Fiscal decentralization and particularistic spending across countries [+]

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ABSTRACT

This paper proposes a way to measure particularistic (or pork-barrel) spending across nations. We posit that "residual capital expenditure" best captures a country's level of fiscal particularism, and we investigate this hypothesis with national and subnational data from fifty-two countries over twenty years. After controlling for basic economic factors determining capital expenditure, we find that residual pork spending is greatest when taxation is centralized and spending decisions are decentralized, *i.e.* the fiscal cost-benefit principle is broken. Under these conditions, legislators can distribute pork with higher electoral efficiency, because voters do not fully internalize the link between more particularistic spending (the benefits) and higher taxes (the costs). Additionally, pork is exacerbated by institutional features that add geographically responsive political actors, such as the presidency or single member districts. To further illustrate how capital expenditure can provide a good measure of pork, we discuss the case of Japan.

Keywords: particularism, pork, single member districts, public spending, decentralization.

I. Introduction

"Pork" is government spending justified to a wide spectrum of voters by some social or economic purpose, but that in reality is pursued primarily for political benefit with a key constituency.[1] Policy analysts lament that politicians allocate too much money to wasteful pork-barrel projects that are difficult to justify on economic grounds, to the neglect of more utilitarian policy initiatives, such as social services, health and education, or universal transfer programs. Politicians benefit from pork because these projects let them claim credit for their work in government. Pork projects are visible, expensive, and *particularistic*: targeted to a politician's preferred locale or constituency.[2] In this paper, we build on this definition of pork as particularistic spending to measure and test the determinants of pork barrel spending across countries.

A key impediment to a unified test of pork-barreling has been operationalizing particularistic spending as a dependent variable. While transfer programs, government consumption, public employment, and even overall central government spending have been used to measure pork, we argue that these variables fail to capture the generally accepted features of pork or include too many non-particularistic items.

To define pork, we choose to start deductively, specifying the types of spending that might be misused for political ends. To maximize electoral benefit, a budget item should be targeted to the constituency of a well-defined geographic area.[3] Moreover, electorally beneficial spending should produce "above-ground" outputs: tangible goods that serve as visual reminders of legislative largess. For these reasons, we propose using *residual capital expenditures* at all levels of government (local, state, and central) as a proxy of particularistic spending. Capital expenditures are typically large physical infrastructural projects, such as

buildings, bridges, and roads, which are visibly located in a place and usually impossible to relocate or withdraw. While some capital expenditure can be explained by fundamental economic variables representing investment needs, the excess residual is what we consider pork.

In explaining cross-national variance in pork spending, most of the existing literature has drawn its key theoretical insight from the "Law of 1/N," proposed by Weingast, Shepsle, and Johnsen (1981), which states – with the United States in mind – that distributive spending increases with the number of electoral districts. The mechanism at work is a common pool problem: when there are N many legislative districts, any project that a legislator approves for her district gives her one unit of benefit, but only 1/N unit of tax cost. With a large N, this makes any project effectively free-of-charge for any given district, and produces incentives to spend beyond even the most permissive conceptions of economic optimality. Accordingly, researchers have explored how pork expenditures change with the parameter "N," such as the number of legislators (Baqir 2002), or how other institutional veto players may affect expenditure levels (Bradbury and Crain, 2001 or Persson and Tabellini, 1999).

A different stand of literature has explored the common pool problem of government spending from a partisan perspective (Perotti and Kontopolous, 2002; Hallerberg and Marier, 2004; and Bawn and Rosenbluth, 2006). In this work, excessive government spending occurs because decision makers are fragmented along partisan lines, and there is no disciplining mechanism through the ministry of finance or some other institution can impose discipline among spending ministries. This work highlights the electoral connection of representatives and their accountability to voters being mediated by electoral rules and institutional details.

Those literatures has not explored enough the most crucial mechanism through which both the Law of 1/N and the common pool resource (CPR) problem are supposed to work: that legislators operate within a fiscal regime that allows expenditures to benefit one jurisdiction while dispersing costs among all. We argue that for the common pool problem to occur, there must exist a *tax-benefit disconnect* between those who benefit from projects, and those who pay for them. In particular, we focus on a central feature of multi-tier government: when tax revenue is collected centrally but spent locally, the assumptions of the *Law of 1/N* and the CPR problem obtain. However, if both expenditure and revenue are controlled by local governments, such that there is a clear one-for-one cost-benefit principle linking expenditures to taxation in each district, citizens should exert tighter fiscal control over their representatives.[4] Fiscal decentralization in a polity thus affects voter demand for pork, which may mitigate the extent to which established political variables – such as the electoral system or presidentialism – actually influence the level of particularistic spending.[5]

Thus, this paper has three goals. First, we further develop our arguments for operationalizing distributive spending as residual capital expenditures. We believe this measure to be substantively closer to pork than any of the other commonly used indicators. Crucially, we depart from existing studies by taking into account spending by all levels of government – national, state, and local. Second, we explicitly test the salience of the tax-benefit disconnect in generating the collective dilemma of overspending. Specifically, we show that the greater the tax-benefit disconnect – the mismatch between the degrees of centralization of expenditure and taxation – the greater a country's trend towards overspending on pork by *sub*national governments. Third, we suggest that some institutional features, such as lower district magnitude and a presidential system, exacerbate particularistic

spending, since these factors increase the number of political actors who want to claim credit for pork. This last finding contrasts with the conventional wisdom that additional veto players constrain particularistic agendas.[6]

Finally, we provide a discussion of the case of Japan, which exhibits a centralized revenue structure but decentralized spending. Using time-series data of capital expenditures in public works, we argue that Japan's high level of fiscal disconnect contributes to particularistic spending for political purposes. In particular, capital expenditures are tightly correlated to diachronic shifts in support for the LDP. Our results accord with the vast literature on the prevalence of pork-barreling in Japan (see Scheiner, 2005), as well as the findings from our cross-sectional analysis.

II. Measuring pork – Operationalizing the dependent variable

The problem with much of the conceptual and empirical discussion of pork is that not enough effort is made to distinguish particularistic, territorial spending from other forms of public spending. In particular, it is often the case that patronage (Calvo and Murillo, 2004), clientelism (Schady, 2000), unproductive spending (Devarajan, Swaroop and Zou, 1996), government transfer payments and entitlements (Milesi-Feretti et al, 2002), public consumption (Bradbury and Crain, 2001) or even the overall size of government (Baqir, 2002; Persson and Tabellini, 1999), are discussed as though they were all indicative of pork. The implicit assumption in most studies is that pork is a fixed proportion of government spending, and a larger budget contains proportionally more pork.

These aggregate measures undoubtedly include politically motivated government spending, but most expenditure captured by these items does not fit a reasonable definition of

pork. For example, transfer programs (such as pension payments), where beneficiaries are decided upon as a general class, are almost impossible to target geographically – at least not while maintaining the guise of truly universal public expenditure. Similarly, consumption-based government spending programs are difficult to target to specific locales, as small consumption goods (e.g., pencils) are unlikely to be produced only in one small geographic area, and it is even less likely for their procurement to produce a visible "landmark" for legislators to display, come election time. In order to be politically expedient, a project must involve a physical good that can be localized in a place.

Public employment – a separate budgetary category – *is* geographically located, since governments must pay wages where employees work. However, current-period expenditures such as wages are not necessarily particularistic spending. While patronage is often discussed in terms of bloated public employment (Geddes, 1994; Golden, 2003), wages and salaries run the gamut of government activity. Most education and health expenditures, for example, are salaries and wages to teachers, doctors, and nurses, which may be essential public goods, rather than unnecessary spending. It is virtually impossible to determine whether variance in public employment costs is due to patronage or to universalistic public goods provisions, as no measures exist for optimal levels of government staffing.[7]

Instead, we seek to provide a more precise empirical measure of pork by focusing on *capital expenditures.* As discussed previously, capital expenditures fund physical projects, such as buildings, roads, and bridges, *visibly located in a place* and *impossible to relocate or withdraw.*[8] A rich economic literature (originating from the seminal contribution by Arrow and Kurz, 1970) posits optimal levels of capital investment expenditure against which we may compare observed expenditure levels. Accordingly, we believe that when stripped of its

economically valid components (through appropriate econometric controls), the residual level of capital expenditures provides a good proxy of particularistic spending. Hence, if we want to disentangle political motivations from other explanations of public spending, we believe it is better to measure capital spending, rather than current expenditure or total consumption.

We operationalize the dependent variable, capital expenditure spending, as *the proportion of* ***central and subnational capital*** *expenditures to* ***total*** *government spending*. The data comes from the International Monetary Fund's *Government Finance Statistics*, which provides annual information reported by national governments. It is important to note that spending measured by our dependent variable is not restricted to central governments, but rather to pork pursued by all levels of government. Cases included are all democracies where GFS reports data on capital expenditures between 1979 and 1999.[9] Figure 1 shows that there is significant cross-national variation in capital expenditure carried out by all levels of government, averaged for each country over the two decades in our dataset.[10]

[Figure 1 about here]

We believe that our dependent variable captures the type of spending that is easy to target geographically, and thus constitutes a large fraction of pork spending. Of course, not all pork is in capital expenditures. Nevertheless, there are four reasons why we believe this measure is better than any other proposed in the literature thus far: levels of government, discretion, location, and dual benefits. All these reasons stem from the territoriality of pork, which we argue is the central attribute that researchers should emphasize.

II.A. Levels of government

While many researchers have focused exclusively on *central* government expenditures as a dependent variable (for example, Persson and Tabellini, 1999; Milessi-Ferreti et al., 2001), such approach seriously underestimates the total budgetary size of government spending. Many projects are undertaken at the subnational level, either voluntarily by local governments or under the guidance (and targeted grants) of the central government. Indeed, a cursory examination of central versus local spending across 65 countries from 1980 to 1999 shows that on average, 32.7% of capital expenditure is made at the subnational level. Two thirds of this subnational level expenditure is made by municipal governments.

Figure 2 shows a ternary plot of the distribution of capital expenditure by each level of government. Each dot denotes a specific country year. The way to read this figure is by noting that when all capital expenditure is concentrated at one level of government, the data point is at a vertex. For example, if all capital expenditure is carried out by local governments, an observation would fall at the vertex labeled with 1, in the bottom left angle of the triangle. All the observations along the upper left side of the triangle denote cases where intermediate governments do not carry out any expenditure, so that the state share is 0; this usually occurs when there is no intermediate level of government. Under these circumstances, the distribution between central and local level is a particular combination along the line that goes from 100 percent being executed by local authorities to 100 percent by central governments.

[Figure 2 around here]

A substantial number of cases are in the upper left side of the triangle. But the figure also shows that in the upper right side of the triangle, there are countries which report no local capital expenditure (at least to the IMF), so the share is only distributed among central and state governments. The observations along that side of the triangle all belong to two federal countries, Argentina and India. The top vertex of the triangle, where the national government makes all capital expenditures, includes multiple observations for Costa Rica, Cyprus, Dominican Republic, Ecuador, Fiji, Gambia, Greece, Sri Lanka, Madagascar, Mauritius, Pakistan, Panama, Papua New Guinea, El Salvador, Turkey, Venezuela and Zambia. In those countries, virtually all capital expenditures are controlled or executed by the national government. The bottom side of the triangle has no cases, because there are no country-years where the central government does not carry out any capital expenditure. Figure 2 thus gives a clear picture of the variation of ways in which multi-tiered governments allocate responsibility for providing capital expenditures.

II.B. Discretion

For government projects to be described as pork, they must be strategically allocated to specific areas by political actors for some partisan benefit. In other words, government spending that is automatic and nondiscretionary, such as interest payments or entitlement transfers, is *not* pork. Certainly, no government spending is entirely free of political control. Spending on public employment, for example, can wax and wane with the ideological composition of government, but even payroll depends on inertia and statutory requirements, as it is difficult to fire bureaucrats. Deciding on what new projects to build and where to build them, however, entails detailed cost-benefit analysis which deeply involves political actors.

The fact that capital expenditures are frequently economically inefficient also makes discretion a critical factor in explaining pork spending. Gramlich (1996) argues that spending on highway construction tends to follow expert assessments of "engineering need," which concerns itself only with the "best" way to do the project at hand, irrespective of any cost-benefit analysis. This calculus tends to recommend an inflated level of capital expenditure, however, because it ignores efficiency considerations, such as the underutilization of capital stock or a recognition that citizens might want to trade off benefits of more capital against their tax costs. Indeed, Devarajan, Swaroop and Zou (1996) find that in 43 developing countries between 1970 and 1990, the share of capital expenditure in central government expenditure had a *negative* effect on economic growth, particularly when the budgetary shares of infrastructure and defense spending were higher.[11] Isham and Kaufman (1999) similarly find that many World Bank investment projects were chosen without a project evaluation or an analysis of the cost of funds.[12] The gap between projected and actual economic rates of return from World Bank projects is on average between 6 and 10 percentage points, with a correlation between the two of only 0.2 (Pritchett, Kaufman, and Isham, 1995; p.3). In fact, 27% of the projects undertaken by the World Bank from 1974 to 1993 were rated as unsatisfactory by its own Operations Evaluation Department.

While often economically inefficient, capital expenditures are popular among politicians, because these projects have the visibility and prominence that allow politicians to claim credit in ways that the universal provision of public services would not. Because their allocation depends on the discretion and political pull of the politician, pork is a useful item that allows politicians to highlight their importance to voters.

II.C. Irreversible location

For voters to believe that they will be rewarded for supporting a politician, the "prize" they receive cannot easily be taken away, making politicians' commitment for supporting their constituents credible (Torvik and Robinson, 2005). Capital expenditure projects, by their very nature, cannot be undone once started. A dam, once built, is fixed in a particular geographical location; it cannot be moved to a different electoral district or be dismantled easily. Current expenditures and transfers, on the other hand, are mutable, making politicians' commitments to them relatively less credible, thus less electorally valuable.

II.D. Dual benefits

As discussed by Weingast, Shepsle, and Johnsen (1981), the benefits of capital expenditure projects come in two forms. First, the district benefits through the consumers' surplus of that project. For example, a bridge benefits citizens through time savings and improved mobility, benefits far greater for a local resident than her share of the tax burden for that bridge. Second, the district benefits through the direct demand-side stimulus provided by payments to construction firms, suppliers, and other businesses in the district involved in the project. In contrast, increasing transfer payments or patronage jobs may have a positive wealth effect on that district's citizens, but such additional wealth need not be *spent* in the district – assuring only one half of the dual benefits to consumers and producers. The dual benefits conferred by pork are valuable precisely because they allow politicians to appeal to both voters (through public goods) and interest groups (through government contracts).

III. Is capital expenditure a good proxy of pork spending?

How does our proposed measure of pork compare to alternative measures that have been proposed in the literature? In this section, we justify the usage of capital expenditures by running a series of regressions with that measure as the dependent variable. We suggest that once we control for the economically meaningful components of capital expenditures, the residual is a good proxy for pork spending, as it correlates with political variables that existing studies have linked to particularism.

We compare the results we obtain from using capital expenditures with those from using *government consumption share of GDP*, a measure that has been used most prominently by Bradbury and Crain (2001).[13] Government consumption is generally the largest budget item reported in National Accounts, and it includes expenditures on health, education, subsidies, and civil service wages. We contend that because a significant portion of government consumption is *not* geographically targeted, it fails to satisfy the criteria implied by the notion of "pork". There is little relation between our proposed measure and Bradbury and Crain's alternative; the correlation between capital spending and government consumption is only .05 in our sample.

We also examine whether the political variables affect central and local government capital expenditures differently. Many cross-sectional analyses of public spending use central government data, since it is the most widely available and ready-to-use cross-country dataset. As most researchers explicitly acknowledge, however, this data reflects a biased view of *actual* overall spending, particularly in decentralized, federal countries where subnational governments play a significant and independent role. By testing the effects of fiscal

disconnect on central and local spending separately (as well as together), we can better assess how different institutional factors influence political actors at distinct levels of government.

III.A. Model Structure

Although "capital expenditures" capture a large portion of overall particularistic spending, there is a danger that this measure overestimates the true level of pork. Put differently, particularistic spending is only a *subset* of capital expenditures. At one level, this is a structural issue: public works in a developing country may be vital infrastructural projects that constitute a public good, while the same projects in a post-industrial nation may be electorally advantageous but economically inefficient. Distinctions can also be subjective: public works can be seen as a job creation program based on government-induced labor demand (public good), or as an underhanded way for legislators to reward political sponsors (pork).[14]

The bottom line is that physical infrastructure must be located somewhere, and there may be sound economic reasons – apart from purely political motives – to choose capital investment instead of other forms of public expenditure. Assessing the incentives for overspending thus requires a normative standard, derived from a baseline capital expenditure model, of a "normal" level of economically necessary capital goods investment. Accordingly, we estimate the level of capital expenditure as a joint function of political factors and economic variables, where pork is the residual value of capital expenditure once economic variables have been accounted for.

In particular, we control for the *level of development*, measured as logged per-capita GDP (current US dollars; from Penn World Tables). We expect the level of development to

negatively affect capital expenditure. The reason is twofold. First, to the extent that poor voters are more likely to be politically swayed by monetary transfers (Dixit and Londregan, 1996), capital expenditures qua pork might be higher in poorer countries. Second, public works spending has an economically crucial role to play in poor countries with underdeveloped infrastructure, since newly paved roads facilitate the transportation of people and goods, sewage systems improve public health, and dams provide scarce electricity.

Developing countries with lower *capital/labor ratios* should devote larger shares of their budgets to capital expenditure, as they are not as far along on the curve of diminishing returns as countries with well-developed infrastructure.[15] We include the passive real interest rate (from World Bank Development Indicators) as a measure of the relative scarcity of capital, and hence the likelihood that a country can engage in financially sound capital projects. As demonstrated in Arrow and Kurz (1970) and other neoclassical economic models, lower interest rates raise the economically recommended level of capital expenditure.

Third, we include a measure of the *percentage of the population living in rural areas.* In less dense regions, capital expenditures can play a more economically valuable role in connecting diffuse industries and markets together. At the same time, the cost of bringing the same set of public goods to a population may be higher when much of a nation's territory is rural, with low population density creating dis-economies of scale.

Incorporating these factors, we estimate a linear model in which capital expenditure as a percentage of government spending is a function of the *economic controls* and the variables operationalizing the *institutional environment.* The model takes the form:

$$\text{Log}(K/G) = \alpha_0 + \alpha_1 \log(GDP/P) + \alpha_2 \log(i) + \alpha_3 (RUR/P) + \beta \text{ Institutions} + e$$

Where *K* is capital expenditure, *G* is government expenditure, *GDP/P* is GDP per capita, *i* is the real interest rate, and *RUR/P* is the percentage of rural population in the country. To ease interpretation K/G is expressed in percentage points before logging it. The institutional variables we use are the disparity between tax and spending centralization (*disconnect*), *presidentialism*, and *district magnitude* in the lower assembly.[16] The tax-benefit disconnect is calculated as the difference in *expenditure* and *revenue centralization*, each measured as the share of state (provincial) plus local government in total government expenditure and revenue, respectively (from the IMF Government Finance Statistics Yearbooks). *Presidentialism* is coded as "1" when there is an independently elected executive (*i.e.* a president), and "0" when it is a parliamentary system. District magnitude is included to observe whether politicians tend to have closer ties to their constituents in single-member districts, and hence have a greater proclivity to spend on particularistic pork-barreling projects. This relationship between smaller district magnitude and voter-politician linkage is cited widely in the literature, and tends to be included in almost all regressions measuring government spending (see Bradbury and Crain 2001 and Persson and Tabellini, 1999, among others). The estimations include 47 countries between 1979 and 1999, for a total sample size of 587 cases; Table 1 describes the sample in greater depth.

[Table 1 about here]

As emphasized earlier, government spending is carried out by different levels of government, and so the key political factors should influence the allocation of capital

expenditures at each level differently.[17] To capture this empirically, we run separate estimations with distinct dependent variables: those which use *total* amount of spending at all levels of government, and those which disaggregate this total into national or subnational expenditures.

In terms of model structure, the conventional approach in estimating pooled time series data is to use lagged dependent variables in order to "mop up" serial autocorrelation, and then estimate a model through ordinary least squares (OLS) with panel corrected standard errors (Beck and Katz, 1995). However, there are some methodological problems which make automatically following this advice problematic for our estimations. As noted by Achen (2000), one should include lagged dependent variables *only if* one believes that there are substantive reasons to expect the lag to have a causal effect on the process under analysis. The indiscriminate usage of the lagged dependent variable can lead to biased estimates, because it will suppress the explanatory power of other exogenous *independent* variables, and this suppression will be proportional to the degree of serial autocorrelation in the independent variables. This caution applies to our institutional variables, such as presidentialism or electoral systems, which are highly correlated through time and change very slowly (if at all). A lagged dependent variable will eliminate the significance of institutional measures and boost the significance of the lag, *even when this lagged variable has no explanatory role*. Our instincts and the theoretical accounts of particularistic spending suggest that the exogenous independent variables, not the lagged dependent variable, are the true explanations for differences in the levels of capital expenditure across countries. Estimations including the lagged dependent variable are available from the authors upon request.

Error correction models, prevalent in recent empirical work using pooled time series, are not immune to the problem of autocorrelated independent variables noted by Achen (2000, p.23). There is also a separate, substantive reason why an error correction model is not the appropriate choice for a statistical analysis of particularistic spending. There is no theoretical reason to expect pork to reach a long-term equilibrium level, in which small deviations in the independent variables will produce temporary shocks that will fade away as the system returns to equilibrium. Indeed, small shocks in features such as the electoral system or the tax-benefit disconnect might have long-lasting effects, fundamentally changing the nature of public expenditure and credit-claiming by politicians.[18]

Our approach, instead, is to use the random effects, generalized least squares (GLS) model for estimations of *total* and *national* level spending. For the estimation of *subnational* capital expenditure, however, the GLS model can be problematic since there are multiple countries where no spending is carried out by subnational governments – a total of 170 truncated observations. To address this issue, we run the subnational estimations through both a random effects *tobit* model, where the dependent variable is measured without logging, and a random effects *GLS* model, but only with data from the non-truncated observations. The tobit model estimates jointly: 1) the likelihood of falling beyond the truncation point, which is calculated through a probit model that determines the probability of not having *any* capital expenditures by the subnational government; and 2) the effect of the economic and political variables on the *level* of the dependent variable (as in a normal regression), when subnational spending is greater than zero. Table 2 reports the results.

[Table 2 about here]

Except for the interest rate in the subnational estimations, the economic controls have the expected signs and are statistically significant. Given that both the dependent variable and the economic controls are measured in logs, the coefficients can be interpreted as elasticities. In the *total* government expenditure estimation (Model 1), for example, an increase in GDP per capita is reflected in a 0.16 decrease of capital expenditure. This is consistent with arguments that richer countries already have a more developed infrastructure than poorer ones, and thus should have less need for additional investment. Similarly, an increase in the interest rate – which raises the price of capital – yields a 0.05 drop in capital expenditures. A one unit increase in the proportion of the rural population raises capital expenditures by about 1.5 percent.

Beyond the confidence we can have in the economic control variables, the regressions suggest that a major distinction must be made in the factors influencing national vis-a-vis subnational spending. A comparison of Models (2) and (3) indicates that for the most part, the baseline economic factors influence central government spending more than they do subnational expenditures. However the political variables are significant only in Model (3), indicating that institutional factors primarily affect expenditure decisions at the *subnational* level.

The most interesting variable in this respect is the *disconnect* variable, which measures the difference between expenditure and revenue decentralization. Disconnect does not increase national-level particularistic spending, but it does powerfully increase subnational-level spending. This suggests that the impact of fiscal disconnect at the subnational level drives the statistical significance of this variable in the estimation of *total* capital expenditure

(Model 1). The results from Model (3) also indicate that the process of particularistic spending in subnational governments is related to the common pool resource problem, stressed by the literature on the "law of 1/N."

The estimations also show that presidentialism reduces overall pork, which can be interpreted to mean that presidents are able to discipline spendthrift legislatures. District magnitude reduces pork, with the effect being significant at both the national and the subnational levels. This is in line with the theoretical literature, which posits that incentives to claim credit for geographically targeted spending are strongest in systems of single member districts, and become attenuated with more proportionate systems of representation.[19]

It is useful to contrast these results with the effects of economic and political factors on a broader measure of government size. Model (5) replicates the specification but replaces capital expenditures with *government consumption*. This estimation is presented to show that the political variables have an opposite effect on government consumption than they do on particularistic spending. Higher district magnitudes yield more government consumption, which is consistent with existing arguments that proportionate electoral systems require politicians to appeal to a wider cross-section of the population through universalistic transfers, rather than particularistic spending (see Persson and Tabellini, 2000). Presidentialism yields a negative sign, indicating that independently-elected executives have incentives to reduce overall government spending. Disconnect does not have a statistically significant effect on government consumption. Hence this suggests that our measure of particularistic spending is quite distinct from the overall size of government.

We can use the analysis to calculate the politically determined particularistic spending in each country. As we have argued, once we control for the economic baseline factors, the

remaining, excess capital expenditure can be interpreted to be "pork." We provide this residual measure in two ways. In the first method, we subtract from total observed capital expenditure the predicted value attributable to the constant term, per capita GDP, interest rate, rural population, and the error term. The residual is intimately linked to institutional factors such as district magnitude and presidentialism, but most crucially to the level of fiscal disconnect. The second method we use for calculating the size of particularistic spending is to use a fixed effects model, where we only include the economic variables and dummy variables (fixed effects) for each country (the estimation is not reported but available from the authors upon request). Here, we can interpret the country fixed effects to represent the residual fraction of capital expenditure which is particularistic in nature, and hence attributable to the political, institutional factors specific to each country.

Figure 3 shows the average value of particularistic spending in each country according to the residuals and fixed effects estimations. The fixed effects method underestimates the degree of particularistic spending when compared to the residuals method, although the two measures are sufficiently linked to suggest that our institutional variables explain a large proportion of pork spending in each country. The countries where particularism is most prevalent include – as expected – many developing nations; and among European countries, we observe high levels of pork in Southern European cases such as Italy and Greece.

[Figure 3 about here]

We should note that these estimations suggest a problem with a country like Brazil, which appears at the lower end of the scale even though the secondary literature posits that

Brazil experiences substantial amounts of pork-barreling. Ames (2001) reports that pork-barrel amendments in that country's federal legislature account for around 1 percent of federal expenditure (and these are only the amendments!). National data sources indicate that capital expenditure in Brazil has historically been around a quarter of total public expenditure during the 1970s and 1980s. We believe that this discrepancy is due to the "lost decade" in Latin America, where the economic recession forced many Latin American nations to cut capital expenditures sharply. At the same time, interest payments on debts inflated the total size of these countries' budgets, giving the appearance that the share of capital expenditure decreased significantly. In our dataset there is, in fact, a negative correlation between debt and capital expenditure in Latin America.

IV. Capital Expenditures in Japan

While the preceding discussion and cross-sectional analysis support our assertion that capital expenditure is a good measure of particularism, does this operationalization make sense when looking at patterns of pork-barreling in a specific country? To explore this question, this final section examines capital expenditures in Japan, a country where public works spending has played a critical role in underwriting the electoral success of the Liberal Democratic Party (LDP). We focus on spending in the 1980s and 1990s, which is the time period explored in our cross-national dataset.

Government construction investment – in roads, bridges, railways, community centers, and housing – has historically been the locus of pork-barreling in the Japanese budget. The redistribution of central taxes as public works has been a widely used political tactic since the

early twentieth century in Japan, but the practice became entrenched with Article Four of the 1947 Finance Law, which forbade the government from issuing bonds to balance the budget *except to finance public works* (bonds for such being called "construction bonds").[20] Although the government has, since 1975, overridden the stipulation against general deficit financing, this *carte blanche* effectively institutionalized public works as a sanctuary for pork-barreling. In 1998, Japan ranked second in the world in overall construction spending (much of which was carried out by the government) at $626.5 billion, or 15.2% of GDP; despite having 24 times the land mass, the United States spent $651.6 billion (only 4% more than Japan), which translates into 8.1% of GDP (Engineering-News-Record 1998).

Observers have long pointed out that Japanese elections hinge on the personal vote, wherein incumbents appeal to constituents by highlighting their proficiency in bringing back funds to build new roads and bridges in their districts (Calder 1988; Ramseyer and Rosenbluth 1993; Curtis 1999). Employing approximately 10% of the labor force, the construction industry is a potent electoral bloc, and the low profitability of the industry and its heavy dependence on government contracts make it a reliable and well-mobilized supporter of the LDP.

This strong emphasis on public works is not without economic reason, given that expansionary government spending during recessions can compensate for decreases in private-sector demand. In fact, private and public sector spending have moved inversely: while private sector investment between fiscal years (FY) 1990 and 1995 – the years immediately after the bursting of the economic bubble – shrank by 5.8% per annum, government investment *grew* at 6.1% per annum (Research Institute of Construction and Economy 2000, pg. 53). Between 1984 and 1999, overall private sector construction

investment grew at only 1.1% per annum, but government investment grew at 3.6%. The proportion of public sector spending to overall spending concomitantly increased from 38.7% to 46.9% in that period (Ministry of Construction 2000).

The economic rationale falls apart, however, when we consider that Keynesian resuscitation has been largely ineffective in restoring economic vitality in Japan. The Research Institute of Construction and Economy – the Ministry of Construction think tank – shows that the average profit margin for the industry decreased from 3.4% in FY1990 to 1.6% in FY1998 (Research Institute of Construction and Economy 2000, pg. 56). The Economic and Social Research Institute (ESRI) of the Cabinet Office reports that Public Investment as a whole has had a negative effect on GDP growth (ESRI 2001). The fact that the government is knowingly spending money on a non-profitable, non-catalytic sector suggests that there is a *political* element to construction spending.

Figure 4 shows diachronic changes in public works spending in Japan as a percentage of GDP (on the left axis) from 1958 to 2000.[21] Construction spending rises and falls in a distinct pattern from the share of government consumption to GDP (calculated from National Accounts figures), which is a frequently cited measure of pork-barreling in existing studies. The correlation between public works and government consumption is approximately 0.40.

[Figure 4 about here]

Figure 4 also shows LDP vote share in parliamentary elections on the right axis. Although the LDP held a single-party majority for thirty-eight years between 1955 and 1993, its electoral margin of victory was slim. The party's electoral popularity peaked in 1958 – the

first election after its formation – when it won 58% of the vote, and it failed to win a majority after 1962. Perhaps more tellingly, fewer people over time were identifying themselves as LDP partisans. According to monthly polls by the Jiji Tsushin between 1960 and 1990,[22] the LDP last had more than 50% support in December 1960, and more than 40% in January 1970.

If pork-barreling follows a political logic, we should see the LDP increase public works spending when it is doing poorly in the polls. Figure 4 shows that the share of public works expenditure increased as the LDP's vote share decreased; indeed, the correlation between the two variables is -0.46.[23] To secure its parliamentary majority, the party has engaged in profligate construction spending to secure its "hard vote" base, particularly in rural areas where public works prop up local economies. One of the most persuasive empirical studies is Kohno and Nishizawa (1990)'s application of the Political Business Cycle model to Japan, which finds that the LDP increased public works spending immediately before elections to create a temporary upswing in economic performance.

The key question, of course, is determining what accounts for the high level of public works spending in Japan. In terms of political structure, Japan has a parliamentary system with a bicameral legislature. While the country went through decades of accelerated growth, particularly in the 1960s and 1970s, there have been no substantial changes to its political institutions except in 1994, when the traditional multi-member district, single non-transferable vote (SNTV) system was replaced with a mixed electoral system. Under the SNTV system, the more powerful House of Representatives had an average district magnitude of four, which is not distinctively high.

We posit that the key variable to understanding clientelistic pork-barreling in Japan is the nation's high level of *fiscal disconnect*, which is epitomized by the inverse proportionality

in revenues and expenditures between central and local governments. Although local public finances accounted for 64.6% of the joint net *expenditure* of the national and local governments in 1996, only 39% of the tax *revenue* went directly to local political entities. Local governments depend on transfers from the central government, which account for about a third of local revenue. While bureaucratic restructuring in the late 1990s reorganized the exact locus of financial decision-making, these purse strings have always been tightly controlled by the Ministry of Home Affairs (MHA; now integrated into the Ministry of Internal Affairs and Communication) and the Ministry of Finance (MOF), who coordinate the allocation of national government transfers.

The two primary components of central government transfers are the Local Allocation Tax (LAT) and National Government Disbursements. LAT revenues are general-purpose grants that provide for a specified amount of national tax revenue to be set aside for disbursements linked to fixed spending requirements of local governments.[24] National Government Disbursements, on the other hand, are earmarked grants transferred locally for functions carried out jointly with the central government. In contrast to LAT, which automatically distributes revenue to local governments, National Government Disbursement revenues are under the greater discretion of the central government. Horiuchi and Saito (2003) find that the level of central-to-local government transfers in Japan varies by the level of political representation: districts that are overrepresented (i.e. more MPs per capita) tended to get more funds, while underrepresented districts got less. While local governments can issue bonds, expenses financed by local debt are limited to those needed for public enterprises, investments and loans, and for the construction of public facilities, and require authorization from the central government (ed. Bureau of Statistics, Japan 1998).

A significant portion of local revenues – 22% in FY1996 – is utilized for public works projects. Local construction investment has accounted for approximately 6% of GDP during the late 1980s and early 1990s (ESCAP 1995, Table II.7). While the lion's share of these projects is physically implemented and financed by local governments, the bulk of the policy planning on where and for whom these projects should be allocated is determined centrally by the MOC, MHA, and MOF (Muramatsu 1988). This control is stronger in the case of *joint* projects, which accounted for 32% of total public works expenditures between 1991-1998 (IMF 2000, Table II.6).

Given the high level of fiscal disconnect, there is significant opportunity for Japanese governments to increase pork-barreling when politically expedient. While the electoral system partially explains the propensity for politicians to *spend* on pork, voters *buy* this tactic because fiscal disconnect lessens the extent to which voters experience the tax burden from individual projects financed in their districts.

V. Conclusion

This paper has sought to accomplish two things in particular. First, we have advocated the usage of *residual capital expenditures at all level of governments* as the best aggregate measure of pork-barreling in a given country. Compared to other variables used in the literature such as overall government spending or government consumption, capital expenditure better captures the territorial-specificity and particularism that one associates with the very notion of "pork". At the same time, our data shows that subnational spending comprises a large proportion of total national expenditures, and hence cautions future researchers from relying solely on central government spending in their analyses.

Second, we have argued that a strong determinant of cross-national variance in pork-barreling is the level of *tax-benefit* disconnect, which is a crucial assumption that tends to be untested in theories whose insights lie with the "law of 1/N." Government accounts can be decentralized for either revenues or expenditures, and while the two are highly correlated, these measures reflect distinct political processes. When only expenditure is decentralized, local governments can spend without paying the total costs. Revenue decentralization, on the other hand, reflects the willingness by central governments to grant authority to tax to their subnational units, and hence lose control over the discretional use of those resources. Hence when only spending is decentralized, central governments can still earmark funds and dictate expenditures, but when revenues are also decentralized, politicians at the subnational levels decide both the collection and disbursement of funds. This distinction is crucial, since if all expenditures are financed by local revenue, then each district is fully responsible for paying for particularistic projects, and as such, the common pool problem – where each district's spending costs are shared by everybody – does not result.

In developing this research further, we intend to derive a more comprehensive theory of particularistic expenditures that better explains how institutional factors, such as presidentialism and the electoral system, interact with the government's fiscal regime, as captured by the disconnect variable. Existing studies argue that the presence of additional actors should decrease pork-barreling, since each political group – whether an independent president or a second legislative chamber – has distinct political incentives to veto other groups' excessive demands. This paper's statistical tests show, however, that presidentialism *increases* capital expenditures. Our intuition is that the presence of additional actors simply

augments the number of political demands that must be assuaged, resulting in a log-rolling of government spending.

A similar case can be made for the electoral system, measured by the district magnitude. The key insight of the "law of 1/N" has been interpreted as meaning that increasing the size of the legislature (N) should lead to higher government spending, since each district bears a smaller fraction of the total spending. A mechanical application of this hypothesis would not consider the nuance of electoral systems around the world, usually not based on single member districts. However, we argue that the important issue is to understand that when there is a high level of fiscal disconnect – breaking the one-to-one relationship between revenues and benefits – one should expect greater particularistic spending. At heart, the fiscal disconnect is the underlying factor that makes CPR problems generally *possible*.

Our ultimate goal is to produce a more theoretically compelling explanation that integrates the conditions which make excessive pork-barreling possible (such as the tax-benefit disconnect), with those that exacerbate the *level* of pork-barreling (such as additional actors within government). Using the dataset we have gathered for this paper, we hope to make further contributions to the literature on particularistic spending.

Figure 1:

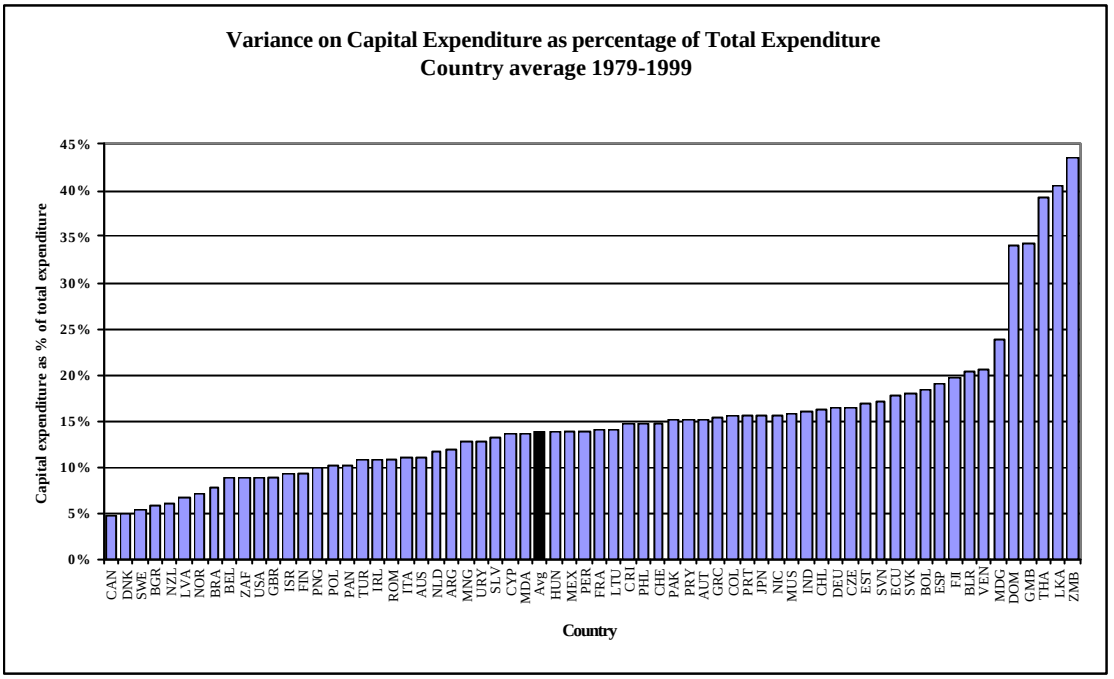

Variance on Capital Expenditure as percentage of Total Expenditure
Country average 1979-1999
Capital expenditure as % of total expenditure
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
CAN DNK SWE BGR NZL LVA NOR BRA BEL ZAF USA GBR ISR FIN PNG POL PAN TUR IRL ROM ITA AUS NLD ARG MNG URY SLV CYP MDA Avg HUN MEX PER FRA LTU CRI PHL CHE PAK PRY AUT GRC COL PRT JPN NIC MUS IND CHL DEU CZE EST SVN ECU SVK BOL ESP FJI BLR VEN MDG DOM GMB THA LKA ZMB
Country

Figure 2: Ternary Plot of the Distribution of Central vs. State vs. Local Capital Expenditures

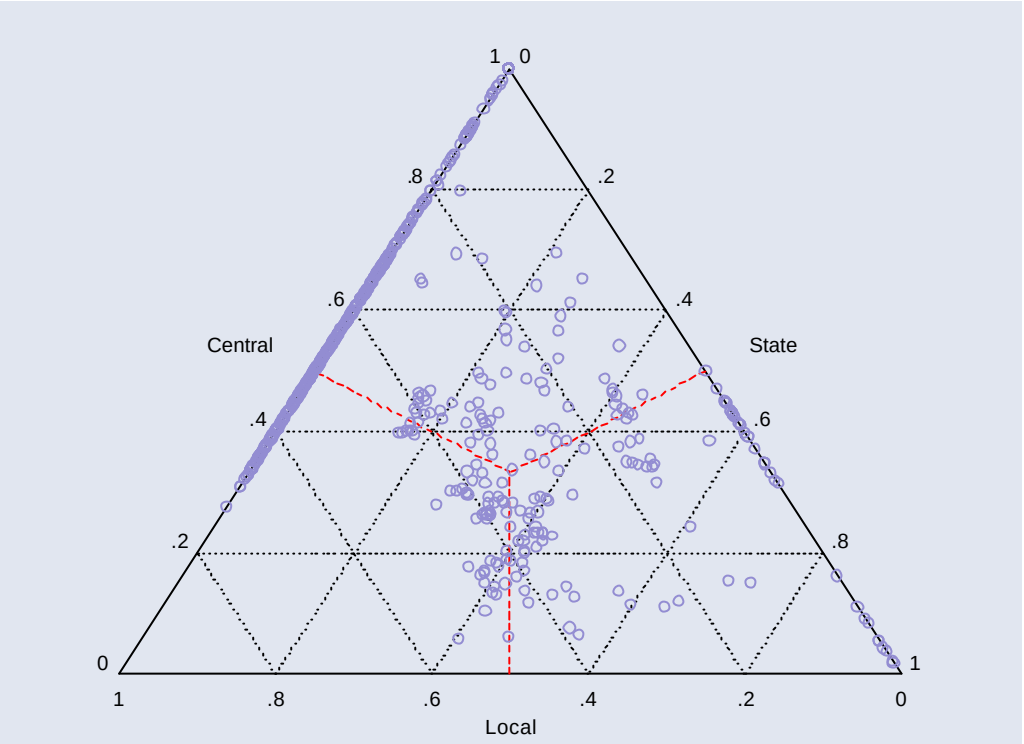


Table 1: Countries Examined in the Cross-Sectional Analysis

	Observations	% sample	Years in sample
Argentina	17	2.9	1983-1999
Austria	21	3.58	1979-1999
Belgium	20	3.41	1980-1998
Bolivia	14	2.39	1986-1999
Brazil	12	2.04	1985-1994, 1997-1998
Bulgaria	9	1.53	1991-1999
Canada	19	3.24	1979-1982, 1985-1999
Colombia	1	0.17	1986
Costa Rica	18	3.07	1982-1999
Czech Republic	4	0.68	1996-1999
Denmark	21	3.58	1979-1999
Dominican R.	7	1.19	1991-1993, 1996-1999
Ecuador	6	1.02	1989-1994
El Salvador	16	2.73	1984-1999
Estonia	4	0.68	1996-1999
Fiji	8	1.36	1979-1986
Finland	17	2.9	1981-1997
France	19	3.24	1979-1997
Gambia	6	1.02	1979, 1989-1993
Greece	20	3.41	1979-1998
Hungary	10	1.7	1990-1999
Ireland	19	3.24	1979-1997
Israel	17	2.9	1983-1999
Italy	10	1.7	1985-1989, 1995-1999
Latvia	4	0.68	1996-1999
Lithuania	7	1.19	1993-1999
Madagascar	3	0.51	1993-1995
Mauritius	19	3.24	1981-1999
Mexico	3	0.51	1997-1999
Moldova	4	0.68	1996-1999
Mongolia	1	0.17	1996
Netherlands	19	3.24	1979-1997
New Zealand	9	1.53	1981, 1992-1999
Nicaragua	4	0.68	1990-1993
Norway	20	3.41	1980-1999
Panama	11	1.87	1989-1999
Papua New Guinea	20	3.41	1980-1999
Paraguay	2	0.34	1992-1993
Peru	2	0.34	1990-1991
Philippines	1	0.17	1992
Poland	6	1.02	1994-1999
Portugal	12	2.04	1987-1998
Slovakia	4	0.68	1996-1999
South Africa	8	1.36	1992-1999
Spain	18	3.07	1980-1997
Sweden	21	3.58	1979-1999
Switzerland	13	2.21	1981-1984, 1991-1999
Thailand	8	1.36	1992-1999
Turkey	17	2.9	1983-1999
United Kingdom	17	2.9	1979-1995
Venezuela	16	2.73	1984-1999
Zambia	3	0.51	1992, 1994-1995

Table 2 Estimations of the Determinants of Capital Expenditure

Models 1-2, 4: DV = Capital expenditure as percentage of total expenditure (log) **Model 3: DV = Capital expenditure as percentage of total expenditure** **Model 5: DV = Government consumption (G) as percentage of GDP (log)**					
	(CapEx log) ***All levels*** **Random Effects GLS Model 1**	**(CapEx log)** ***Central*** **Random Effects GLS Model 2**	**(CapEx)** ***Subnational*** **Random Effects *Tobit* Model 3**	**(CapEx log)** ***Subnational*** **Random Effects GLS Model 4**	**(G log)** ***Total*** **Random Effects GLS Model 5**
Real GDP per capita (log)	-0.1593** (0.8029)	-0.3325*** (0.1079)	0.0099* (0.0055)	–0.0516 (0.0898)	-0.6612*** (0.0806)
Interest rate (log)	-0.0454*** (0.0163)	-0.2064*** (0.0224)	0.0090*** (0.0017)	0.0516*** (0.0135)	0.0567*** (0.0165)
District magnitude (lower house)	-0.0025** (0.0012)	-0.0024 (0.0016)	–0.0002*** (0.0001)	–0.0023** (0.0010)	0.0032*** (0.0012)
Presidential	0.1831** (0.0908)	0.1936 (0.1230)	–0.0037 (0.0002)	–0.0301 (0.0938)	-0.2963*** (0.0914)
Disconnect	0.0106*** (0.0034)	-0.0014 (0.0046)	0.0004* (0.0002)	0.0096*** (0.0027)	0.0037 (0.0034)
Rural Population	0.0149*** (0.0035)	0.0137*** (0.0046)	0.0025*** (0.0002)	0.0197*** (0.0047)	-0.0057 (0.0035)
Constant	3.4008*** (0.8301)	5.2347*** (1.1166)	–0.0401 (0.0570)	2.4783*** (0.9146)	4.1672*** (0.8335)
P<.1 (*), <.05 (**), <.01 (***)					
N	587	587	587	417	587
Groups	52	52	52	38	52
Average Obs. per group	11.3	11.3	11.3	11.0	11.3
R2 – Within	0.10	0.15		0.16	0.19
R2 – Between	0.37	0.45		0.05	0.35
R2 – Overall	0.23	0.30		0.15	0.38
Sigma-u	0.4003	0.5136	0.1152	0.5486	0.3878
Sigma-e	0.2579	0.3604	0.0355	0.1915	0.2572
Rho	0.7067	0.6700	0.9133	0.8914	0.6945

Figure 3: Alternative Measures of Particularistic Spending

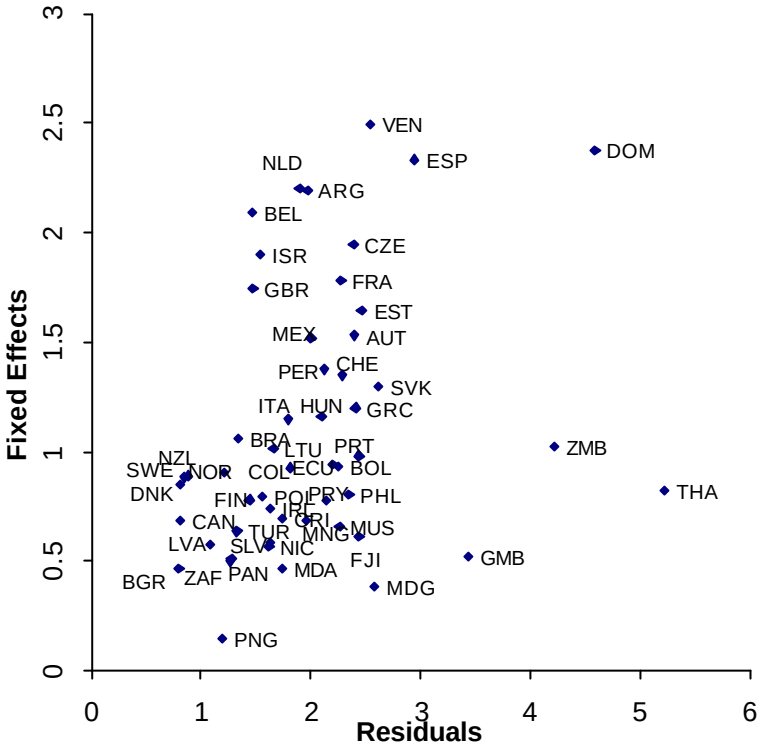
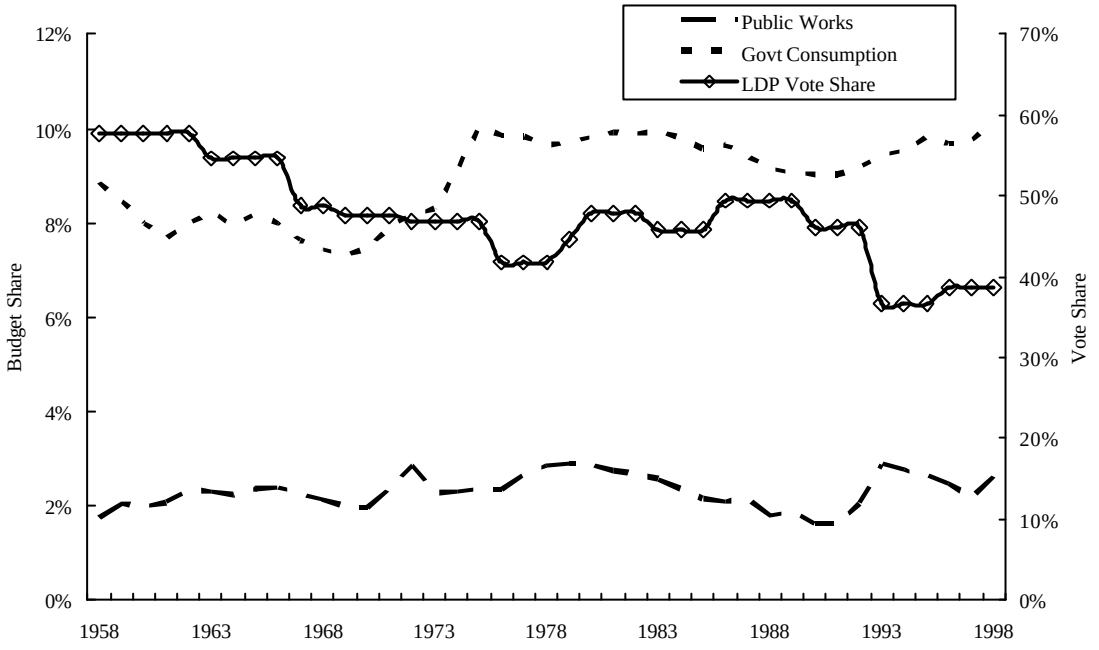


Figure 5: LDP Support, Particularistic Spending, and Government Consumption in Japan



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[1] "Pork barrel came into use as a political term in the post-Civil War era. It comes from the plantation practice of distributing rations of salt pork to slaves from wooden barrels" (C-SPAN Congressional Glossary. Consulted On-Line, February 21, 2005, http://www.c-span.org/guide/congress/glossary/porkbarr.htm)

[2] Critics often define pork as projects which are too expensive. However, price need not be a distinguishing trait of pork. Taxpayers may complain because public spending is inefficient, or because they would rather have public money spent for other purposes. It may be true that the cost paid for a project is high as compared with market prices, but it might also be the case that the project is priced correctly, and still constitute pork. Pork projects tend to be expensive

single items, rather than multiple small items which might be less visible and tangible.

[3] In the US this will usually mean Congressional districts, but various electoral systems define the politically relevant geographic units in various ways, which are distinct from single-member districts.

[4] Perhaps the best analysis of this disconnect from a political economy perspective, mostly focusing on debt and the subnational bailout problem, can be found in Rodden, 2006.

[5] In this sense, this paper is related to the vast literature on fiscal federalism, although that is not its essential focus.

[6] Although further research is still needed in order to assess the effects of these institutional features, our initial findings also suggest that after controlling for fiscal decentralization, variables that have been proposed in the literature, such as the number of districts or legislators, are not consistently significant determinants of pork spending.

[7] Although see the creative use of wage data in Argentina by Calvo and Murillo (2004).

[8] Specifically, capital expenditures contain 1) the acquisition of fixed capital assets; 2) purchases of stocks; 3) purchases of land and intangible assets; 4) domestic capital transfers to other levels of government, to non-financial public enterprises, and to private financial institutions and other industries (also some transfers abroad).

[9] We coded countries as democracies if they had a score of 6 or higher in the Polity index for any given year (Marshall and Jaggers, 2002).

[10] GFS is the most comprehensive dataset on public expenditure for both developed and developing countries which uses a consistent methodology. The source of this data is national governments' reports to the IMF, but there are discrepancies between the GFS figures and official national statistical data. These accounting issues are exacerbated during moments of

public finance disarray and hyperinflation, when the data is less reliable. Hence, although we are aware of such data issues in more than one country, we are limited by our effort at comparability to use the GFS data, defective as it might be.

[11] Devarajan, Swaroop and Zou (1996) also find that the only part of the budget that seems to enhance growth in developing countries is current expenditures. In OECD countries, on the other hand, Devarajan Swaroop and Zou (1996) show that the relationship between the share of capital expenditure and growth is positive. Such findings are at odds with neoclassical growth models, where public expenditure is posited to increase the capital stock, and thereby complement private sector productivity, particularly in poor, capital-deprived countries. Devarajan, Swaroop and Zou (1996) provide a model which explains these findings, in line with the distinction made by Aschauer (1989) between productive and unproductive government expenditure. In their view, developing countries have misallocated public expenditure by spending too much on capital goods.

[12] Public expenditure reports, commonly carried out by banks in numerous countries, often find substantial projects with no justifiable economic purpose (Devarajan, Swaroop and Zou, 1995). Kaufman and Wang (1995) calculate that around 30% of World Bank social sector projects in countries characterized by fiscal deficits, overvalued exchange rates, distortionary trade policies, price distortions, and negative interest rates, did not have satisfactory rates of return. This contrasts with dynamic, neoclassical economic models in the tradition of Arrow and Kurtz (1970), which suggest that optimal public capital formation is where the marginal rate of return to government capital should equal the interest rate (i.e. the price of capital). Empirical studies show, however, that rates of return from specific projects are often below the marginal productivity of public capital expenditure.

[13] From Penn World Tables

[14] United States Senator Robert Byrd's famous quote illustrates this, "One man's pork is another man's job."

[15] This control is also utilized by Bradbury and Crain (2001) and Milesi-Ferreti et al. (2001).

[16] Electoral system variables are calculated from the "particularism database", constructed by Seddon, Gaviria, Panizza, and Stein (2000). Where data was incomplete or in case of any doubt, we cross-referenced our findings with information from the "Database of Political Institutions 2000" (Beck et al, 2001), Henisz's "Political Constraints" database, and the *Political Handbook of the World*. When coding our data, we only counted seats and districts if their legislators were actually *elected*. Seats decided by appointment are excluded from the count.

[17] We thank an anonymous referee for the suggesting that we explore more fully the subnational features of our dataset.

[18] An error correction model estimated to our data produced rather implausible results: the only variables that explain the level of particularistic spending are changes in rural population and changes in GDP. Most other first difference variables and every level variable turn out to be statistically *not* significant according to the estimation. To a large extent this is an artifact of the data: institutional changes are so rare that we are unable to estimate the effect of changes in presidentialism, bicameralism or district magnitude on particularistic spending.

[19] Unreported estimates were made in which the number of legislators, the number of legislative districts, the existence of upper chambers, and other institutional variables were used as independent variables. Those variables failed to reach statistical significance and often their signs were reversed from what has been found in other studies in the literature. We leave

this issues, however, for future research.

[20] The Public Finance Law [Law No. 34 of 1947] reads: "Article IV Any expenditure of the State shall be covered by revenues other than public bonds or borrowings. However, public works, investments, and loans can be financed by the issuance of public bonds or borrowings within a specific amount approved by the Diet."

[21] If anything, this measure actually *under*estimates the true magnitude of public works spending in Japan, because it does not take into account construction expenditures allotted through supplementary stimulus packages. Between 1993 and 1999, seven stimulus packages were legislated by the Diet, contributing to massive construction outlays. Moreover, national accounts figures do not include funds funneled through the Fiscal Investment and Loans Program (FILP). FILP allows considerable money from postal savings and public pensions, channeled through the Trust Fund Bureau of MOF, to be lent for public works, and their total magnitude actually *outstrips* general budget allocations.

[22] Jiji Tsushin is the rough equivalent of the Associated Press (AP) in Japan. Thanks to Steven Reed for this data.

[23] Although not reported here, we also tested the relationship between LDP vote share and public works spending using a linear regression (OLS) model. Our dependent variable was public works expenditures as a share of total government expenditures. The independent variables included: the normal and squared vote shares of the LDP; the share of government consumption in GDP (as a control for total budget size); share of the public sector in construction space, measured as floor space in square meters (which captures public sector participation in the construction industry in general); and the lagged value of public works from the previous year. We find that LDP vote share is the best predictor of public works

spending; simulations showed that expenditures increased exponentially as the party's electoral performance approached 50%. Contact authors for more information.

[24] Total LAT funds are determined by a fixed formula and serve to reapportion local revenue from the more affluent jurisdictions – mainly in metropolitan areas – to the less populous regions. They can be adjusted annually to compensate for cyclical shortfalls in tax revenues, and the specific distribution is subject to negotiation between MOF and MHA. There is also a third revenue source – Local Transfer Taxes – which are taxes collected by the central government but reverted automatically to local governments. Examples include the local road tax and special tonnage tax, but they only account for 2-3% of local government revenue.