. Our results reveal that openness to trade does not have a robust and significant effect on growth. However, the interaction of openness with strict labour regulations enhances the contributions of trade to growth.

JEL Codes: F10, F16, J80

Keywords

Dynamic panel data, growth, international trade, labour standards, openness

Corresponding author:

Burçak Polat, Antalya Science University, Çıplaklı Mah. Akdeniz Bulvarı. No: 290 Döşemealtı, Antalya, Turkey.

Email: burcakpolat@hotmail.com

Introduction

According to international trade theory, trade openness contributes to the economic welfare of countries by forcing firms to improve their productivity to survive in the international market. International trade improves productivity through two channels: foreign research and development (R&D) spill-over effects and selection effects. While foreign R&D spill-over effects depend on the country's capacity to absorb new technology, the success of selection effects depends on the allocation of more productive resources towards more productive firms or sectors.

According to this theory, since selection effects reallocate factors of production to more productive industries by driving out the least productive ones, this process may be frustrated by strict regulation of labour. If the reallocation of labour is restricted by entrenched labour regulations, reallocation of labour towards more efficient sectors or firms may be hindered. Correspondingly, the gains to be realised from international trade may be reduced in more regulated economies so that trade is less able to serve as a force of growth.

An analysis of the existing literature implies that most scholarship has considered the relationship between trade openness and growth, or between labour protection and growth. By contrast, this study will analyse the relationship between trade openness and growth while considering the role of labour movements in the labour market.

Thus, the main objective of this study is to assess the impact of labour market rigidity on the contributions of trade to economic growth among 30 Organisation for Economic Co-operation and Development (OECD) countries for the period from 2006 to 2013. The study contributes to the existing literature in three dimensions. First, it employs three different one-step system Generalised Method of Moments (GMM) specifications, each including three different measures for employment protection legislation (EPL; OECD, 2013), to ensure the robustness of our estimates. Second, we are able to assess whether or not restricted labour markets contribute to economic growth. Third, by employing one-step GMM methods of estimation and addressing the dynamic structure of growth within the specifications, we are able to predict whether or not restricted labour markets hinder the contribution of trade openness to economic growth among OECD countries.

The rest of the article is organised as follows: the first section discusses the existing literature dealing with the relationship between growth and trade openness. Next, the data sources and methodology of the study are presented. The third section explains the empirical results, while the final section concludes the study by summarising its policy implications.

Literature review

After the mid-1980s, due to the rapid liberalisation of trade and financial flows by emerging markets, trade was widely seen as an engine of economic growth. However, the real effects of trade openness are still ambiguous and largely undetermined. While some researchers claim that openness has a positive effect on growth, others produce support for a negative effect, and still others do not find any effect at all.

Neoclassical trade models regarded technological change as exogenous rather than endogenous (e.g. Solow, 1957). However, newer models assume that technology is

endogenous and can be affected by trade openness (e.g. Romer, 1990). Thus, as a country opens its markets to the rest of the world, production becomes more efficient and enables the country to grow faster than if the economy were closed. Dollar (1992), Sachs and Warner (1995), Harrison (1996), Vamvakidis (1999), Frankel and Romer (1999) and Bahmani-Oskooee and Niroomand (1999) have all found that trade has a robust, positive effect on growth.

Meanwhile, other researchers have found that the contribution of trade to economic growth is not consistent and may not even be proven. Levine and Renelt (1992) have argued that openness may affect growth through investment flows alone so that openness only contributes to growth in the long run as it provides improved access to investment. By contrast, Hye and Lau (2012) claimed that trade openness is associated positively with growth only in the short run, whereas human and physical capital correlate with long-run economic expansion. Furthermore, Kim et al. (2010) have claimed that trade only contributes to the growth of high-income, low-inflation and non-agricultural economies. They also found that the development of the financial sector makes a significant contribution to trade, whereas the contribution of trade to financial sector development is ambiguous. Similarly, Huang and Chang (2014) investigated the impact of financial development on the contribution of trade to growth. They determined empirically that trade openness boosts economic growth more, the more a country's stock markets are developed. Jin (2000) examined the effect of openness on economic growth among growing economies in East Asia and claimed that openness does not have a significant positive effect in the long run. Furthermore, Lutz (2010) investigated the relationship between these two variables for industrialised countries and found no evidence supporting a positive effect of trade on growth in industrialised countries.

Busse and Hefeker (2009) investigated the role of labour market regulations in moderating the impact of trade on growth. They confirmed empirically that countries with more flexible labour markets are more likely to gain from trade compared to countries with inflexible ones. Thus, they noted that 'mixed evidence [about trade openness and growth] would be then attributed to the different degrees of regulations of labour markets' (p. 810). Therefore, one possible explanation of the contradictory evidence regarding the actual effects of trade openness on economic growth could be that highly regulated labour markets complicate selection processes and prevent countries from realising gains from international trade.

Data and methodology

Data. To test the role of labour regulations in moderating the effect of trade openness on economic growth for 30 OECD countries from 2006 to 2013, we have specified the gross domestic product (GDP) per capita growth rate as our dependent variable. As explanatory variables, we include the following: gross capital formation, as an indicator of physical capital; school enrolment, representing human capital; trade openness, measured as the ratio of exports plus imports to GDP; EPL indices; and country risk (CR) indices, including a separate index for financial risk ratings as a component of CR. EPL is an index made up of different OECD indicators that measure the costs and procedures involved in hiring workers on fixed-term or temporary work agency

Table 1. Summary and descriptive statistics.

| Variable | Sign | Observation | Mean | Std. dev | Min | Max |
|----------------|-------|-------------|---------|----------|---------|---------|
| Growth | – | 227 | 1.3700 | 3.4765 | –4.7375 | 10.6811 |
| Openness | (+) | 227 | 101.306 | 61.347 | 24.7658 | 371.439 |
| Investment | (+) | 227 | 22.9360 | 4.2414 | 11.4796 | 39.3465 |
| Human Capital | (+/-) | 227 | 0.9963 | 0.0185 | 0.9501 | 1.098 |
| EPL1 | (-/+) | 227 | 2.1503 | 0.7300 | 0.2566 | 4.4166 |
| EPL2 | (-/+) | 227 | 3.0759 | 0.7720 | 1.63 | 5.13 |
| EPL3 | (-/+) | 227 | 1.6225 | 0.9916 | 0.25 | 4 |
| GDP | (-) | 227 | 146.590 | 288.07 | 1.6958 | 1676.8 |
| CR index | (+) | 227 | 77.7131 | 6.8086 | 56.625 | 92 |
| Financial risk | (+) | 227 | 38.0523 | 4.2725 | 27.2916 | 47.625 |

GDP: gross domestic product; CR: country risk.

Labour protections are measured and labelled as EPL1 for the strictness of employment protection for collective and individual dismissals (regular contracts), EPL2 for the strictness of employment protection for individual dismissals (regular contracts) and EPL3 for the strictness of employment protection for temporary contracts.

contracts. EPL indices range from 0 where EPL is the least restrictive to 6 where restrictions are strongest. Since regular contracts provide more rights to employees than temporary contracts do, hiring or firing costs may be expected to vary more with regular contracts. Therefore, we have incorporated three types of EPL indices: regular contracts featuring collective and individual dismissals, regular contracts with only individual dismissals and temporary contracts. Due to the global financial crisis (GFC) at the end of 2007, there was a major decline in both international trade and economic growth. To capture the lagged effect of this GFC on growth, we have also included time dummies from 2006 to 2013. Data on per capita growth, gross capital formation, school enrolment and trade openness are gathered from the World Bank database (www.worldbank.org), while EPL indices are extracted from OECD data (www.oecd.org). The remaining CR indices have been acquired from the Political Risk Service (PRS) international guide (www.prsgroup.org). The CR index is a composite of economic, financial and political risk ratings for each country. Data points range from very high risk to very low risk (0–80). As the score increases, the risk is lowered. Furthermore, all variables in these estimates are measured in US dollars.

The expected signs of the coefficients, and descriptive statistics for all variables, are presented in Table 1.

As one may observe in Table 1, all data points fall within expected ranges and have no missing values. From a simple inspection of the standard deviations, it is clear that the most volatile variables are GDP and Openness, while the least volatile ones are Human Capital and the EPL indices (EPL1, EPL2 and EPL3). Since most countries in our sample represent developed economies, human capital (education levels) and EPL may be expected to be similar. However, variations in the GDP and Openness variables may be attributed to differences in the population sizes of these countries and their contrasting trade policies.

Model specification. To measure the role of labour regulation on the contribution of trade to growth, we have used a new endogenous trade model, which assumes that openness of trade is an endogenous rather than an exogenous variable. Our endogenous growth model specification can be shown as follows

$$Y_{i,t} = \text{function}(K_{i,t}, L_{i,t}, O_{i,t}, X_{i,t}) + \varepsilon_{i,t} \quad (1)$$

where $Y_{i,t}$ represents the GDP per capita growth rate in country i in year t and $\varepsilon_{i,t}$ indicates the error component. The production function consists of the standard production components of capital ($K_{i,t}$) and labour ($L_{i,t}$) while including trade openness ($O_{i,t}$) as an endogenous variable in the aggregate. Our main variables of interest and additional control variables are represented by $X_{i,t}$, including the three labour protection indices, GDP, CR indices and financial risk as a component of CR.

Once the assumption of openness as an endogenous variable is acknowledged in the new trade model, this calls for a dynamic structure. Thus, we estimate equation (1) using a dynamic panel data estimator. In this context, we employ a GMM method that is simply an ordinary least squares (OLS) procedure applied to a suitably transformed version of the model whose parameters we are trying to estimate. The transformation involved is an instrumental variables transformation. All instrumental variable estimators can be interpreted as a GMM estimator. Whenever autocorrelation or heteroskedasticity arises in the error terms, a GMM approach is more efficient than using a two-stage least squares (2SLS) approach. Whenever we use a system of equations, the benefits of the GMM approach become more apparent.

There are several reasons to employ the GMM approach. First, the estimation procedure is a plausible fit because growth is persistent over time. In essence, the correlation between the economic growth and their corresponding first lagged values is higher than the threshold level of 0.800 for persistence in a dependent variable. Second, the number of years (T) should be lower than the number of cross-sectional units – in this case, countries (N), a condition that applies here. For a large T , the Arellano–Bond method generates many instruments, leading potentially to a poor performance of asymptotic results. Furthermore, if T is bigger than the cross-sectional N , panel data may incorporate time series for several cross sections so that the unit-root tests can also be of interest. Moreover, as N increases, one may need to control for unobserved cross-sectional heterogeneity. Thus, the GMM estimation method is mostly appropriate for short panel data where T is less than N (cross section) (see Cameron and Trivedi, 2010). Third, the GMM approach also controls for potential endogeneity among the explanatory variables.

First, the one-step difference GMM estimation (GMM-dif), deriving from Arellano Bond (1978), has been estimated but not chosen as the best GMM estimation technique since this estimation technique may perform poorly if the autoregressive parameters are too large or if the independent variables are persistent. As a result, the instruments may become weak in the sense noted by Staiger and Stock (1997). The usage of additional instruments by using lagged first differences (LFD) leads to what is described as GMM system estimation (GMM-sys). Although the inclusion of extra instruments will inevitably create additional moment conditions (associated with both first differenced and level

form), we are nevertheless able to incorporate additional information by this method, reducing bias and imprecision. Many disappointing features of the standard GMM-dif approach can be overcome by GMM-sys, although this may also come at a cost as the time dimension grows, since with the resulting increase in the number of instruments, the power of the tests may weaken. However, the costs of this trade-off between efficiency and power may be alleviated by adopting Roodman's (2009) instrument reduction technique, imposing lag limits and collapsing the instrument matrix. Consequently, we have adopted the system approach and performed it as our main estimation method to ensure the robustness of our estimates. Both the Hansen and the AR(2) test results reveal no evidence of misspecification associated with over-identification or serial correlation for GMM system specification. Thus, using Roodman's instrument reduction technique and collapsing instruments does not come at the expense of lost information, so in our analysis we rely on system GMM rather than GMM-dif.

Empirical results

Employing annual data from 2006 to 2013, we have used three types of EPL in three different one-step GMM specifications to ensure the robustness of our estimates. The results of this process are presented in Table 2. While analytical variables are presented in the first column of Table 2, three one-step GMM specifications are given in the second, third and fourth columns, labelled as sys-GMM1, sys-GMM2 and sys-GMM3. Furthermore, to ensure the robustness of our estimates, we have also presented the results of the Hansen test and Arellano–Bond AR(2) test statistics at the bottom of Table 2. We are unable to reject either the Hansen test of over-identification or a test for second-order serial correlation of the residuals, in the first difference equations for the three one-step sys-GMM specifications.

As seen in Table 2, while EPL1 and EPL2 are negatively associated with economic growth, EPL3 has no association with growth at all. In other words, regular contracts (represented by the collective–individual dismissal and individual dismissal contracts) that provide more rights for employees, and therefore involve more restrictions on employers, lead to a reduction in the rate of economic growth. Meanwhile, temporary contracts involving fewer restrictions, by their very nature, have no effect on growth. Furthermore, the interaction term between labour market rigidity and openness is significant only in the GMM1 specification where EPL1 is employed. EPL1 (representing regular contracts with collective–individual dismissals) has a negative effect on growth without taking the consideration of countries' involvement in international trade. However, while openness index is not a determinant of growth by itself, including the openness index as an interaction term with EPL1 demonstrates that the joint effect of these two factors has a slightly significant and positive effect on growth. Thus, the contribution of international trade to growth is not hindered by the labour market rigidity as the selection effect theory suggests. Our intuition is that the OECD countries are mostly well endowed with highly skilled employees who are already highly qualified and productive. Thus, as the volume of international trade becomes larger, managers will favour retention of existing employees or hiring new ones in the same workplace rather than redistributing them to less productive sectors. Thus, one may easily argue that the

Table 2. Estimation results.

| Variables | Sys-GMM1 | Sys-GMM2 | Sys-GMM3 |
|--------------------------|-------------------|-------------------|-------------------|
| Growth _{t-1} | 0.3030 (0.040)* | 0.3091 (0.028)* | 0.3184 (0.001)** |
| Openness _{t-1} | -0.0963 (0.052) | -0.0894 (0.062) | -0.0055 (0.872) |
| Openness _{t-2} | 0.0506 (0.263) | 0.0558 (0.234) | -0.0118 (0.779) |
| EPL ₁ | -2.4947 (0.018)** | — | — |
| EPL ₂ | — | -2.1341 (0.023)* | — |
| EPL ₃ | — | — | -0.6971 (0.290) |
| EPLO | 0.0196 (0.058)* | 0.0151 (0.123) | 0.0054 (0.348) |
| Inflation | -0.0081 (0.947) | -0.0162 (0.894) | 0.0253 (0.864) |
| Investment | 0.1692 (0.028)* | 0.1922 (0.015)** | 0.2051 (0.002)** |
| Human capital | 5.8884 (0.538) | 3.6433 (0.680) | 7.5950 (0.403) |
| GDP | -0.0018 (0.140) | -0.0013 (0.218) | -0.0006 (0.996) |
| CR index | 0.0487 (0.317) | — | 0.0235 (0.629) |
| Financial risk | — | 0.0656 (0.255) | — |
| d6 | — | — | — |
| d7 | — | — | — |
| d8 | -1.3741 (0.041) | — | -1.0898 (0.101) |
| d9 | -3.9575 (0.000)** | -2.7334 (0.000)** | -3.9853 (0.000)** |
| d10 | 2.4989 (0.001)** | 3.8514 (0.000)** | 4.0616 (0.000)** |
| d11 | (0.8270) (0.248) | 2.2184 (0.005) | 0.9436 (0.101) |
| d12 | — | 1.0508 (0.055)* | — |
| d13 | 0.6295 (0.156) | 1.9108 (0.000)** | 0.9832 (0.023)* |
| Wald test | 464.34 (0.000)** | 478.40 (0.000)** | 377.81 (0.000)** |
| Hansen test | 0.080 | 0.104 | 0.239 |
| Arellano–Bond AR(2) test | 0.311 | 0.269 | 0.260 |
| Observations | 169 | 169 | 169 |
| Instruments | 23 | 23 | 27 |
| Fixed effects | -0.0896 | -0.0663 | 0.1393 |
| OLS | 0.3657 | 0.3821 | 0.3386 |

GDP: gross domestic product; CR: country risk; OLS: ordinary least squares.

**denotes the 1% significance level, whereas *denotes the 5% significance level. The probability values of the coefficients are shown in parentheses.

selection effect may not hold for developed countries such as most OECD members. Meanwhile, we could not find any effect of interaction between EPL2 or EPL3 and the openness index on growth. This may be interpreted as follows: EPL2 measures labour rigidity for individuals rather than collectively. The hiring or firing cost of individuals, *if any*, may not have an effect on overall labour costs that would prevent economic openness from contributing to growth. As noted above, for EPL3, strictness of labour regulations is measured only for temporary contracts in which labour rights are not extensive. We may therefore expect that these temporary contracts may not cause a cost effect of hiring or firing on the growth through openness index.

Furthermore, as expected, we have found strong evidence that increased investment has a positive effect on growth. This result is consistent with both neo-classical and

post-Keynesian theories of economic growth. As firms invest more, they are able to increase their production capacity, which is reflected in increased growth and higher tax payments. Finally, dummy variables introduced to capture temporal effects show that the GFC of 2007 (initiated by the collapse of the United States' real estate sector) had a detrimental effect on the economic growth in the year of 2009.

However, we could not find any effects of human capital measures or risk indices on economic growth (considering a composite risk index and a financial risk index as components of overall risk). This finding is attributed to the country characteristics of the sample since the majority of these countries represent developed economies having similar CR indices and highly qualified workforces.

Discussion

This study aims to provide new insights by measuring the possible impact of labour regulations on the contribution of trade to economic growth among 30 OECD countries for the period 2006–2013. In this context, we have applied an endogenous trade model that assumes openness to be an endogenous rather than an exogenous variable.

The novelty of this study is thus threefold: first, it employs three different one-step GMM system specifications to ensure the robustness of our estimates by capturing the dynamic structure of growth. Second, we are able to predict whether or not labour market restrictions will matter for the economic growth. Third, the study is able to capture the possible moderating effect of EPL on growth by exploring the interaction between three different EPL indices (EPL1, EPL2 and EPL3) with the openness index.

Finally, we have shown that regular contracts associated with more restrictions for both collective–individual and individual dismissals have a deterrent effect on economic growth. As the labour market becomes more highly regulated and labour rights more protected, the possibility of diminishing growth rates arises. Our intuition is that except under conditions of autarky, stricter protections for employees may cause a reduction in economic growth. However, this negative association between EPL and growth may not result from a selection effect but rather from other social benefits given to employees. However, when openness is taken into consideration, EPL1 (representing collective–individual dismissal contracts) turns out to be positively correlated with growth. This surprising result is worth noting: contrary to the popular belief, EPL may increase growth rates only as these countries increase their exposure to international trade. Meanwhile, selection effects may only apply in markets where the labour force consists of less qualified or less productive employees. Since the country group under analysis is made up largely of developed economies, their labour markets mostly feature highly educated and productive employees. Thus, as these countries take part in international markets, they may take advantage of the productivity level of current employees to survive in global markets. One may therefore assume that the theory of selection effects might be realised only in sectors or industries where the labour market responds inefficiently to international demand. Contrary to a study by Busse and Hefeker (2009), who claimed that EPL inhibits trade from contributing to growth, we attribute the selection effects of international trade to the structure of labour markets. Accordingly, one policy implication worth noting is that

the deterrent impacts of labour market rigidity on economic growth can be counteracted by the countries' involvement with the rest of the world if the labour market itself is well structured.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

References

- Arellano M and Bond S (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies* 58(2): 277–297.
- Bahmani-Oskooee M and Niroomand F (1999) Openness and economic growth: an empirical investigation. *Applied Economics Letters* 6(9): 557–561.
- Busse M and Hefeker C (2009) Trade, labour market regulations and growth. *Applied Economics Letters* 16(8): 809–812.
- Cameron AC and Trivedi PK (2010) *Microeconometrics Using Stata*. College Station, TX: Stata Press.
- Dollar D (1992) Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976–1985. *Economic Development and Cultural Change* 40(3): 523–544.
- Frankel JA and Romer D (1999) Does trade cause growth? *The American Economic Review* 89(3): 379–399.
- Harrison A (1996) Openness and growth: a time-series, cross-country analysis for developing countries. *Journal of Development Economics* 48(2): 419–447.
- Huang LC and Chang SH (2014) Revisit the nexus of trade openness and GDP growth: does the financial system matter? *Journal of International Trade & Economic Development* 23(7): 1038–1058.
- Hye QMA and Lau WY (2015) Trade openness and economic growth: empirical evidence from India. *Journal of Business Economics and Management* 16(1): 188–205.
- Jin JC (2000) Openness and growth: an interpretation of empirical evidence from East Asian countries. *Journal of International Trade & Economic Development* 9(1): 5–17.
- Kim DH, Lin SC and Suen YB (2010) Are financial development and trade openness complements or substitutes? *Southern Economic Journal* 76(3): 827–845.
- Levine R and Renelt D (1992) A sensitivity analysis of cross-country growth regressions. *The American Economic Review* 82(4): 942–963.
- Lutz J (2010) Growth of industrialized countries and trade openness. *The International Trade Journal* 15(4): 429–455.
- Organisation for Economic Co-operation and Development (OECD) (2013) Protecting jobs, enhancing flexibility: a new look at employment protection legislation. In: OECD (ed.) *OECD Employment Outlook*. Paris: OECD Publishing. Available at: http://dx.doi.org/10.1787/empl_outlook-2013-6-en (accessed 5 July 2017).
- Romer PM (1990) Endogenous technological change. *Journal of Political Economy* 98(5): 71–102.
- Roodman (2009) Mixed-process models with cmp. *IDEAS Working Paper Series from RePEc*. St Louis. Available at: <http://ideas.repec.org/p/boc/dcon09/11.html> (accessed 27 July 2017).
- Sachs JD and Warner A (1995) Economic reform and the process of global integration. *Brookings Papers on Economic Activity* 26(1): 1–118.
- Solow RM (1957) Technical change and the aggregate production function. *The Review of Economics and Statistics* 39(3): 312–320.

- Staiger D and Stock JH (1997) Instrumental variables regression with weak instruments. *Econometrica* 65(3): 557–586.
- Vamvakidis A (1999) Regional trade agreements or broad liberalization: which path leads to faster growth? *IMF Staff Papers* 46(1): 42–68.

Author biographies

Burçak Polat is an Assistant Professor and Head of the Department of Economics in Antalya Science University, Turkey. Her research fields include international economics and development economics, with a methodological focus on economic modelling and econometrics. Her publications include studies of foreign direct investment and the effects of labour standards and employment protection.

Antonio Rodríguez Andrés has worked in Madrid and in Universidad del Norte, Colombia, and has recently taken up a position as a Senior Researcher in the Department of National Economy in the Faculty of Economics at the Technical University of Ostrava in the Czech Republic. An applied economist, he has undertaken studies in the fields of globalisation, trade, crime, gun control, copyright law and software piracy, suicide, mental health and income inequality.