Government Size and Intersectoral Income Fluctuation: Panel Analysis

Zahra Afshari*, Mahdokht Habibi**

*Full Professor, Department of economic and management, Alzahra University, Tehran, Iran

**MSC, Department of economic and management, Alzahra University, Tehran, Iran

Abstract

There has been an extensive empirical literature on the stabilization effect of government spending on income; no existing paper has examined the interaction between economic uncertainty and government size as the stabilization effort of a government. This paper addresses this issue within a Keynesian framework utilizing the inter sectoral income fluctuations as a new measure of economic uncertainty. Our empirical model allows for the interaction of government size and uncertainty through panel data for 11 Asian countries during 1985-2005 periods. Taking into account the interaction in accordance with these simple models, we obtained the following main result. As Rodrik (1998) hypothesized, this study finds that an economy with high inter sectorial income fluctuations will have a large government, but at the same time, the size of government has a substantial effect on the stabilization of inter sectorial income fluctuations. Furthermore, instruments & dummy variable is introduced into the model for 3SLS method.

Keywords: Knowledge Management, Organizational Culture, Entrepreneurial Orientation, Innovation

Introduction

Although there are widespread literatures about the stabilizer role of government in income, there are negligible studies about the mutual relation between the size of government (as the stabilizer effect) and economic insecurity and instability (Abizadeh and Basilevsky,2002). In this study, the mutual relation between the size of government and economic insecurity has been considered for the group of the selected Asian countries (included Iran) in 1985-2005. According to the mutual relation of the size of government and economic insecurity, the Keynesian simple model, considering of the assumptions of Rodrik’s assumptions in 1988 and using of the SLS3 method (three stage least squares), the results of the study show that: the economy which has more income fluctuations, is willing of superior and bigger government. In addition, the size of government has significant effect on stabilization of the fluctuations of midsection income. On the other hand, the growth of the size of government decreases the insecurity (BayoumiT,Woglim,1996).

Economic stability and its implication on the growth and welfare is one of the most important aims in macroeconomic. Primarily, the people have not overcome the negative effects of economic fluctuations in capital market or credit markets. In addition, according to the experiences, the market mechanism does not protect the people against the economic insecurity (Beaudry, and Carmen,2001). The subjects such as market setback, imperfect risk, economic fluctuations and nonsymmetrical information which lead to the problems such as: ethical
danger, suggest a kind of size for more intervention of government in the economic. The economic role of government and the sum of the effectiveness of its size through monetary and fiscal policies on the fluctuations and economic stability have been in the center of the discussions. Particularly, the fiscal policies have been considered as a kind of tool for stabilization of the fluctuations and smoothing of income and stability (Don, 1957).

On the one hand, the role and the size of government have experienced growing progress of development and mutation. It seems that the views about the role and the size of government have passed two different and specific paths. The first path is known as the classical schools which emphasis on the efficiency of the economy of the market totally. It believes that the existent imbalance in the economy is temporary and if there are not any external interference (noninterference of the government) and the forces of market act freely and the economy experiences the equilibrium, balance and employment automatically (Daehaeng and Chul, 2007; Delong, 1986). One of the subjects which must be considered in this view is something which is known as “being dichotomous of the classics”. In this view, the economy has been divided into two parts of monetary (monetary business cycle) and real, effective (real business cycle). Firstly, the classics concentrated on the monetary tensions. Then they concentrated on the real tensions since the first decades of 1980.

The second paths have been known as the Keynesian schools which has emphasized on the intervention of the government in the economic affairs. It believes that if the economy is abandoned on its own way, it will not achieve the equilibrium and balance with complete employment. In addition it is possible that it confronts deep stagnation and then crisis but makes severe tensions in the economy. As the result, the economy of the free market may experience simple employment by chance. In many cases, it is possible that it is placed in the position which is called the issue of “knife edge” by Harrod. It means that the economy experiences downturn or stagflation in many cases [Beaudry .1991; Acmoglu.1997]. As the result, it seems that the intervention of the government and adoption of the proper policies is necessary for removing the economic imbalances and placing economy in the path of the efficiency and balance in this view. Since the last of decades of 1970, Keynesian economic confronted important crisis because of inattention to the infrastructure of micro economy. As a result, the recent views of the neo Keynesians have accepted many of these criticisms and have tried to present its models on the basis of the new assumptions. The challenge which was began by these two views of the classics and Keynesians have continued in their two developed views, means the neo classics and the neo Keynesians. In addition, it seems that none of them has not been able to perform the dominant role and exclude the other view.

So, the present study will consider the way of acknowledging of the mutual relation between the size of the government and insecurity. In fact, the aim is answering to this question: is the size of the government is effective in the insecurity of the economy?

2. Literature Review

The contemporary economic situation and the new economic theories necessitate the development of the activities of the government. In fact, the governments are not satisfied with the small size which the classic economist knew for them. On the other hand, they act as one of the economic elements of the society. The size of the government in the economic actions and practices is increasing with growing acceleration. This acceleration leads to making of the organizations, institutions and interventions which leads to increasing of the proportion of government from the national income (Alesina, 1998; Asdrubali, 1996).

The governments must try to consider the issues such as allocation of the sources, distribution of income, employment, keeping of the level of the prices, economic stability, economic development, international trade, etc for obtaining of the aim of social welfare, in addition to the traditional duties which is accepted by the classic economist (Fatas, 2001). According to this study, one of the most important duties of the government is the stabilizer role of the government. It seems that the most important difference between these two views- the neo
classics and the neo Keynesian- is the issue of tenacity of the wages. The classics believe that the prices have clarified the market with its rapid modifications and they make balance in supply and demand. In fact, they believe in the absolute competition market and balance (Fatas, Antonio, and IlianMihov, 2001). In addition they consider the monetary tensions (the monetary business cycle) and technology tensions (the real business cycle) as the sources of fluctuations and they have defined the fluctuations in the frame of the competitive markets and without any friction and attrition (Gali, 1994). The neo classic models have ignored their attention to involuntary and forced unemployment. So, the Laissez-Faire economy, excluding of unavoidable tensions, acts properly and there is no need to the intervention of the government (Frankel, 1999).

The neo Keynesians believe that the expectations have been formed reasonably and intellectually but they remind that the monetary mages and employment-at least in short term- have not modified for clarifying of the markets. In fact, they have accepted the existence of the markets with imperfect and heterogeneous competition and unsymmetrical information in the real world. Neo Keynesians have remodeled the macro economy in the frame of the models of imbalance, with emphasis on the basis of the fundamentals of micro economy. They believe that money is not neutral (Kerbs,2003). In fact the occurrence of the commercial cycles can be explained with changing in the macro and whole demand and this problem will be related to the defeat of the employment markets and capital (Rodriguez,2001). They think that involuntary unemployment as well as changing in the product will be made and the government can decrease unemployment though increasing of its own costs. It may be defined in this way that the main message of Neo Keynesian economy has emphasized the regulatory and modulator role of the public sector. It means that the policies of the public sector must affect the structure of the market directly and indirectly and in the direction of the demand of the economy.

May be it is proper to indicate this argumentation that the government may have a kind of informative superiority. In other words, it has valuable information about the particular part (procreative units, the employers), so the atmosphere of using this superiority will be provided in the private sector for regulation of its policies for making stabilization in economic behavior for modification and increasing of the made tensions in the private sector (Marvin & Robert, 1997; Sachs, 1992). As the result, the active policies of the government will have positive effects on the economy. So, if the private unit has less information or it can modifies itself with less speed in comparison with the government, the policies of the government may leads to increasing of stability and welfare (Sachs, 1992). This interpretation has been guided to the fundamentally political results which is different from the model of neo classic’s. So, according to the explanations, it seems that neo Keynesian school has more chance to achieve its dominant role in the macro economy (Lucas, 1987).

According to the mentioned issues, it can be concluded that the size and the role of the government in economic stabilization and the extent of the effectiveness of the government through monetary and financial politics in the fluctuations and economic stability have been the centre of discussion all the times. Economic stability leads to

---

1. the theory or system of government that upholds the autonomous character of the economic order, believing that government should intervene as little as possible in the direction of economic affairs.-absolute economic freedom

2. In the present time, this informative superiority is clear specially in Asian countries

3. For this aim it is necessary to remind that the people can not anticipate the future. Also, they have not a high scientific position to have reasonable act to the future. so, it is expected that the future advances in economy move in the direction of the concept “reasonable”
decreasing of insecurity in economy, increasing of income and employment and as the result welfare (Michael, 1999).

3. Introducing model and index

For considering of the mutual relation of ASY, GOV, with reference to the model of SLS3, the following equations will be considered:

\[ ASY_{jt} = C_j + y_t + \alpha_1 GOV_{jt} + \alpha_2 OPN_{jt} + \alpha_3 OPN_{jt} ToT_{jt} + \alpha_4 ToT_{jt} + V_{jt} \]  
(1)

\[ GOV_{jt} = C'_j + y'_t + \beta_1 ASY_{jt} + \beta_2 DEP_{jt} + \beta_3 INC_{jt} + \beta_4 PoP_{jt} + \beta_5 LND_{jt} + U_{jt} \]  
(2)

j: Country  
t: Year  
V \sigma,: Disturbing Sentence  
ASY: Itersectoral income fluctuation  
GOV: Government Size  
y_t: year t specific intercept  
C_j: Region j specific intercept  
OPN: Openness to trade  
ToT: Terms of trade shocks  
DEP: Dependency ratio  
INC: Log GDP per capital  
LND: log Land Area (in Square Kilometers)

The first relation is indicative of the effective elements of the fluctuations of midsection income. It is measured as the standard deviation from the rate of midsection income growth which will be explained in chapter 3. The second relation is a kind of extended relation from the usual model which determines the size of the government. In fact, it is main difference of increasing of fluctuation of midsection income.

3.1. Model variables

In the present study, the following variables have been used for considering of the mutual relation between the extent of the government and the fluctuations of the midsection income:

1. The size of Government (GOV): the proportion of the costs of the government in GDP, in calculation of the size of the government, expenditure proportion in GDP has been considered. The statistical sources of the size of government have been IFS, in which GDP has been used from the national accounts (in Iran, petrol income is included too). It is expected that the effete of increasing of the size of government on the fluctuations be negative.
2. Insecurity in economic: the fluctuations of the midsection income were introduced as a new concept of economic insecurity which is defined as the weight average of the deviances in the sector labor productivity logarithm

$$PRDEF = \sum_{j=1}^{M} n_j (\ln y_{jt} - \ln y_t)^2$$

$y_{jt}$: The average of the sector labor productivity $j$, $y_t$: the whole sector labor productivity

It is expected that the effect of the economic insecurity on the size of the government be positive. It means that the economic who has bigger fluctuations of midsection income, wants a bigger government.

6. Openness to trade (OPN): it is equal to the full amount of import and export to GDP. As it was mentioned in the previous part, the more the economic is open, the bigger and higher is the fluctuations of midsection earning (the index in Iran exists with considering of the petroleum part of the government). It is expected that the effect of openness to trade be positive on the fluctuations. In addition, there is not any direct relation between the size of the government and the openness to trade.

7. Terms of trade shocks (TOT): for introducing of the Terms of trade shocks, at first the Terms of trade must be defined as a proportion of the value of one unit of export to the value of one unit of import. In addition, trade shocks are introduced as the modulus of the difference between the percentage of the annual changes and the average of terms of trade.

The effect of the foreign and external shocks on the fluctuations of midsection income depends on openness to trades; it seems that the foreign shocks decrease the special-midsection income risk in the closed economy. On the contrary, they increase these risks in the open economy (Van den Noord, 2000).

8. Dependency ratio (DEP): it has been determined as the proportion of the unemployed population to the whole population. According to the studies of Panel, it is expected to have positive and significant relation with the variable of the size of government (Rodrik, 1998).

9. In addition to the openness to trade and Terms of trade shocks, their correspondent behavior has considered $OPN \times TOT$ as the other element in determining of the fluctuations of midsection income.

10. There are some of the other variable which have been considered according to economic literature such as GDP log per capita (INC) which has been brought according to the Wagner’s law (i.e. demand for governmental services depends on powerful income). Therefore, it is expected that the proportion of the government expenditure increases with increasing of income.

As it was mention before, the size of the government and its fluctuations doesn’t have any effect on the process and procedure of the elements of the total income. When the effective demand become less then the natural or potential amount (stagnation), the expansionary effect of the fiscal policy of the expenditure of the government is expected.

---

4It must be considered that this variable has been shown in the form of opentoto in the table of regression

5Extensive matters have been presented in chapter 3 and 4

6For the reason of the least crowding out
3.2. Instruments variables (Iv)

According to this view, the size of government is irrelevant in determining of the income in the time of richness. Using of the procedure of the element of GDP per capita for measurement and calculation of income, removes the inverse feedback of the size of government on total income.

As it was suggested in the previous sections, the fluctuations of midsection income and the size of the government are the endogenous variables in this system. These endogenous variables have been affected by some exogenous variables directly or indirectly. The exogenous of many variables is ambiguous. So the instrumental variables are used in estimations such as the population logarithm (POP) and the land area logarithm (LND) which has been brought in the equation the size of government. These variables have been used for separating of the effects of endogenous variables on each other in the estimation of SLS3, regression. Some of them are in this way: population logarithm, income logarithm, land area logarithm etc. different instrumental variables are used in different estimations.

3.3. Dummy variables

In addition to instrumental variables, dummy variables have been added to both relations for obtaining of the special, fixed information -aerial and special effect- year. It seems that these effects be correlated with key variables, rate of interest, the size of government and insecurity of economic. So both relations include spatial dummy variable (D) for separating of the aerial effect of each country and temporal dummy variable (T) for separating the special effects of the years. It means that D1 for the first country is number 1 and for the other countries is number 0. In addition, D2 for the second country is number 1 and for the other countries is number 0, it can be continues in this way to D11. Additionally, temporal dummy variable is in this way that T1 for the first year is number 1 and for the other years is number 0. In addition T2 for the second year is number 1 and for the other years is number 0, it can be continues in this way to T21.

3.4. Data Sources and Limitations

The necessary statistics of this study have been calculated from (WDI) - (IFS) - (TRADEMAP) - APO Productivity Databook (2008) for the years of 1985-2005. Each of the mentioned indexes means (fluctuations of midsection income, the size of the government, terms of trade shocks, openness to trade, the population logarithm, the income per capita logarithm and land area logarithm) have been calculated and estimated in the software of Excel. The mentioned countries have been chosen according to their availability to the necessary statistics for calculation of the indexes which are in this way:

1- Bangladesh, 2-China, 3- India, 4- Indonesia, 5- Iran, Islamic Rep., 6- Japan, 7-Korea, Rep., 8- Malaysia, 9- Philippines, 10- Sri Lanka, 11- Thailand.

On the contrary of single equation patterns, the patterns which have more than one equation can be called multi-equation patterns. The equations (1) and (2) have been estimated in the form of multi-equation pattern by using of system command in the Microsoft of EViews 6.

7Although this matter that the governmental expenditure can cause changed in the process of income must be considered (for example, id a new endogenous technology progress is determined by private investment and the governmental expenditure remove these investments. National policy of the government cannot change the procedure of income).the results of the limitations must be tested because of the strength of the first strategy
4. Estimation strategy

It is in this way that firstly, we estimate a kind of compound by using of ordinary least square methodology (OLS), if the statistics of the test support the theory, the relations can be estimated by using of three stage least squares methodology. It is a kind of method which considers and estimates the structural equations of one simultaneous pattern cumulatively. The two phases of this method is TSLS. In the third phase, matrix, variance, covariance and error sentences have been intervened in the computations.

4.1. Estimated regression

According to the theory, it is expected that coefficient of the size of the government be negative in estimation of the relation (1). The reason is that increasing of the size of government decreases the fluctuations of income. So it is expected that $\alpha$ be negative. In estimation of OLS, it is observed that the coefficient of the size of government be negative and something about -0.19 which is meaningful statistically. The other coefficients have not been positive and significant (but the sign of all variants are correct and they confirm the theory). The reason is that instrumental variables have not been used and the endogenous variables are affected on each other (linear). So, firstly, endogenous of the size of the government and openness to trade must be corrected by considering the population logarithm, the land area logarithm and the income per capita logarithm as instrumental variables. Then, we register the civil and temporal dummy variables to simultaneous equation system. Then we will estimate SLS. The ratio of the size of government has been changed to -0.27 which is positive and meaningful in the level of 95% too. Also, the openness to trade ratio is positive and meaningful.

2- The relation (2) is a kind of extended model for determining of the size of the government whose difference with the previous one is adding of the fluctuation of income according to the result of the presented theory in relation to the fluctuations. In the third chapter, it was concluded that the government that confront with more fluctuations have more expenditures. So, it is expected that the coefficient of the income fluctuation be positive in the relation (2). According to the estimation of OLS, the coefficient of the fluctuations is positive and is something about 0.1 which is meaningful statistically. The other coefficient has been entered with right sign and the theory is confirmed. Then, the estimation of the coefficient of SLS has been changed and has reached to 0.12 approximately.

In relation to the openness to trade ratio, there is positive relation between the fluctuations of both estimations. According to the results, openness to trade is indigenous variable. Because of being indigenous of the openness to trade variable, the instrumental variable of $opn*TOT$ and $TOT$ is used in estimation of SLS. The other conclusion of estimation of the relation (1) is that it increases trade shocks of income fluctuation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Median</th>
<th>Standard deviation</th>
<th>number of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASY</td>
<td>0.056</td>
<td>0.481</td>
<td>0.0024</td>
<td>0.03</td>
<td>0.082</td>
<td>232</td>
</tr>
<tr>
<td>GOV</td>
<td>0.19</td>
<td>0.377</td>
<td>0.095</td>
<td>0.18</td>
<td>0.051</td>
<td>232</td>
</tr>
</tbody>
</table>
In the conclusion of estimation, the dependency ration has positive effect on the expenditure of the government. It is meaningful and positive statistically. On the other hand, our regression supports Wagner’s law because the size of the government increases with increasing of income. In addition, the size of the government of the countries that have larger territory is bigger and larger. In other words, the country with larger territory and less population has larger government. The result of the estimation supports the theory.

The results of the estimation of OLS and SLS3 have been brought with different variants in the following Table 2.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>ASY</th>
<th>GOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOV</td>
<td>-0.19</td>
<td>-0.122</td>
</tr>
<tr>
<td>OPN</td>
<td>0.003</td>
<td>0.068</td>
</tr>
<tr>
<td>OPN*TOT</td>
<td>0.0001</td>
<td>-0.01</td>
</tr>
<tr>
<td>TOT</td>
<td>0.0004</td>
<td>0.005</td>
</tr>
<tr>
<td>ASY</td>
<td>0.10</td>
<td>0.12</td>
</tr>
<tr>
<td>POP</td>
<td>-0.11</td>
<td>-0.08</td>
</tr>
<tr>
<td>LND</td>
<td>0.06</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Table 2: Regression Results
5. Test of hypothesis via the method of (SLS3)

5.1. Test of first hypothesis:

According to estimating of SLS3, the coefficient of the size of government is negative and meaningful statistically. So in the mentioned countries, increasing of the size of government decreases the midsection fluctuation of income (insecurity of economy).

\[ \text{ASY}_{\mu} = 0.051 + 0.15 - 0.27 \text{GOV}_{\mu} + 0.068 \text{OPN}_{\mu} - 0.01 \text{OPN}_{\mu} \text{TOT}_{\mu} + 0.005 \text{TOT}_{\mu} \]

According to the estimated model, as we can see, the relation of the size of government and income fluctuation is negative and meaningful. It means that increasing of one unit in the size of government decreases the insecurity of economy to the amount of 0.27.

5.2. Test of the second hypothesis

According to the fluctuations ratios in estimating of OLS, it can be concluded that the mentioned countries have had larger size by increasing of the insecurity of economy.

\[ \text{GOV}_{\mu} = 0.320 + 0.06 + 0.1122 \text{ASY}_{\mu} + 0.11 \text{DEP}_{\mu} + 0.042 \text{INC}_{\mu} - 0.08 \text{POP}_{\mu} + 0.06 \text{LND}_{\mu} \]
According to the estimated model, as it can be observed, the relation of the size of the government and the income fluctuation is positive and meaningful. In other words, increasing of one unit in insecurity of economy necessitates increasing of the size of government to the amount of 0.11 in economy.

6. Conclusion

Basically, the people cannot overcome the negative effects of the fluctuations and market mechanism does not support people against insecurity of economy totally. On the other hand, the present economical situations need development of governmental activities for growth and stability of economy and obtaining of welfare. The reason is that the governments are seeking for a proper background for economic and political assertion. The economy role of the government and the degree of the effect of its size has been considered through the monetary and fiscal politics. The studies show that there is reverse relation between the proportion of the governments’ performance and insecurity of economy. So, the mutual proceeds and performance of the size of the government and insecurity of economy have been considered.

The results have proved the authenticity of the first hypothesis. In addition, they have shown that the midsection income fluctuations have decreased by increasing of the size of the government. In other words, if the size of the government increases to the amount of 0.27 units, the insecurity of economy decreases 1 unit. So the first hypothesis is accepted. Also, the results of the estimating of the pattern of simultaneous equations have verified the results of the second hypotheses. In other words, the country confronts more insecurity and it wants a government with larger size.

6.1 Suggestions

According to the theory and the results of regression: increasing of the size of government decreases the fluctuations of midsection income. Of course, it must be mentioned that the results – as it was mentioned- are according to the Rodrik’s assumptions in 1998 whose main one is safety of the governmental part.

1. The main message of this study is emphasizing on the regulatory role of the public sector. It is in this way that the politics of the public sector affect the structure of the market.

2. According to the limitation of the governmental budget, the active politics of management are necessary for allocation of budget. According to the conclusion of the regression about the positive effect of dependency ration on the size of the government, it is possible to decrease the expenditure of the governments by decreasing of employment rate and increase the development expenditures.

References


