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GRANT EFFECTS ON PUBLIC FINANCE FOR LOCAL GOVERNMENTS WITH SELF-SELECTION BEHAVIOR*

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Abstract

This paper estimates causal effects of intergovernmental grants on local expenditure and tax revenue. This is done by utilizing a rule-based grant distribution scheme in the Philippines. The results provide evidence of a flypaper effect among both municipalities and cities in the Philippines, i.e., grants create a large stimulative effect on local spending but have no effect on the reduction of local taxation. The result is robust to a noticeable self-selection bias in the Philippine local governance, where a municipality can opt to convert to a city to receive more grants once it meets conversion criteria.

Keywords: intergovernmental grants, instrumental variable, self-selection, public finance, flypaper effect
JEL Classification Codes: C26, H71, H72, H77, R51

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I. *Introduction*

In many countries, central governments provide unconditional grants to lower-tier governments, which allows for recipients' discretion in allocating funds. Intergovernmental grants finance about one-third of subnational expenditure in OECD countries, and about 60 percent in developing countries (Shah, 2007). Grants help to preserve local autonomy and fund public goods provision, given that local governments better understand the needs of their localities and have an advantage in service delivery.[1] Knowledge about whether and to what extent grants do stimulate local governments to provide the desired level of public goods is, therefore, crucial for the appropriate design of fiscal decentralization.

Starting from Bradford and Oates' (1971) seminal work, economic theory suggests that a lump-sum grant to a local government induces a pure income effect and thus affects its public goods expenditure according to the median voter's marginal propensity to spend on local public goods, i.e., 5 to 10 percent of income (Hines and Thaler, 1995).[2] Because a median voter perceives grants and private income to be fungible, receiving a one-dollar grant transfer should have an effect on total spending no different from a one-dollar increase in private income. In other words, intergovernmental grants are expected to result in a small stimulating effect on local public spending and a large effect on private goods in the form of tax reduction. The phenomenon that grants crowd out private income is also referred to in the literature as the crowding-out effect. Most empirical studies, however, find that grants have a larger stimulating effect on public expenditure than predicted in theory. This anomalous result has gained recognition in the literature and is known as the "flypaper effect," also referred to as crowding-in effect. See Hines and Thaler (1995) and Inman (2008) for reviews of the empirical evidence.

One of the explanations that has been offered for the apparent flypaper effect is in relation to the data (Inman, 2008). Researchers may mismeasure conditional grants (e.g., matching grants that lower the marginal price of public services) as unconditional grants. Such a mismeasurement causes not only an income effect but also a price effect, in which the price effect will stimulate more government spending than an equivalent dollar of a lump-sum unconditional grant. Another explanation for the flypaper effect sees the anomaly as an econometric problem. In general, intergovernmental grants are an endogenous variable, so that any observed relationship between grants and expenditures may simply reflect the influence of unobserved third factors. For example, more ambitious cities could intentionally expand population figures to be entitled to a higher level of grants,[3] and also have a higher expenditure level.

This paper aims to contribute to this literature with convincing estimates of intergov-

[1] For example, Articles 4 and 9 of the European Charter of Local Self-Government state that, "Public responsibilities shall generally be exercised, in preference, by those authorities which are closest to the citizen ..." and "... as far as possible, grants to local authorities shall not be ear-marked for the financing of specific projects. The provision of grants shall not remove the basic freedom of local authorities to exercise policy discretion within their own jurisdiction."

[2] Lundqvist (2015) also points out that estimates may range from 15% to 20% for most countries depending on the types of grants (e.g., conditional or unconditional).

[3] In the existing rule of intergovernmental grants distribution, population is usually an underlying determinant since fiscal revenue (e.g., residents' income tax) depends on population.

ernmental grant effects on expenditures and tax revenues of all municipalities and cities in the Philippines over the period 1993-2016.[4] Fiscal decentralization in the Philippines has become institutionalized since the enactment of the Local Government Code (effective since 1992). It mandates that local governments are entitled to receive intergovernmental grants, officially referred to as internal revenue allotment, in which the utilization of such grants is mainly at the discretion of the recipient local government (i.e., unconditional). In addition, its distribution to local government units is based on a two-tiered (vertical and horizontal) formula. Specifically, the grant transfer is divided vertically into four parts according to four existing types of local government units, among which 34 percent of the total transfers are allocated to municipalities and 23 percent are allocated to cities. Then, for both municipalities and cities, their designated bulks of grant are further distributed horizontally to each local government unit according to population, land area, and equal sharing, with a specific weighting for each of the three factors. This rule-based grant transfer scheme, which is universally applied to municipalities and cities, thus facilitates our causal effect analysis.[5] However, there exists another notable aspect in the Philippine grant distribution scheme: a municipality can opt to convert to a city to improve its grant receipts if its locally-sourced income, and population or land area, are above certain thresholds. In such an empirical context, the potential endogeneity problem in estimation comes from the fact that a municipality may self-select to be a city for greater grant receipts. In fact, the number of cities has become more than doubled over the period 1993-2016. To correct this potential self-selection bias, we make use of the instrumental variable (IV) method based on two policy changes: the launch of the criteria in the creation of cities in 1992, and the subsequent policy change in cityhood conversion criteria in 2001.

Our study thus complements the literature that makes use of the quasi-experimental approach in investigating the flypaper effect. Dahlberg et al. (2008), Litschig and Morrison (2013), Lundqvist (2015), and Baskaran (2016) use data from Sweden, Brazil, Finland, and Germany, respectively, and they all explore the effects of general-purpose grants on public expenditures and taxes, which are in common with our study.[6] Knight (2002) and Gordon (2004), on the other hand, both deal with specific transfer programs in the U.S. context (federal highway grants and the Title I program for education grants, respectively), and explore whether the targeted grants stick to the specific sector as intended.[7] All these studies provide mixed

[4] The Philippines is administratively organized into the following four types of local government units: province, city, municipality, and barangay (village), which are all entitled to unconditional grants. Municipalities and cities cover the national territory non-exclusively, and they are the main entities that directly provide basic public goods and services. There were 63 cities and 1,529 municipalities in 1993. See Section 2 for discussions of their differences and similarities.

[5] The enforcement of Local Government Code is unlikely to be anticipated or responded in advance by local government units. See Section 2 for details.

[6] Dahlberg et al. (2008) make use of a discontinuity based on out-migration percentage in the Swedish grant system to identify the causal effect of general intergovernmental grants in their IV estimation. Similarly, Baskaran (2016) also relies on discontinuities in the allocation formula for general-purpose transfers in the German state of Hesse and applies IV estimation. Litschig and Morrison (2013) rely on the discontinuity of census-based population change for identification, and offer the regression discontinuity evidence for general federal grant effects in Brazil. Lundqvist (2015) utilizes policy-induced increases in intergovernmental grants for a group of municipalities in Finland and applies a difference-in-differences approach. All these studies find evidence of the flypaper effect, while Litschig and Morrison (2013) focus more on broader development outcomes.

[7] Knight (2002) constructs his IV based on the political power of congressional delegations to solve the endogeneity

evidence: the results within the U.S. setting are generally in favor of the prediction of median voter theory, while others find evidence of the flypaper effect. It is likely that different types of grants may have different effects, and the effects are sensitive to the institutional design of fiscal decentralization. Moreover, the empirical studies on the flypaper effect that utilize a quasi-experimental approach predominantly focus on the fiscal institution in developed countries. The only one exception, to the best of our knowledge, is Litschig and Morrison (2013), who study the municipalities in Brazil. Hence, we still know little about the causal effects of grants on local governments' behavior, especially in developing countries.

Our empirical results show that one additional Philippine peso in per capita unconditional grant causes the per capita local public spending to increase by 84 cents. On the other hand, we do not observe local tax revenue reduction since a one-peso increase in per capita unconditional grant has no effect on per capita local tax revenue. These results are robust to using different identification strategies of fixed effects and IV estimations, and different sample definitions. Also, our results indicate that there are heterogeneous flypaper effects with respect to the incomes of local governments, as the high-income ones exhibit greater flypaper effects on public expenditure. The possible mechanisms for this outcome are discussed in Section 5.1.

This study is, as far as we know, the first paper to estimate the causal effect of intergovernmental grants using the data of all municipalities and cities in the Philippines while taking explicit account of potential self-selection problem. There are a few papers that aim to study the Philippines' fiscal decentralization, but do not focus on all municipalities and cities and do not establish causality. Balisacan (2016), for example, focuses on the correlation between public expenditure and grants (i.e., internal revenue allotment) by using only the municipalities that converted to cities after local fiscal autonomy was established in 1992. Diana (2008) and Canare (2016) use data of provinces and cities, respectively, and conclude that there is a strong correlation between grants and expenditure, suggesting the existence of the flypaper effect.

The remainder of the paper is organized as follows. The Section 2 provides the institutional and policy background of the Philippine grant distribution system and the policy on conversion into cityhood. This is followed by the data description and the discussion on the identification strategy in Section 3. Section 4 presents the baseline results accompanied by the robustness check and subsample analysis. In Section 5, we briefly discuss our results with particular focus on why the grants have a large stimulating effect on public spending in the Philippines. Finally, Section 6 offers concluding remarks.

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problem of distribution of the U.S. federal highway aid grants, and concludes that there is no evidence of the flypaper effect. Gordon (2004) takes advantage of the discontinuity in the allocation formula for federal school grants in the U.S., in which the census-determined change is used as an instrument for the actual change of the grant. She shows that the flypaper paper effect vanishes once the delayed adjustment by the local government (to counter the grant stimulating effects) occurs in later years.

II. *Institutional and Policy Background*

1. Intergovernmental Grant Transfers in the Philippines

Before the 1990s, the governing power in the Philippines mostly resided in central government. The Philippines consists of four types of local government units (hereafter referred to as LGUs) and they are organized into three layers: province is the first layer, city and municipality are the next layer, and the third layer is village-level barangay.[8] Each LGU is headed by an elected official and has a legislative body. There were 73 provinces, 63 cities, 1,529 municipalities, and around 41,502 barangays in the Philippines directly after the LGC became effective, and all four types of LGUs have election structures for their local legislatures and chief executives.[9] The most extensive reform in decentralization, both politically and fiscally, occurred with the approval of the Local Government Code (LGC) in 1991, which has been effective since 1992. This code, which is one of the outcomes to diverge from a highly centralized setup, has clearly designated duties and responsibilities for local governments such as health, education, and social welfare services.

Moreover, LGC formalized the financial resources, either locally or non-locally, available to LGUs. The local sources include (i) non-tax revenues, including regulatory fees from permits and licenses, service charges, and business income, and (ii) tax revenues, including local real property tax, and business tax. The non-local source mainly comprises unconditional fiscal transfers from the central government, referred to as internal revenue allotment (IRA) in the Philippines.[10] IRA accounts for a large chunk of LGUs' total income (see Figure 1 for the cases of city and municipality), and its distribution follows an LGC-mandated formula (see Section 2.2). Balisacan (2016) pointed out that, before the enactment of LGC, IRA was used as a tool for patronage politics, since the old distribution rule is discretionary rather than rule-based. Hence, the implementation of the LGC marks the beginning of greater fiscal autonomy for LGUs in the Philippines (Llanto, 2012).

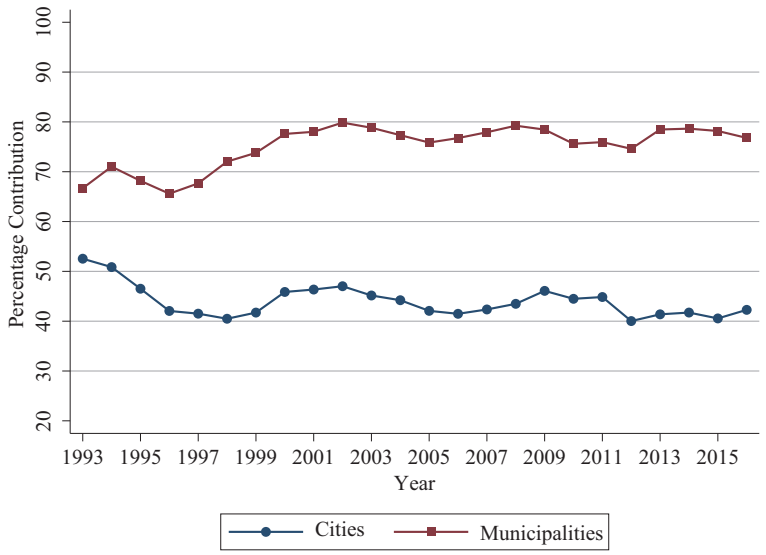
Note that, among all types of LGUs, municipalities and cities, which cover the whole Philippines territory non-exclusively, are the focus of this paper. They are the key entities that directly provide and implement basic public services (Uchimura and Suzuki, 2012). Both municipalities and cities belong to the same administrative layer, and they are also the

[8] To be more specific, the province consists of component cities and municipalities, in which component cities on average have higher populations and higher incomes than municipalities. There also exist some independent cities that are politically independent of their home provinces; the number of these is much lower than the component cities. The powers of independent cities are essentially the same as those in other regular ones, except that voters in the independent cities are excluded from voting for provincial officials. In addition, although there exists an administrative division, or "region," in which each comprises several provinces, cities, and municipalities, it is not considered as an LGU given that it has no election structure and mainly serves the role of coordination.

[9] The number of each type of LGU changes over time, given that some LGUs disappear due to mergers or new LGUs are created through conversion from one type to another.

[10] Aside from IRA, there exist other external financial resources from central government. According to Soriano et al. (2005), those sources include (1) congressional allocation or priority development assistance fund (PDAF), (2) government-funded programs and project, excluding PDAF, (3) official development assistance (ODA) loans and grants-funded transfers, and (4) off-budget funding in the forms of grants or donations. Among all these categories, IRA comprises a large and regular part of intergovernmental transfers.

FIGURE 1. CONTRIBUTION OF IRA TO TOTAL INCOME IN MUNICIPALITIES AND CITIES, 1993-2016



Note: Total income includes IRA, own-sourced revenue, and other external sources of local governments. Each point on the trend is calculated based on the ratio of $\sum_i IRA_i$ to $\sum_i Total\_Income_i$ in the corresponding year where i stands for an LGU of either municipality or city.
Source: Statement of Income and Expenditures of the respective local governments.

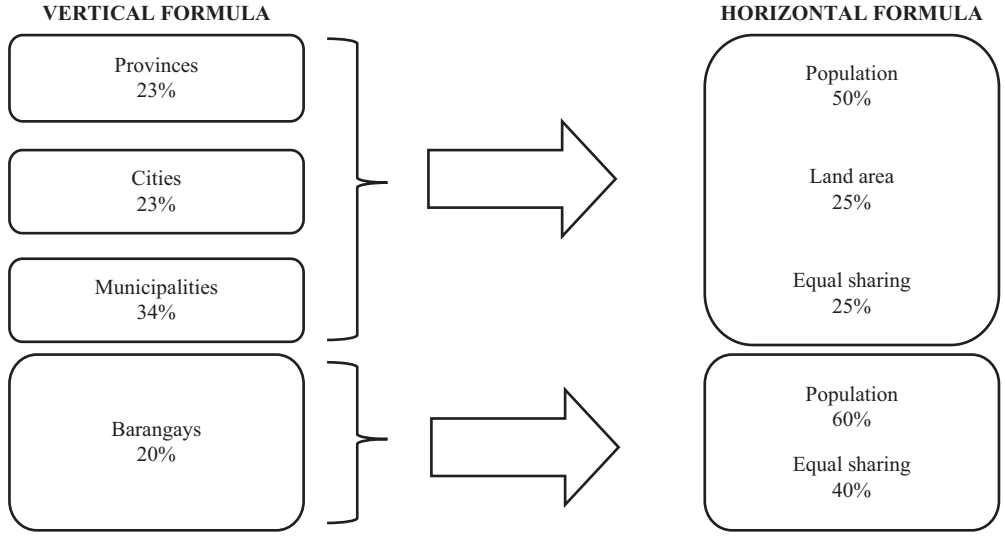
fundamental administrative division that can reclassify land use from agricultural to non-agricultural purpose to a certain extent. However, they differ in land size, population, and income revenues (locally and non-locally), whereas a city is generally larger than a municipality in all the aspects just mentioned. As for LGUs' goods and services and financial resources, cities are required to offer a wider range of public goods and services and are endowed with a larger scope of taxation power in terms of broader taxation types and higher tax rate ceiling.[11,12] Furthermore, a city, on average, receives a larger amount of IRA given the LGC-mandated formula, which will be illustrated in the next subsection. Lastly, Figure 1 shows that the gap in the trends of IRA's percentage contribution (relative to total income) in the two types of LGUs has been around 30 percent for a significant period of time, suggesting that municipalities' public finance relies more on IRA.

Since the LGC aimed to transfer substantial power, responsibility, and resources from central government to local governments in the Philippines, LGC approval was a process with twists and turns. Prior the launch of the LGC, many public administration specialists had for years advocated decentralization. The central government, however, only paid it lip service to

[11] Based on Section 17 of the LGC, cities cover all the services and facilities that are provided by municipalities, plus those of communication and transportation. Hence, the relevant personnel expenses are also larger in cities than in municipalities.

[12] See Manasan (2005) for the comparison of tax power assignment among all types of LGUs.

FIGURE 2. VERTICAL AND HORIZONTAL FORMULAE IN COMPUTING IRA



Notes: The vertical and horizontal formulae are based on Section 285 of the LGC. The presentation of the formulae is adapted from Japan International Cooperation Agency (2009).

this idea, given that Congress members in control of its passage are often rivals of local officials. LGC approval in 1991 was, therefore, a sudden and unanticipated change in local governance that was referred to as a "Saturday morning surprise" by a team of writers from the National Economic and Development Authority (Rood, 1998). Nevertheless, it opened the possibility of considering specific designs in the policy as quasi-experimental when exploring issues regarding fiscal decentralization in the Philippines.

2. Rule-based Transfer Scheme

The key element of the LGC, from the perspective of LGUs, is the transfer of significant financial resources. According to Section 284 of the LGC in the Philippines, all LGUs shall receive a 40 percent annual share from the internal revenue taxes collected by central government, i.e., IRA. Section 285 of the LGC further specifies that, among the four types of LGUs, province and city have the same shares, 23 percent, of the total transfer. The municipality and barangay share 34 percent and 20 percent of the transfer, respectively. Then, within the same type of LGUs, the share for each individual province, city, and municipality is determined based on the following formula: population by 50 percent, land area by 25 percent, and equal sharing by 25 percent. The share for each individual barangay is determined by a formula with two determinants: population by 60 percent and equal sharing by 40 percent. The IRA receipts are considered as unconditional grants since their utilization is mainly at the discretion of the respective subnational government units.[13] Figure 2 illustrates and summarizes

[13] Although the allocation of a minimum of 20% for local development projects and 1% for children's programs is required by laws, those conditions do not actually bind local governments' spending decisions and are considered as

the vertical and horizontal formulae in computing the IRA for each LGU.

Note that the LGC provides LGUs with the power to source their own revenues through local taxation such as business and/or real property taxes. However, in practice, LGUs aiming at the improvement of financial resources generally manage local taxes carefully in order not to drive away local business. Rather, many LGUs, especially for the type of municipality, consider the conversion to cityhood as a more convenient way to significantly improve IRA receipts, given that the LGC also formalizes the criteria for LGUs conversion from one type to another. Take the LGUs of municipalities as an example. Such conversions can become possible once a municipality becomes large enough in terms of its income revenue and population (or land area). Since there were 1,529 municipalities but only 63 cities in 1993, the gap in IRA receipts between each municipality sharing 34 percent of the transfer and each city sharing 23 percent was large. Consequently, one noticeable effect of LGC enforcement was that it provided larger municipalities (in terms of the size of population and local income) with a strong incentive to convert to cityhood in order to substantially improve their IRA receipts by taking a share of the larger IRA "pie" allocated to cities.

3. Requirements for Cityhood Conversion During 1992-2000

Based on the LGC, a municipality was eligible for conversion during 1992-2000 if it satisfied the following requirements: (i) an (locally-generated) average annual income of 20 million pesos for the last two consecutive years based on 1991 constant prices, and (ii) a land area of at least 100 km^2 or a population of not less than 150,000. Once the criteria were met, the decision to apply for conversion was at the full discretion of the municipality concerned.[14] Following this policy, 53 extra cities emerged from the conversion of municipalities during 1993-2000, i.e., "new cities" after LGC approval. The so-called mad rush phenomenon of conversion to cities in the Philippines refers to this period.

Note that the rapid conversion into cityhoods directly after the LGC became effective was motivated by the need to improve IRA receipts as well as the new clear-cut conversion criteria. The approval of the LGC, as mentioned earlier, was considered a surprise at that time. Rood (1998) further points out that the LGC was approved so abruptly in 1991 that many observers questioned whether the LGUs had the ability to manage a wide range of newly delegated functions. It is thus less likely that the LGUs concerned could anticipate or respond in advance to those extensive tasks in the LGC, as well as to the introduction of specific conversion requirements. This enhances the credibility of selecting this episode as part of our experimental framework.

4. Requirements for Cityhood Conversion since 2001

Following LGC approval, the IRA-driven incentive to convert to cities raised concerns

nonbinding. This is because the specific criteria on these programs and projects are not explicitly stated. Also, it is not clear how these provisions are enforced in practice.

[14] In particular, the respective municipal council can pass a resolution indicating their desire to be converted into a city and submit it to Congress. The latter will then conduct deliberations and pass an Act of Congress for meritorious requests for conversion, which will become law once approved by the president. The law incorporating the cityhood will only be officially valid when it is ratified, i.e., it has acquired approval from the majority of its voting residents.

TABLE 1. CONVERSION CRITERIA FROM MUNICIPALITY INTO CITYHOOD

	From 1992 to 2000	From 2001 to date
Conversion criteria	1. Average annual income for last two consecutive years $\geq$ 20 million pesos 2. Population $\geq$ 150,000 or land area $\geq$ 100 km^2	1. Average annual income for last two consecutive years $\geq$ 100 million pesos 2. No change

Note: The income criteria of both periods are based on 1991 and 2000 constant prices, respectively. The "income" refers to the locally-generated income, including both tax and non-tax revenues.
Source: Section 285 of the LGC and Republic Act No. 9009.

over dependence on the IRA and weak local fiscal autonomy. Some municipalities applying for conversion at that time were in fact not yet economically developed to the extent that they could function as cities. This was contrary to the vision of LGUs being able to respond to local needs and preferences (Llanto, 2012). Moreover, a proliferation of cities was causing the "old cities" (those that already had city status prior to LGC approval) to settle for a lower grant allocation, resulting in lower fiscal capacity for their public goods provision. In response to these concerns, an amendment to the LGC (i.e., the Republic Act No. 9009) was introduced to restrain the mad rush phenomenon of cityhood conversion, and this became effective in June 2001. In this policy revision, central government sharply increased the average annual income threshold from 20 million pesos to 100 million pesos for the last two consecutive years based on year 2000 constant prices. The population and land area requirements remained unchanged. Table 1 summarizes the conversion criteria during the two periods. Once the criteria are met, the decision to apply for conversion is still subject to the relevant municipality's discretion.

Introduction of the amendment was an unexpected shock to the municipalities concerned. This can be explained by the famous "League of Cities of the Philippines vs. Commission on Elections" case. Specifically, 16 municipalities which sought conversion into cities just before the amendment became effective, but had not yet completed the legal procedure, were affected.[15] Whether or not the conversion criteria of these 16 cities should follow the revised local income requirement became an issue and was then brought to the Supreme Court. Their administrative division status had gone through an atypical process given that their petitions for city conversion were granted, withdrawn, restored, and then withdrawn again during the period 2007-2010. The Supreme Court, in its final decision in 2011, ruled that the application of revised conversion criteria on the 16 cities was unconstitutional and their city status should be granted. We would not have observed this legal battle if the policy change had been anticipated or responded in advance by the municipalities concerned, suggesting the credibility of considering it in our experimental framework.

There were 53 municipalities converted to cities between 1993 and 2000. Another 29 municipalities, including the 16 atypical ones, converted to cities since the introduction of the new conversion requirement in 2001. This means that there was a total of 145 cities in the Philippines by 2016, whereas the number of municipalities was 1,447 in 2016.

As a final note, the design of the IRA distribution mechanism provides us with the necessary variation in estimating its effect on local public finance of both municipalities and

[15] The 16 cities are Baybay, Bogo, Catbalogan, Tandag, Lamitan, Borongan, Tayabas, Tabuk, Bayugan, Batac, Mati, Guihulngan, Cabadbaran, El Salvador, Carcar, and Naga.

cities in the Philippines. On the one hand, each municipality and city receive a designated amount of IRA each year through our data period according to the same horizontal formula—the weights imposed on population, land area, and equal sharing are the same among cities and municipalities. On the other hand, a municipality which chooses to convert to a city receives a boost in its IRA receipts. Such a design also implies the conversion to cityhood is an endogenous variable, provided that the aforementioned conversion requirement is met. As discussed in Section 3, we will take advantage of the exogenous feature of the conversion requirement that was initially enforced in 1992 and later revised in 2001 in dealing with the self-selection problem.

III. *Data and Methodology*

1. Data

Our data consists of a 24-year panel of all Philippine cities and municipalities between 1993 and 2016, in which these LGUs are categorized within the same administrative layer and cover the whole territory non-exclusively. In total, there are 1, 592 LGUs. Note that 10 municipalities and 2 cities are dropped from those LGUs. This is because these twelve LGUs expanded by merging with other municipalities into new cities or new municipalities in the later years, so their locations and boundaries cannot be uniquely identified during the period from 1993 to 2016. Also, we exclude one municipality due to missing data in all years. This leaves us a panel of 1,579 LGUs over the period 1993-2016, starting with 1,518 municipalities and 61 cities in 1993, and total observations of 37,337.[16,17]

Table 2 shows the composition of municipalities and cities in the 1,579 LGUs across time. In general, the number of cities increases over time reflecting the need for IRA improvement for some municipalities. The number of cities decreased in 2010 since the Supreme Court had cancelled the city status of the 16 atypical LGUs. The decision was later reversed and finalized for granting city status in 2011.

Table 3 provides the summary statistics of the variables used in the empirical analysis for all LGUs and for different subsamples. The expenditure variable includes both operating and non-operating expenses. The former is composed of expenses in general public services, education, health, labor and employment, housing and community development, social services, economic services, and debt services in interests; the latter includes expenses for capital outlay and debt services in principal cost. The tax revenue variable refers to the locally-sourced tax revenue, and the grant variable refers to the IRA. We collect the information of the three variables from the Statement of Income and Expenditures of the respective LGUs, in which they are submitted annually to the Philippine Bureau of Local Government Finance. The statistics of the three variables are in peso per capita, and the data of the populations are based

[16] The 16 atypical LGUs that experienced a lawsuit over the conversion policy in the Supreme Court and eventually converted to cities are included in our sample, even if we include a dummy variable in the regression model indicating whether an LGU is a municipality or a city across time. Because the Supreme Court's decision of granting city status to the 16 atypical LGUs should be independent, there should be no endogeneity problem in including those 16 LGUs.

[17] A few of the LGUs lost data on expenditure or tax revenue in some years, so that our data does not present a balanced panel. In total, around 1% of observations are missing.

TABLE 2. COMPOSITION OF THE MUNICIPALITIES AND CITIES ACROSS TIME

Year	LGU		Year	LGU	
	Municipality	City		Municipality	City
1993	1518	61	2005	1464	115
1994	1518	61	2006	1464	115
1995	1515	64	2007	1463	116
1996	1515	64	2008	1445	134
1997	1513	66	2009	1444	135
1998	1499	80	2010	1460	119
1999	1498	81	2011	1459	120
2000	1498	81	2012	1443	136
2001	1465	114	2013	1437	142
2002	1465	114	2014	1437	142
2003	1465	114	2015	1437	142
2004	1465	114	2016	1436	143

Note: The total number of municipalities and cities presented in this table has excluded 10 municipalities and 2 cities due to merging, and another one municipality due to missing data.

TABLE 3. SUMMARY STATISTICS OF THE VARIABLES FOR LGUS

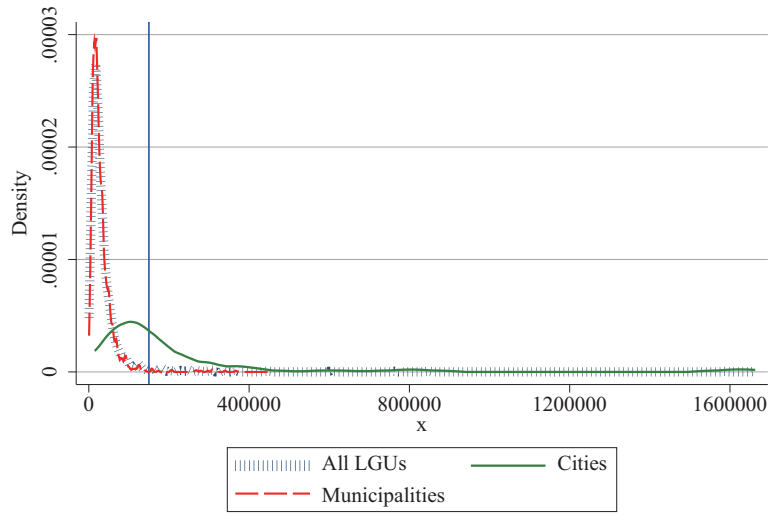
	All LGUs			Municipalities			Cities		
	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.
Expenditure	1335.28	4121.25	37333	1279.34	4253.18	34780	2097.33	1144.53	2553
Tax revenue	136.54	443.24	37337	96.34	322.11	34784	684.17	1066.83	2553
Grant	1265.49	4980.71	37337	1244.70	5154.62	34784	1548.79	840.66	2553
Population	52.82	126.01	37337	37.62	74.1	34784	259.88	333.8	2553

Notes: Expenditure, tax revenue, and grant are in peso per capita, adjusted by year 2000 constant prices. In 2000, one Philippine peso was equivalent to US$0.02. The population variable is measured in thousands of people.

on the Philippine census conducted in 1990, 1995, 2000, 2007, 2010, and 2015. Consistent with our previous discussion regarding the differences in the scopes of public goods and services, taxation powers, and IRA receipts between municipalities and cities, Table 3 shows that, on average, cities have higher values than municipalities in the variables of expenditure, tax revenue, and grants. Also, on average, cities are larger than municipalities in terms of population. Note that the population size of an LGU in a certain year is represented by the value in the latest census.

Note that our sample includes all municipalities and cities in the Philippines. Not surprisingly, there exists a lot of heterogeneity in terms of social-demographic characteristics and public administrative capacities among the 1,579 LGUs. For instance, Figure 3 shows that the distributions of population sizes among cities and municipalities are significantly different. The majority of municipalities have small populations, while the populations of cities are larger in general and had a long right tail. Due to the high heterogeneity between cities and municipalities, we conduct subsample analysis in the next section to explore the heterogeneous effects of grants on expenditure and tax revenue with respect to the city status of LGUs in 1993.

FIGURE 3. DENSITY OF POPULATION PER LGU IN 1993



Notes: The solid vertical line in the figure indicates the population size requirement for cityhood conversion (i.e., population $\geq$ 150,000).
The x-axis represents the population size per LGU in 1993.
Source: The Philippine census of population.

2. The Empirical Model

We focus on 1,579 LGUs that are either municipalities or cities with the caution that a number of municipalities were converted to cityhood during our data period. The effect of intergovernmental grants on the public spending and tax revenue of LGUs in the Philippines is estimated using the following equation:

$$y_{it} = \beta_0 + \beta_1 g_{it} + \beta_2 c_{it} + \boldsymbol{lgu}_i \boldsymbol{\gamma} + \boldsymbol{yr}_t \boldsymbol{\rho} + u_{it}, \quad (1)$$

where y_{it} is the outcome variable in an LGU i at time t measured by per capita expenditures, exp_{it}, and per capita tax revenues, tr_{it}. The notation g_{it} is unconditional grants in the form of IRA, c_{it} is the dummy variable for being a city, $\boldsymbol{lgu}_i$ is a row vector of the local government fixed effects, $\boldsymbol{yr}_t$ is a row vector of the year dummies, and u_{it} is the idiosyncratic error.

The main variable of interest is the grant, g_{it}. By taking advantage of the rule-based nature of the Philippine fiscal structure in providing IRA to local governments, the grant variable is exogenous for the following reasons. First, the variables with monetary units are measured in per capita terms, i.e., the amount (in real terms) is divided by the population, and hence the population size factor in the horizontal formula has been taken into account. Second, the land area, another factor in the formula, is considered as exogenous in our context since the boundaries of cities are fixed and hence areas of them did not change over time.[18] Moreover,

[18] As discussed in Section 3, 12 LGUs are excluded from our sample since they changed their land areas by merging with other municipalities during the period of 1992-2016.

the conversion process usually takes several years from initial application to final approval, and there is no evidence that such a process is influenced by other LGUs. Hence, the change in the number of LGUs for municipalities and cities, which would have an effect through an equal sharing factor, is an exogenous shock to the existing LGUs.

The variable c_{it} can also be a confounding factor in our estimation equation. This is because a number of large municipalities, in terms of their population size and income level, converted to cities during our data period. The local government fixed effects, however, do not necessarily capture those municipalities' preferences for cityhood conversion that would affect both IRA receipts and the level of the outcome variables (expenditure and locally-sourced tax revenue).

3. Self-Selection Issue and IV Method

Unlike the rule-based grant variable (i.e., IRA), the city status dummy of an LGU may be endogenous. This dummy variable, c_{it}, suffers from self-selection bias, since the conversion from a municipality to a city is a *choice* of the prospective municipalities depending on whether they are able to meet the required thresholds and then wish to pursue city conversion. Since the municipalities' unobservable preference cannot be directly included in the model, the OLS regression results from equation (1) can be biased.

This self-selection bias can be eliminated by using a factor that can capture the exogenous part of the effect of being a city. We therefore exploit the policy changes on city conversion requirements that have occurred twice since the LGC was approved. In particular, we construct an IV to identify whether an LGU was an eligible municipality for converting to cityhood at the beginning of each policy period, i.e., 1993 and 2001, respectively.[19] Among the initial 1,518 municipalities who were subject to the exogenous policy change in 1993 (i.e., cityhood conversion criterion in the LGC), 16 municipalities were eligible in 1993. Perhaps surprisingly, a few of them failed to complete the legal process of cityhood conversion by the end of 2000 due to lack of consensus in pursuing cityhood conversion on time.[20] Hence, among those 16 municipalities which were assigned eligibility in 1993, 13 became cities by the end of the first policy period (i.e., by the end of 2000). Meanwhile, a number of municipalities which were not eligible for cityhood conversion in 1993 (about 2.7%) nevertheless became cities by 2000, as they became eligible from the later year of the first policy period (i.e., from 1994) and completed the legal process of conversion by 2000.[21] Therefore, at the start of the second

[19] According to the LGC and its amendment, the eligibility for cityhood conversion requires municipalities to meet income criterion for 2 consecutive years. Hence, in the first policy period, we can decide whether a municipality is eligible for cityhood conversion from 1993 by checking the income data in both 1992 and 1993. As for the second policy period, the eligibility of a municipality was determined in the year 2001.

[20] For example, citizens of municipalities surrounding Metro Manila (e.g., Bacoor and Dasmariñas) may be wary that higher property taxes would be imposed after converting to cities, and thus against cityhood bids even if their municipalities had met the criteria for several years.

[21] The municipalities whose locally-sourced income is below the conversion threshold might implement programs within their jurisdiction to improve income, such as higher local tax collection efforts or the provision of incentives to attract new businesses. If population is a binding constraint, these municipalities might execute large social infrastructure projects such as school buildings, tertiary hospitals, and low-cost housing. Aligned with Tiebout's (1956) argument regarding people within LGUs "voting with their feet", individuals whose preferences have been met by these public services might choose to move to these municipalities, resulting in an increase in the population.

policy regarding the exogenous increase of income criterion for cityhood conversion in 2001, there were 1,465 municipalities subject to the policy. Among them, 9 municipalities were eligible in 2001, where 7 out of those 9 municipalities became cities by the end of 2016. In the meantime, among those who were not eligible in 2001, a number of municipalities (approximately 1.5%) still became cities by 2016. Figure 4 summarizes this important information.

Since our panel data contains both cities and municipalities, we need two variables to construct the above-mentioned IV as shown in Table 4. Specifically, let the variable $imuni_{ik}$ denote whether an LGU is a municipality at the beginning of policy period k, and let $eligimuni_{ik}$ denote whether an LGU is an eligible municipality for cityhood conversion at the beginning of policy period k. Note that $k \in \{1,2\}$; in other words, k refers to the year of either 1993 or 2001. The following examples further illustrate how these IVs are constructed. Suppose municipality j was eligible to upgrade to city in 1993 but it did not upgrade till 2000, and it became not eligible in 2001 (no matter whether or not it became eligible between 2002 and 2016), then the IVs of $imuni_j$ and $eligimuni_j$ take the values of 1 and 1 between 1993 and 2000, and take the values of 1 and 0 in 2001 and after, respectively. In another case, suppose municipality l was not eligible to upgrade to city in 1993 and did not upgrade till 2000 (no matter whether or not it became eligible between 1994 and 2000), but it became eligible in 2001, then the IVs of $imuni_l$ and $eligimuni_l$ take the values of 1 and 0 between 1993 and 2000, and take the values of 1 and 1 in 2001 and after, respectively. Note that, in our panel data, the existence of two policy changes instead of one ensures that our instrument will not be absorbed by the local government fixed effects.

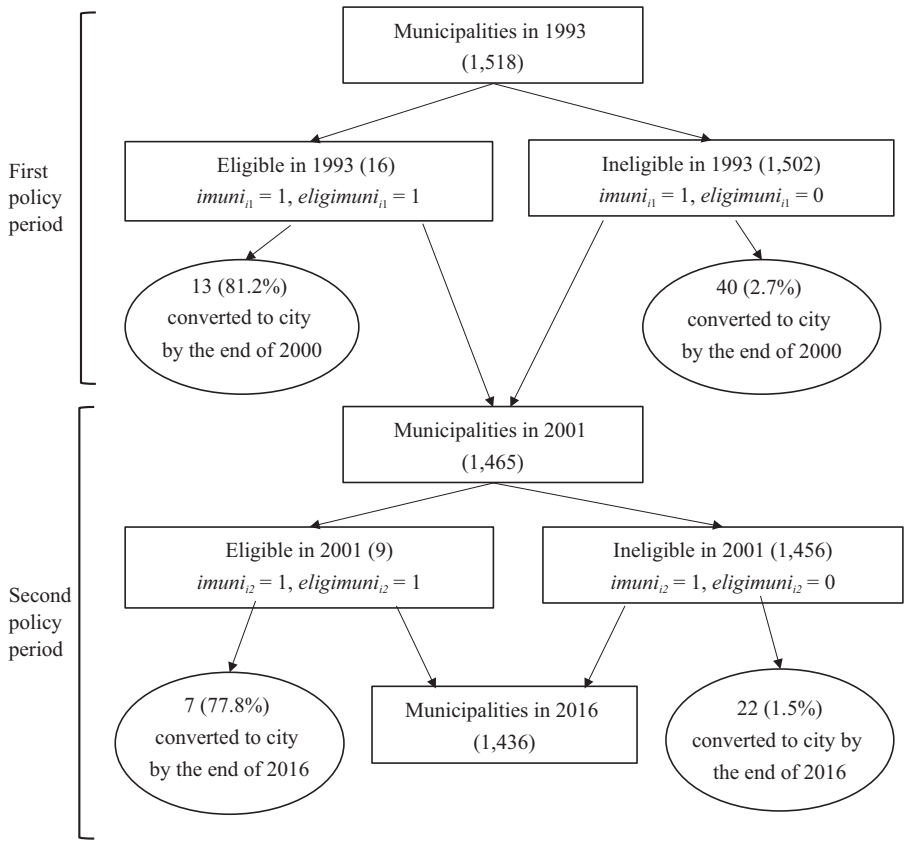
The validity of the IVs can be justified as follows. Since the IV construction is based on the conversion criteria that directly affect the probability of a municipality converting to a city in each of the two policy periods, the *relevance condition* is likely to hold (see also Section 4.2 for support from the first-stage result). Furthermore, as we argued in Section 2, the cityhood conversion criteria apply to all municipalities and are unlikely to be anticipated by the municipalities concerned. Therefore, the *exogeneity condition* regarding the validity of IV is also plausible. Hence, our first-stage equation is as follows:

$$c_{it} = \pi_0 + \pi_1 g_{it} + \pi_2 imuni_{ik} + \pi_3 eligimuni_{ik} + \boldsymbol{lgu}_i\boldsymbol{\delta} + \boldsymbol{yr}_t\boldsymbol{\tau} + \nu_{it}. \quad (2)$$

The signs of π_2 and π_3 are equally important with their relevance. First, π_3 is expected to be positive. This is because, compared with ineligible municipalities at the beginning of period k, initially eligible municipalities are more likely to (i) become cities as shown in Figure 4,[22] and (ii) convert to cities earlier and hence experience more years for $c_{it}=1$. Also, the sum of π_2 and π_3 is expected to be negative. Because, compared with the LGUs which had been cities throughout policy period k, not all initially eligible municipalities in period k convert to cities and so they are obviously less likely of being cities and also experience fewer years for $c_{it}=1$. Then, the expectations for the signs of π_3 and $(\pi_2+\pi_3)$ together imply π_2 is negative.

[22] In Figure 4, the odds of cityhood conversion are 81.2% versus 2.7% between eligible and ineligible municipalities in the first policy period, and the odds of conversion are 77.8% versus 1.5% between eligible and ineligible ones in the second period.

FIGURE 4. THE CHANGES OF CITY STATUS FOR MUNICIPALITIES OVER THE TWO POLICY PERIODS



Notes: The total number of municipalities presented in this figure has excluded 10 municipalities due to merging, and another one municipality due to missing data.

TABLE 4. THE DEFINITION OF THE IVS

		At the beginning of period k, $eligimuni_{ik} = \begin{cases} 1, \textit{if LGU i is an eligible municipality} \\ 0, \textit{otherwise} \end{cases}$.	
		At the beginning of period k: "eligible municipality"	At the beginning of period k: "otherwise"
$imuni_{ik}$	Municipality: 1	1,1	1,0
	City: 0	0,0	

Notes: Once LGU i is a city at the beginning of period k, the exogenous assignment of municipality' eligibility is not relevant to it and so its value of $eligimuni_{ik}$ is always zero in period k. The number of LGUs with the dummy values (0,0) (i.e., city) is 61 if $k=1$ and the number is 114 if $k=2$.

TABLE 5. BASELINE REDUCED FORM RESULTS

	All LGUs		Municipality (in 1993)	City (in 1993)
	(1)	(2)	(3)	(4)
Panel A: Dependent variable - Expenditure				
Grant	0.80***	0.84***	0.84***	0.90***
	(0.02)	(0.02)	(0.02)	(0.13)
City	585.65***	-4.09	-11.90	
	(89.64)	(54.56)	(54.59)	
Constant	200.05***	195.96***	182.99***	414.90
	(9.83)	(19.92)	(19.55)	(267.05)
Year dummy	Yes	Yes	Yes	Yes
LGU fixed effect	No	Yes	Yes	Yes
No. of observations	37333	37333	35872	1461
R-squared	0.93	0.85	0.86	0.45
Panel B: Dependent variable - Tax revenue				
Grant	0.00	0.00	0.00	0.07
	(0.00)	(0.01)	(0.01)	(0.09)
City	583.65***	191.92***	198.41***	
	(93.68)	(39.27)	(39.20)	
Constant	65.49***	80.55***	74.76***	304.31*
	(4.61)	(9.48)	(8.87)	(154.72)
Year dummy	Yes	Yes	Yes	Yes
LGU fixed effect	No	Yes	Yes	Yes
No. of observations	37337	37337	35876	1461
R-squared	0.12	0.02	0.02	0.18

Notes: Standard errors, clustering within each LGU, are in parentheses. ***, **, * denote significance at 1%, 5%, and 10%, respectively.

IV. *Empirical Results*

1. Baseline Estimates

Table 5 shows the results from estimating equation (1). Columns (1) and (2) present the results from the regressions covering the entire sample that uses pooled OLS and LGU fixed effects, respectively. The results indicate that the intergovernmental grant has a positive and significant effect on local public expenditure while it seems to have no effect on tax revenue. With LGU fixed effects, the grant effect on local public expenditure is 0.84, which is slightly higher than the estimate obtained from the pooled OLS estimation. The grant effect on tax revenue is much smaller than that on expenditure in terms of magnitude, which is less surprising since local governments have autonomy in sourcing their revenues through local taxation but only to a certain extent. Though the city status has no effect on local public expenditure, it has a positive and significant effect on tax revenue. The result supports that cities do have larger scope of tax power (i.e., broader tax categories and a higher tax rate ceiling) and hence can generate higher tax revenue compared to municipalities.

Besides using the entire sample, we also conducted a subsample analysis by including the LGUs which were either municipalities or cities in 1993. In Table 5, columns (3) and (4)

TABLE 6. RESULTS FROM IV ESTIMATION

	All LGUs		Municipality (in 1993)	
	Expenditure	Tax revenue	Expenditure	Tax revenue
	(1)	(2)	(3)	(4)
Grant	0.84***	0.00	0.84***	0.00
	(0.02)	(0.01)	(0.02)	(0.01)
City	68.82	240.46***	58.76	248.26***
	(60.27)	(68.49)	(60.42)	(68.59)
Constant	193.24***	78.74***	183.13***	74.85***
	(19.66)	(10.03)	(19.52)	(8.82)
First-stage IV estimates				
imuni	-0.89***	-0.89***	-0.89***	-0.89***
	(0.03)	(0.03)	(0.03)	(0.03)
eligimuni	0.25***	0.25***	0.25***	0.25***
	(0.06)	(0.06)	(0.06)	(0.06)
Year dummy	Yes	Yes	Yes	Yes
LGU fixed effect	Yes	Yes	Yes	Yes
No. of observations	37333	37337	35872	35876
Hansen-J (p-value)	0.34	0.39	0.35	0.39
Cragg-Donald F-statistics	21021.78	21024.30	20164.66	20167.19

Notes: The coefficients of *imuni* and *eligimuni* indicate the results of the first-stage equation. Standard errors, clustering within each LGU, are in parentheses. ***, **, * denote significance at 1%, 5%, and 10%, respectively.

present the regression results with LGU fixed effects for municipalities and cities, respectively. Since the majority of LGUs are municipalities, it is sensible that the results presented in column (3), i.e., including municipalities only, are similar to the results in column (1). The grant effect on expenditure for cities is 0.9, which is higher than that for municipalities ($\widehat{\beta}_1 =$ 0.84). For both municipalities and cities, the intergovernmental grant has no effect on tax revenue.

2. IV Estimates

As discussed in Section 3.3, the variable of city status in equation (1) appears to be endogenous. We therefore estimate equation (1) using the IV method. In Table 6, columns (1) and (2) show the results obtained from covering the entire sample; columns (3) and (4) are for the subsample of the LGUs which were municipalities in 1993 and so may have the self-section problem. For all the four specifications in Table 6, we conducted Hansen's J test and the weak identification test (Cragg-Donald Wald test); the p-value and F-statistics of these two tests are reported at the bottom of the table. The test results support that the initial eligibility status of municipalities are valid IVs since the overidentifying restrictions appear to be satisfied and the variables are not weak IVs.

In the first-stage regressions, the coefficients of *imuni* and *eligimuni* are -0.89 and 0.25, respectively, with the signs as expected. Compared to Table 5, columns (2) and (4) in Table 6 indicate that the impacts of city status on tax revenue would be underestimated if the endogeneity issue of the city status is not rectified. This is because, compared to municipalities,

cities should have a higher capacity and efficiency for tax collection. After removing the self-selection bias of the conversion from municipality to city, the effect of city status on local tax revenue should be larger. However, the estimates of grant effect in all the specifications in Table 6 are similar to the main results in Table 5. Compared to the IV estimation, the results obtained from the fixed effects models are robust against the self-selection of city status.

3. Robustness to the Control Variable: Population Size

In our reduced estimation equation, we measure grant, expenditure, and tax revenue variables in pesos per capita since the population is a deciding factor for IRA distribution. Meanwhile, population size can also play a role in affecting local expenditure due to economies of scale. That is, the per unit cost of public services is likely to be lower due to the increase in population. In order to investigate such a possible impact of population in our model, we regress equation (1) again by including population sizes in the independent variables.

Table 7 presents the estimation results based on the regressions stated in Table 5 but adding the population size in the regressors. For local government expenditure, the coefficients of the population size range between -0.16 and -0.23, which are statistically significant except for the sample with cities in 1993 only. The negative effect of population on expenditure suggests that there are economies of scale in the provision of public services. However, after adding the population size as a control variable, the effects of intergovernmental grant on expenditure are still the same as those presented in Table 5, which are 0.84 for all LGUs and municipalities, and 0.9 for cities. We also conducted the same estimations for tax revenue. Panel B of Table 7 indicates that tax collection does not exhibit economies of scale, and grants have no effect on tax revenue.

4. Heterogeneous Effects of Intergovernmental Grants

Table 5 illustrates that the grant effect on local expenditure for cities is higher than that for municipalities. It suggests that the intergovernmental grant may have heterogeneous effects on local expenditure and tax revenue with respect to the scale of the local governments. In order to examine the potential heterogeneous grant effects, we conducted a subsample analysis by dividing the observations into the low-income and high-income groups. We adopted the income requirement for municipalities to convert into cities in 1993, and constructed the low-income group as the municipalities with average annual incomes of 1992 and 1993 were less than 20 million pesos. Hence, the other subsample consists of the remaining LGUs after excluding the low-income municipalities.

Table 8 shows the results from the subsample analysis. Columns (1) and (2) indicate that the estimated grant effects for the low-income municipalities on both expenditure and tax revenue are the same as the estimation results from using the entire sample. However, for the remaining LGUs, as shown in columns (3) and (4), the estimates of the grant effects on expenditure are 0.92 from the fixed effects model and 0.94 from the IV estimation. This implies that the grant effect on local expenditure is slightly higher in the relatively high income LGUs, which is similar to what we have observed from the results of the main model in Table 5. On the other hand, columns (3) and (4) indicate that, after using the IVs, the grant effect on expenditure increases slightly from 0.92 to 0.94. Since in this subsample, the portion of

TABLE 7. SENSITIVITY ANALYSIS BY INCLUDING POPULATION VARIABLE

	All LGUs		Municipality (in 1993)		City (in 1993)
	(1)	(2)	(3)	(4)	(5)
Panel A: Dependent variable - Expenditure					
Grant	0.84***	0.84***	0.84***	0.84***	0.90***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.13)
City	8.00	86.03	-2.50	72.48	
	(55.16)	(61.33)	(55.04)	(61.40)	
Population	-0.22**	-0.23**	-0.16*	-0.18*	-0.23
	(0.11)	(0.12)	(0.10)	(0.10)	(0.19)
Constant	203.96***	201.60***	188.14***	188.76***	466.53
	(18.70)	(18.50)	(18.19)	(18.24)	(269.72)
First-stage IV estimates					
imuni		-0.89***		-0.89***	
		(0.03)		(0.03)	
eligimuni		0.25***		0.25***	
		(0.06)		(0.06)	
Year dummy	Yes	Yes	Yes	Yes	Yes
LGU fixed effect	Yes	Yes	Yes	Yes	Yes
No. of observations	37333	37333	35872	35872	1461
R-squared	0.85		0.86		0.45
Hansen-J (*p*-value)		0.38		0.37	
Cragg-Donald *F*-statistics		20699.10		19807.07	
Panel B: Dependent variable - Tax revenue					
Grant	0.00	0.00	0.00	0.00	0.07
	(0.01)	(0.01)	(0.01)	(0.01)	(0.09)
City	191.08***	239.88***	200.60***	251.82***	
	(38.72)	(68.21)	(38.56)	(68.31)	
Population	0.02	0.01	-0.04	-0.05	0.20
	(0.05)	(0.05)	(0.04)	(0.04)	(0.24)
Constant	79.99***	78.51***	75.95***	76.37***	258.50*
	(9.58)	(10.01)	(8.72)	(8.59)	(157.85)
First-stage IV estimates					
imuni		-0.89***		-0.89***	
		(0.03)		(0.03)	
eligimuni		0.25***		0.25***	
		(0.06)		(0.06)	
Year dummy	Yes	Yes	Yes	Yes	Yes
LGU fixed effect	Yes	Yes	Yes	Yes	Yes
No. of observations	37337	37337	35876	35876	1461
R-squared	0.02		0.02		0.18
Hansen-J (*p*-value)		0.39		0.38	
Cragg-Donald *F*-statistics		20701.57		19809.54	

Notes: The coefficients of *imuni* and *eligimuni* indicate the results of the first-stage equation. Standard errors, clustering within each LGU, are in parentheses. ***, **, * denote significance at 1%, 5%, and 10%, respectively.

municipalities that had converted into cities is higher than that in column (3) of Tables 5 and 6, the grant effect would be underestimated if no IV is applied.

TABLE 8. REGRESSION RESULTS BASED ON INITIAL INCOME LEVEL OF LGUS

	Low income municipalities in 1993		LGUs excluding low income municipalities in 1993	
	(1)	(2)	(3)	(4)
Panel A: Dependent variable - Expenditure				
Grant	0.84***	0.84***	0.92***	0.94***
	(0.02)	(0.02)	(0.11)	(0.15)
City	-103.21**	40.58	399.96**	325.93
	(52.39)	(51.60)	(169.03)	(296.90)
Constant	169.49***	169.69***	272.29	298.02**
	(19.49)	(19.44)	(171.02)	(148.88)
First-stage IV estimates				
imuni		-0.89***		-0.75***
		(0.03)		(0.10)
eligimuni		0.26***		0.20**
		(0.06)		(0.10)
Year dummy	Yes	Yes	Yes	Yes
LGU fixed effect	Yes	Yes	Yes	Yes
No. of observations	35299	35299	2034	2034
R-squared	0.86		0.40	
Hansen-J (*p*-value)		0.11		0.25
Cragg-Donald *F*-statistics		22467.83		468.78
Panel B: Dependent variable - Tax revenue				
Grant	0.00	0.00	0.06	-0.04
	(0.01)	(0.01)	(0.08)	(0.14)
City	98.24***	110.93***	330.02**	678.98*
	(17.38)	(25.34)	(135.53)	(405.51)
Constant	59.57***	59.59***	280.17*	158.90
	(7.73)	(7.72)	(166.23)	(247.53)
First-stage IV estimates				
imuni		-0.89***		-0.75***
		(0.03)		(0.10)
eligimuni		0.26***		0.20**
		(0.06)		(0.10)
Year dummy	Yes	Yes	Yes	Yes
LGU fixed effect	Yes	Yes	Yes	Yes
No. of observations	35303	35303	2034	2034
R-squared	0.01		0.21	
Hansen-J (*p*-value)		0.06		0.74
Cragg-Donald *F*-statistics		22470.63		468.78

Notes: The coefficients of *imuni* and *eligimuni* indicate the results of the first-stage equation. Standard errors, clustering within each LGU, are in parentheses. ***, **, * denote significance at 1%, 5%, and 10%, respectively.

V. *Discussion*

1. Potential Mechanisms for the Flypaper Effect in the Philippines

A glance at the Philippine national accounts from World Bank Open Data shows that, on aggregate, total consumption has accounted for around 85% of GDP since 1993. Out of the total consumption, only around 15% is public consumption, and around 85% is private consumption. If we interpret this 15% public consumption as the proxy of the representative agent's marginal propensity to spend on public goods, the results in Table 5 and 6 suggest that grants do have a large stimulating effect on the spending of LGUs. Our result can thus be interpreted as evidence of the flypaper effect.

The analysis so far focuses on how LGUs in the Philippines respond to the increase in grants. Regarding why the LGUs respond as they do (i.e., the flypaper effect), the reason can be quite context dependent (Dahlberg et al., 2008; Lundqvist, 2015; Baskaran, 2016). Here we propose one potential explanation that is related to the institutional design of the Philippine budgetary system, and also discuss other mechanisms that were suggested by the above studies. Note that our proposed explanation for the flypaper effect is merely suggestive, and it should be taken as a starting point for future, more thorough, exploration of various mechanisms.

Brooks and Phillips (2008) argue that the crowding-out effect, which stemmed from Bradford and Oates' model, depends crucially on the assumption that the recipient local government already satisfies the pivotal voter's preferred level of public goods prior to the arrival of the unconditional grants. However, such an assumption would fail if the recipient local government faces institutional constraints that limit its size of budget or put an indirect cap on the quantity of public goods. Then, for example, if the cap of public spending is below the pivotal voter's desired level, it is likely that the recipient local government will use some or all of a grant as a supplement to its budget in an attempt to resolve the underprovision problem in public goods. In this event, a share of the grant revenue is treated as a supplement to public expenditures and will not be returned to voters in the form of tax cuts, and so we would observe that grants stimulate large public spending. By using community development block grant data in the U.S., Brooks and Phillips find empirical support that restrictive fiscal institutions (e.g., municipal tax and expenditure limitations in the budgetary system) increase the stimulative power of federal grants.

The Philippine municipalities and cities also face some fiscal constraints that have the potential to restrict public spending and thereby their responsiveness. The most relevant legal restriction is on locally collected revenue. An example of this is real property tax, which is an important source of tax revenue for LGUs. The LGC and the follow-up amendments set ceilings on the tax rates that LGUs may impose, and mandate that tax rates can be adjusted no more than once in five years and by no more than 10%. Also, LGC sets limitations on the assessment of property value, expressed as an allowable percentage increase in accessed value. By the assessment of real property value alone, this constraint may be nonbinding, since LGUs can still generate additional tax revenue by keeping the assessed market value of property constant but increasing the property tax rate. When combined with the tax rate limit, however, they can bind the fiscal choices of LGUs. As for local expenditure, the most notable limitation is the cap on the ratio of annual personnel expenses to total annual regular incomes imposed by

the LGC, ranging from 45% to 55% depending on the income class of municipalities and cities. Manasan (2005) points out that LGUs have faced a heavy fiscal burden in the personnel expenses since 1992 because LGUs are also required by several newly approved mandates to provide budget support to many central government agencies operating at the local level (e.g., the police and local courts). Hence, the LGC-imposed limitation on personnel expenses makes it difficult for some LGUs to maintain well-functioning public services.[23]

Following Brooks and Phillips' (2008) argument, the above-mentioned fiscal limitations in the Philippines can cause the underprovision of local public goods, either by themselves or when adopted alongside others. Therefore, the Philippine municipalities and cities may treat IRA as a supplement to their public expenditures, leading to large stimulating effects of the grants (i.e., the flypaper effect) as we observe in the data.

In Dahlberg et al. (2008), they speculate that "... there may be a rational flypaper effect [in Sweden] where federal government has better tax instruments than local governments while local governments has an advantage in service delivery." Our explanation that also appeals to limited tax instruments of LGUs in the Philippines thus echoes their idea, but further illustrates the existing constraints on fiscal capacity in the context of the Philippines and the supplementary role of the IRA.

In Lundqvist (2015), she proposes two potential mechanisms, separate mental accounting and political alignment, to explain why there exists the flypaper effect in Finland. Separating mental accounting, attributed to Tversky and Kahneman (1984) and Thaler (1985), refers to the budget that is the responsibility of government officials is different from the one that is citizens' responsibility. As pointed out by Lundqvist (2015), the intergovernmental transfers in Finland consist of both generic and the so-called sector grants (i.e., grants to social services, health care, and education), but in fact all these grants are unconditional. She is able to test whether the labeling of sector grants could trigger such mental accounting by comparing the effects of the sector grants on expenditures in the respective sectors with those of generic grants. However, given that IRA is a lump-sum grant without any sub-category label in the Philippine budgetary system, we are not able to test the hypothesis of separate mental accounting.

As for the second mechanism proposed by Lundqvist (2015), she finds the flypaper effect is more prominent for the local governments that are politically aligned with central government, and then argue that central government's policies may encourage local spending. Indeed, using provincial level IRA data in the Philippines, Diana (2008) shows that there seems to be a positive relationship between party affiliation of province governor and local expenditure.[24] It is possible that such a mechanism is also at work in the Philippine city and municipality, although we lack party affiliation data of city and municipality mayor to conduct heterogeneity analysis regarding political alignment.

In Baskaran (2016), he speculates the strong flypaper effect in German may be due to municipalities' investment behavior in the past, and then suggests that, if that is the case, grants should have strong effect on the non-tax revenue (e.g., revenues from economic activities). We

[23] Brooks and Phillips (2008) particularly focus on fiscal constraints such as property rate and levy limits, limits on the property assessment, and caps on total expenditure. The same types of tax and expenditure limitations can be found in the Philippine municipalities and cities.

[24] Diana (2008) uses the provincial data from 2001 to 2006 for the exploration of the flypaper effect, while her study does not aim to establish causality.

thus conduct a test by regressing IRA on the non-tax revenue, but do not find strong effect as he did.[25] Hence, such a mechanism barely plays a role in the Philippines.

Lastly, when focusing on the political economy explanation to the flypaper effect, Inman (2008) points out that "the flypaper effect is a consequence of an inability of citizens to write complete 'political contracts' with their elected officials....one might expect these contracting problems to be greater, and the flypaper effect more likely, for large governments." Our results in the Table 5 and 6 are indeed consistent with this perspective, given that the grant effect on expenditure for cities is larger than that for municipalities. This result motivates further research on the political economy approach in explaining the flypaper effect.

2. Underspending in the Local Governments

Aside from the observed flypaper effect, our results seem to suggest that 0.16 pesos per capita income disappear given that a one-peso increase in grant per capita induces a 0.84-peso increase in expenditures and has zero effect on tax revenue. However, if we check aggregate data of annual budget for all municipalities and cities during our data period, we find that a budget surplus exists at year end, ranging from 0.9% to 16.1% with an average of 9.6%, where the surplus is defined as the income in excess of the expenditure. In other words, our results confirm the existing "underspending" phenomenon in Philippine local governments (Monsod, 2016).

Note that the underprovision of public goods, the phenomenon discussed in Section 5.1, is different from the underspending of LGUs' budget. In our context, the former occurs due to the ex-ante limitations or ceilings in receiving external funds and in spending on specific categories, while the latter occurs due to the ex-post inability of using up all the funds as planned in the budget. According to the report of the Union of Local Authorities of the Philippines (2016), the inability of LGUs to spend a significant share of the budget is due to multiple-dimension factors that induced by LGUs' poor budget preparation and lax budget execution. Some of these factors, such as inflated budget estimation and unexpected price change of budget items are in fact uncorrelated with the underprovision of public goods and services. Even though the ex-ante fiscal constraints are removed so that underprovision is not an issue, one can still observe underspending as long as there exist systematic problems in preparing and in executing the budget.

3. Effects of Using IV Method

Lastly, one issue we had considered with our model specification is that there may be selection bias among the municipalities which decided to convert into cities. To address this concern, we adopted the IV estimation by using the initial status of the municipalities as the instrument. Our results show that although the instrument variables have a significant positive effect on the city status, the estimates of the effects of intergovernmental grants on expenditure and tax revenue exhibit minimal differences between the fixed effects and IV models. Such results are plausible since the proportion of municipalities converting to cities is quite low (82 out of 1,518 municipalities converted between 1993 and 2016). Hence, the effects of the self-

[25] In our regression analysis, the partial effect of the grant on non-tax revenue is only 0.01.

selection behavior of municipalities on the coefficient estimates are very small. However, the results in Table 8 imply that if there are higher proportion of municipalities that are eligible to upgrade to cities, the effect of intergovernmental grant on expenditure may be underestimated without using the IVs.[26]

VI. *Concluding Remarks*

Most empirical studies about the effect of intergovernmental grants on local expenditures and tax revenues focus on the developed countries with decentralized system. Less is known about grant effects in the developing countries. This paper investigates the causal effect of intergovernmental grants on local expenditure and tax revenue in the Philippines where the decentralization and local autonomy is underlined in its constitution.

Our finding shows that one-peso increase in grant per capita induces 0.84-peso increase in local expenditure and has zero effect on local tax revenue. Moreover, we consider the noticeable feature in the Philippine administrative system in our empirical analysis, where a municipality can self-select to convert to a city once it meets conversion criteria. Because such self-selection behavior suggests that city status variable is endogenous, the estimation of grant effect would be bias provided that a local government's city status is correlated with its grant receipts. We apply the IV method by making use of two policy changes about the conversion criteria from a municipality to a city to correct the potential estimation bias. The aforementioned estimates of grant effect are robust to the IV estimation. The large stimulating effect and zero tax reduction in our finding thus suggest there exists a flypaper effect (crowding-in) in the Philippine municipalities and cities.

Moreover, we show that grants have heterogeneous flypaper effects among low-income and high-income LGUs, where the grant effect on local expenditure is slightly higher in the relatively high-income LGUs. When focusing on the subsample that includes more municipalities which are eligible to upgrade to cities, the grant effect would be slightly underestimated if the IV method is not applied. Lastly, our results indicate that population size plays an additional role in affecting local expenditure due to economies of scale.

Given the existence of flypaper effect, the next question is why the Philippine municipalities and cities exhibit flypaper behavior. Although the answer to this question is beyond the scope of this study, we apply Brooks and Phillips (2008)'s argument and suggest that fiscal limitations in the Philippines can cause underprovision of local public goods. As a result, the local governments may treat IRA as a supplement to their public expenditures, leading to large stimulating effect of the grant as we observe in the data. This explanation is merely suggestive, and should be seen as to motivate continuous research on the institutional explanations of flypaper effect.

[26] We also estimate the grant effect by using the top 100 municipalities in terms of their income level in 1993. The result also shows that the grant effect on expenditure increases slightly from 0.82 to 0.85 if we employ the IV method.

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