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Fiscal decentralization and tax incentives in the developing world

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ABSTRACT

Many developing countries use tax incentives to attract foreign direct investment, sacrificing immediate revenue from foreign capital, even though the effects of tax incentives on investment, growth, and revenue are empirically dubious. This leads to the puzzle of why states adopt tax incentives. Extant studies of tax incentive adoption overlook the fact that many countries have decentralized fiscal authority, allowing subnational governments to offer tax incentives. Public finance scholars argue that fiscal federalism intensifies tax competition among regions. Hence, drawing on the public finance scholarship, one may ask: Does fiscal decentralization lead to a race to the top among subnational governments and an oversupply of tax incentives in a country? This article argues that fiscal decentralization affects tax incentives in complex ways. When subnational governments are authorized to set tax policies, their politicians have economic and political incentives to engage in tax competition for mobile capital, providing more tax incentives in a country. However, the politicians are less likely to do so if they are held accountable and have to fund most expenditures through own-source tax revenues. An empirical analysis of over 50 developing countries in early 2000s produces robust supporting evidence. This research challenges both the view that fiscal decentralization is always beneficial and the view that horizontal competition invariably produces inefficiently low tax rates. The impact of fiscal decentralization on tax incentives and by implication, revenue mobilization depends on the design of the central–local government relations.

KEYWORDS

tax incentive; fiscal decentralization; foreign direct investment; developing countries; quantitative analysis.

In a globalizing world economy, developing countries confront a variety of opportunities and challenges in revenue mobilization. On one hand, to

expand tax base, many governments seek to attract foreign capital. On the other hand, facing growing competition for foreign investment, they often have to offer generous tax incentives, suffering immediate revenue loss.[1] If tax incentives help to promote investment and growth over the long run, they may generate more revenue than the tax incentive-induced revenue loss. But as discussed later in the paper, the effects of tax incentives on investment, growth, and revenue are empirically dubious. This leads to the puzzle of why countries adopt various tax incentives in the first place.

Extant political economy literature offers several explanations for the adoption of tax incentives. They focus on the competition among national governments for growingly mobile foreign capital (Guisinger 1985; Klemm 2009; Stopford and Strange 1991; Thomas 2000), the ability to afford tax holidays (Bond and Samuelson 1986), the credibility deficit due to poor economic conditions or rule of law in many developing countries (Janeba 2002; Li 2006; Lim 1983; Shah and Toye 1978), the role of democratic political institutions (Jensen 2013; Li 2006; Li and Resnick 2003), and the credit-claiming incentive of local politicians (Jensen, Malesky, Medina, and Ozdemir 2014). These studies, however, have overlooked the fact that many countries have decentralized fiscal authority, authorizing subnational governments to set tax policies and offer tax incentives. While many public finance scholars (Brennan and Buchanan 1980; Breton 1991; Kenyon 1997; Oates 2001; Rauscher 1998; Weingast 1995) argue that fiscal decentralization intensifies tax competition, this expectation has not been applied to explain the adoption of tax incentives. Therefore, one may naturally ask: Does fiscal decentralization lead to a race to the top among subnational governments and an oversupply of tax incentives in a country?

Addressing this question has important implications for tax competition, fiscal federalism, and the issue of revenue mobilization in cash-strapped developing countries. Both tax incentives and fiscal decentralization have been spreading quickly around the world in the past several decades. If fiscal decentralization leads to a race to the top over tax incentives among subnational governments, the overall level of tax incentives in a country will increase excessively. Overly generous tax incentives, when coupled with a lack of fiscal discipline at the subnational level, are likely to cause net revenue loss, impose enormous strains on revenue mobilization, and produce economic hardships. If true, this will be an unintended negative consequence of the widely applauded fiscal federalism.

I argue fiscal decentralization affects tax incentive policies in complex ways. When subnational governments are authorized to set tax policies, their politicians have economic and political incentives to engage in tax competition for mobile capital, providing more tax incentives in a country. This is consistent with the expectation of public finance scholars

regarding tax competition. However, the politicians are less likely to do so if they are held accountable and have to fund most expenditures through own-source tax revenues, rather than via transfers and grants or revenue sharing with the central government.

To test my argument, I conduct a cross-national analysis of over 50 developing countries during the early 2000s and find supporting empirical evidence. My analysis focuses on less developed economies because both tax incentive politics and foreign direct investment (FDI) activities often differ in significant ways between developing and developed countries, warranting separate analyses (e.g., Blonigen and Wang 2004; Klemm 2009; Li 2006). My statistical findings are largely robust, with an alternative measure of tax incentives, variations in measuring subnational fiscal authority and revenue autonomy, different estimation techniques, and various controls for alternative explanations.

The rest of the paper proceeds as follows. Section 1 discusses the evolution of tax incentives, highlighting the potential tension between tax incentives and revenue mobilization that motivates this research. Section 2 reviews briefly the literature on the causes of tax incentives. Section 3 presents the theoretical argument linking fiscal decentralization and tax incentives. Section 4 discusses the empirical research design, Section 5 presents the key findings, and Section 6 concludes the paper.

1. TAX INCENTIVES AND REVENUE MOBILIZATION IN THE DEVELOPING WORLD

Klemm (2009) defines tax incentives as all types of preferential tax treatment that target certain activities or sectors only, as opposed to general preferential tax treatment applicable to all. Governments often create various tax incentive policies. So an exhaustive and consensus list of tax incentives does not exist. But common tax incentives often include tax holidays (temporary tax exemption), special zones, investment tax credit (tax deduction of a fraction of investment), investment allowance (deduction from taxable profit), accelerated depreciation, reduced tax rates or exemptions (corporate income, tariffs, excises, value added tax (VAT)), and financial incentives (Klemm 2009).

Countries at all development stages have actively pursued using tax incentives to encourage FDI. This has happened in the OECD economies (Oman 2000), transition economies (Cass 2007), African countries such as Southern African Development Community and sub-Saharan Africa (Bolnick 2004; Cleeve 2008), and a variety of different countries in the world (UNCTAD 2000). Tax incentives are so widespread as to become a global phenomenon (Klemm 2009). Since my analysis focuses on the developing world, my review of the arguments and evidence on the

effect of tax incentives on FDI and revenue mobilization will largely draw on those studies of less developed economies.

Particularly relevant to revenue mobilization is the fact that tax incentives are costly. They cause immediate revenue loss, bring about economic distortions resulting from targeted preferential treatment, incur administrative costs of managing incentive programs, and encourage possible rent-seeking corruption (Bolnick 2004; Klemm 2009; Oman 2000). But their benefits are not always tangible or immediately obvious. An extensive body of literature shows that the effects of tax incentives are dubious at best.

Several survey or experimental studies of executives of multinational firms find that government tax incentives rank very low in a list of factors that attract foreign owned companies (Rondinelli and Brupitt 2000; Single 1999). Most notably, James (2013) reports that in a number of Foreign Investment Advisory Services surveys in various developing countries (Burundi, Guinea, Jordan, Kenya, Nicaragua, Rwanda, Servia, Tanzania, Tunisia, Uganda, Vietnam, and Thailand), the majority of investors, ranging from 61% to 98%, respond that they would have invested even if incentives were not provided.

Statistical evidence over the effect on FDI flows is rather weak. In a study of 41 developing countries, Root and Ahmed (1978) do not find tax incentives attract foreign investors. In a sample of 27 developing countries, Lim (1983) finds that generous tax incentives are associated with less investment flows. Porcano and Price (1996) indicate that tax incentives are at best marginally important in foreign investment decisions. Similarly, Rolfe and White (1992) find that tax incentives (tax holidays and import duty exemptions) may affect investment location decisions only when non-tax factors such as wage rate, quality of infrastructure, and host country dividend remittance policy are also favorable.

More recent empirical studies also fail to prove the effectiveness of tax incentives. In a study of post-socialist transition economies, Beyer (2002) finds tax incentives have little effect on the level of FDI. Bobonis and Shatz (2007) find that incentives offered by state governments in the US fail to influence the locations of investments by German manufacturers in the US. Cleeve (2008) finds that in a sample of 16 sub-Saharan African countries, offering too many tax concessions decreases FDI inflows. Klemm and van Parys (2009) find that for a panel of African, Caribbean, and Latin American countries, tax incentives increase FDI, but do not increase total gross fixed capital formation or economic growth. In a time series analysis of Nigeria since 1970s, Fowowe (2013) finds that fiscal incentives are negatively correlated with both private investment and FDI. In a study of US multinational investments abroad during the 2001−2008 period, Wellhausen (2013) finds that R&D investment

incentives by host governments are often negative predictors of R&D FDI by American multinational affiliates.

In contrast, empirical support for the positive effect of tax incentives is limited. Loree and Guisinger (1995) and Hines (1999) argue that foreign investors do respond to tax incentives significantly and investment incentives are effective. Guisinger (1985) shows that in a World Bank survey of 74 FDI projects, host government incentive programs have significantly affected the decisions of foreign investors in about two out of three projects. Warr (1989) reports that managers of companies in East Asian export possessing zones indicated that few would have invested without tax incentives. In an empirical analysis, Tung and Cho (2001) show that many areas in China that offer lower tax rates and higher tax incentives attract more FDI. Even in those cases where incentives help attract investment, one common concern is the so-called 'winner's curse', that is, having to give up too much for too little (James 2013).[2]

The overall tenor of the literature is that the evidence on the effect of tax incentives on investment is largely negative and rather mixed at best, particularly for the developing countries. One would be hard pressed to assert that in most cases, tax incentives help to attract more investment, promoting growth and revenue generation. In the absence of a strong case in favor of tax incentives, it is reasonable to accept the premise that there exists tension between generous tax incentives and revenue mobilization. Some scholars (Keen and Mansour 2010) even go so far as to claim that the main negative effect of tax incentives is their damage to revenue generation.

Assuming this is the case, an important question for analysts and policymakers is to understand the conditions under which generous tax incentives are offered. Only by identifying and modifying the conditions that induce overly generous tax incentives can one expect to reduce the potentially damaging effects of tax incentives on revenue mobilization.[3] This motivates my analysis.

2. EXISTING EXPLANATIONS OF CAUSES OF TAX INCENTIVES

As noted earlier, extant literature offers several explanations for tax incentives. In one of the earliest papers on the topic, Shah and Toye (1978) argue that tax holidays often signal to potential investors that the host country may have poor natural resource endowment, infrastructure, and technology such that it has to compensate those weaknesses with generous tax incentives. Extending this idea beyond economic conditions, Janeba (2002) suggests that host countries with low credibility have to offer more generous incentives to foreign investors. Li (2006) links this idea to political regime type, arguing that relative to democracies,

autocratic countries often have weaker property rights protection and higher political risk, which they often compensate by giving foreign investors more generous tax incentives.

In a seminal theoretical paper, Bond and Samuelson (1986) present almost exactly the opposite case. They argue that tax holidays are costly such that not every country can afford them. Therefore, only productive economies have the resources to afford using tax holidays to attract investment. In this case, tax holidays become a signal of a host country's long-term productive capacity and quality.

A third explanation focuses on the competition among national governments for foreign capital (Guisinger 1985; Stopford and Strange 1991; Thomas 2000). As firms gain more outside options because of rising capital mobility and financial integration, countries have to compete with each other to attract and keep capital investment. Greater bargaining power of firms leads to a race to the top competition among governments such that they have to offer increasingly more generous tax incentives. Klemm and van Parys (2009) find that a panel of African, Caribbean, and Latin American countries responds to other countries' tax incentives.

A fourth explanation highlights the role of political regime type (Jensen 2013; Li 2006; Li and Resnick 2003). According to Li and Resnick (2003), because investment incentives represent a transfer of benefits from domestic taxpayers to foreign investors, domestic interests hurt by foreign firms will oppose incentive programs. Relative to autocracy, electoral accountability and political competition in democracy enable the opposition forces to constrain tax incentives.

Li (2006) offers a more refined theoretical argument linking political regime type and tax incentives. First, democracy has less credibility deficit in property rights protection and does not have to offer as generous tax incentives as autocracy. Second, democracy that experiences greater FDI inflows is likely to confront stronger opposition and thus, offer less generous incentives programs. Third, autocracy that restricts foreign entry offers less generous tax incentives than one that is open to foreign capital. In a cross-national sample of 52 developing countries, Li (2006) finds evidence supporting his argument. More recently, using firm level data on firm tax payments from the US Bureau of Economic Analysis, Jensen (2013) shows that foreign affiliates of US firms pay more tax in democratic countries than in non-democratic ones, which further corroborates the regime type effect.

A most recent explanation relates to the political incentives of local politicians. According to Jensen et al. (2014), voters often reward local politicians who offer tax incentives to attract investment and promote local development, and at the same time, voters do not necessarily penalize the politicians for ineffective incentives. The authors conduct an internet survey experiment that asks voters to evaluate incumbent US governors

and find supporting evidence. This implies that local politicians are politically motivated to offer tax incentives because they can claim credit for investment inflows into their jurisdictions or merely for their effort to try to attract investment.

3. FISCAL DECENTRALIZATION AND TAX INCENTIVES

Fiscal decentralization and federalism has a long intellectual history. Pertinent to my analysis is the consensus view that fiscal decentralization increases tax competition between regions. Since tax incentives often result from tax competition between regions (Klemm 2009), fiscal decentralization should have a direct impact on tax incentive policies. The key is whether fiscal decentralization produces optimal or excessive tax incentives. Building on recent political economy scholarship on fiscal decentralization, I argue that fiscal decentralization influences tax incentives in complex manners, depending on subnational taxation authority and revenue autonomy. In expectation, they produce competing effects on tax incentives. Below, I elaborate my argument.

Tax incentives represent a resource transfer from the host government, both at the national and subnational levels, to foreign investors. They often result from the competition among national governments for growingly mobile foreign capital (Guisinger 1985; Stopford and Strange 1991; Thomas 2000). However, tax competition also happens frequently among subnational governments, especially when they have the authority to set their own tax rates. Baccini, Li, and Mirkina (2014), for example, show that in the year after the Russian Tax Code reform in 2002, which allowed the regions for the first time to reduce corporate profit tax rates, various regions experimented with different tax cut policies. Ten regions cut their profit tax rates on net income from all direct investments from 24% to 20% while some other 34 regions cut corporate tax rates on select government-approved investment projects from 24% to somewhere between 20% and 23.5%. The authority to tax was critical in generating the tax cuts by different regions and producing tax competition among them.

It has long been argued that fiscal decentralization increases competition among regional governments for revenue and investment. When subnational governments have the authority to set tax policies, they become more sensitive to the possibility that investors move to other regions with lower tax rates (Brennan and Buchanan 1980). As regional governments seek to increase their own tax base and revenues, their competition for capital intensifies. Thus subnational governments have to refrain from over-taxing capital, fearing that investors move elsewhere to pay lower taxes (Weingast 1995). Many public finance scholars (e.g., Breton 1991; Kenyon 1997; Oates 2001; Rauscher 1998) use the Tiebout type of models to examine interjurisdictional tax competition among

state and local governments in the US or member states in the EU. In this type of horizontal competition among similar jurisdictions (among local governments or national ones), governments often compete to set inefficiently low tax rates.

Other than the presumed benefit of attracting more capital, there are also political and institutional incentives to do so. By offering tax incentives, local politicians can claim credit for firms' investments into their jurisdictions, regardless of whether those programs work or not (Jensen et al. 2014). In addition, politicians can use tax incentives to reward political supporters and themselves (Easter 2008; James 2013). Hence, self-interested politicians are politically motivated to provide more generous tax incentives.

In sum, by increasing interjurisdictional competition, the decentralization of taxation authority from the central to the subnational government is likely to result in competitive tax incentives by different regional governments. As a result, the overall level of tax incentives within a country grows higher.

Hypothesis 1: Fiscal decentralization leads to more generous tax incentives in a country.

In the traditional view, as fiscal decentralization increases competition among regional governments for revenue and investment, governments tend to become less extractive in taxation and more efficient and disciplined in spending, resulting in smaller governments and better public services (Brennan and Buchanan 1980; Persson and Tabellini 2000; Qian and Roland 1999; Weingast 1995). This benign view of federalism, however, has been challenged since the 1990s by both real-world events and empirical evidence. In many countries that exercised fiscal decentralization, such as Argentina, Brazil, Mexico, Spain, and South Africa, subnational governments have accumulated unsustainable deficits and sought financial bailout transfers from central governments (Rodden 2002). Cross-national studies show that relative to non-federalist countries, federalist systems in developing countries often experience higher deficits and inflation rates (Wibbels 2000) or are less able to control them (Treisman 2000), and they are often no less corrupt (Treisman 2001). This scholarship helps us explain under what conditions fiscal decentralization will or will not lead to overly excessive tax incentives.

As noted earlier, fiscal decentralization incentivizes local politicians both economically and politically to overspend on subsidies and tax breaks to compete with other regions for investment. Even though tax incentives are costly and often fail to generate more investment and revenue, those costs may not be obvious to voters such that they do not punish overspending politicians. This situation is particularly likely under

the so-called 'fiscal illusion' phenomenon. That is, if government revenues are not completely transparent or perceived by taxpayers (because of complex revenue sharing schemes or unobserved revenues, for example), taxpayers often underestimate the true cost of government, demand more public expenditures, and are less likely to sanction overspending politicians (Oates 1988; Rodden 2003).

In the context of fiscal decentralization, subnational governments often receive financial transfers and grants from the central government. Those transfers and grants enable local politicians to mask the costs of their policies and reap in economic and political benefits without being fiscally responsible. As a result, decentralization in spending, funded through grants and transfers, often leads to higher government spending and deficits (Rodden 2002, 2003; Rodden and Wibbels 2002). However, when decentralization is associated with subnational spending funded largely via local taxation, government deficit tends to be lower, and the size of the public sector smaller. This type of subnational revenue autonomy constrains fiscally irresponsible behaviors of local politicians.

These discussions have significant implications for the level of tax incentives in a country. Fiscal decentralization incentivizes politically motivated subnational governments to offer overly generous tax incentives. It is not inconceivable that under certain conditions, the political incentive could be so strong and the potential cost is so low or hidden that local politicians may offer excessive tax incentives, blow the budget, and still manage to avoid being blamed but get credit instead. This type of behavior should be most pronounced if local politicians expect to pay for expenditures with transfers and grants from the central government. Such behavior, however, is more likely to be mitigated and curbed if subnational governments have to fund expenditures largely through own-source tax revenues. By relying on own-source tax revenues, subnational governments maintain revenue autonomy from the central government and have to exercise fiscal discipline in designing tax incentives. Therefore, subnational governments with revenue autonomy are much less likely to adopt generous tax incentives than those without such autonomy and fiscal discipline, a qualitative difference between two types of countries.[4]

Hypothesis 2: Tax incentives in a country with subnational revenue autonomy will be lower than those in a country without subnational revenue autonomy.

The source of subnational revenue autonomy, while beyond the scope of this paper, is worth some further discussion. Regulation by the central government could be important. Rodden (2002) shows that when subnational borrowing autonomy is restricted by the central government, it

helps to reduce subnational deficit spending, resulting in lower national level deficits. Kemmerling and Seils (2009) argue that while EU failed to control general tax rate competition, it was able to reduce targeted tax competition in the form of preferential tax regimes by instituting targeted regulations. In the context of our analysis, if our argument were empirically valid, then strengthening subnational revenue autonomy could benefit the country as a whole.

4. RESEARCH DESIGN

The dependent variable is a summed index of six dichotomous variables measuring six different types of tax incentives (VAT, corporate income tax, property tax, licensing fees, import duties, and sales tax). It ranges from 0 to 6, with larger values indicating higher levels of incentives. Data are from Li (2006), which are collected for the year 2001 from chapters on investment climates in 52 developing countries from the 2002 Country Commercial Guides of its Non-Agricultural Market Research Reports published by the U.S. Commercial Service, a global business solutions unit within the Department of Commerce.

While data are drawn from an earlier published study, several caveats and clarifications are worth noting. First, because not too many observations exist for values 5 and 6 of the dependent variable and the results might be sensitive to those few observations, I recode those observations into value 4 to prevent spurious findings. A robustness test will be conducted for this choice. Second, governments often creatively design a variety of tax incentives such that a single reliable and up-to-date source and measure of tax incentives do not currently exist (see, e.g., Klemm 2009). This requires a robustness test to be discussed below. Third, the dependent variable measure is likely to have various measurement errors and depends on additional assumptions for validity. For example, VAT rebate is possible only if a country currently has VAT. The additive count of incentives does not directly reflect the costliness of incentives. Indeed, it captures the generosity of tax incentives only if the host bears more costs as the count increases. The U.S. Commercial Service should report incentive policies at the national or subnational level using a consistent methodology. Violations of these assumptions cause measurement errors. To the extent that the measurement errors are randomly distributed, coefficient estimates remain unbiased, and standard errors remain valid but become larger, making hypothesis testing more conservative (e.g., Dougherty 2011).

Fiscal decentralization is a multifaceted concept, involving subnational authority over taxation and spending. To test hypothesis 1, ideally one employs a measure of subnational taxation authority as regions with such authority are able to offer competitive tax incentives against each

other. Data on this measure are not readily available for developing countries. As a proxy measure, I use the *author* variable, which measures *subnational fiscal authority*, from the Database of Political Institutions compiled by Beck et al. (2001). It is coded 1 if a provincial level government has authority over taxing, spending, or legislating, and 0 otherwise. The variable should have a positive effect on tax incentive generosity.

Two caveats are worth noting in testing hypothesis 1. First, the key concept focuses on taxation authority but the *subnational fiscal authority* variable also captures spending authority. In a robustness test discussed later, I create a new measure based on the *subnational fiscal authority* variable to capture *subnational taxation authority* alone. Second, some tax incentives such as import duties, though sometimes collected at the regional level, are often beyond the jurisdiction of subnational government. This reflects a more general possibility that regional authority over tax incentives is just weak. If this were the case, then regional taxation authority should be uncorrelated with tax incentives, which should work against finding any statistical evidence supporting hypothesis 1.

Subnational revenue autonomy is the key concept in hypothesis 2. But direct measures of it are not available. To operationalize this concept, I employ two indicators – subnational expenditures as a percent of total public sector expenditures and subnational tax revenue as a percent of total subnational revenues and grants, both of which are widely used in the fiscal decentralization literature (e.g., Garrett and Rodden 2003; Rodden 2003). As argued and demonstrated in previous studies (e.g., Rodden 2002, 2003, 2004; Rodden and Wibbels 2002), the spending measure correlates positively with subnational discretion over spending whereas the tax revenue measure correlates positively with the degree to which subnational governments fund expenditures with own-source revenues. The concept of subnational revenue autonomy implies that a subnational government must not only have discretion over spending decisions but also is able to meet spending needs largely with own-source revenues. Hence, only those subnational governments with discretion over own spending and supported largely with own-source revenues are considered to enjoy subnational revenue autonomy. Based on this conceptualization, I classify countries into those with and without revenue autonomy.

Figure 1 presents a scatter plot for the two indicators: subnational spending (ranging from 2.07% to 54.84%) and own-source revenue share (ranging from 4.74% to 78.36%), measured as averages from 1991 to 2000, for 52 developing countries in our sample. Data are from the World Bank's (2001) database of Fiscal Decentralization Indicators based on the IMF's Government Finance Statistics. In Figure 1, the median values of the two measures are drawn along the respective axis while the values for tax incentive generosity are marked inside the figure. The upper right quadrant represents those cases that enjoy subnational revenue

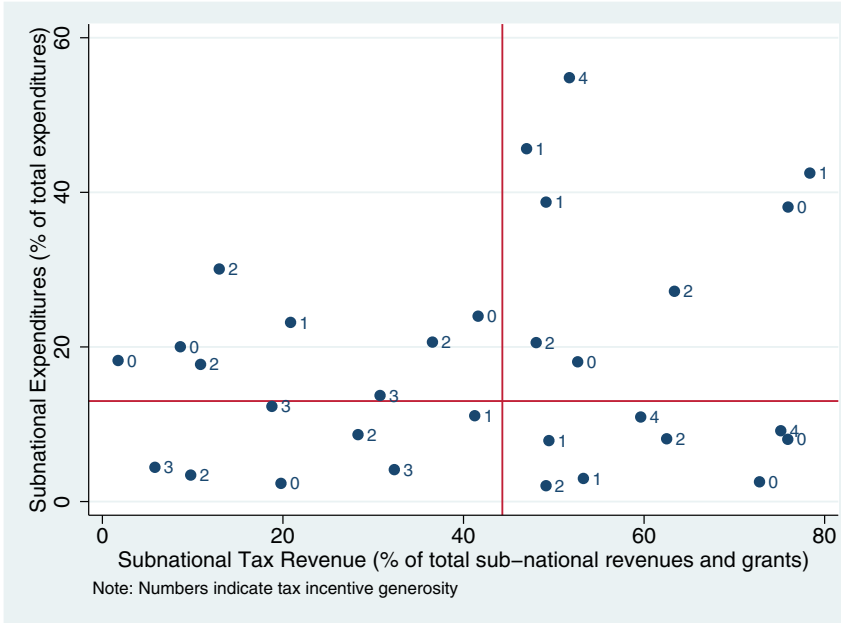

Figure 1 Subnational spending and revenue in 52 developing countries.

autonomy. I create a dummy variable *revenue autonomy* that is coded one if a country lies in the upper right quadrant of Figure 1 and zero otherwise.[5] This variable should have a negative effect on tax incentive generosity.

For the primary models, I control for the rule of law, a dummy variable for democracy, FDI net inflows into a country in 2000, and the interaction between democracy and FDI inflows. The variable *law* measures the degree to which agents have confidence in and abide by the rules of society, including perceptions of a large number of enterprise, citizen, and expert survey respondents in industrial and developing countries of the incidence of violent and non-violent crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts. It is for year 2000 and comes from Kaufmann, Kraay, and Mastruzzi (2003).

The variable *democracy* is coded 1 for a democracy if a country's POLITY2 index is equal to or greater than 6, and 0 otherwise (Marshall and Jaggers 2000). The analysis also includes an interaction term between *democracy* and the level of *FDI inflow* into the host. Data are for year 2000 from the *World Development Indicators* (World Bank 2002). The variable for *FDI inflow* is centered around the sample mean. Hence, the coefficient for *democracy* by itself represents the level of tax incentive generosity at the mean level of *FDI inflow*; the coefficient for *FDI inflow* represents the

level of tax incentive generosity in autocracy at the mean level of *FDI inflow*; and the coefficient for the *democracy* × *FDI inflow* interaction indicates the additional effect of *FDI inflow* in a democracy as *FDI inflow* changes from its mean level. Countries that experience more inflows and are more open to foreign capital are more likely to respond to tax competition (Mutti 2003), offering higher levels of tax incentives. However, more FDI inflows into a democracy are likely to raise opposition from losers of foreign competition in a democracy and thus, lead to lower tax incentives than in an autocracy.

As noted earlier, the tax incentive generosity index is not an exhaustive measure and so, should be treated as an observed indicator of the latent continuous measure of the level of tax incentives. Thus the latent model of tax incentive generosity can be specified as follows[6]:

$$y_i^* = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1 fiscal\ authority + \boldsymbol{\beta}_2 revenue\ autonomy + \boldsymbol{\beta}_3 law_i + \boldsymbol{\beta}_4 democracy_i + \boldsymbol{\beta}_5 (democracy_i \times FDI\ inflow_i) + \boldsymbol{\beta}_6 FDI\ inflow_i + \varepsilon_i$$

where y_i^* is the continuous latent tax incentive generosity of country i, $\boldsymbol{\beta}$ is the vector of unknown parameters, and ε_i is the error term, normally distributed with mean zero. Instead of y_i^*, however, only an ordinal index of tax incentive generosity y_i is observed for the sample and it is related to y_i^* as follows:

$$\begin{aligned} y_i &= 0 \text{ if } y_i^* \leq \boldsymbol{\mu}_0 \\ &= 1 \text{ if } \boldsymbol{\mu}_0 < y_i^* \leq \boldsymbol{\mu}_1 \\ &= 2 \text{ if } \boldsymbol{\mu}_1 < y_i^* \leq \boldsymbol{\mu}_2 \\ &= 3 \text{ if } \boldsymbol{\mu}_2 < y_i^* \leq \boldsymbol{\mu}_3 \\ &= 4 \text{ if } \boldsymbol{\mu}_3 < y_i^* \end{aligned}$$

where $\boldsymbol{\mu}$ is a vector of unknown threshold parameters to be estimated together with the $\boldsymbol{\beta}$ vector, with five ordered categories from 0 to 4. For this observable ordinal indicator, ordinary least squares (OLS) is not appropriate and thus, ordered probit is used to estimate the effects of the explanatory variables on the latent variable. To deal with possible heteroskedastic error variance, Huber/White robust standard errors are estimated.

The specification above is the primary model setup. But data availability limitations with expenditure and revenue variables that are used to measure *revenue autonomy* sharply reduce the sample size for the primary full model. Hence, a model without revenue autonomy is first estimated in order to get a more precise estimate for the effect of subnational fiscal authority in a larger sample, and then the primary full model is estimated.

Since I only have a cross section of 52 developing countries, the results might be sensitive to a variety of issues. Therefore, I carry out a battery of

robustness checks. First, as noted earlier, the categories of 5 and 6 of the tax incentive variable are all recoded as 4 to control for possible undue influences of the few observations in those categories. Now, the primary model is re-estimated for robustness check, using the untransformed dependent variable.

Second, while linear regression is not appropriate in this case, OLS provides a good comparison for checking the sensitivity of the results to the estimator choice. The primary model is re-estimated using OLS with robust standard errors.

Third, there is not a single reliable source of tax incentive policies. The tax incentive data I use are from one published source. It is useful to make sure that the results are not sensitive to the measure and data source for the dependent variable. Hence, an alternative measure and data source in a survey report published by the UNCTAD (2000) is used, which covers a somewhat different set of tax incentives − tax holiday or exemption, reduced tax rate, investment allowance or tax credit, R&D incentives, and qualified expenditure deduction − for some 50 countries. Since I focus on developing countries, I exclude four developed economies from the sample such as Australia, Ireland, Israel, and Singapore. An index variable *ungenerosity* is created, which is the sum of those five dummy categories minus one so that it ranges from 0 to 4, with 0 indicating the presence of at least one of the five types of incentives. The primary models are re-estimated using this new dependent variable, with the largest sample covering some 42 countries and the smallest sample only 22. Of course, the measurement errors noted earlier may still exist with this new measure.

Fourth, previous empirical studies of tax incentives (e.g., Li 2006) often control for GDP and GDP per capita. For robustness check, I also control for the size of the host economy, measured by logged GDP, and its level of development, measured by logged GDP per capita. Data are from the Word Development Indicators.

Fifth, as noted earlier, a main measurement issue with subnational fiscal authority is that it reflects subnational authority over both taxation and spending. Though the two components are integrally related, they are two distinct policy dimensions. For robustness check, a new measure for subnational taxation authority alone is created. I first estimate a logit model predicting *subnational fiscal authority* using subnational expenditure share as the predictor, and then use the residual from the logit model, which is now uncorrelated with expenditure share, as a new indicator of subnational taxation authority alone.

Sixth, recall that *subnational revenue autonomy* is dichotomous, coded one for countries whose subnational expenditure share and tax revenue share are above their respective median values, and zero otherwise. To evaluate whether the results are sensitive to the median cutoffs, a new

revenue autonomy measure, based on the mean value cutoffs for expenditure and revenue share, is created.

Seventh, the sample size is not particularly large. Estimation results may be sensitive to the presence of particular observations in the sample. For robustness check I use the jackknife resampling technique, which leaves out one observation at a time and then calculates the average of all estimates.

Eighth, another way to assess the effect of small sample size is to examine if the results still hold when sample size increases with some missing values of revenue autonomy filled with crude estimates. In a robustness test, the missing values of revenue autonomy for five countries are estimated based on their 1980s values of subnational spending and revenue, though the filled values are likely to have large measurement errors.

Ninth, as Figure A1 shows, the distribution of tax incentive generosity is more spread out for countries without *subnational fiscal authority*, but more concentrated for countries with *subnational fiscal authority*. So the variable might be systematically correlated with the variance of the dependent variable. While I do not have any theoretical reason to expect this pattern, it is important to test whether the results of the primary model are sensitive to the impact of *fiscal authority* on the variance of tax incentives. For robustness check, I estimate a heteroskedastic ordered probit model for which the variance equation includes *fiscal authority* as a right-hand side variable.

Finally, one may be concerned the results here are subject to alternative explanations, particularly the influences of interstate tax competition and resource endowment. It is plausible that tax competition between nation states could drive their incentive policies. In addition, those countries with more FDI potential such as richer natural resources do not have to compete for foreign capital as hard as others and thus, have less need to offer as generous tax incentives. Even though both the rule of law and past FDI inflows correlate with the FDI potential of a country, it is still worth investigating the effect of natural resource endowment and interstate competition. For robustness tests, I measure interstate competition with average tax incentive level among countries in a region since neighbors are more likely to engage in competition, and for resource endowment, I use fuel, minerals, and metals as a percentage of merchandise exports, from Jensen and Wantchekon (2004). Interstate competition should affect tax incentives positively whereas natural resource endowment should affect tax incentives negatively.

5. FINDINGS

Tables 1 and 2 present statistical results for various models, including 2 primary models (one with subnational fiscal authority only and the other

Table 1 Fiscal decentralization and tax incentives in the developing world

	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal authority	0.700**	1.940***	1.876***	1.663***	1.604**	10.50***
	(0.321)	(0.556)	(0.565)	(0.435)	(0.782)	(1.474)
Revenue autonomy		−1.911***	−1.840***	−1.533***		−1.402
		(0.658)	(0.650)	(0.477)		(1.149)
Law	−0.354	−1.432***	−1.358***	−1.283***	0.354*	−0.133
	(0.250)	(0.533)	(0.524)	(0.428)	(0.199)	(1.054)
Democracy	−0.841**	0.0393	−0.182	0.0815	−0.247	0.0825
	(0.345)	(0.798)	(0.811)	(0.823)	(0.389)	(1.013)
FDI inflow	0.0883***	0.171***	0.209***	0.117***	0.0414***	0.138***
	(0.0236)	(0.0478)	(0.0414)	(0.0305)	(0.00892)	(0.0477)
Democracy × FDI inflow	−0.123***	−0.173***	−0.211***	−0.126***	−0.0376	−0.184**
	(0.0321)	(0.0525)	(0.0462)	(0.0372)	(0.0255)	(0.0717)
Cut1	−1.283***	−1.145*	−1.319*		−1.040***	−0.991
	(0.341)	(0.676)	(0.701)		(0.371)	(0.618)
Cut2	−0.765**	−0.366	−0.544		−0.113	−0.0366
	(0.309)	(0.672)	(0.698)		(0.308)	(0.567)
Cut3	0.366	0.844	0.659		1.022***	1.114**
	(0.302)	(0.733)	(0.767)		(0.289)	(0.491)
Cut4	1.133***	1.635*	1.456		2.193***	8.384***
	(0.361)	(0.868)	(0.918)		(0.403)	(0.857)
Cut5			1.756*			
			(1.040)			
Cut6			3.099***			
			(0.592)			
Constant				1.715**		
				(0.708)		
N	52	31	31	31	42	22
Pseudo R^2	0.0760	0.183	0.201		0.102	0.307
Chi^2	46.33	38.73	80.58		43.48	103.6
R^2				0.422		

Note: Models 1 and 2 are primary models. Model 3 employs the uncombined tax incentive measure. Model 4 applies OLS. Models 5 and 6 are based on an alternative measure of tax incentives. Robust standard errors in parentheses. Two-tailed test: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

with both subnational fiscal authority and revenue autonomy) and 12 other robustness tests.[7] The results largely support hypotheses 1 and 2, with robust evidence for significant effects of both key variables. The only exception is the insignificant effect of revenue autonomy in model 6,

Table 2 Additional robustness tests

	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Fiscal authority	0.660***	2.290***	2.122***	1.940**	1.069*	2.050***	1.548**	3.464***
	(0.180)	(0.772)	(0.588)	(0.930)	(0.576)	(0.582)	(0.686)	(0.776)
Revenue autonomy	−1.209**	−1.806**	−2.277***	−1.911*	−1.160*	−2.182**	−1.657**	−3.273***
	(0.512)	(0.878)	(0.663)	(1.015)	(0.622)	(0.892)	(0.814)	(0.904)
Law	−1.338***	−1.682**	−1.630***	−1.432*	−0.806*	−1.112	−1.213**	−2.336***
	(0.482)	(0.796)	(0.561)	(0.807)	(0.418)	(0.812)	(0.583)	(0.584)
Democracy	−0.117	0.191	0.225	0.0393	−0.240	0.136	0.347	1.225
	(0.747)	(0.500)	(0.827)	(3.543)	(0.565)	(0.767)	(0.705)	(0.825)
FDI inflow	0.175***	0.233***	0.187***	0.171	0.143***	0.163***	0.157***	0.260***
	(0.0460)	(0.0809)	(0.0506)	(1.313)	(0.0343)	(0.0464)	(0.0483)	(0.0514)
Democracy × FDI inflow	−0.166***	−0.265***	−0.186***	−0.173	−0.144***	−0.164***	−0.145**	−0.283***
	(0.0498)	(0.0849)	(0.0562)	(1.308)	(0.0382)	(0.0535)	(0.0563)	(0.0605)
GDP per capita						−0.446		
						(0.609)		
GDP						0.124		
						(0.164)		
Interstate competition							0.902**	
							(0.388)	
Resource endowment								−0.0390**
								(0.0177)

(*continued*)

Table 2 (*Continued*)

	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Cut1	−1.586**		−1.217*	−1.145	−1.120**	−1.740	0.338	−1.230*
	(0.617)		(0.694)	(3.559)	(0.540)	(7.603)	(0.824)	(0.690)
Cut2	−0.818		−0.365	−0.366	−0.421	−0.937	1.231	−0.112
	(0.590)		(0.692)	(3.562)	(0.517)	(7.650)	(0.840)	(0.676)
Cut3	0.406		0.937	0.844	0.733	0.287	2.578***	1.356*
	(0.624)		(0.774)	(3.657)	(0.524)	(7.722)	(0.881)	(0.777)
Cut4	1.209		1.749*	1.635	1.429**	1.100	3.374***	2.736***
	(0.747)		(0.928)	(3.832)	(0.608)	(7.775)	(0.964)	(0.878)
Variance equation								
Fiscal authority		−1.618***						
		(0.480)						
N	31	31	31	31	36	31	31	27
Pseudo R^2	0.177	0.279	0.223	0.183	0.120	0.196	0.230	0.328
Chi^2	44.25	58.70	38.07		43.66	54.67	47.29	71.44

Note: Model 7 uses the estimated subnational taxation authority measure. Model 8 applies heteroskedastic ordered probit. Model 9 uses a new revenue autonomy measure based on mean cutoffs. Model 10 reports jackknife estimates. Model 11 fills missing values of revenue autonomy based on values from 1980s. Model 12 controls for GDP and GDP per capita. Model 13 controls for interstate competition. Model 14 controls for resource economy. Robust standard errors in parentheses. Two-tailed test: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

in which the power of the test for revenue autonomy is weak because the sample size is very small. Below, I discuss in detail how I interpret the main findings.

The methodological discussion earlier implies that there are two ways to interpret the estimated effects from ordered probit. First, one may treat estimated coefficients as the marginal effects of the independent variables upon the continuous latent variable. If so, one may interpret them just as one would interpret an OLS estimate, meaning the change in the latent dependent variable for one unit change in the independent variable. To facilitate comparison across the models, I plot the estimated coefficients and their 90% confidence intervals for subnational fiscal authority and revenue autonomy, respectively. Figure 2 shows the results for the six models in Table 1, and Figure 3 for the eight models in Table 2.

Figures 2 and 3 show that subnational fiscal authority consistently have a positive and statistically significant effect on the latent tax incentive generosity. Among the different models, some estimates are noticeably more precise, with much smaller confidence intervals in, for example, model 1 of Table 1 (largest sample size) and model 7 of Table 2 (estimated subnational taxation authority). Other models produce less precise estimates, such as model 6 of Table 1 (smallest sample and based

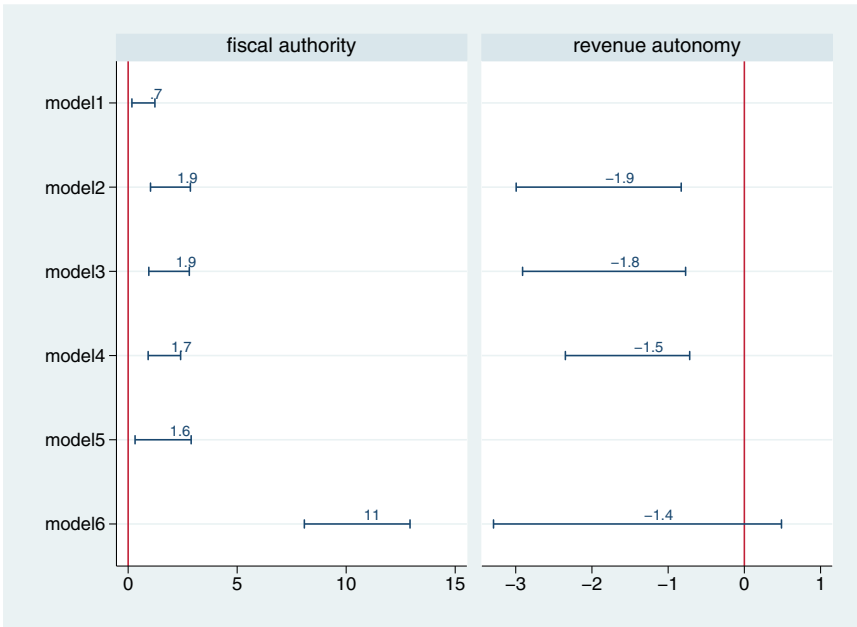

Figure 2 Coefficient estimates and 90% CI of fiscal authority and revenue autonomy.

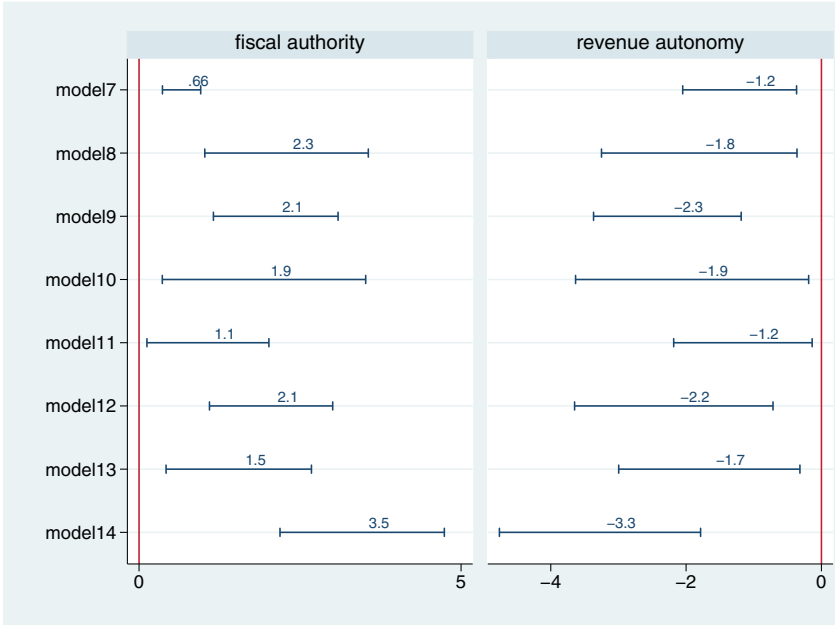

Figure 3 Additional coefficient estimates and 90% CI of fiscal authority and revenue autonomy.

on a different measure of tax incentives) and model 10 of Table 2 (jackknife estimation). Even the most conservative estimate suggests that relative to countries without subnational fiscal authority, the latent level of tax incentives in those with subnational fiscal authority is higher by about 0.7. The effect of estimated subnational taxation authority, as noted in model 7, has about the same size of effect (0.66), suggesting that the measurement error is small.

Subnational revenue autonomy consistently has the expected negative effect and it is statistically significant in 11 out of 12 models, when one applies 10% significance level or less. The insignificant result is for model 6 of Table 1, which has the smallest sample and based on an alternative tax incentive measure (p value 0.22). This is not surprising since small sample size reduces estimate precision. The most precise estimates come from model 4 of Table 1 (OLS regression) and model 7 of Table 2 (estimated subnational taxation authority). The most conservative significant estimate suggests that relative to countries without subnational revenue autonomy, the level of latent tax incentives in those with revenue autonomy is lower by 1.2 units.

Now, a second way to interpret estimated effects in ordered probit is to examine the marginal effect of subnational fiscal authority or revenue

autonomy on the probability of each category of the ordinal indicator, holding other variables constant at specific meaningful values. This is a useful exercise for non-linear models because it is valuable to know the probability of choosing a particular category of tax incentive under particular scenarios and because the probability is now also sensitive to what values other variables in the model take on.

Based on the estimates in model 1 of Table 1, Figure 4 presents the change in the probability of each tax incentive category as fiscal authority changes from 0 to 1, first for non-democracy, and then for democracy, holding the rule of law at sample mean and *FDI inflow* at sample median. Holding *FDI inflow* at sample median is meaningful because FDI inflows tend to have fat tails and the sample mean is always heavily skewed toward outliers, making it unrepresentative. In non-democratic countries with average rule of law and median FDI inflows, relative to a country with centralized fiscal authority, a country with decentralized fiscal authority is significantly less likely to choose values 0 and 1 of tax incentives, but significantly more likely to choose value 4 of tax incentives, and they are equally likely to choose values 2 and 3. In contrast, in democracies with average rule of law and median FDI inflows, relative to a country with centralized fiscal authority, a country with decentralized fiscal authority is significantly less likely to choose value 0, but

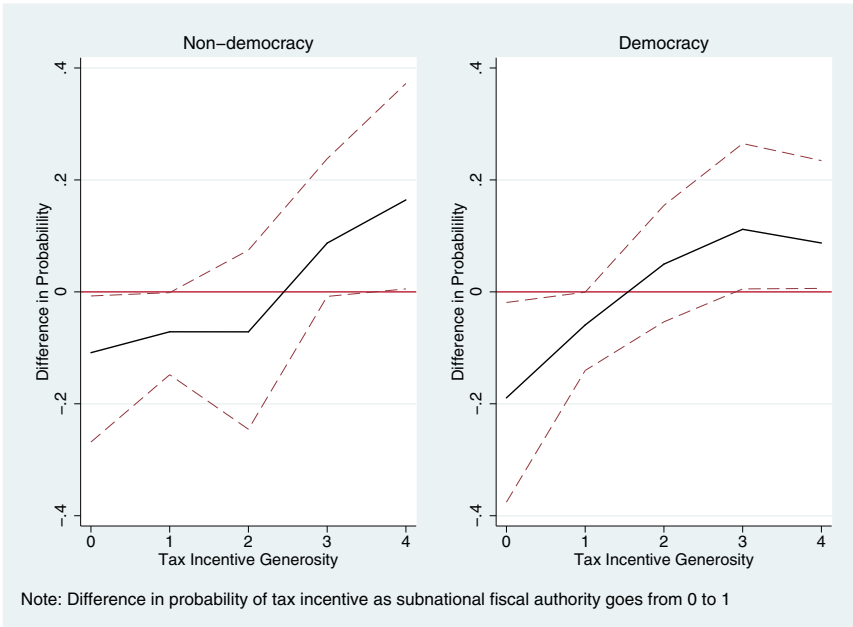

Figure 4 Effect of subnational fiscal authority on tax incentive generosity.

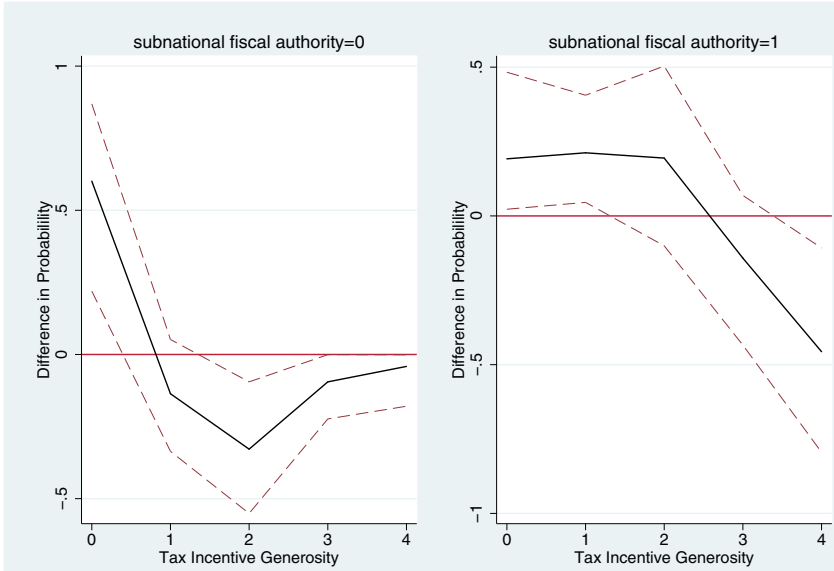

Figure 5 Effect of subnational revenue autonomy on tax incentive generosity.

significantly more likely to choose values 3 and 4, and they are equally likely to choose values 1 and 2. These findings support hypothesis 1. They suggest that regardless of regime type, decentralizing fiscal authority increases interregional tax competition and the probability of a country offering more generous tax incentives.

Based on the estimates of model 2 in Table 1, Figure 5 presents the change in the probability of each tax incentive category as subnational revenue autonomy changes from 0 to 1, first for a democracy with centralized fiscal authority, and then for a democracy with decentralized fiscal authority, holding the rule of law at sample mean and *FDI inflow* at sample median. In democracies with centralized fiscal authority, average rule of law, and median FDI inflows, a country with subnational revenue autonomy is significantly more likely than one without subnational revenue autonomy to choose value 0 of tax incentives, but significantly less likely to choose value 2, and they are equally likely to choose values 1, 3, and 4. In contrast, in democracies with decentralized taxation authority, average rule of law, and median FDI inflows, a country with subnational revenue autonomy is significantly more likely than one without subnational revenue autonomy to choose values 0 and 1 of tax incentives, but significantly less likely to choose value 4, and they are equally likely to

choose values 2 and 3. These findings support hypothesis 2. Subnational revenue autonomy forces regional governments to be fiscally more responsible and reduces the probability of a country offering more generous tax incentives. As shown in Figure 5, such suppressive effect is more pronounced in countries with decentralized taxation authority.[8]

6. CONCLUSION

This research studies the effects of fiscal decentralization on tax incentives to foreign investors. Theoretically, decentralized fiscal authority increases interregional tax competition and motivates local politicians to adopt generous tax incentive programs. However, subnational revenue autonomy, which refers to that subnational governments have to fund their expenditures largely with own-source tax revenues, leads to more fiscal discipline and less generous tax incentives. Therefore, whether fiscal decentralization leads to excessive tax incentives depends on whether subnational governments have taxation authority and/or revenue autonomy. A cross-national empirical analysis produces supporting evidence in a sample of over 50 developing countries from the early 2000s. Statistical results are largely robust with an alternative measure of tax incentives, variations in the measures of taxation authority and revenue autonomy, different estimation techniques, and various controls for alternative explanations.

Some caveats regarding this research are in order. First, this research focuses on tax incentives, which are particular policy instruments, and thus it does not make general claims about other types of policies such as general tax cuts or subsidies used to attract foreign capital. How fiscal decentralization might affect other policies is a useful topic for future research. Second, the empirical design is cross-sectional. Future research could look into the alternative time series design, such as the changes in tax incentives before and after fiscal decentralization in countries like, say, Brazil. Third, the tax incentive measure employed is rather crude and likely suffers from measurement errors. Future research could fruitfully look at developing better measures of and collecting better data on tax incentive policies. Finally, one important weakness of this research is its small sample size, resulting largely from the lack of data on and crude measures of subnational taxation authority and revenue autonomy. While small sample size does not prevent us from making statistical inferences from sample to population, it does make one wonder which countries outside the sample may deviate away from predicated patterns. Even though robustness tests based on jackknife estimation, filled missing values for revenue autonomy, and alternative subnational taxation authority measure provide some confidence in the validity of statistical

inference, future research could certainly improve by developing better measures of subnational taxation.

Despite these caveats, this research has some important implications. First, many public finance scholars (e.g., Breton 1991; Kenyon 1997; Oates 2001; Rauscher 1998) often employ the Tiebout type of models for subnational tax competition in the US or EU. They show that horizontal competition often leads to inefficiently low tax rates such that public goods, including social welfare, are underprovided. This research provides only qualified support for that pessimistic prediction in the context of tax incentives. Indeed, decentralized taxation authority induces more generous tax incentives, a result of greater interregional tax competition. But this effect can be moderated if fiscally disciplined subnational governments have to finance much of their spending with own-source revenues. The design of subnational governance matters to the impact of horizontal competition on tax incentives and by implication, revenue mobilization.

Second, conventional wisdom on fiscal federalism claims that fiscal decentralization improves both democratic accountability and economic efficiency by bringing voters and politicians closer together and enabling optimal taxation decisions given the local conditions. Recent scholarship (e.g., Rodden 2002, 2003, 2004; Rodden and Wibbels 2002), however, challenges this view. Focusing on fiscal decentralization and macroeconomic performance (e.g., inflation, deficit spending), these studies find that for the conventional wisdom to hold, intergovernmental fiscal system has to be structured such that it motivates local politicians to serve their constituencies and prevents them from exploiting the common pool of resources in a self-serving manner. That position receives further empirical support from a new policy issue area in this research. That is, whether a particular country with fiscal decentralization oversupplies tax incentives is contingent upon the configuration of the central–local government relationship. When this relationship is structured such that local politicians are free from bearing much of the costs economically and politically when offering tax incentives, then one can expect to see excessive tax incentives and most likely, poor revenue mobilization.

For developing countries that are interested in attracting foreign capital and mobilizing revenues, this research provides some useful lessons. First, the empirical literature reviewed does not support the position that tax incentives are effective in attracting FDI. Second, given rising competition for foreign investment, decentralized fiscal authority often leads to an oversupply of tax incentives, potentially harming government revenue mobilization. This is particularly the case when politicians can expect to use transfers and grants from the central government to cover deficit spending. Finally, states with strong fiscal discipline may overcome the potentially harmful consequences of tax competition and decentralized fiscal authority.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

NOTES

1. Some developing countries gave up more than one-third of tax revenues as tax incentives (James 2013, 37).
2. Though the focus of my analysis is on the developing countries, it is worth noting that evidence for tax incentives and enterprise zones in the US context is more mixed. For example, using US state level data, Bobonis and Shatz (2007) find that while general investment incentives have no effect on the location of FDI, targeted policies (e.g., unitary taxation and state foreign offices) do have some impact. Similarly, using the real book value of gross property, plant, and equipment in each US state from seven countries as a measure of the average size of FDI, Halvorsen (2012) finds that corporate income tax rate has no effect, but unitary taxation and tax exemption by a foreign country affect the size of FDI.
3. It is plausible that for countries dependent on non-tax revenues from resource endowment, the negative effect of tax incentives on tax revenue generation is a less serious problem. However, resource rich economies in the developing world tend to be autocratic and have weak rule of law, which make them more dependent on offering generous tax incentives to attract foreign investors (Li 2006).
4. One may wonder if the transfer system is correctly designed, even subnational governments which finance most spending from transfers may have little or no incentive to be wasteful. But a rigorously designed and tightly monitored transfer system is unlikely to leave much room for subnational governments to engage in unproductive and wasteful tax competition with each other. The effect of such a system will resemble that of fiscal discipline imposed by the central government. As a result, if such transfer systems do exist among the cases under study, one will be less likely to find support for hypothesis 2.
5. One may wonder if one can simply run an interactive model including expenditure and revenue variables and their interaction to capture this idea. In principle the interaction does not clearly identify the upper right quadrant alone. In addition, our sample size is too small and generates serious multicollinearity. The variance inflation factor (VIF) statistics are over 16 for

the interaction term and over 10 for the expenditure variable, making their estimates unreliable.
6. See Greene (2000), Long (1997), and Long and Freese (2001) for estimating the ordinal regression model as a latent variable model.
7. A Wald test of parallel lines assumption based on model 1 of Table 1 fails to reject the assumption, producing an insignificant test statistic of 6.13. This suggests that ordinal regression is appropriate.
8. One may wonder if tax incentives are only important to small economies but not a big issue for big ones. The question is beyond the scope of this paper, but it is worth noting that model 12 in Table 2 shows that the size of economy is not significantly related to tax incentive generosity.

SUPPLEMENTAL DATA

Supplemental data for this article can be accessed at http://dx.doi.org/10.1080/09692290.2015.1086401

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