The Effect of Financial Openness Measure on the Government Size in Selected Countries

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Abstract
A decline in private sector investment expenditures, crowding-out effect, lack of conditions for optimal allocation of resources, reduction inefficiency, and the possibility of increasing inequality in income distribution are considered as the effects of increasing the government size according to many theoretical studies and empirical evidence. Hence, it is essential to identify the government's size and position determinants. In this study, in addition to inflation and economic growth rate, the effect of financial openness measures on the government size in selected countries such as Iran has been tested experimentally. In the present paper, Chinn and Ito's indicators are used as variables of financial openness measure. Also, to analyze the sensitivity of the results to the statistical sample, the econometric model for the two groups of countries with high and low GDP per capita (2000-2016) was estimated by the Generalized Moment Method (GMM). The results showed an increase in the degree of financial openness in both groups of studied countries would reduce the size of the government. Still, this effect is more in countries with high GDP per capita and minimal in countries with low GDP per capita. In high GDP per capita countries, the relationship between inflation and government size is positive and significant, and the relationship between GDP per capita and government size is negative and significant. But the study of low GDP per capita countries shows a negative and significant relationship between inflation and government size and a positive and meaningful relationship between GDP per capita and government size. Besides, according to research findings, the economic growth rate has the most considerable impact on government size in both countries.
Keywords: Financial Openness Measure, Government Size, Generalized Moment Method.
JEL Classification: G15, F32, H11, O16.

1. Introduction

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With the spread of the phenomenon of economic globalization, economic and political boundaries between countries have become much faded. Hence, employment, prosperity, economic growth, income distribution, and technology transfer are not the only variables under the influence of globalization. In the framework of the process of globalization, the role of policy-making institutions, such as the government and central bank, is evolving; for this reason, the government size under open economic conditions may be different from that of the closed economy. Obviously, with an increase in economic openness measure, the risk level and possibility of economic vulnerability increase. In this situation, the government size will increase in the economy.

Efficiency, resource allocation, and crowding-out effect are variables that change with the government size. In all economic communities, the government, even to the smallest possible extent, is responsible for the production of public goods and maintenance of order and security, and it enters the economy through expenditures and taxes. What sets the government size in an economy is not just a list of government tasks, but there are economic and non-economic determinants that can change the government's share of the economy. One of these variables is economic growth and inflation. The variables of economic growth and inflation have traditionally been used in modeling in most studies conducted on government size.

In economies with a higher degree of capital mobility, the effect of the fluctuations of international financial markets, and the global economy on the national economy is more tangible. In these conditions, the financial openness measure can be an important determinant in the transmission of uncertainty to domestic markets and, ultimately, to the national economy. Here, governments that pursue economic stabilization programs will increase their spending to support the national economy. This could lead to an increase in government size. There are many criteria for measuring the financial openness measure. The indicators used to study financial openness measure are Quinn, Mody & Abiad, FOL, and Chinn & Ito (KAOPEN) (Chinn & Ito, 2008).

The present study uses a generalized moment method to study the effect of financial openness measure on the government size as well as

the effect of economic growth and inflation as additional variables on the government size and its comparison in two groups of selected countries, based on GDP per capita in two groups of countries with high and low GDP per capita between 2000-2016. To study financial openness measure, Chinn & Ito index (KAOPEN) has been used and the ratio of government expenditures to GDP has been used to study the government size.

The present paper is organized into five sections, and in the second section, a review of the literature on the subject, including the principles of the theory and literature review, is addressed. In the third section, the research method is introduced. In the fourth section, the results of the model estimation are presented and the final section is dedicated to the conclusion and presentation of the proposal.

2. Literature Review

Public expenditures have always played an important role in various economic aspects. These expenditures are spent on the production of various products, services as well as development and upgrading of various types of infrastructure. The governments do various financial measures, such as transfer payments, to stimulate economic activities, especially during the recession. They are interested in understanding and studying the factors that change and affect economic activities in the country and over time so that they can make appropriate decisions during the recession, and then the government's expenditures will be spent on improving the economic status (Wang & Alvi, 2011).

Max Weber (1978) argued that sustainable tax enables advanced states to expand "administrative duties" and "focus on management tools". Wagner says: "when the economy moves toward industrialization, the complexity of the relationship between developed markets and the behavior of economic agents will increase, which protecting these achievements will require the regulation of laws as a result of more government involvement in the economy. Consequently, with the growth of per capita income of the economy, the relative size of the public sector will also increase" (Dadgar & Nazari, 2012).

Some researchers such as Rodrik (1998) argued that the expansion of international markets and globalization may lead to increased

economic inequality, economic insecurity, and external risk. In this case, the governments need to increase their expenditures, especially in the social insurance sector, to protect citizens from these threats (Liberati, 2006).

Although there are several ways to calculate the government size based on exclusive expenditures, however, the government's influence in a single economy goes beyond expenditures and taxes. Governmental ownership of companies, controlling prices, regulations, and constraints in the competition are examples of government involvement that can have profound effects on the economy (Garen & Trask, 2005).

Some economists believe that almost any government can reduce economic fluctuations by increasing its size by employing more persons. In countries with an efficient government can reduce economic fluctuations by increasing their ability and reducing costs through appropriate macro policies, financial policies, wisdom policies, and appropriate social policies. Also, the governments have the capacity for economic development, and the promotion of the quality of public institutions affects economic policies (Franco Chuaire et al., 2014)

Given that efficient and strong financial markets are among the most important indicators in the economic field, accordingly, the analysis of the effect of financial openness on government size has always been one of the most controversial problems. Stiglitz (1994) argues that "financial markets are the main core of the economic system and decision-making, and if these markets fail, the whole economic system's function will be damaged". Various empirical studies have been conducted on the effect of financial openness measure on the government size, which has provided different results. Among the studies by Kimakova (2009), Zakaria & Shakoor (2011), Olawole & Adebayo (2017) indicated a positive relationship between financial openness measure and the government size. In their study, Sanz & Velázquez (2003) stated that financial openness has a positive relationship with the government expenditures on health and social security, and has a negative relationship with government expenditures on education, housing, transport, and communications. Garen & Trask (2005), Liberati (2006), Falahati & Sepahban

Gharehbaba (2009), Shahbaz et al. (2010), Abounoori & Ghaderi (2011), Wu & Lin (2012) and Tohidi et al. (2015) have concluded the negative relationship between financial openness and the government size. Also, the results of a study by Rafat et al. (2013) suggest a significant and negative relationship between financial openness and government size for lower than average income countries and low-income countries, and insignificance of the coefficient of financial openness indicators for higher than average income countries. In sum, it is impossible to determine with certainty the effectiveness of financial openness on government size.

There are many criteria for describing the degree of capital account control, including the index provided by Mody, Abiad, & Murshid (2005). They derived Financial Convergence Index using the analysis of the main components on four variables including K_1 represents the multiple presences of the exchange rate, K_2 represents current account transactions' restrictions, K_3 represents capital account transactions' restrictions and K_4 requires the transfer of export earnings (Quinn & Schindler, 2011).

Chinn & Ito (2008) studying on Mody, Abiad, & Murshid (2005) work introduced Chinn and Ito's index based on international financial transactions and IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and analysis of K_1, K_2, K_3, and K_4 components on binary variables. In 1996, the classification method was changed at AREAER, and the four groups were further divided into attempts to better illustrate the complexity of capital control policies.

To focus on the effect of financial openness on their control, Chinn and Ito showed a variable with 1 in the absence of capital account restrictions. Also, to control the capital account transactions (K_3), they first introduced the KAOPEN index to measure financial openness based on the main standard components $SHAREK_3$, K_1, K_2, and K_4. The component $SHAREK_{3,t}$ is obtained by the following equation:

$$SHAREK_{3,\text{t}} = \left(\frac{k_{3,t} + k_{3,t-1} + k_{3,t-2} + k_{3,t-3} + k_{3,t-4}}{5} \right) \tag{1}$$

The main advantage of this index is transparency in structure, ease of updating, and extensive coverage in all countries and periods. Besides, the index calculates countries' higher-valued and more open international capital transactions (Chinn & Ito, 2002, 2006, 2008, 2016 and 2018)

FOL index, which was introduced by Johnston & Tamirisa (1998) and Brune & Guisinger (2006), distinguishes between the flow of input and output and static and non-static transactions. These components split capital flows into precise details. The main drawback of the FOL index is that the data and details of this index are not publicly available, unlike Chinn and Ito index. Both FOL and KAOPEN indicators are very suitable for reaching the integrated information of a large number of countries and periods (Quinn & Schindler, 2011).

If the more non-integrated information is needed, Schindler index is appropriate, although its sample size is small. This index is useful for researchers who are interested in classifying individual assets and topics related to capital account liberalization arrangements (Estrada et al., 2015).

Lane & Ferreti (2007) Index is calculated by the sum of assets plus the gross domestic product debt of a country. The information on this index includes equity, Foreign Direct Investment (FDI), debt, foreign assets, and financial derivatives.

Inflation and economic growth are among the most important indicators affecting government size. The currency's purchasing power is heavily influenced by inflation. Regarding increased inflation, the currency of a country weakens and, therefore, the government will have to spend more on supplies of goods and services. As a result, the country's revenue may increase and more taxes will be collected, but economic growth will be affected by this phenomenon (Wambui, 2013).

BrescianTurroni was the first economist who examined the relationship between budget deficit and inflation. He concluded that the relationship between budget deficit and inflation could be negative. Patinkin (1993) believed that when government expenditures were higher than income, it could be borrowed from the central bank to finance it. This measure will raise the inflation rate, so the real

expenditures of the government will be reduced. The negative impact of inflation on government expenditures is known as Pattinkin's effect (Mehrara et al., 2016).

Tanzi in his studies stated that increasing inflation could lead to an increase or reduction in real tax revenues, depending on the delay in collecting taxes, indexing, and stretching. Tanzi points out that inflation can reduce real financial income by delaying tax payments, which is a common phenomenon in developing countries relative to industrialized countries. In this case, increasing inflation will increase the budget deficit in developing countries. This phenomenon is known as the Tanzi effect (Cardoso, 1998).

Some economists believe that the relationship between inflation and government size depends on the political conditions of countries as well. Some studies show that at the beginning of the wars, inflation has risen above the normal level, and government expenditures are increasing to cover defense costs. While at the end of the war, the inflation rate is lower than normal (except in failing countries), expenditures will not be reduced to the pre-war level (Han & Mulligan, 2008).

Grosman (1988) considering Wagner's law mentioned the relationship between government and economic growth as a two-way one. Wagner's law (Increasing Government Size) sees the growth of economic activity as the main driver of the expansion of the public sector. Indeed, Wagner considers the economy's income the most important determinant of the government size. Accordingly, increasing incomes and urbanization, the need for education and social service because of industrialization can have its own external and additional implications, which itself requires more government involvement in the economy (Brady & Lee, 2014). Wagner's law states that: 1. The expansion of the functions of governments leads to an increase in public expenditures in the administration and regulation of the economy; 2. The development of a modern and industrial community will increase political pressure for social progress; 3. Public expenditures are increased proportional to the national income and thus increase the relative proportion of the public sector, so economic growth determines the government size (Jelilov & Musa, 2016).

According to the mentioned contents, some economists have criticized Wagner's model .They believe that Wagner's law framework has not a strong theoretical view, in other words, Wagner has used only the experiences of countries in drawing his theory .Second, Wagner's law has been compiled in certain circumstances in the industrialization history of some countries; therefore, it cannot be extended to all countries according to their developmental level .Also, Wagner has paid special attention to the sector but does not care about the supply sector of the economy (Dadgar & Nazari, 2012)

In addition to Wagner, Rostow (1960), Musgrave (1969), and Peacock & Wiseman (1979) explored the causes of government size growth. Based on the Rostow and Musgrave model, which is known as the "developmental government model", the economies that are at the early stages of development are facing a high demand for public capital formation to strengthen their infrastructure. But at the next stages of development, private capital formation institutions will be further developed, hence the share of public expenditures may reduce. At the same time, regarding changing models of private consumption due to increasing per capita income in the aftermath of industrialization, it is possible to increase the share of public capital to support the growing demand for public goods such as education, infrastructure, social security, health systems, etc. (Scharmer, 2002). The Peacock and Wiseman model (1979), in addition to economic status, enters the political arena. According to this view, the expansion of government size is related to political developments and electoral processes and the motivation of political parties (Dadgar & Nazari, 2008).

According to Keynesian School, active financial policy is an important tool available to governments to stimulate economic activity and economic growth. This hypothesis states that if the increase in government expenditures is not accompanied by an increase in revenue, it leads to a deficit. If the deficit is secured through internal debt issuance, it can have negative consequences for domestic interest rates. If the deficit is financed by monetary policy, it may lead to an increase in inflation expectations due to rising credit and liquidity, which in turn will increase nominal interest rates. These factors lead to

a decline in private sector investment, resulting in lower economic growth and capital accumulation in the long run (Hasnul, 2015).

The effect of growth on government size varies in countries with different levels of development. Bergh & Henrekson (2011) according to their studies, in developed countries, showed a negative relationship between per capita income and government size. But based on the hypothesis of compensation, if large-size countries have a high level of social trust and well-managed market management in other areas, can compensate for their high expenditures. Also, in less developed countries, based on the endogenous growth model, the negative impact of tax increases can be offset by the government expenditures on things like infrastructure, health care, and education (Bergh & Henrekson, 2011).

In economies like Iran, which have natural reserves such as oil, gas, and mines, the income from these resources forms a large part of government revenue, which this will increase the government enterprise in the economy; and if revenue from these sources is not managed correctly, in the long-run, will reduce economic growth (Maddah et al., 2015). Reducing government intervention in the economy, encouraging the private sector, and promoting competition are some of the goals and guidelines for improving the quality of public sector management. The public sector in Iran, on the on hand, must to strengthen its supervisory and protection role and, on the other hand, to reduce its interventional role and, by creating the legal appropriate contexts, the expansion of the private sector and the use of other institutional changes, provide sufficient security for domestic and foreign investments to provide the necessary ground for economic development in the country (Dadgar & Nazari, 2018).

3. Methodology

The periods for the years 2000 to 2016 and the spatial area of research are selected from countries that are divided into two groups of countries with low GDP per capita and high GDP per capita:

1) The selected countries with low GDP per capita include Uruguay, Iran, Trinidad and Tobago, Peru, Jamaica, Czech Republic, Costa Rica, Kenya, Guatemala, Mongolia, and Nicaragua.

2) The selected countries with high GDP per capita include Australia, Austria, Italy, Germany, United Kingdom, Denmark, France, Canada, Norway, and the Netherlands.

According to the literature, the following model is proposed to test the effect of financial openness on government size:

$$dln(Gov)_t = \beta_0 + \lambda_{it-1}$$
$$+\beta_1 dln(KAO_{it-1}) + \beta_2\, dln(INF_{it-1}) + \beta_2\, dln(PCI_{it-1}) + \mu_{it-1} \qquad (2)$$

In the above equation, i represent the country and t represents time. Also: GOV_{it}: The government size, KAO_{it}: Financial openness measure (based on Chinn & Ito index), PCI_{it} : GDP per capita, INF_{it}: Inflation rate and ε: model error term, the variables listed all entered as logarithm differential. In this study, to determine the government size, the ratio of total government expenditures to gross domestic product has been used.

The proposed model is estimated by a generalized moment method for both groups of studied countries. The linear GMM estimator in the economics literature was first introduced by Hansen (1982) and Hansen & Singleton (1982). This estimation, due to its high flexibility and the need for only weak assumptions, was quickly used as one of the most widely used econometric methods, both in cross-sectional and combined data estimations. It is very useful to use this method, especially when the model is too identifiable. The central core of GMM estimation is the formulation of significant torque conditions that allow the model coefficients to be adapted adequately. By applying the principle of comparison, one can move from the moment conditions of the sample and using the sample moment conditions to estimate the model coefficients. GMM estimator adaptability depends on the assumption of a lack of serial correlation for error terms and tools, which can be specified by two tests. The first is the Sargan test that tests the validity of the tools. The second is a test that examines the existence of second-order serial autocorrelation in first-order difference errors. The non-rejection of the null hypothesis in both tests provides evidence of the assumption of a lack of serial autocorrelation and the reliability of the tools. If there is no first-order serial

correlation in error terms from the first-order differential equation, the GMM estimator is consistent.

4. Results
4.1 Estimation of Proposed Model for Countries with Low GDP Per Capita
4.1.1 The Results of Stationary Test
Since in the estimation of econometric models of non-stationary existence in the studied variables, false regression is made, it is necessary to perform a single root test for the model variables. Table 1 shows the results of the single root test.

Table 1: The Results of Unit Root Test

Variable	Levin, Lin & Chu	Im, Pesaran & Shin	Fisher-ADF	Fisher-PP
dln(GOV(-1))	-10. 91	-10.74	128.94	169.44
	(0.00)	(0.00)	(0.00)	(0.00)
dln(KAO)	-30. 62	-31.38	55.71	66.28
	(0.00)	(0.00)	(0.00)	(0.00)
dln(INF)	-17.71	-14.01	158.67	176.21
	(0.00)	(0.00)	(0.00)	(0.00)
dln(PCI)	-6. 43	-5.04	63.43	82.49
	(0.00)	(0.00)	(0.00)	(0.00)

Source: Research calculations.
Notes: The figures in parentheses indicate the possibility.

As shown in Table above, the hypothesis of the existence of a single root is rejected in the variables dln(GOV), dln(KAO), dln(INF), and dln(PCI). Therefore, these variables are stationary. The results of the model 1 estimation are given in Table 2.

Table 2: The Results of Estimating the Model

Variable	t- statistic	Coefficient
dln(GOV(-1))	5.76	0.45
dln(KAO)	-4.69	-0.002
dln(INF)	-4.11	-0.05
dln(PCI)	7.30	0.75
Test	Value	Probability

J- statistic	9.27	0.23

Source: Research calculations.

According to the results of model estimation in Table 2, all coefficients are statistically significant, and an increase in financial openness measure and inflation will reduce the government size and GDP per capita growth will increase the government size. According to the above Table, a one percent increase in the degree of financial openness measure will reduce the government size index by 0.002 percent. Increasing inflation by one percent would reduce the government size by 0.05 percent. Also, Table 3 shows that by a one percent increase in GDP per capita, the government size would increase by 0.75 percent. Thus, according to the results, in low GDP per capita countries, the relationship between inflation and financial openness with government size is negative and significant, and the relationship between GDP per capita and government size is positive and significant. Also, the impact of GDP per capita growth on government size index is more than inflation growth and financial openness measure growth.

To ensure a lack of autocorrelation in the first-order difference residuals, Arellano and Bond first and second tests have been used. The null hypothesis in this test indicates no serial autocorrelation. Table 3 shows the results of Arellano and Bond's first and second-order serial autocorrelation test.

Table 3: The Results of Arellano and Bond Serial Autocorrelation Test

Autocorrelation order	m-statistic	Probability
1st	-2.63	0.008
2nd	-1.47	0.14

Source: Research calculations.

Regarding the null hypothesis on the lack of serial correlation in residuals, the model is not rejected at $\alpha = 0.05$ level.

4.2 Estimation of the Proposed Model for Countries with High GDP Per Capita

Table 4: The Results of Unit Root Test

Variable	Levin, Lin & Chu	Im, Pesaran & Shin	Fisher-ADF	Fisher-PP
dln(GOV)	-11.23 (0.00)	-9.63 (0.00)	113.99 (0.00)	178.54 (0.00)
dLn(KAO)	-0.4 (0.34)	0.14 (0.55)	1.13 (0.56)	1.13 (0.56)
dln(INF)	-3.84 (0.00)	-2.58 (0.00)	9.31 (0.00)	9.73 (0.00)
dln(PCI)	-11.23 (0.00)	-9.63 (0.00)	113.99 (0.00)	178.54 (0.00)

Source: Research calculations.
Notes: The figures in parentheses indicate the possibility.

As shown in Table above, the hypothesis of the existence of a single root in the variables the growth of the government size dlnGOV, inflation growth (dlnINF), and GDP per capita growth (dlnPCI) is rejected. Therefore, these variables are stationary. However, the growth of financial openness measure (dlnKAO) is not stationary, for this purpose, the stationary of this variable is repeated in the first-order difference, which does not reject the results of the test in the first-order difference.

In the present study, to avoid false regression and be aware of the existence of a long-run equilibrium relationship between the model variables, the co-integration test of residues is used. The null hypothesis of this test is the lack of co-integration. Table 5 shows the results of the cointegration test.

Table 5: The Results of Cointegration Test

Null hypothesis on lack of convergence in the dimensions				
Statistics	Weighted			
	Statistic	Prob.	Statistic	Prob.
v Panel	-0.92	0.82	-0.92	0.82
rho Panel	0.71	0.76	0.71	0.76
pp Panel	-0.03	0.48	-0.03	0.48
ADF Panel	-1.83	0.03	-1.83	0.03
Null hypothesis on lack of convergence among the dimensions				
Statistics	Statistic	Prob.		

rho Group	1.23	0.89
pp Group	0.28	0.61
ADF Group	-1.97	0.02

Source: Research calculations.

According to the results of Table 5, 4 tests do not reject the hypothesis H_0 of lack of co-integration. Therefore, the variables are also co-integration in the long run. The results of estimating the model (2) are presented in Table 6.

Table 6: The Results of the Model Estimation

Variable	t-statistic	Coefficient
dln (GOV(-1))	-15.75	-0.60
dln (KOA)	-6.17	-0.41
dln (INF)	3.52	0.04
dln (PCI)	-10.23	-0.74
Test	Value	Probability
J- statistic	6.62	0.3

Source: Research calculations.

According to the results of model estimation in Table (6), all coefficients are statistically significant. As shown in Table above, the GDP per capita growth and financial openness measure growth will decrease the government size, and inflation growth will increase the government size. One percent increase in financial openness measure will reduce the government size index by 0.41 percent. Also, with increasing inflation growth by one percent, the government size will increase by 0.04 percent. Also, according to Table 6 data, by a one percent increase in GDP per capita, the government size will be reduced by 0.74 percent. Thus, according to the results, in high GDP per capita countries, the relationship between GDP per capita and financial openness with government size is negative and significant, and the relationship between inflation and government size is positive and significant. Also, the impact of GDP per capita growth on government size index is more than inflation growth and financial openness measure growth.

Table 7: The Results of Arellano and Bond Serial Autocorrelation Test

Autocorrelation order	m- statistic	Probability
1st	-2.36	0.01
2nd	-0.55	0.57

Source: Research calculations.

Regarding the null hypothesis on the lack of serial correlation in residuals, the model is not rejected at $\alpha = 0.1$ level. In this way, the results from both groups indicate that the effect of GDP per capita on the government size index is greater than inflation and financial openness measure.

5. Conclusions

Regarding the spread of the phenomenon of economic globalization in recent years, the role of this factor in the transformation of indicators such as employment, prosperity, economic growth, income distribution, and technology transfer has been more than before. Accordingly, the function of policy-making institutions, such as the government and central bank, also evolves. On the one hand, regarding the increase in uncertainty and possibility of economic vulnerability due to the increased measure of the openness of the economy, the role of the government as an institution responsible for maintaining order and security will increase. On the other hand, according to many theoretical studies and empirical evidence, increasing government size has implications such as the decline in private-sector investment expenditures, crowding-out effect, lack of conditions for the optimal allocation of resources, reduction inefficiency, and the possibility of increasing inequality in income distribution.

Many economic and noneconomic indicators affect the government's contribution to the economy. One of the most important of these variables is economic growth and inflation. Also, in this study, in addition to economic growth and inflation variables, the effect of financial openness measures on government size has been empirically tested.

In the present study, Chinn & Ito index has been used as the variable of financial openness measure. Also, to analyze the sensitivity of the results to the statistical sample, the econometric

model was estimated for the two groups of countries with high and low GDP per capita (2000-2016) by generalized moment method. The results showed that in high GDP per capita countries, the inflation growth will increase the government size, and GDP per capita growth and financial openness measure growth will decrease the government size. Moreover, in high GDP per capita countries, an increase in inflation and financial openness measure will decrease the government size, and an increase in GDP per capita will increase the government size. In summary, the impact of financial openness measure both groups of countries on government size is negative and significant, but this effect is more in countries by high GDP per capita and minimal in countries by low GDP per capita. Also, the results show that the economic growth rate has the largest impact on government size in both groups of countries.

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