Fiscal Decentralization, Public Governance, and Economic Performance
Examination of Two PLS-SEM Models

Louis Chih-hung Liu

Abstract

Fiscal decentralization has become a central theme in the academic field as well as for international aid programs. Current studies of fiscal decentralization center on its economic benefits. However, the possibility that fiscal decentralization facilitates economic performance through enhanced public governance largely is ignored. This essay attempts to examine the possible associations among fiscal decentralization, public governance, and economic performance. Different from traditional statistical techniques such as regression analysis, this research employs a novel analytical approach (i.e., partial least square-structural equation modeling, or PLS-SEM) to explore these associations. We established two PLS-SEM models, the Oates Model and the Superior Goods Model, to test our hypotheses. Our empirical results suggest that the Oates argument and the Superior Goods contentions are both valid in our models. These outcomes also imply that, to reap ultimate economic benefits, fiscal decentralization should be implemented along with proper institutional reforms for better public governance.

Keywords: Economic performance, fiscal decentralization, PLS-SEM, public governance.

Ever since Wallace Oates conducted his pioneer research, fiscal decentralization has become a central theme of the academic field of economics and international aid programs. Several definitions have been proposed to capture the dimensions of this fashionable term. In general, most experts agree that fiscal decentralization refers to the assignment of expenditure functions and revenue sources to subnational levels of government. In keeping with

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2 For the past few decades, the lower levels of government have become increasingly important in
this conceptualization, fiscal decentralization is operationally defined as the ratio of subnational government expenditure/revenue over total government expenditure/revenue. This indicator has been used widely in subsequent research concerning fiscal decentralization.

Current studies of fiscal decentralization focus on its economic benefits. Fiscal decentralization is advocated widely on the premise that it improves economic performance by increasing economic efficiency in the provision of public-sector services.3

Even though research on fiscal decentralization is burgeoning and flourishing, several controversies regarding it remain unsolved. First and foremost, the current and most widely used fiscal decentralization indicator has been criticized as a measure that is too simplistic to accurately gauge the degree of fiscal decentralization among the nations embarking on it. The second problem, while not as significant as a public policy matter, nevertheless poses a threat to empirical analyses as more and more studies begin to question whether fiscal decentralization is simply an endogenous variable of economic growth. Furthermore, the possibility that fiscal decentralization facilitates better economic performance through other factors, such as enhanced public governance, largely is neglected.

Oates, also, was wary of some deficiencies in the theoretical arguments regarding fiscal decentralization.4 He thus proposed the so-called second-generation theory of fiscal federalism.5 Rather than focus on the degree of subnational government expenditure/revenue as a percentage of total government expenditure/revenue, in his theoretical arguments of second-generational fiscal federalism, Oates began to emphasize the institutional arrangements that could facilitate fiscal decentralization. He formulated the second-generational theoretical arguments based on a new approach to institutional economics. Furthermore, after examining the negative effects of fiscal decentralization, he emphasized the necessity of “hard budget constraint” over a subnational government.

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This author also has attempted to tackle the first problem related to simple measurement of fiscal decentralization mentioned above by regarding fiscal decentralization as a system.\textsuperscript{6} Under his research framework, fiscal decentralization can be composed of several indicators, including the ratio of a subnational government’s expenditure/revenue, the taxing and borrowing power possessed by a subnational government, political decentralization, and so on. Nicholas Awortwi and A. H. J. Bert Helmsing observe that many developing countries in Africa, Asia, and Latin America have created new local government jurisdictions as part of their decentralization strategies.\textsuperscript{7} Nonetheless, by investigating a case study in Uganda, they determine that this strategy neither affords better services to the people nor promotes participatory democratic governance.

Owing to the discrepancies among the aforementioned arguments, this essay attempts to investigate all the relevant variables at one time. In other words, the effects of fiscal decentralization, pubic governance, and economic performance, put forth in the same model, can more appropriately address the concerns of fiscal decentralization. Traditional statistical techniques, or the so-called first-generational techniques such as multiple regression analysis or analysis of variance, have been proven to have limitations.\textsuperscript{8} Therefore, we employ an advanced statistical method (i.e., partial least square structural equation modeling, or PLS-SEM), to analyze the pressing issues. Currently, few articles in public administration or public policy research employ advanced SEM analysis. Eran Vigoda analyzed the association between public sector performance and citizenship involvement with the SEM method.\textsuperscript{9} Nevertheless, while Vigoda used primary data (i.e., survey data) in his study, this essay attempts to examine secondary data.\textsuperscript{10} Hence, this pioneer research contributes to the use of SEM methods in the fields of public administration and public policy analysis.


\textsuperscript{10} Secondary data, as opposed to primary data, refers to data collected routinely as part of the daily operations of an organization, institution, or agency. For example, macroeconomic data such as gross domestic product growth rate, unemployment rate, inflation rate, and so on, are typical of secondary data. Primary data, on the other hand, are those collected by researchers by means of survey, interview, and direct observation. Both types of data exhibit advantages and disadvantages.
In general, we attempt to employ a more advanced analytical tool for statistics to explore fiscal federalism theory. In the following paragraphs, we will review previously established arguments about fiscal decentralization and provide a brief introduction to PLS-SEM methodology. Later in this essay, we will present an empirical model to test our research hypothesis and discuss some policy implications.

Literature Review

A preponderance of the public administration and public policy literature has been devoted to the study of fiscal decentralization. Above, we have identified a number of studies endeavoring to explore the relationship between fiscal decentralization and economic development. Besides its association with economic development, fiscal decentralization is considered a means to foster macroeconomic stability and acceptable public governance. Accordingly, for some, the implementation of fiscal decentralization has been treated as a universal remedy for several macroeconomic problems in developing countries.

Several arguments support the view that fiscal decentralization can facilitate economic development. The first and most commonly accepted argument is that fiscal decentralization enhances economic efficiency. This argument relies heavily on the premise that a subnational government is more in tune with local needs and is thus much more capable than a national government in delivering necessary services and collecting taxes. This argument is referenced as so-called “fiscal federalism.” Many empirical studies have been undertaken to investigate the fiscal federalism argument, including those by Hamid Davoodi and Heng-fu Zou, Jorge Martinez-Vazquez and Robert McNab, the latter in collaboration and alone, Tao Zhang and Heng-fu Zou, Raj DeSai et al., Andrew Feltenstein and Shigeru Iwata, Atsushi Iimi, Jan Brueckner, John Thornton, Philip Bodman, and Thushyanthan Baskaran and Lars Feld.

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11 Oates, Fiscal Federalism.

In tension with Oates’s famous assertion about fiscal federalism, is the research of Kiichiro Fukasaku and Luiz DeMello. Fukasaku and DeMello contended that fiscal decentralization would promote sound macroeconomic management through efforts that streamlined public sector activities and reduced operational and informational costs of service delivery, which thus would stimulate private-sector development. They conducted their empirical study using cross-country datasets in search of an association between fiscal decentralization and macroeconomic performance. Their findings suggest that fiscal decentralization is likely to generate fiscal and monetary imbalances that impair the performance of economic growth in developing countries. Organisation for Economic Co-operation and Development (OECD) countries, however, are better equipped than other developing countries to reap the benefits of fiscal decentralization, while maintaining the fiscal discipline that appears to lead to increased economic growth. In sum, there seem to be contradictory conclusions over whether fiscal decentralization promotes economic growth.

Aside from the arguments proposed by Oates, some researchers contend that it is only when a country’s economic development reaches a certain level that the benefits of fiscal decentralization can be acquired—the so-called Superior Goods assertion. In other words, the Superior Goods argument contends that the implementation of fiscal decentralization requires fully developed institutional arrangements, commonly seen in high-income-level countries. Contrary to the Superior Goods contention, Leonardo Letelier discovered an inverse association between income level and fiscal decentralization, while Whitney Buser asserted a positive relation between fiscal decentralization and per-capita income. Therefore, in the Superior Goods argument, the association between fiscal decentralization and economic performance is vice versa. Ahead, we will use the PLS-SEM method to investigate the actual relationship between fiscal decentralization and economic performance.


With respect to arguments postulating that fiscal decentralization strengthens a country’s governance, a growing body of literature has emerged in recent years which recognizes a positive association between decentralization and quality of governance. Robert Inman and Daniel Rubinfeld assert that fiscal decentralization has been shown to strengthen social capital and encourage political participation, usually leading to a higher level of accountability for government behavior. By fostering the emergence and strengthening of democratic institutions, fiscal decentralization reduces opportunities for malfeasance and the misallocation of public resources. Resources that would otherwise be diverted are available for investment and the provision of public goods, thereby enhancing long-term economic growth. In other words, McNab’s argument suggests that fiscal decentralization improves economic performance by strengthening public governance. That is to say, public governance may play the role of mediator between fiscal decentralization and economic performance. We will discuss this association further in our illumination of the empirical model design.

In addition to the indirect effects of fiscal decentralization on economic performance, some scholars focus on the direct relationship between fiscal decentralization and corruption, while others associate fiscal decentralization with some type of general governance indicator, ranging from citizen participation and transparency in government, to the rule of law, among others. Different from previous empirical studies, Charles Hankla proposed normative assertions that fiscal decentralization is good for governance under certain conditions.


17 McNab, “An Empirical Examination of the Outcomes of Fiscal Decentralization.”


Despite the diversity of conclusions regarding the relationship between fiscal decentralization and economic growth, there appears to be greater consensus among empirical conclusions concerning whether fiscal decentralization promotes improved governance.

**Research Method**

In the light of the aforementioned statements and contentions, our research attempts to examine the various research hypotheses with the application of the SEM approach. As mentioned in the previous section, the SEM approach permits us to tackle unresolved empirical problems associated with the deficiency of traditional statistical analytical tools. The so-called deficiency is primarily that current widely used statistical analysis is unable to tackle the measurement error in traditional regression analysis, which may harbor false coefficients.\(^{20}\) In other words, the effect of independent variables over dependent variables may be problematic under current statistical analysis. As a result, we have adopted a different analytical approach to investigate the associations among fiscal decentralization, public governance, and economic performance.

A second deficiency justifies the use of the SEM approach. Traditional regression analysis permits the examination of only one proposition at a time, therefore, it can test a complex theoretical model only in fragments.\(^{21}\) This type of statistical analysis usually results in spurious relationships. The SEM approach, on the other hand, permits us to avoid spurious causal relationships. In addition, traditional regression analysis is deficient in dealing with indirect effect (mediation), which can be achieved easily in the SEM model.

In our empirical analysis, we established two PLS-SEM models to explore a causal relationship. Normally referenced as a second generation of multivariate analysis, the PLS-SEM model features a more flexible interplay between theory and data than other methods.\(^{22}\) Furthermore, it uses statistical techniques that can examine relationships simultaneously among multiple

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20 While traditional regression analysis utilizes an instrumental variable to run the Two-Stage Least Square (2SLS) method to avoid measurement error, this analysis remains unable to test different dependent variables at one time. In other words, it requires several models to explore effects of fiscal decentralization on economic outcome and public governance performance. Therefore, we regard the use of PLS-SEM as more condensed and adequate in this research essay.


Empirical studies that employ the PLS-SEM method are receiving more attention in social science research than previously. Moreover, in the past few years, the analytical approach of partial least square (PLS) for examining structural models has become increasingly popular.

The most frequently cited reasons for using the PLS-SEM method are associated with a small sample size. Nils Urbach and Frederik Ahlemann summarized several additional arguments for choosing PLS to test SEM models:

1. PLS makes fewer demands regarding sample size than other methods.
2. PLS does not require normal-distributed input data.
3. PLS can handle both reflective and formative constructs.
4. PLS is especially useful for prediction.

To investigate the aforementioned contentions, this research employed the advanced PLS-SEM method to explore the causal relationships among fiscal decentralization, public governance, and economic performance. Only by using PLS-SEM analysis would we be able to avoid spurious causal relationships and identify the indirect effects among the three latent factors. We, thus, maintain that the PLS-SEM approach is best suited for analyzing the current policy considerations of fiscal decentralization.

In our study, we treat fiscal decentralization, public governance, and economic performance as three different latent factors. Each factor is operationally defined by selective variables. These variables are selected based on indicators widely used in previous literature. For example, in terms of fiscal decentralization, we used the indicators of subnational government expenditure/revenue over total government expenditure/revenue, and a subnational government’s own tax revenue over total subnational government revenue as the variables to capture the content of the latent factor—fiscal

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26 While Dziobek, Mangas, and Kufa, contend that countries around the globe tend to be more decentralized in the expenditure side than the revenue side, we still include both expenditure and revenue indicators in our PLS-SEM model. See Claudia Dziobek, Carlos Mangas, and Phebby Kufa, “Measuring Fiscal Decentralization—Exploring the IMF’s Databases,” IMF Working Paper WP/11/126 (Washington, DC: International Monetary Fund, 2011).
decentralization. With this methodology employed, not only can we explore the association between the latent factor of fiscal decentralization and economic performance, but also we can examine the possibility that fiscal decentralization improves economic performance through better public governance (or vice versa), which rarely has been studied in previous research.

**Research Model and Hypothesis**

In our research model, three latent factors are created: fiscal decentralization, public governance, and economic performance. Each latent factor is assigned selective variables to capture the contents of the factor. Accordingly, our research hypothesis can be stated as follows:

Hypothesis I—Oates Hypothesis: Fiscal decentralization helps to facilitate public governance, and thus better economic performance.

Vito Tanzi has contended that deepening democratization gives citizens greater rights and freedoms to express their preference for more adequate provision of public goods and services. This requires corresponding levels of accountability for local governments. The governance of a public entity is thus strengthened. On the other hand, as argued in the previous section, fiscal decentralization facilitates the efficient allocation of public goods, which diminishes the waste of public resources and thus brings about better economic performance.

Hypothesis II—Superior Goods Hypothesis: Income level is positively associated with fiscal decentralization and public governance.

The Superior Goods argument stipulates that income level facilitates the implementation of fiscal decentralization and public governance, and has been advocated by several studies, as noted. We describe this argument as the Superior Goods hypothesis, as opposed to Oates’s famous assertion that fiscal decentralization facilitates economic growth. In our empirical model, we also test the mediator effect of fiscal decentralization on public governance, as indicated in figure 2.

**Operational Definitions of Variables**

The operational definitions of the three latent factors are as follows. First, the fiscal decentralization factor is assigned three indicators. The three fiscal decentralization indicators listed below are those recommended by the World

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27 Tanzi, “Pitfalls on the Road to Fiscal Decentralization.”
Bank, as fiscal decentralization is a multiple-dimension concept. While these indicators exhibit some limitations, they remain the most commonly used to measure fiscal decentralization due to data availability and their completeness. This database is readily accessible through the *Government Finance Statistics Yearbook* (GFS), published annually by the International Monetary Fund (IMF).

1. The subnational government expenditure over total government expenditure of a country;
2. The subnational government revenue over total government revenue of a country; and
3. The subnational government own-source tax revenue over total subnational government revenue.

Although the first two indicators are used widely to measure the expenditure and revenue independence of subnational governments, the third indicator also has been employed to measure the fiscal independence of local governments in several studies. In keeping with previous studies on the measurement of fiscal decentralization, our study is able to examine whether the commonly used indicators are appropriate for capturing content in the employed PLS-SEM method.

Second, concerning public governance, Kaufmann et al., created six indicators to measure the quality of public governance: (1) voice and accountability; (2) political stability; (3) government effectiveness; (4) regulatory quality; (5) rule of law; and (6) control of corruption. We attempt to inspect the association between fiscal decentralization and public governance. However, in our model, we employ only the indicators of “voice and accountability,” “government effectiveness,” and “control

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29 Thornton also used subnational discretionary tax revenue to measure the subnational government’s fiscal autonomy, one of the significant concepts of fiscal decentralization. See Thornton, “Fiscal Decentralization and Economic Growth Reconsidered.”
31 Capturing perceptions of the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and freedom of the press. See Worldwide Governance Indicators, http://info.worldbank.org/governance/wgi/index.aspx#home (accessed December 25, 2016).
32 Capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies. See Worldwide Governance Indicators, http://info.worldbank.org/governance/wgi/index.aspx#home (accessed December 25, 2016).
of corruption” to capture the concept of public governance. The first two indicators have been tested in many previous studies, while several scholars have attempted to investigate the association between fiscal decentralization and corruption.

Third, regarding economic performance, a multiple-dimension concept, we collected two variables to capture its content. While the GDP growth rate frequently is used to measure economic development, GDP per capita also is commonly used to gauge the income level of a nation. Consequently, we established two economic performance factors. One includes a GDP growth rate variable; the other is comprised of GDP per capita.

**Data and Sample**

While we have accomplished the establishment of designated indicators, the facilitation of datasets remains the top challenge of cross-country research. Sample observations usually are not large enough due to the difficulty of accessing fiscal data in emerging markets. Even though the *Government Finance Statistics Yearbook* (GFS) 2011 provided comprehensive fiscal decentralization data worldwide, the fiscal decentralization dataset in several emerging markets remains limited. Therefore, we endeavored to collect as many sample observations as we could. We collected sixty-four cross-national sample observations in 2010, in both advanced economies and emerging markets. Fortunately, our PLS-SEM analytical tool allowed us to investigate the relevant associations and to calculate the coefficients with minor sample observations. We then created eight variables to run our PLS-SEM analysis:

1. GDPCAP: GDP/capita
2. GDP: GDP Growth Rate (%)
3. EXPFD: Expenditure Decentralization

33 Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as the “capture” of the state by elites and private interests. See Worldwide Governance Indicators, http://info.worldbank.org/governance/wgi/index.aspx#home (accessed December 25, 2016).


35 These sixty-four countries include the advanced economies of Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, and the United States, and the emerging markets of Armenia, Azerbaijan, Belarus, Bosnia, Brazil, Bulgaria, Colombia, Costa Rica, Croatia, Cyprus, El Salvador, Georgia, Honduras, Kazakhstan, Latvia, Lithuania, Mauritius, Moldova, Mongolia, Morocco, Paraguay, Peru, Romania, Russia, Serbia, South Africa, Thailand, Tunisia, and Ukraine.
To test the intermediate effects of public governance on economic performance, we treated the public governance factor (PGOV) as the mediator in this structural equation model. By doing so, we could explore how the fiscal decentralization factor (FDCN) directly affects the public governance factor and economic performance factor (ECON1 and ECON2, which stand for GDP growth rate and GDP per capita, respectively); further, we could see how fiscal decentralization indirectly influences economic performance. We then illustrated the two structural equation models as the Oates Model in figure 1 and the SG Model (Superior Goods Model) in figure 2.

Figure 1. Oates Model

Figure 2. SG Model
In this research, we employed advanced statistical software SMARTPLS 3.0 to run partial least square analysis. SMARTPLS 3.0, statistical software that can be downloaded from the web without charge, is widely used in the analysis of a structural equation model.

**Empirical Results and Model Evaluation**

Rather than using traditional regression analysis, we employed the advanced statistical technique, partial least square structural equation model, to render more precise calculation on the entangled influence of fiscal decentralization, public governance, and economic performance. Figure 3 and figure 4 demonstrate the results of these two PLS-SEM models. The numbers in

![Figure 3. Empirical Results of the Oates Model](image1)

![Figure 4. Empirical Results of SG Model](image2)
figures 3 and 4 stand for factor loadings, path coefficients, and R-square. To be precise, numbers specified on the shorter arrow (between the oval and square) indicate factor loadings, while the numbers specified on the longer arrow (between the oval and oval) are path coefficients. Lastly, the numbers placed within the oval are indicative of R-square.

We first analyzed every indicator for each factor. Factor loadings above 0.8 were considered excellent for the construction of an indicator. Figures 3 and 4 show that the indicators for FDCN and PGOV factors were all well-constructed due to their high factor loading value. In the following paragraphs, we briefly discuss model evaluation and present the results in two phases: measurement model and structural model. This common two-step approach for reporting results is advocated by Wynne Chin and has been applied in several journal articles.36

Table 1. Results of Measurement (Outer) Model Convergence Validity

<table>
<thead>
<tr>
<th>Oates Model</th>
<th>AVE^</th>
<th>Composite Reliability</th>
<th>Cronbach’s α</th>
<th>Cross-validate Communality</th>
<th>Cross-validate Redundancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDCN</td>
<td>0.831</td>
<td>0.936</td>
<td>0.905</td>
<td>0.618</td>
<td>N.A.</td>
</tr>
<tr>
<td>PGOV</td>
<td>0.931</td>
<td>0.976</td>
<td>0.963</td>
<td>0.819</td>
<td>0.096</td>
</tr>
<tr>
<td>ECON1</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.098</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SG Model</th>
<th>AVE</th>
<th>Composite Reliability</th>
<th>Cronbach’s α</th>
<th>Cross-validate Communality</th>
<th>Cross-validate Redundancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDCN</td>
<td>0.828</td>
<td>0.935</td>
<td>0.905</td>
<td>0.608</td>
<td>0.053</td>
</tr>
<tr>
<td>PGOV</td>
<td>0.931</td>
<td>0.976</td>
<td>0.963</td>
<td>0.821</td>
<td>0.647</td>
</tr>
<tr>
<td>ECON2</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Note: ^AVE means average variance extracted.

Table 2. Results of Measurement (Outer) Model Discriminant Validity

<table>
<thead>
<tr>
<th>Oates Model</th>
<th>AVE</th>
<th>Composite Reliability</th>
<th>ECON1</th>
<th>FDCN</th>
<th>PGOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON1</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDCN</td>
<td>0.831</td>
<td>0.936</td>
<td>0.095</td>
<td>0.912</td>
<td></td>
</tr>
<tr>
<td>PGOV</td>
<td>0.931</td>
<td>0.976</td>
<td>-0.362</td>
<td>0.327</td>
<td>0.965</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SG Model</th>
<th>AVE</th>
<th>Composite Reliability</th>
<th>ECON2</th>
<th>FDCN</th>
<th>PGOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON2</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDCN</td>
<td>0.828</td>
<td>0.935</td>
<td>0.325</td>
<td>0.910</td>
<td></td>
</tr>
<tr>
<td>PGOV</td>
<td>0.931</td>
<td>0.976</td>
<td>0.831</td>
<td>0.336</td>
<td>0.965</td>
</tr>
</tbody>
</table>

**Measurement (Outer) Model Evaluation**

Structural equation modeling analysis emphasizes the significance of convergent validity and discriminant validity. In this essay, table 1 demonstrates the outcome of our PLS-SEM convergent validity analysis on each factor, and table 2 displays the results of discriminant validity. Generally speaking, our model’s convergent and discriminant validity look decent and are adequately consistent with the criterion value suggested by previous studies.37

**Structural (Inner) Model Evaluation**

Table 3 exhibits the statistical results of our structural models. The path coefficients for all the other related factors are largely in accordance with our research hypothesis, as illustrated in the previous section, except for the coefficient value between PGOV and ECON1.38 To further examine the significance of the three path coefficients, we ran bootstrap analysis to calculate the t-statistics value for each coefficient. R-square value is moderate in the Oates Model and strong in the SG Model. F-square value (f 2) also ranged from moderate to strong, as indicated by Cohen.39

<table>
<thead>
<tr>
<th>Oates Model</th>
<th>Path Coefficients</th>
<th>T-Statistics</th>
<th>f-Square</th>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDCN→PGOV</td>
<td>0.327**</td>
<td>2.532</td>
<td>0.120</td>
<td>0.107</td>
</tr>
<tr>
<td>PGOV→ECON1</td>
<td>-0.440***</td>
<td>6.173</td>
<td>0.212</td>
<td>0.182</td>
</tr>
<tr>
<td>FDCN→ECON1</td>
<td>0.239**</td>
<td>2.556</td>
<td>0.063</td>
<td>0.182</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SG Model</th>
<th>Path Coefficients</th>
<th>T-Statistics</th>
<th>f-Square</th>
<th>R-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON2→FDCN</td>
<td>0.325**</td>
<td>2.251</td>
<td>0.118</td>
<td>0.106</td>
</tr>
<tr>
<td>FDCN→PGOV</td>
<td>0.074</td>
<td>0.787</td>
<td>0.016</td>
<td>0.696</td>
</tr>
<tr>
<td>ECON2→PGOV</td>
<td>0.807***</td>
<td>14.926</td>
<td>1.917</td>
<td>0.696</td>
</tr>
</tbody>
</table>

Note: § T-statistics is calculated through bootstrap procedures. *90% significant level; **95% significant level; ***99% significant level.


38 A possible explanation is that our sample observations consist mostly of advanced economies due to their data completeness. While most advanced economies always exhibit a high level of public governance, they usually display a lower degree of economic growth. On the other hand, emerging markets normally display remarkable economic growth along with poor public governance. The remedy to this outcome may require a time-series cross-sectional dataset, or so-called panel data, to test this hypothesis. Nevertheless, this is one of the research limitations in our essay.

**Mediator Affects Evaluation**

In our PLS-SEM models, both the Oates and SG models have a mediator factor, which is PGOV in the Oates Model and FDCN in the SG Model. Tables 4 and 5 exhibit the total effects and indirect effects in our empirical analysis. Below, we illustrate how strong the mediator is by conducting a Sobel z test.\(^{40}\)

Table 4 reveals total effects, direct effects, and indirect effects of the Oates Model. The calculated Sobel z = -1.430, which means the indirect effect is not statistically significant at a confidence level of 95 percent. The calculated Sobel z for the SG Model = 0.393, also revealing statistical insignificance. Both models suggest weak mediator effects. In other words, direct effects (i.e., FDCN→ECON1 and ECON2→PGOV) in both models are much more statistically significant in our examinations. This type of empirical result is referred to as a partial mediator by Chin.\(^{41}\)

<table>
<thead>
<tr>
<th>Indirect effects</th>
<th>Sample Mean</th>
<th>Standard Error</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDCN→PGOV</td>
<td>0.297*</td>
<td>0.200</td>
<td>1.638</td>
</tr>
<tr>
<td>PGOV→ECON1</td>
<td>-0.440***</td>
<td>0.083</td>
<td>5.276</td>
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<table>
<thead>
<tr>
<th>Total effects</th>
<th>Sample Mean</th>
<th>Standard Error</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDCN→ECON1</td>
<td>0.115</td>
<td>0.137</td>
<td>0.694</td>
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<thead>
<tr>
<th>Direct effects</th>
<th>Path Coefficients</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDCN→ECON1</td>
<td>0.239**</td>
<td>2.556</td>
</tr>
</tbody>
</table>

Note: *90% significant level; **95% significant level; ***99% significant level.

<table>
<thead>
<tr>
<th>Indirect effects</th>
<th>Sample Mean</th>
<th>Standard Error</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON2→FDCN</td>
<td>0.373**</td>
<td>0.150</td>
<td>2.172</td>
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<tr>
<td>FDCN→PGOV</td>
<td>0.043</td>
<td>0.108</td>
<td>0.680</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Total effects</th>
<th>Sample Mean</th>
<th>Standard Error</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON2→PGOV</td>
<td>0.850***</td>
<td>0.036</td>
<td>23.053</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Direct effects</th>
<th>Path Coefficients</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON2→PGOV</td>
<td>0.807***</td>
<td>14.926</td>
</tr>
</tbody>
</table>

\(^{40}\) The formula for calculating Sobel z = a * b / SQRT\[\{(b^2 * SE_a^2) + (a^2 * SE_b^2)\}\], where a is the sample mean of FDCN→PGOV and SEa is the standard error; b is the sample mean of PGOV→ECON1 and SEb is the standard error.

\(^{41}\) Chin, “How to Write Up and Report PLS Analyses.”
Discussion

In a nutshell, while the convergence validity and discriminant validity in the measurement model is decent, the indicators in the structural model are not all desirable. For instance, the Oates Model exhibited a low R-square value, which represents the explanatory power of the empirical model. Besides, mediator effects are not statistically significant in both models, which suggests significant and powerful direct effects in our PLS-SEM models. The SG Model, however, provides strong and significant explanatory power due to its high R-square value. Moreover, path coefficients in the SG Model largely are consistent with our research hypothesis and reveal statistical significance, except for the effect of fiscal decentralization on public governance. This “insignificance” outcome is probably a result of the small number of sample observations in our empirical models.

This research reviewed the current body of knowledge in the literature on fiscal decentralization and attempted to provide comprehensive inferences by employing advance tools of statistical analysis. We analyzed the causal relationship among fiscal decentralization, public governance, and economic performance with a novel quantitative method. Our empirical models suggest that Oates’s argument and the superior goods contentions are both valid in our PLS-SEM analysis. Nonetheless, the assertion that fiscal decentralization facilitates economic growth by improving public governance is not so significant in our empirical study.42 Meanwhile, this essay also echoes previous research concerning the so-called “superior goods” argument, which stipulates that benefits of fiscal decentralization can be entirely exploited only when the national economy is developed to a certain level. High-income-level countries normally are associated with better institutional arrangements than other countries, which enable the successful implementation of fiscal decentralization and subsequent satisfactory public governance.

Consequently, fiscal decentralization and public governance are both essential to national development, as these movements provide better institutional arrangements for developing countries, as opposed to a centralized authoritarian regime. We have seen many economies fail to implement fiscal decentralization, such as Argentina and the former Yugoslavia, which imported concepts and policy tools for fiscal decentralization, without engaging in supplementary institutional reform. In other words, fiscal decentralization alone is not appropriate as a national development strategy.

42 This is the indirect linkage between fiscal decentralization and economic growth proposed by Martinez-Vazquez and McNab, “Fiscal Decentralization and Economic Growth.” In our PLS-SEM model, we treat public governance as a mediator to test the indirect effect on economic growth.
Conclusion and Policy Implications

Several policy implications can be drawn from our empirical results. First, owing to the inextricable intertwinement of economic performance, fiscal decentralization, and public governance, institutional reform is supposed to be a priority, particularly at the subnational level. The institutional arrangements of subnational governments usually are considered less developed than those of a central government due to lower salaries, fewer promotion opportunities, and weaker mechanisms for surveillance and therefore for governance and accountability. This is particularly apparent in developing countries. Under such circumstances, fiscal decentralization can be used to advance subnational institutions, such as through the installation of more democratic local government officials, stronger citizen engagement in public affairs, and greater scrutiny of local finance. These institutional reforms not only benefit the successful implementation of fiscal decentralization, but also facilitate public governance and accountability.

Second, in the light of the reasons and arguments provided, rather than just assigning public resources to subnational governments, fiscal decentralization should be treated as an overhaul of institutional arrangements. Previous studies have contended that fiscal decentralization should be comprehensive, with implementation of fiscal decentralization treated as a holistic fiscal system laying out different elements. As a consequence, institutional reforms that are pertinent to both fiscal decentralization and public governance, such as hard budget constraints and locally elected officials, are highly recommended.

Third, international organizations such as the World Bank, the IMF, and the OECD are encouraged to play significant roles in the implementation of fiscal decentralization. Lacking proper human resources and management skills, emerging markets normally are afflicted with problems as to how to adequately implement fiscal decentralization and simultaneously garner the benefits of better development and public governance. The IMF and the OECD have formulated an official document (i.e., Best Practice of Budget Transparency), to facilitate the implementation of fiscal transparency. Official documents specifying the best practices of fiscal decentralization and formulated by an international organization are essential. Only cross-countries cooperation can facilitate fiscal decentralization as a feasible development strategy.