**EXTENDED ABSTRACT**

# The long-run economic growth effects of local public finance

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## Abstract

The trend of fiscal decentralization has increased the importance of local public finance. However, arguably due to a previous lack of consistent data, relatively little is known about the economic effects of local public finance. Based on endogenous growth theory, this article uses the Pooled Mean Group estimator to investigate the long-run economic effects of local public finance by using the *Fiscally Standardized Cities* database. Preliminary results suggest local public finance to have significant long-run economic effects in cities.

**Keywords**: fiscal decentralization, local public finance, Fiscally Standardized Cities database, Pooled Mean Group estimator

**JEL classification:** H30, O40, R51

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## Introduction

Since the 1990s, developed and developing countries have increasingly decentralized their fiscal system, placing more power in the hands of the state and municipal governments (Oates, 1999; Rodríguez-Pose and Ezcurra, 2011). Although the implications of public finance at the federal and state level have been extensively investigated, little attention has been paid to the implications of local municipal public finances, arguably due to a lack of consistent data. With the construction of the *Fiscally Standardized Cities* (FISC) database by the Lincoln Institute of Land Policy, it has recently become possible to carry out such an in-depth analysis of local public finance at the city level. The FISC database consists of fiscally standardized panel data on: 150 of the largest United States cities; across more than 120 categories of revenues, expenditures, debt, and assets; over the period 1977 – 2012. The FISC database is merged with the *Regional Data* from the Bureau of Economic Analysis (BEA) to examine the relationship between local public finance and long-run economic growth. A better understanding of the long-run economic effects of local public finance will be helpful for local public policy makers in designing their policies and provides a valuable addition to the academic fields of public economics.

The analysis is performed by using the endogenous growth model of Barro (1990), which describes how public policies influence long-run economic growth. Influenced by the work of Gemmell et al. (2014; 2015), the Pooled Mean Group (PMG) estimator, as proposed by Pesaran et al. (1999), is used to measure the long-run economic effects of different revenue and expenditure policies. The PMG estimator allows the intercepts; short-run coefficients; and error variances, to differ across groups, just like the Mean Group (MG) estimator. However, the long-run coefficients are constrained to be the same across groups, just like ordinary pooled regressions. This estimator is perfect for models in which one is interested in the long-run effect, and short-run effects may be ambiguous or different across groups. The PMG results are compared and tested, using the Hausman test, to the MG estimator- and dynamic fixed effects regression results in order to check for robustness.

The following section outlines the relevant literature, after which the data; methodology; and preliminary results are discussed. Lastly, some concluding remarks are given.

## Literature

The literature section starts off with describing the theoretical debate on fiscal decentralization. Subsequently, the literature on endogenous growth theory analyzes the current theoretical state of the endogenous growth theory and the empirical gap this article fills.

### Fiscal decentralization

Over the past 20 years a global fiscal decentralization trend emerged (Oates, 1999; Rodriguez-Pose and Ezcurra, 2011). Fiscal decentralization is the process of transferring more resources and power to subnational tiers of governments. The fiscal decentralization theorem assumes local governments to have informational advantages, allowing them to tailor their policies to the local needs (Tiebout, 1956; Klugman, 1994). Other arguments in favor of fiscal decentralization are: policy innovation due to policy competition (Tiebout, 1956; Donahue, 1997; Martínez-Vázquez, and McNab, 2003); reduced costs due to shorter supply chains and less inefficient bureaucracies (Klugman, 1994; Ezcurra and Pascual, 2008); and increased participation, transparency and accountability in policy making (Putnam et al., 1993; Ebel and Yilmaz, 2002).

However, not all scholars agree on these positive effects. For example, Prud'homme (1995) argues that government should provide basic needs which do not differ too much across regions and can therefore be organized centrally. In addition, no consensus has been reached on the argument of local public policy makers being better at uncovering the local differences, compared to the central government. (Prud'homme, 1995). Other counter arguments are: the capacity constraints of local governments (Rodríguez-Pose and Gill, 2005); lack of adequate expertise and human resources (Rodríguez-Pose and Gill, 2004; Sapir et al., 2004); less efficient administrations (Prud'homme, 1995); regional-inequality due to differences in leverage to the central government (Rodríguez-Pose and Gill, 2004); major influence or corruption by local elites and interest groups (Inman and Rubinfeld, 2000; Storper, 2005); and lack of necessary size for major projects, such as big infrastructural projects.

Since many of these arguments, both in favor of and against fiscal decentralization, are of an economic nature, scholars have tried to link fiscal decentralization directly to economic growth. The empirical results are mixed, and shown to be influenced by the idiosyncratic characteristics of the empirical models and samples used (Baskaran et al., 2016). This article

takes a different approach by analyzing the economic effects of local public finance itself. Instead of linking the degree of fragmentation to economic growth, this project links the composition of local public revenues and expenditures to economic growth.

## Endogenous growth theory

The link between public finance and long-run economic growth is generally accepted to have started with the paper by Romer (1986), which describes how technology has an endogenous effect on long-run economic growth, resulting in increasing returns. This is in contrast to neoclassical growth models, which argue that government spending and taxation do not affect long-run economic growth, but only the level of output through the savings rate (Solow, 1956; Swan, 1956). These short term growth effects may last some years but eventually disappear. Lucas (1988) further investigates the concept of technology in multiple endogenous growth models, by looking at physical capital and human capital. Aschauer (1989) uses the endogenous growth theory to empirically analyze how productive public expenditure is, and finds non-military public capital to determine productivity quite well, and the stock of public infrastructure to determine it even better. From the theoretical literature on endogenous growth models, empirical literature emerged, most notably the paper by Barro (1990), who developed a way to analyze the effects of government tax and expenditures on long-run economic growth. He distinguishes between two different types of tax, distortionary and non-distortionary; and two types of expenditures, productive and non-productive expenditures (Barro, 1990). This proved to be a fruitful distinction for empirical analysis (see for example: Kneller et al., 1999; Bleaney et al., 2001; Gemmell et al., 2011). Other types of endogenous growth models were developed by (Romer, 1990), King and Rebelo (1990) Devereux and Love (1994) and Milesi-Ferretti and Roubini (1998), in which they determined the endogenous effects of human capital and technological change.

The empirical evidence for an influence of public finance on long-run economic growth is somewhat mixed (Nijkamp and Poot, 2004), although there seems to be a general agreement that public investments contribute to economic growth and productivity to some extent (Murova and Khan, 2017). Some scholars find tax policies to have an influence on economic growth (e.g. Romero-Avila and Strauch, 2008), while others do not (e.g. Mendoza et al., 1997). Another bundle of research is focused on the expenditures side of the story and find government expenditures to influence long-run economic growth (e.g. Devarajan et al., 1996; Gemmell et al., 2014), while others only show limited significance, for example only

government expenditures on education or infrastructure (e.g. Bose et al., 2007). Furthermore, some scholars have investigated both tax policies and government expenditures simultaneously and found some categories to have a significant effect on long-run economic growth (e.g. Kneller et al., 1999).

All aforementioned research has been on aggregated country or state level data. There seems to be no analysis of economic effects of local public finance, besides research investigating the effects of public infrastructure investment (e.g. Eberts, 1986; Duffy-Deno and Eberts, 1991). Part of the reason for this could be that it is difficult to get the data needed to perform such an empirical analysis. With the introduction of the FISC database by the Lincoln Institute of Land Policy, such an analysis has become possible.

## Data

The FISC database is used for the data on local public finances, which are measured by the amount of money each revenue and expenditure category consists of. Following the paper by Barro (1990), the cities' revenues and expenditures are divided into: distortionary tax; non-distortionary tax; productive expenditures; and non-productive expenditures. Economic growth is usually measured in terms of growth in 'GDP', or 'personal income'. The *Regional Data* of the BEA has data on 'personal income' for the period 1977- 2012, while their data on 'GDP' only goes from 2001 – 2015. Regressions are run on both variables leading to similar results.

## Methodology

Influenced by the work of Gemmell et al. (2014; 2015), the PMG estimator, as proposed by Pesaran et al. (1999), is used to measure the long-run economic effects of different revenue and expenditure policies. The PMG estimator allows the intercepts, short-run coefficients, and error variances, to differ across groups, just like the MG estimator. However, the long-run coefficients are constrained to be the same across groups, just like ordinary pooled regressions. This estimator is perfect for models in which one is interested in the long-run effect, and short-run effects may be ambiguous or different across groups. In addition, Pesaran et al. (1999) have shown that in case of possible endogeneity issues, an appropriate lag order of the PMG model ensures consistent estimates. The advised steps to ensure an appropriate lag order are taken. The PMG results are compared and tested, using Hausman

test, to the MG estimator- and dynamic fixed effects regression results in order to check for robustness.

The 'government budget constraint' control variable is added to recognize that expenditures must be financed by revenues (Kneller et al., 1999; Gemmell et al., 2011). Furthermore, a control variable is added to capture the difference in city size between the FISC database and the data from the BEA. The data are normalized by dividing it by the population. In addition, all data series are measured as deviations from their sample means in each year to remove common shocks from the data, as recommended by Pesaran et al. (1999).

## Preliminary results

Preliminary results suggest distortionary taxes to have a negative effect on long-run economic growth. In addition, the effect of non-distortionary taxes also seems to be negative. The results for productive expenditures do not appear to be robust. However, when only expenditures on education and infrastructure are defined as productive expenditures, they do show a robust, positive significance. Moreover, education and infrastructure have a significant positive effect when regressed individually. The non-productive expenditures appear to have a significant negative effect on long-run economic growth. All Hausman tests show PMG to be the preferred measurement method.

The results may be influenced by the way in which the different taxes and revenues are divided into one of the four groups. We are now performing robustness checks by: rearranging the groups; running regressions on individual revenue and expenditure categories; performing IV regressions; and including more control variables, such as 'employment growth' and 'investment ratio'.

## Conclusion

The trend of fiscal decentralization has increased the importance of local public finance. However, arguably due to a previous lack of consistent data, relatively little is known about the economic effects of local public finance. Based on endogenous growth theory, this article uses the PMG estimator to investigate the long-run economic effects of local public finance by using the FISC database. Preliminary results suggest local public finance to have significant long-run economic effects in cities.

## References


Aschauer, D. A. (1989). Is public expenditure productive?. *Journal of monetary economics*, *23*(2), 177-200.

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy, 98(S5), 103-125.*

Baskaran, T., Feld, L. P., & Schnellenbach, J. (2016). Fiscal Federalism, Decentralization, and Economic Growth: A Meta-Analysis. *Economic Inquiry*.

Bleaney, M., Gemmell, N., and Kneller, R. (2001). Testing the endogenous growth model: public expenditure, taxation, and growth over the long run. *Canadian Journal of Economics/Revue canadienne d'économique*, *34*(1), 36-57.

Bose, N., Haque, M. E., and Osborn, D. R. (2007). Public expenditure and economic growth: A disaggregated analysis for developing countries. *The Manchester School*, *75*(5), 533-556.

Devarajan, S., Swaroop, V., and Zou, H. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, *37*(2), 313-344.

Devereux, M. B., & Love, D. R. (1994). The effects of factor taxation in a two-sector model of endogenous growth. *Canadian Journal of Economics*, 509-536.

Donahue, J. D. (1997). Disunited states. *Atlantic Monthly*, *279*, 18-21.

Duffy-Deno, K. T., & Eberts, R. W. (1991). Public infrastructure and regional economic development: a simultaneous equations approach. *Journal of urban economics*, *30*(3), 329-343.

Ebel, R. D., & Yilmaz, S. (2002). *On the measurement and impact of fiscal decentralization* (Vol. 2809). World Bank Publications.

Eberts, R. W. (1986). *Estimating the contribution of urban public infrastructure to regional growth* (Vol. 8610). Cleveland, OH: Federal Reserve Bank of Cleveland.

Ezcurra, R., & Pascual, P. (2008). Fiscal decentralization and regional disparities: evidence from several European Union countries. *Environment and Planning A*, *40*(5), 1185-1201.

Gemmell, N., Kneller, R., and Sanz, I. (2011). The timing and persistence of fiscal policy impacts on growth: evidence from OECD countries. *The Economic Journal*, *121*(550), F33-F58.

Gemmell, N., Kneller, R., and Sanz, I. (2014). The growth effects of tax rates in the OECD. *Canadian Journal of Economics/Revue Canadienne d'Économique*, *47*(4), 1217-1255.

Gemmell, N., Kneller, R., and Sanz, I. (2015). Does the Composition of Government Expenditure Matter for Long-Run GDP Levels?. *Oxford Bulletin of Economics and Statistics*.

King, R. G., & Rebelo, S. (1990). Public policy and economic growth: developing neoclassical implications. *Journal of Political Economy*, *98*(5, Part 2), S126-S150.

Klugman, J. (1994). *Decentralization: A survey of literature from a human development perspective* (No. HDOCPA-1994-05). Human Development Report Office (HDRO), United Nations Development Programme (UNDP).

Kneller, R., Bleaney, M. F., and Gemmell, N. (1999). Fiscal policy and growth: evidence from OECD countries. *Journal of Public Economics*, *74*(2), 171-190.

Lincoln Institute of Land Policy. Fiscally Standardized Cities Database. *http://datatoolkits.lincolninst.edu/subcenters/fiscally-standardized-cities/. Accessed on: January 13, 2017.*

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of monetary economics*, *22*(1), 3-42.

Martínez-Vazquez, J., & McNab, R. M. (2003). Fiscal decentralization and economic growth. *World development*, *31*(9), 1597-1616.

McKinsey Global Institute Cityscope Database Version 3.0. (*http://www.mckinsey.com/global-themes/urbanization/urban-world-meeting-the-demographic-challenge-in-cities*). *Accessed on: January 13, 2017*

Milesi-Ferretti, G. M., & Roubini, N. (1998). On the taxation of human and physical capital in models of endogenous growth. *Journal of Public Economics*, *70*(2), 237-254.

Murova, O., and Khan, A. (2017). Public investments, productivity and economic growth: a cross-state study of selected public expenditures in the United States. *International Journal of Productivity and Performance Management*, *66*(2).

Nijkamp, P., and Poot, J. (2004). Meta-analysis of the effect of fiscal policies on long-run growth. *European Journal of Political Economy*, *20*(1), 91-124.

Oates, W. E. (1999). An essay on fiscal federalism. *Journal of economic literature*, *37*(3), 1120-1149.

OECD Fiscal Decentralisation Database. (*www.oecd.org/tax/federalism/oecdfiscaldecentralisationdatabase.htm). Accessed on: January 13, 2017.*

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, *94*(446), 621-634.

Prud'homme, R. (1995). The dangers of decentralization. *The world bank research observer*, *10*(2), 201-220.

Putnam, R., Leonardi, R., & Nanetti, R. (1993). Making democracy work Princeton. *NJ: Princeton University Pi-ess*.

Rodríguez-Pose, A., and Ezcurra, R. (2011). Is fiscal decentralization harmful for economic growth? Evidence from the OECD countries. *Journal of Economic Geography*, *11*(4), 619-643.

Rodríguez-Pose, A., & Gill, N. (2004). Is there a global link between regional disparities and devolution?. *Environment and Planning A*, *36*(12), 2097-2117.

Rodríguez-Pose, A., & Gill, N. (2005). On the 'economic dividend' of devolution. *Regional studies*, *39*(4), 405-420.

Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of political economy*, *94*(5), 1002-1037.

Romer, P. M. (1990). Endogenous technological change. *Journal of political Economy*, *98*(5, Part 2), S71-S102.

Romero-Avila, D., and Strauch, R. (2008). Public finances and long-term growth in Europe: Evidence from a panel data analysis. *European Journal of Political Economy*, *24*(1), 172-191.

Sapir, A., Aghion, P., Bertola, G., Hellwig, M., Pisani-Ferry, J., Rosati, D., ... & Smith, P. M. (2004). *An agenda for a growing Europe: the Sapir report*. OUP Oxford.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, *70*(1), 65-94.

Storper, M. (2005). Society, community, and economic development. *Studies in comparative international development*, *39*(4), 30-57.

Swan, T. W. (1956). Economic growth and capital accumulation. *Economic record*, *32*(2), 334-361.

Tiebout, C. M. (1956). A pure theory of local expenditures. *Journal of political economy*, *64*(5), 416-424.