

Trade Openness and Macroeconomic Policy in OECD Countries

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Abstract

Trade openness has been subject to an important issue many studies in literature. It allows us to analyze potential trade as a percentage of gross domestic product. Total value of international trade in goods and services shows the countries' integration into the world economy. Generally, small countries are more integrated because of their dependency on imports. On the other hand, there many variables which effects trade integration. Our study focuses on to analyze the effects on trade openness and make inferences for OECD countries.

In this paper we aim to examine the relationship between trade openness and macro-economic indicators in OECD countries. To analyze the relationship, we used panel data regression analysis. Data obtained from World Bank, The Heritage Foundation and United Nations Conference on Trade and Development (UNCTAD). The panel data covers 2000-2013 periods and 33 countries. The analysis made through the Stata econometric packet program. We predicted pooled, fixed effects and random effects panel data models and analyzed them.

It has been found that gross domestic savings, investment freedom, and unemployment rate are statistically significant. The results found in this paper show that investment freedom and gross domestic savings have positive effect on trade openness as we expected. On the other hand, unemployment rate has positive effect on trade openness. These findings have important policy implications for OECD countries. Our interpretation of these findings is that, integration to world economy has generally positive effects for macroeconomic factors in OECD countries, but it should be limited.

1 Introduction

The analysis of trade openness and macroeconomic policy has been a popular area of interest for a very long time. Trade openness is an indicator which allows us to analyze potential trade as a percentage of gross domestic product. Total value of international trade in goods and services shows the countries' integration into the world economy. Also there are many variables which effects trade integration.

In this paper in order to examine the relationship between trade openness and macro-economic indicators, panel data analysis has been used. The data covers 2000-2013 periods and 33 OECD countries Data obtained from World Bank, The Heritage Foundation and United Nations Conference on Trade and Development (UNCTAD).

2 Literature Review

Sachsida, et. al, (2003), discussed the impact of trade openness on inflation. The sample consists of 152 countries for the 1950-1992 period. They estimated the relation between inflation and trade openness with the use of panel data methods. The results show that there is a negative relation between inflation and trade openness. And the authors indicate this relation can be generalized for all countries for every period (Sachsida, et. al, 2003: 318).

Bowdler and Nunzata (2006), investigated impact of trade openness on the probability of such an event. The data set consists of 19 OECD countries covering the period 1961-93. Panel data regression results indicate that trade openness reduces the probability of an inflation start (Bowdler and Nunzata 2006:553).

Manole and Spataraneu (2010), investigated the relationship between trade policy and level of income. They used OLS regression and instrumental variables method with 131 countries between 1990 and 2004. The results suggested that higher trade protection is associated with lower per capita income (Manole and Spataraneu, 2010:3).

Kim, et. al (2010), discussed in their paper, the dynamic effects of trade openness on financial development. The data set consists of 88 countries covering the period 1960-2005. They run ARDL model and they evaluated the coefficients for long-term and short-term. The results shows while that trade openness and financial development has a positive relationship in the long term, has a negative relationship in the short term. Also they find that the trade-finance relationship differs along with inflation (Kim, et al 2010:254).

Kim et. al, (2013) examined the impacts of trade and foreign direct investment on domestic investment. The authors run instrumental variable regression approach the data set which consists of 85 countries over the period 1975-2010. The results suggested that trade has negative effects on domestic investment in under-developed countries but positive effects in developed countries which have better financial sectors, or low corruption (Kim, et. al, 2013:57).

Gosh (2014), discussed in his paper the impact of openness and exchange rate regimes on inflation with using dynamic panel GMM method. The data set consist of 137 countries from 1999-2002. The regression analysis shows that there is no clear evidence of a significant negative effect of trade openness on inflation except for nations with low trade openness and high inflation rates. Also, the author found that higher capital account openness as well as a movement towards a fixed regime to lower inflation (Ghosh, 2014: 190-191).

Nasreen and Anwar (2014), investigated the causal relationship between economic growth, trade openness and energy consumption. The study covers the period of 1980-2011 using 15 Asian countries. Firstly they applied panel unit root tests to check the stationary properties of the variables. Secondly, they used the panel cointegration tests applied for long-run examination. The results confirm that the presence of cointegration between variables. The impact of economic growth and trade openness on energy consumption is found to be positive. And also the analysis indicate that there is a biddirectional causality between economic growth and energy consumption, trade openness and energy consumption (Nasreen and Anwar, 2014: 82).

Sbia, et. al (2014) examined the relationship between foreign direct investment, clean energy, trade openness and economic growth in United Arab Emirates covering the period of 1975-2011. Granger causality analysis applied the data series. The results show that foreign direct investment, trade openness and carbon emissions decline energy demand (Sbia, et. al, 2014:191).

Menyah et. al, (2014) investigated the causal relationship between financial development and economic growth. In order to examine the author used panel bootstrap approach to Granger causality. The data set covers 21 African countries during the period 1965-2006. The results show that financial development and trade liberalization don't have a significant effect on growth (Menyah, et al 2014:386).

Le (2014), examined impacts of trade openness and institutional reforms on household welfare. The data set includes Vietnam Household Living Standarts Surveys of 2006 and 2010. The results show that trade openness and institutional reforms have positive impact on household welfare in provinces (Le, 2014:68).

Musila and Yiheyis (2015), examined the relationship between trade openness on level of investments and the economic growth for Kenya. The data consists of the period 1982-2009. According to the results, trade openness is found to have positively impact the level of investment .On the other hand Granger Causality tests indicate that there is a long-term relationship between economic growth and trade openness (Musila and Yiheyis 2015:342-354).

3 Data Source

Data set comprises 2000-2013 period of 33 OECD countries. Trade openness is selected as dependent variable and Gross Domestic Savings, investment freedom of countries and unemployment rate are selected as independent variables in the study.

Trade openness used as a dependent variable in our models shows sum of exports and imports as a percentage of nominal gross domestic product. Trade openness data is downloaded from the database of the United Nations Conference on Trade and Development (UNCTAD).

Gross Domestic Savings is obtained by subtracting the final consumption expenditures from the Gross Domestic Product. Domestic savings is one of the most important variables when economy is analyzed in its entirety. According to the tendency to saving in a country, the rate of external savings to be made, the field where the investment will be made and the way of position to be taken in that country will be determined. Data of Gross Domestic Savings are obtained from the database of the World Bank. In our study, the numbers of gross domestic savings are taken as the percentage in the gross domestic product.

Unemployment rate shows the percentage of the total labor force that is unemployed but available and seeking employment. Unemployment rate data is downloaded from the database of the Worldbank.

Investment freedom index, on the other hand, is an index which shows the freedom of the investors in a country to use the investment capital in an unlimited manner as they desire. Many countries have different limitations in the application. Considering these limitations, an index is created for the countries. Data of the investment freedom index are also downloaded from the web site of the heritage foundation broadcasting the index of economic freedom.

4 Empirical Results

Pooled regression model, fixed effects panel regression model and random effects panel regression model are used in the model prediction. The results for every three models are presented in the following table.

	Pooled OLS	Fixed Effects	Random Effects
c	-87.14*** (-7.91)	40.32*** (4.52)	33.65*** (3.25)
Unemployment Rate	3.06*** (7.30)	0.70*** (3.32)	0.75*** (3.55)
Gross Domestic Savings	3.45*** (12.77)	1.28*** (5.14)	1.44*** (5.93)
Investment Freedom	0.93*** (7.32)	0.14*** (1.97)	0.18*** (2.39)
F stat	94.73***	137.48***	43.13***

Table 1: Effect of unemployment rate, gross domestic savings and investment freedom on trade openness

Note: Terms on brackets denote t-stat based on robust standard errors. *, **, *** indicate significances at the %10, %5 and %1 levels. The coefficients in bold are the ones that are statistically significant.

With respect to the pooled panel regression model, index of unemployment, gross domestic savings and investment freedom is observed to be statistically significant according to the 5% significance level. According to these results, while one unit of increase in the index of investment freedom increases the trade openness 0.93 unit, one unit of increase in unemployment rates leads to a 3.06 unit increase in the trade openness. One unit of increase in the percentage of gross domestic savings in gross domestic product, however, leads to a 3.45 unit of increase in trade openness. Signs of the coefficients are suitable to our financial expectations. When fixed effects panel regression model is predicted, however, coefficients of every three variables are observed to be suitable to our financial expectations as in pooled model and to be significant in a 5% significance level. One unit of increase in unemployment rate increases the trade openness about 0.70 unit while one unit of increase in the percentage of domestic savings in gross domestic product increases the trade openness 1.28 unit. One unit of increase of the investment freedom, on the other hand, increases the trade openness 0.14 unit.

Finally, random effects panel regression model is predicted. In this model all the coefficients are economically significant. While one unit of increase in the investment freedom increases the trade openness 0.18 unit, one unit of increase in the unemployment rate increases the trade openness 0.75 unit. One unit of increase in the percentage of gross domestic savings in gross domestic product, however, leads to a 1.44 unit of increase in trade openness.

After the coefficients for the three models are interpreted, model comparison is performed. F test can be applied for the comparison of pooled model and one way fixed effects model. The hypothesis where all the unit effects are equal to zero is tested in F test. To carry out this test, fixed effects model is predicted and F statistics calculated here is compared with the table value. F statistics value obtained here is tested by being compared with F distribution table with $33-1=32$ and $(N(T-1)-K)=426$ degree of freedom. According to the obtained $F(32, 426) = 137.48$ and $\text{Prob}>F=0.0000$ result, the hypothesis that the unit effects are equal to 0 is rejected and thus, it is understood that unit effects are present. Pooled model is not suitable. Hausman test is conducted for the comparison of fixed effects and random effects models. Hausman test results are given in the table. As known, Hausman test shows which of the fixed effects model and random effects model predictors are consistent. Actually in this test the significance of the difference between the fixed effects model parameter predictors and random effects model parameter predictors is examined. The biggest difference between the fixed effects and random effects models is that while unit effects are allowed to be correlated with independent variables in the fixed effects model, this correlation is not at stake and is random in the random effects model. If there is no correlation between the unit effects and explanatory variables, the use of random effects model predictors will be suitable. The main hypothesis of Hausman test is as the following: "No correlation is available between explanatory variables and unit effects" and the alternative hypothesis thereof, however, is as the following: "Explanatory variables and unit effects are correlated".

Test results are given in the table 2. Zero hypothesis could not be rejected according to the Hausman test results. In conclusion, it was determined that random effects model predictor is valid for this model.

	Fixed Effects	Random Effects	Difference	Standard Error
Unemployment Rate	0.70	0.75	-0.05	.
Gross Domestic Savings	1.28	1.44	-.166	0.0512
Investment Freedom	0.145	0.175	-0.30	0.0024
chi2(3)=	3.87			
Prob>chi2	0.2760			

Table 2: Hausman Test's results

5 Concluding Remarks

Macroeconomic variables affecting the trade openness of OECD countries were analyzed in our study. When pool panel regression model, fixed effects and random effects models are predicted, it has been determined that unemployment rate, investment freedom and gross domestic savings variables are statistically significant for every three model. Every three variables are positively correlated with the trade openness. Thus, as the domestic savings and investment freedom increase, trade openness increases as well in the OECD countries; external integration of the country has been observed to positively affect these macroeconomic variables. Besides, positive correlation between unemployment rate and trade openness shows us that as the external openness of the countries increases, they need less labor especially thanks to the technological developments. Then, it may be concluded that the increase in the trade openness is generally positive for the countries, but it should be kept in a certain limit.

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