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Investigation of the Relation between Economic Globalization and Government Size in Asian Developing Countries

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Abstract

The purpose of this paper is to examine the relation between government size and openness for a 26-years panel of 30 Asian developing countries. It is argued that there is a negative relation between country size and government size and also between country size and openness. Considering that, some researchers concluded that there is a positive relationship between openness and the size of government. To reveal the relation between these two variables, we used two proxies for measuring the extent of openness. The proxy used for openness is the economic dimension of KOF index of globalization. Employing a non-stationary panel data technique and DOLS estimator, the results show that there is a positive relationship between economic globalization and government size.

Keywords: Government Size, Openness, KOF index, Panel Data.

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Introduction

Recently, in public economics literature, a lot of researches have focused on the economic determinants of government size and openness and the relation between these two variables.

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Alesina and Wacziarg (1998) stated that the size of government and the degree of openness is larger in smaller countries and concluded that there is a positive relation between the government size and country's openness.

But Rodrik (1998) has suggested a direct link between openness and government size. According to the Rodrik's hypothesis, more open countries are more sensitive to external shocks such as shifts in their terms of trade originating from world market, and because government expenditures can stabilize income and consumption, so it can be found that more open countries will demand a larger government to play a stabilizing role (alesina and wacziarg, 1998:16). In other words, government spending appears to provide social insurance in economies to compensate for growing external shocks and government spending plays a "risk-reducing role" in economies exposed to significant amount of external risk (Rodrik1998:998).Which is known as compensation hypothesis.

In general, there are two extreme theories about the relevance between volume of trade and the scope of government: the first idea is that more economic globalization and openness leads to a reduction in the size of government and the government intervention descends to the minimum of its level. In other words, in this view, it is argued that along with more globalization and increasing openness, the market's prevalence and the private sector's domination will increase admitedly. On the other side, the Neo liberalists believe that at the age of globalization, tasks; authorities and the power of governments will be at the maximum of its level; because the globalization process causes a wide variety of disorders in the economic system and therefore it is necessary for governments to intervene more extremely in order to decrease the effects of globalization's disorders on the economic structures of their countries (Falahati and Ghare baba, 2009).

As previously stated, there have been many debates on the government's size response to the increasing openness but this issue isn't yet fully understood.

Rodrik (1998) concluded that there was a positive relation between an economy's exposure to international trade and its government size. According the results of this paper, the relation between these two variables holds for most measures of government spending, in low as well as high-income countries and by including any control variables, this relation holds for.

Alesina and wacziarg (1998) showed that the positive empirical relation between trade openness and government size is due to a country-size effect, in special for the government consumption part of government spending.

According to Sanz and Velazquez (2003) Rodrick's hypothesis is supported. More exactly, they used the stock of FDI as a proxy for globalization and then concluded that there was a positive relation between the stock of FDI and government size even after controlling for a wide variety of other variables affecting the size of government.

Liberti (2007) concludes that capital openness is significantly and negatively related to government expenditures. So, in this paper the compensation hypothesis which originally proposed by Rodrik (1998) was not supported by the data.

Epifani and Ganica (2008) provided a theoretical framework for why openness could increase the size of government. They argue that the positive relation between openness and government size can be derived through two channels: "A term of trade externality" and the "demand for insurance". In addition the most staple result of this paper is that a key parameter, namely, the "elasticity of substitution between domestic and foreign goods".

Jiang (2013) provided a dynamic general equilibrium model with differentiated factor intensities in tradable and non-tradable sectors. The findings of this paper show that if the non-tradable sector is more capital intensive in its production, there is a positive link between trade openness and government size. To the contrary, if the tradable sector be more capital intensive in its production, there is a negative relation between the two mentioned variables.

Benaroch and Pendy (2013) using panel regressions found that unlike Rodrik (1998) there was no relation between openness and the size of government. In addition by employing Granger causality test, they showed that higher lagged government size could decrease trade openness. So the findings of this paper can't support Rodrik (1998) hypothesis.

Ram (2009) attempted to survey the relation between openness and government size by estimating the association of country size with both openness and government size. In general the results of this paper supported Rodrik's (1998) hypothesis.

Hanslin (2008) analyzes the impact of trade liberalization on public sector spending in a general equilibrium model with a continuum of industries supplying tradable and non-tradable goods under monopolistic competition. According the result of his research the optimal public consumption good is positively related to the degree of openness.

So, considering the empirical and theoretical researches, it is obvious that the impact of openness on government size is yet unclear and undoubtedly controversial because some of them propose a positive relation between aforementioned variables while some others show a negative one. Hence, in this paper we are going to clarify the relationship between these two variables in a sample of 30 Asian developing countries during the period 1990-2015.

Data Description and Model Estimation

Following Ram (2009) we are going to examine the relation between government size and openness through below equation:

$$GS_{it} = \alpha_0 + \alpha_1 \, Open + \alpha_2 \, GP + U_{it} \qquad (1)$$

Where GS is Government size in country i and year t; Open is a measure of openness; GP denotes real GDP per capita and U is the error term.

In this paper we used the share (percent) of government consumption in GDP for measuring government size; Openness is proxied by the economic dimension of KOF

index of globalization which is shown by EG and. So far, to the best of our knowledge, the majority of studies have used the conventional index of openness [(EX+IM)/GDP], which has been known as trade openness index, and this is the first paper which utilize the KOF index as a proxy for openness to investigate the relation between government size and openness. The KOF index was introduced in 2002. The overall index covers the economic, social and political dimensions of globalization. As mentioned before, we use the economic dimension of this index. This index has many advantages to the conventional index of openness. More specifically it is more comprehensive than the other one because The conventional trade openness share in KOF is only 19 percent and the remaining 81 percent indicate other factors of openness including Foreign Direct Investment, flows and stocks (percent of GDP), Income Payments to Foreign Nationals (percent of GDP) and Restrictions that itself including Hidden Import Barriers, Mean Tariff Rate, Taxes on International Trade (percent of current revenue) and Capital Account Restrictions ignored by the traditional index. (Jafari Samimi et al. 2012)

This paper employed panel data of 30 developing countries over the period 1990-2015. (Sample of countries includes: Armenia, Azerbaijan, Bangladesh, Bahrain, Brunei, Bhutan, China, Georgia, Indonesia, India, Jordan, Kazakhstan, Kuwait, Kyrgyz Republic, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Qatar, Sri Lanka, Syrian Arab Republic, Tajikistan, Thailand, Turkey, Turkmenistan, Uzbekistan, Vietnam and Yemen. The annual data of economic globalization were taken from the KOF index of globalization and other data were obtained from WDI.

Methodology

LR Test

At the first step, in order to select between pooled or panel data, we use LR test. The null hypothesis of this test implies that the data have pooled structure. In contrast, the alternative hypothesis implies panel structure of data.

Panel Unit Root Test

By the next step, in order to identify whether the data are stationary or not, panel unit root tests should be employed.

Several Panel unit root tests have been presented to investigate the stationary properties of panel data. This paper applied four tests proposed by Levin et al. (LLC, 2002), Im et al. (IPS, 2003), Breitung (2000) and Fisher-type test proposed by Maddala and Wu (1999) and Choi (2001) to test the null hypothesis of having unit root.

Following Dickey and Fuller (1979, 1981), Levin and Lin (1993), and Levin, Lin and Chu (2002), consider a panel extension of the null hypothesis that each individual time series in the panel contains a unit root against the alternative hypothesis that all individual series are stationary (Hsiao, 2003).

The adjusted t-statistic of LLC can be written as follows:

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$$t_{\rho}^{*} = \frac{t_{\rho} - N\tilde{T}\hat{S}_{N}\hat{\sigma}_{\tilde{\varepsilon}}^{-2}\hat{\sigma}(\hat{\rho})\mu_{m\tilde{T}}^{*}}{\sigma_{m\tilde{T}}^{*}}$$

Where $\mu_{m\tilde{T}}^{*}$ and $\sigma_{m\tilde{T}}^{*}$ are the mean and standard deviation adjustments provided by table 2 of LLC. Levin, Lin and Chu show that t_{ρ}^{*} is asymptotically distributed as N (0, 1).

The test of Im, Pesaran and Shin (IPS, 2003) allows for a heterogeneous coefficient of y_{it-1} and propose an alternative testing procedure based on averaging individual unit root test statistics. IPS suggests an average of the ADF tests when u_{it} is serially correlated with different serial correlation properties across cross-sectional units.

The t-statistic of IPS can be expressed as follows:

$$t_{IPS} = \frac{\sqrt{N}(\bar{t} - \frac{1}{N}\sum_{i=1}^{N} E[t_{iT} \mid \rho_i = 0])}{\sqrt{\frac{1}{N}\sum_{i=1}^{N} \mathrm{var}[t_{iT} \mid \rho_i = 0]}} \Rightarrow N(0,1) \qquad (3)$$

Values of $E\ [t_{iT} \mid \rho_i = 0]$ and $\mathrm{var}\ [t_{iT} \mid \rho_i = 0]$ obtained from the results of Monte Carlo simulations carried out by IPS.

As mentioned in Baltagi (2005), LLC and IPS tests may not keep nominal size well when either N is small or N is large relative to T. Breitung (2000) found that the LLC and IPS tests suffer from a dramatic loss of power if individual-specific trends are included. Breitung suggests a test statistic that does not employ a bias adjustment whose power is substantially higher than LLC or the IPS tests using Monte Carlo experiments. The test statistic of Breitung (2000) panel unit root test has the following form:

$$\lambda_{B} = \frac{\sum_{i=1}^{N} \sigma_{1}^{-2} y_{i}^{*'} X_{i}^{*'}}{\sqrt{\sum_{i=1}^{N} \sigma_{1}^{-2} X_{i}^{*'} A' A_{i}^{*}}} \qquad (4)$$

Maddala and Wu (1999) and Choi (2001) proposed a Fisher-type test of unit root, which combines the p-values from unit root tests for each cross-section i to test for unit root in panel data. The Fisher test is nonparametric and distributed as chi-square with two degrees of freedom:

$$p\lambda = -2\sum log_{e}\pi_{i} \qquad (5)$$

Panel Co- integration Test

Several tests have been presented to survey the existence of co-integration in panel data model. This paper applied panel co-integration test of Pedroni (1999, 2004) and Kao (1999).

Pedroni has introduced seven statistics for testing the null hypothesis of no co-integration in panel data. Four statistics called panel co-integration statistics and based on pooling along what is commonly referred to the "within-dimension" and other three statistics developed by Pedroni called group-mean panel co integration statistics, are based on pooling along what is commonly referred to "between-dimension". (Dahmardeh and Mahmoodi, 2012)

Hausman Test

In panel data models, for estimating the model we have to select one of the Fixed Effects Model (FEM) or random Effects Model (REM). Hausman (1978) have presented a test for this aim. Based on Hausman test under the null hypothesis and assumption of the lack of correlation between cross-sectional data and other explanatory variables, both estimator (LSDV and REM GLS) are inconsistent but the LSDV estimator is also inefficient. But, in contrast in terms of correlation between cross-sectional data and other explanatory variables (FEM), the LSDV estimator is consistent but GLS is inconsistent. (Greene, 2003, 301)

Generally, this test explains its assumptions as follows; H_0: The two estimators should not be significantly different from each other however, the random effects model is preferred, and H_1 implies the existence of fixed effects model and rejection of random effects model. (Shahiki tash & Ghodrat, 2012)

Empirical Results

LR Test

As stated previously, to identify the structure of data we can use the LR test. The results of this test have been shown in table 1.

Because of the heterogeneity of economic structure of countries and according to the results of table 1, it is clear that the model should be estimated by using panel data.

Table1. LR Test

Effects Test	Statistic	d.f.	Prob.
Cross-Section F	46.854	(20,425)	0.000
Cross-Section Chi-Squar	521.777	20	0.000

Panel Unit Root Test

The results of Im et al. (IPS, 2003), Levin et al. (LLC, 2002), Breitung (2000) and Fisher-type panel unit root tests are reported in table 1.

Table 2.Panel Unit Root Tests

test variable	LLC (2002)	IPS (2003)	Breitung (2000)	ADF-Fisher	PP-Fisher
(GS)	-4.227 (0.052)	-4.124 (0.000)	-1.245 (0.106)	90.257 (0.000)	81.083 (0.000)
EG	-5.336 (0.001)	6.124 (0.000)	3.225 (0.850)	36.789 (0.002)	9.326 (0.000)
GP	-4.365 (0.004)	0.358 (0.640)	5.443 (1.000)	74.691 (0.001)	68.006 (0.006)

Note: Probability values have been reported in parenthesis.

As seen in table 1, in general, the results of different panel unit root tests indicate that all variables are non-stationary in levels.

Panel Co-integration Test

The results of Pedroni panel co- integration tests have been presented in table 3.

Table 3.Pedroni Panel Co-integration Test

Statistics	
Panel *v*-statistic	2.231 ***
Panel *ρ*-statistic	-1.789**
Panel non-parametric (PP) *t*-statistic	-2.548 **
Panel parametric (ADF) *t*-statistic	-2.22 6 **
Group *ρ*-statistic	0.158
Group non-parametric *t*-statistic	-1.608 **
Group parametric *t*-statistic	-1.454 **

Note: *** and ** denote statistical significance at the 1and 5% levels, respectively.

According to the results of table3.Except Group *ρ*-statistic, other statistics show that the hypothesis of no co-integration is strongly rejected. So we can detect there is a long run relationship in the model.

Model Estimation

Finally, at the last stage, we should estimate the model. As mentioned before because our variables are non-stationary in level but there is co-integration between them in long-run, so we estimate the model by using DOLS estimator.

Table4. Results of model estimation

Variable	Coefficient	Prob.
EG	0.052	0.071
GP	0.632	0.008
R^2=0.66		

Source: Author's findings

According the results of table 4 trade openness has a significant and positive effect on government size in our sample. Also there is a positive relation between GDP per capita and government size. Also all independent variable in two models are significant at 10% level. As seen in table 5, 1 unit increase in economic globalization increase the government size by 0.05 unit.

Conclusion

The Size of government and the factors that influence on it, is one of the most challenging issues in public economics. Recently, in public economics literature, a lot of researches have focused on the economic relation between government size and openness. The globalization process has led to a growing government's ability to continue providing the social protection at the level of the past decades. Also, more open countries are facing with increasing demand for social security and welfare expenditure to mitigate the exposure to external risk exerted by globalization process (Sanz and Velazquez,2003). So, this paper aims to explore the relation between economic globalization and government size for 30 Asian developing countries. Using the KOF index of economic globalization as a proxy for trade openness, this paper aims to reveal this relation for a panel of 30 Asian developing countries during 1990-2015. After exerting the LR and Hausman test it was concluded that the model should be estimated by Random Effect Model (REM).

The results of estimating the model show that for our sample there is a positive relation between economic globalization and government size. This finding is compatible with Rodrik's theory (1996) because according to this theory open countries face external shocks more than closed economies and thus these countries need a larger public sector in order to stabilize the economic situation and decrease the external shocks.

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