European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.6, No.20, 2014

The Optimal Point for Fiscal Decentralization

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Abstract

The paper's purpose is to shed more light on the impact of fiscal decentralization on the economy and determine whether or not a tipping point can be identified as an optimal point of fiscal decentralization. To do so, we proposed a new theoretical model to link two measurements of fiscal decentralization such as fiscal autonomy and fiscal importance to provincial GDP, and then apply our model with panel data to provincial GDP of Vietnam over ten years and across 56 provinces to test the significance of the impact of fiscal decentralization on the economy and compute the optimal point of fiscal decentralization. Generalized linear model with maximum likelihood method was applied to estimate coefficients in the analytical model. The results of empirical analysis indicated that our model is statistically significant and there exists an optimal point for fiscal decentralization with value captured is 7.33 of fiscal autonomy index and 0.25 of fiscal importance index. Additionally, the study also investigated that the fiscal decentralization would become a positively influential element on the economy, if the degree of fiscal decentralization underlies the optimal point. If the degree of fiscal decentralization exceeds the optimal point, however, it would affect negatively on the economy.

Keyword: Fiscal decentralization, Optimal point, Provincial GDP

1. Introduction

Up to now, there has been many debates about the impact of fiscal decentralization on economic growth and development. Many scholars have suggested that the fiscal decentralization could provide better public services and goods and instigate horizontal and vertical competition at a local and regional level (Tiebout, 1956; Musgrave, 1958; Oates, 1972). Contemporaneously, it was also known as one of the elements that creates incentives for subnational governments in fostering markets (Weingast, 1995; McKinnon, 1997) and allows for greater transparency and accountability (Azfar *et al.,* 1999; Ebel and Yilmaz, 2002). The fiscal decentralization could also force governments to concentrate on the efficient production of public goods and services, limit the capacity of bureaucrats to act as revenue maximizers, generate greater consumer efficiency (Thießen, 2003), and improve resource allocation as well as potential for achieving Pareto efficiency (Martínez-Vázquez *et al.,* 2003; Ezcurra *et al.,* 2008). While a large number of scholars believed that the fiscal decentralization contributed considerably to economic growth, a few empirical analyses have shown that the fiscal decentralization hasn't any significant correlation with, even it has affected negatively on economic growth in developing countries. Almost all of them assumed that the fiscal decentralization was a potential risk leading to budget deficits, influence of interest groups, lower quality of government decisions, corruption, greater interregional inequalities, causes leads to higher inflation rate, which may result in lower overall economic growth and development (Prud'Homme, 1995; Rodriguez and Gill, 2005; Rodden, 2003).

For our initial perceive, the impact of fiscal decentralization on the economy can't be expected in a monotonic way that is a positive or negative one as whole, it needs to be taken into account from the specific context of each country or region in a certain phase. According to Oates (1972), fiscal decentralization was a certain extent of fiscal power transferred from central to local governments to perform duties in providing public services and goods. This means that the fiscal decentralization related to two problems as the revenue-raising jurisdiction and the expenditure levels for public services and goods; in which the expenditure level of local government is dominated by the packages of public services and goods and the revenue depends on tax bases, local government's own revenue source, borrowing power, and financial grants from central government. When the total cost of the packages of public services and goods exceeds the revenue, the financial shortage will occur. In order to compensate for this shortage, local governments need to increase their revenue by raising taxing level, borrowing, or more financial subsidy. In this case, the high degree of fiscal decentralization can become a catalyst promoting the economic growth and development. Whereas, if the total cost of them is lower than the revenue, it will lead to the financial superabundance, which can lead to negative issues such as misappropriation

and embezzlement (Rodriguez and Gill, 2005; Rodden, 2003) and consequently the high degree of fiscal decentralization can become an element impeding the economic growth and development.

As discussed in the above paragraph, it is clear that there is a limitation of fiscal decentralization, where the excessive fiscal decentralization will become an element that affects negatively to the economy. This study's purpose, therefore, is to determine a limit degree of fiscal decentralization that can be considered as an optimal point, where the output of an economy achievable is maximized, and to shed more light on the impact of fiscal decentralization on the economy, as a direction help authorities make decisions on fiscal decentralization and provide a new view of the impact of fiscal decentralization on the economy to academic literatures. To do so, we propose a new analytical model link fiscal decentralization to provincial GDP and then apply our model with panel data to provincial GDP of Vietnam over last ten years and across 56 provinces to test the significance of the impact of fiscal decentralization on the economy and compute the optimal point of fiscal decentralization.

2. Fiscal decentralization in Vietnam

First fiscal decentralization represented by Resolution No.108/CP on May 13th, 1980 has regulated that local governments' revenues were constrained by their spending responsibilities based on earnings from fixed owned source revenue, fiscal transfer from central government to the provincial government, and shared taxes with a certain rate predetermined by the central government. However, at this time there was an imbalance between the assignment of expenditure responsibilities and taxing powers from the central government to local government (Vo, 2005). From 1983 to 1989, local governments' revenues were determined by the economic capability of the locality and tax sharing rates were applied at a same level to all provinces (Resolution 138-HDBT, 1983). Local governments could receive a more amount if their revenue exceeded the assigned amount by the central government, however localities with financial difficulty could receive more revenue from increasing the shared tax rate by the central government. Within this regulation, provinces were not depended financially on the national government. During the period from 1989 to 1995, it was regarded as a breakthrough for Vietnam fiscal decentralization when Resolution 186/HDBT was issued on 27 November 1989. Provincial government's spending was assigned based on their fiscal capacity. Tax rates shared by the central government were relatively different across provinces depending on the local government's owned source revenue and spending assignment. When local government's revenue is greater than their spending responsibilities, the surplus must be transferred to the national government, which contributed to the total consolidated government budget.

In during period from 1980 to 1995, Vietnam has remarkable changes of fiscal decentralization, but it hasn't any formal law on State budget issued. Fortunately, up to 1996, the first law on State budget was issued and implemented as an important milestone in Vietnam fiscal history. It has regulated about revenue and spending responsibilities for both the central government and the local government. The law was revised in 1998, but there were almost no changes of the principles of the issue. The revised problems related to its only mentioned in the extending the revenue-increasing jurisdiction and the spending responsibilities of provincial governments, but it did not mention spending responsibility and tax revenue to the local governments at the district and commune levels. So far, various issued policies represented the extent of fiscal power transfer from the central government to the provincial government in Vietnam. Typical for these policies were Decree No.93/2001/ND-CP and Decree No.141/2003/ND-CP, in which Decree No.93/2001/ND-CP allowed HCM City to implement the policy of management decentralization for taxing powers as the pioneering city in Vietnam. Decree No.141/2003/ND-CP related to the issuances of urban bonds from local governments at provincial levels are officially permitted, which represents provincial government's borrowing powers.

Thus, from after the national reunification, Vietnam's fiscal decentralization was gradually becoming clearer. It was started by focusing on the assignment of expenditure responsibilities, the taxing power assignments to provincial governments, fiscal transfers from the national government, and finally subnational government's borrowing power.

3. Methodology

3.1 Analytical model

We begin with a heuristic device that describes the maximum output in an economy that can be produced from different combination of inputs using a given technology. This can be expressed mathematically as a mapping $f: R^N_+ \rightarrow R_+$ such that $Y=f(X)$, where X is a vector of factor inputs $X=[X1, .., Xj, \ldots, Xn]$ and $f(X)$ is the maximum output that can be produced by a given set of inputs $X \in R_+$. Support that Y is a Cobb-Douglas production function. According to Eric Miller (2008), the production function at time (t) could be given by

$$Y(t) = Ae^{\lambda t} \prod_{j=1}^{n} X_j^{\beta_j} \quad (1)$$

, where *Y(t)* is the output of an economy in a time period of *t*, X_j is the j^{th} input, λ is a growth parameter in period of *t*, and *A* is overall productive. As mentioned in the previous section, fiscal decentralization is a certain degree of fiscal power transferred from central government to local to perform duties in providing public services and goods. Here, the public services and goods provided by local government typically are public infrastructures, education, healthcare services, etc., which implies that the fiscal decentralization is a catalytic environment. It will be an element stimulating economic activities if the public service packages meet current needs of the locality. Whereas, it will become an impeding element if the packages are far different from current needs of that locality. Thus, the productive *(A)* is influenced by the fiscal decentralization *(Z)* that can be defined as a facilitating factor, and treated as endogenous factors. Support that $A=exp(g(Z(t)))$, where *Z(t)* is the extent of fiscal decentralization at time *(t)*, which implies that $A>0$ with any *Z(t)*. Additionally, we assume that there exists a unique point of z^*, $z^* \in Z$ with $Z \in R_+$, where *A* can capture a maximum value. This implies that if $0<Z<z^*$, *Z* will influence positively on output. Whereas, if $z^*<Z<+\infty$, *Z* will influence negatively on the output of the economy. In order to *A* obtains maximum value at z^*, if and only if, *g(Z(t))* is a quadratic equation with respect to *Z* and second condition of *g(Z(t))* must be less than zero.

To avoid the problem of sign restrictions and the complexity of computation, to restrict the value of *g(Z(t))* within a sensible region, and to allow for both positive and negative marginal output of fiscal decentralization, we propose the following specification with respect to the role of fiscal decentralization in controlling productive *(A)* as

$$A = exp(-g(Z(t))) = exp\ (-(a+bZ)^2) \tag{2}$$

, where *a* and *b* are parameters. This function has a minimum of zero when $\partial g(Z(t))/\partial z=0$, i.e., at the point where $z^*= -a/b$, which implies that the sign of $a \neq b$, due to $z^* >0$ with any $z^* \in Z$. The value of function *g(Z(t))* in the upper panel first decreases with Z; it reaches its minimum of zero at z^* and then increases. Translated into the function of $A=exp(-g(Z(t))$ in the lower panel, the function of *A* first increases with *Z* and then the function decreases as illustrated in Figure 1. *Y(t)* is defined as

$$Y(t) = e^{-(a+bZ)^2} e^{\lambda t} \prod_{j=1}^{n} X_j^{\beta_j} \tag{3}$$

$$Y(t) = e^{\lambda t-(a+bz)^2} \prod_{j=1}^{n} X_{jT}^{\beta_{jt}} \tag{4}$$

Eq.(4) implies that *Z* plays a role of controlling factor that government can control the output of economic activities through adjusting *Z*. We now consider a change of *Y(t)* in each period of time, *T=[1,.., t, …, m]* and *T* is assigned by a dummy variable of *D*. Taking the natural log on both sides and rearranging equation (4) as follows;

$$LnY(t) = \sum_{t=1}^{m} \lambda_t D_t + \sum_{j=1}^{n} \beta_{jt} Ln(X_{jt}) - (a + bZ_t)^2 \tag{5}$$

Let $-(a+bZ)^2= -a - 2abZ - bZ^2$, $-a^2=\alpha$, $-2ab=\mu$, $-b^2= \eta$, equation (5) is rearranged as

$$LnY(t) = \alpha + \sum_{t=1}^{m} \lambda_t D_t + \sum_{j=1}^{n} \beta_{jt} Ln(X_{jt}) + \mu Z + \eta Z^2 \tag{6}$$

In order to estimate the parameters in Eq. (6), an error term ε is added to Eq.(6). We have an overall function, as equation (7), representing the relationship between output, inputs, and fiscal decentralization.

$$LnY(t) = \alpha + \sum_{t=1}^{T} \lambda_t D_t + \sum_{j=1}^{n} \beta_{jt} Ln(X_{jt}) + \mu Z + \eta Z^2 + \varepsilon \tag{7}$$

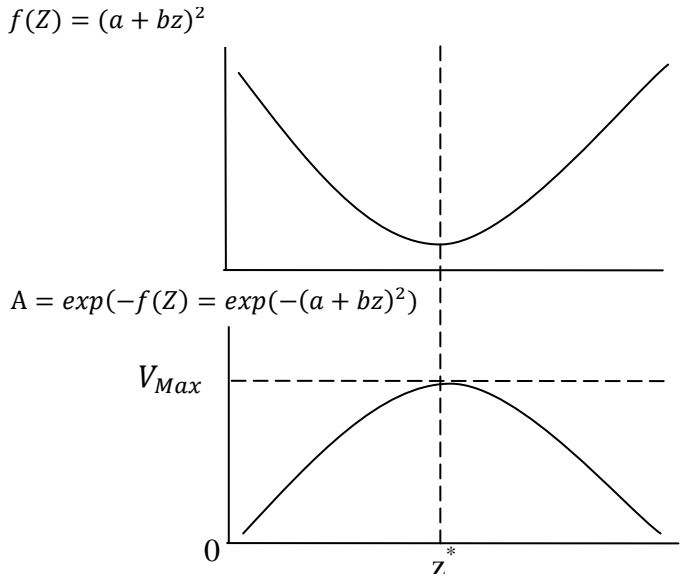
This specification is appealing as it characterizes the output levels of fiscal decentralization control without imposing explicit bounds on the parameters in the nonlinear model. The illustrated process of fiscal decentralization conceptually differs from frequently used models of previous researchers (Davoodi, 1998; Eller, 2004; Iimi, 2005). From Eq.(6), maximum value of output can capture, so logarithmic function is a covariate one, by the first derivative of *LnY(T)* with respect to *Z*, and setting to zero,

$$\frac{\partial LnY(t)}{\partial Z} = \mu + 2\eta Z = 0 \tag{8}$$

$$Z^* = -\frac{\mu}{2\eta} \tag{9}$$

From Eq. (9), it is easy to recognize that $z^*>0$, if and only if, the sign of η differs the sign of μ, which implies there will exist an optimal point of the fiscal decentralization where the output of an economy will obtain a maximum value.

Figure 1 The relationship between *A* and *Z*



3.2 Measurement of fiscal decentralization

So far, there have been many measurements of fiscal decentralization suggested by scientists. For instance, Oates (1972) employed the national government share in total public revenue as the degree of fiscal centralization. Woller and Phillips (1998) suggested that fiscal decentralization could be measured by one of four ways; (1) the ratio of local government revenues to total government revenues, (2) the ratio of local government revenues less grants-in-aid to total government revenues, (3) the ratio of local government expenditures to total government expenditures, and (4) the ratio of local government expenditures to total government expenditures less defense and social security expenditures. Additionally, Davoodi and Zou (1998) measured the degree of fiscal decentralization as the spending by SNGs as a fraction of total government spending. However, almost all their measures seem to be a lack of considering the relationship between the revenue-raising jurisdiction of and the assignment of spending responsibilities in providing services and goods to local governments, which inherently is particular important to access the degree of fiscal decentralization of an nation or region. Moreover, if the measurements of fiscal decentralization are built without considered from this relationship, it will become the measures that are far from the locality's actual need of public services and goods, which is harder for authorities to make decisions on the degree of fiscal decentralization and it can lead to mistakes in process of fiscal decentralization. Fortunately, up to 2005, Duc Vo has constructed two measurements of fiscal decentralization that could reflect fully the relationship between the revenue-raising jurisdiction of and the assignment of spending responsibilities in providing services and goods to local governments, in other word the relationship between the expenditure and revenue of local governments, namely; fiscal autonomy and fiscal importance.

For our purpose, two measurements of fiscal decentralization such as fiscal autonomy index and fiscal importance index provided by Duc Vo (2005) are employed as main measures, appropriate with the Vietnam context, for this study. In which the fiscal autonomy was measured by the ratio of total revenue to the total expenditures of local government as

$$FA_j = \frac{\sum_{i=1}^{n} R_{ji}}{\sum_{i=1}^{m} E_{ji}} v\acute{o}i n \neq m \quad (10)$$

, where FA_j is the fiscal autonomy of local government *j*, R_{ji} is the i^{th} revenue of the local government *j*, E_{ji} is the i^{th} expenditure of the local government *j*, and the fiscal importance of local government is measured by the ratio between total expenditure of local government and total public expenditures of the whole country as

$$FI_j = \frac{\sum_{i=1}^{n} E_{ji}}{TE} v\acute{o}i n \neq m \quad (11)$$

, where FI_j is the fiscal importance of local government *j*, *TE* is total public expenditures of all whole country.

3.3 Data

Panel data were employed in this study, collected from 56 provinces in Vietnam in the period from 2001 to 2011. It was supported by General Statistic Office, Ministry of Plan and Investment, and Ministry of Finance of Vietnam, including data of provincial GDP, provincial labor, provincial agricultural land area, provincial foreign direct investment capital, total revenue and public expenditure at provincial level, and total public expenditure at national level. In which total revenue at provincial level (R), total public expenditure at provincial level (E), and total public expenditure at national level (TE) were used to compute fiscal autonomy index (FA) and fiscal importance index (FI), based on equation (10) and (11). SPSS version 16.0 was used to analyze the variables.

The summary statistic of variables was represented in Table 3.1, which shows that the range of provincial GDP variable fluctuates from 386.50 billion VND to 288000 billion VND, with mean value is 11852 billion VND. Similar to the GDP, the difference of population between provinces was also found to be considerable; of which the province with highest population is 7521.10 thousand people and the province by lowest population is only at the level of 278.4 thousand people. Not only with the variable of population, the disparity of foreign direct investment capital (FDI) variable and agricultural land area (ALA) variable were also found to be relatively large with a mean value of FDI variable is 747.92 million dollar and a mean value of ALA variable is 166.82 thousand ha. The result of summary statistics also reveals that there are a considerable disparity of fiscal autonomy and of fiscal importance between provinces with a mean value of fiscal importance is 0.0467 and of fiscal autonomy is 1.042.

Table 3.1 The results of summary statistics

Variables	Unit	Mean	Median	Minimum	Maximum
Provincial GDP (Y)	Billion VND	11852	5860.7	386.5	288000
Provincial POP (X_1)	Thousand peoples	1347.3	1120.8	278.4	7521.1
Provincial FDI (X_2)	Million dollar	747.92	45.50	0.00	1900
Provincial ALA (X_3)	Thousand ha	166.82	114.70	7.80	1238.32
Fiscal autonomy (Z_1)	-	1.0427	1.0280	0.05	8.87
Fiscal importance (Z_2)	-	0.0467	0.0340	0.001	0.42

Note: GDP; Gross domestic production, POP; population, FDI; foreign direct investment capital, ALA; agricultural land area

4. Result and discussion

To clarify the impact of fiscal decentralization on the economy, measurements of fiscal decentralization such as the fiscal autonomy index (Z_1) and fiscal importance index (Z_2) were put into analytical models in the role of explanatory variables. Generalize Linear Model with Maximum Likelihood Estimate method was applied to estimate coefficients in models. Dummy variables employed is to show the trend of provincial GDP over time. Additionally, in order to enhance the strengthen of estimation results, three control variables, namely; Provincial *POP*, Provincial *FDI*, and Provincial *ALA,* were linked to the analytical models. The results of regression analysis are represented in Table 4.1, which showed that both models are statistically significance with LR Chi-Square value captured is 922.648 (model 1) and 904.448 (model 2). The sign of all coefficients of dummy variable was found to be positive and almost is statistically significance, which implies that the overall trend of provincial GDP increases significantly over years. Almost control variables have a positive and significant influence on provincial GDP, excepting variable of agricultural land area in model 1.

As it is empirical evidence indicated in Table 4.1, the impact of fiscal autonomy and fiscal importance on provincial GDP are consistency in terms of the sign of the coefficients in both models. While variable of Z_1 and Z_2 have a positive and strong influence on provincial GDP, the impact of variables of Z_1^2 and Z_2^2 were found to be negative with correlated coefficients of -0.003 (model 1) and -1.711 (model 2), all are statistically significance at 1% level. This result is relatively suitable with our initial assumption that suggested that if the sign of the coefficients of Z_1 and Z_1^2 variable or/and of Z_2 and Z_2^2 variable were different, then there would exist an optimal point of fiscal decentralization (z^*), where the output of an economy achievable is maximum. By replacing the estimated coefficients of Z_1 and Z_1^2 variable and of Z_2 and Z_2^2 variable into Eq.(9), the optimal point of fiscal decentralization was found to be 7.33 of fiscal autonomy index and 0.25 of fiscal importance index. The existence of this optimal point implies that there will be two scenarios about the impact of fiscal decentralization on the economy;

For first scenario; if the degree of fiscal decentralization is in interval of *[0, z*],* the fiscal decentralization will become an element stimulating for economic growth and development. This is caused by the fact that when the

localities' actual needs of public services and goods like infrastructure, education, and healthcare services, etc., increases due to the process of social-economic development, it will lead to an increase in the expenditure level of local government. When the expenditure level goes up beyond the revenue of local government, it will generate a financial shortage in the process of implementing the packages of public services and goods. In order to offset this shortfall, the local governments must increase their revenue by raising the tax level, borrowings, or calling for more financial subsidy from central government, or all three. However, if the taxing bases and borrowing power are imposed at a specific level by central government, in other word the revenue- increasing jurisdiction is restricted, the revenue-increasing of local governments will totally depend on grant resource of central government. In fact, the grants transferred from central government sometimes are delayed, due to the procedures of accountability and budget limitations, while the financial demand requires must be solved quickly to deploy public projects. So that, if the local governments only expect the grants from central government, the public projects provided by them will likely have to face with distortions that arise in implementing its and it will become more difficult to accomplish their projects timely. Whereas, if the local governments get more autonomy in taxation and borrowing power, the gap between the revenue and expenditure will soon be filled up and it will become easier for the local governments to implement their projects. Moreover, if the revenue- increasing jurisdiction of local governments is expanded, flexibility and creativity of local governments will be promoted maximally and the packages of public services and goods provided by them will be more suitable with the actual needs of that locality, which is very important to achieve high efficiency of the public projects (Shah, 2006). In this case, higher degree of fiscal decentralization can become an element that stimulates economic growth and development.

For second scenario; it is suggested that the fiscal decentralization will become an element that has a negative influence on the economy, if the degree of fiscal decentralization is in interval of $[z^*, +\infty]$. The fact that when the locality's actual need for public services and goods is at low level, the total expenditure level of local government to implement the public services and goods will also be low. And if this expenditure level is lower than the revenue that was collected from tax, borrowing, and grants from central government, the financial surplus will appear. Additionally, it is obvious that if the degree of fiscal decentralization increases, it will lead to the growth of the revenue-increasing jurisdiction of local government, which causes the growth of financial surplus. When the financial surplus increases, it can pullulate negative issues such as misappropriation and embezzlement that were determined as root of inflation, budget deficit, low quality of government decisions, corruption, and greater interregional inequalities (Prud'Homme, 1995; Rodriguez and Gill, 2004; Rodden, 2002). For example, to misappropriate redundancy amounts after accomplishing public projects that are suitable with the realize need of locality, local corrupt officials can design more public projects that inherently are far different from the actual demand of that locality, only with a sole purpose is for accountability. This doesn't only lead to budget deficits from corrupt behaviors of local officials, but also it creates a big waste from investments to deploy these projects, which affects negatively to the economy. Thus, in this case, higher degree of fiscal decentralization will become an element that has a negative influence on the economy.

Table 4.1 Parameter Estimates

Variables	Model 1 Fiscal autonomy index	Model 2 Fiscal importance index
(Intercept)	1.035(0.0346)***	1.124(0.0389)***
Dummy (2001)	0.161(0.0116)***	0.158(0.0115)***
Dummy (2002)	0.130(0.0120)***	0.123(0.0120)***
Dummy (2003)	0.114(0.0116)***	0.111(0.0115)***
Dummy (2004)	0.095(0.0116)***	0.092(0.0115)***
Dummy (2005)	0.077(0.0116)***	0.073(0.0115)***
Dummy (2006)	0.063(0.0116)***	0.057(0.0115)***
Dummy (2007)	0.048(0.0116)***	0.043(0.0115)***
Dummy (2008)	0.030(0.0116)***	0.023(0.0116)**
Dummy (2009)	0.022(0.0115)*	0.023(0.0114)**
Dummy (2010)	0.012(0.0113)	0.014(0.0114)
Dummy (2011)	0.023(0.0113)**	0.017(0.0114)
$Ln(X_1)$	0.141(0.0045)***	0.127(0.0057)***
$Ln(X_2)$	0.002(0.0004)***	0.002(0.0005)***
$Ln(X_3)$	0.005(0.0032)	0.009(0.0034)**
Z_1	0.044(0.0088)***	-
Z_1^2	-0.003(0.0012)***	-
Z_2	-	0.856(0.1742)***
Z_2^2	-	-1.711(0.4399)***
(Scale)	0.004(0.0002)	0.004(0.0002)
P-value	0.000	0.000
LR Chi-Square	922.648	904.448

*Note: *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level*

5. Conclusion

With regards to the relationship of fiscal decentralization with economic growth and development, there are many harshly ongoing controversies within this topic. While a larger number of scholars believed that the fiscal decentralization contributes considerably to economic growth and development (Tiebout, 1956; Musgrave, 1958; Oates, 1972; Weingast, 1995; McKinnon, 1997; Azfar *et al.,* 1999; Ebel and Yilmaz, 2002), a few others suggested that the fiscal decentralization hasn't any significant correlation with, even it has a negative influence on economic growth in developing nations (Prud'Homme, 1995; Rodriguez and Gill, 2005; Rodden, 2003). Due to such debates, it became ambiguous in our perception of this relationship, which inherently is more difficult for authorities in making decisions on fiscal decentralization. For our initial awareness, fiscal decentralization can't be expected in a monotonic way to be a positive or negative influence on the economy, it seems to exist a tipping point where the excessive fiscal decentralization will have a negative impact on the economy. In order to light up this idea, therefore, a new theoretical model was introduced in this study to shed more light on the impact of fiscal decentralization on the economy and identify the tipping point that is considered as an optimal point of fiscal decentralization.

By applying our model to Vietnam economy, we have demonstrated that there exists an optimal point of fiscal decentralization, which implies that there will be two scenarios of the impact of fiscal decentralization on the economy. As it is a strong explanation, which was tested from our result of empirical analysis, for harshly ongoing controversies in during the last several decades; the fiscal decentralization will become an element stimulating economic growth and development, if the expenditure level to enforce duties in providing public

services and goods is less than or equal to the revenue of local government. Whereas, it will become a factor impeding economic growth and development, if the expenditure level is greater than the revenue of that local government. Additionally, we also note to authorities that in the process of making decisions on fiscal decentralization, it is necessary to take into account from locality's actual need for public services and goods to avoid arising negative issues in future. In addition, in this study, we only employ two measurements of fiscal decentralization for our research purpose, so that using others is necessary to be conducted for next studies.

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