WHAT DRIVES PUBLIC EMPLOYMENT?

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ABSTRACT

Excessive levels of government employment is one of the most frequent complaints made

about public-sector governance in developing economies. The explanation typically offered is that

governments have used public-sector employment as a tool for generating and redistributing rents.

This paper suggests an alternative hypothesis for government employment practices: relatively safe

government jobs represent partial insurance against undiversifiable external risk faced by the

domestic economy. By providing a larger number of "secure" jobs in the public sector, a

government can counteract the income and consumption risk faced by the households in the

economy. I show that countries that are greatly exposed to external risk have higher levels of

government employment and have experienced faster rates of growth of government consumption.

The basic finding on the (partial) correlation between government employment and exposure to

external risk is robust against the alternative hypothesis that government employment has been

driven by considerations of rent-seeking and rent distribution.

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I. Introduction

Excessive levels of government employment is one of the most frequent complaints made

about public-sector governance in developing economies. "Bloated bureaucracies and over-

staffed public enterprises are ... among the less tackled legacies of a long history of state-led

development," writes Rama (1997). The World Bank's Africa adjustment report concludes:

"civil services are larger than countries need, more costly than they can afford, and less effective

and productive than they should be" (World Bank 1994, 121). A recent IMF study of

government spending finds "an excessive number of ministries, duplications of functions, or the

existence of ghost workers as major instances of unproductive spending." (IMF Survey,

February 24, 1997, p. 50). "The civil services of many developing economies today are too

large, too expensive, and too unproductive," notes Lindauer (in Lindauer and Nunberg 1996, p.

28).

Cross-country growth regressions typically find a negative relationship between levels of

government consumption and long-run growth (see for example Commander et al. 1996). Figure

1 shows one set of results: controlling for other determinants of growth (such as initial income,

human capital, and relative price of capital goods), there is a strong negative relationship

between the average share of government consumption in GDP during the period 1960-89 and

the average rate of growth over the same period. There are some interpretational problems with

cross-sectional results of this form (Slemrod 1995), but the idea that big governments have been

detrimental to economic performance is one that is widely held among development

practitioners. Since the wage bill is a significant part of government consumption expenditures,

over-staffing is a key determinant of high levels of government consumption.

Public-sector employment has grown in most countries of the world since the early post-war years. But this growth was especially marked in Latin America and sub-Saharan Africa. Table 1 shows some descriptive statistics on trends in government consumption between the early 1960s and the late 1980s. The mean (median) increase in the share of government consumption in GDP was 25 percent (25 percent) in the OECD countries, whereas it was 72 percent (47 percent) in Latin America and a stupendous 91 percent (76 percent) in sub-Saharan Africa. The increase in government consumption was comparatively modest in East Asia.

Why have so many developing countries created bloated public sectors? The reigning explanation is that governments have used public-sector employment as a tool for generating and redistributing rents. For example, in a widely cited paper, Gelb et al. (1991, 1186) state: "Consistent with theories of rent seeking behavior, public sector surplus labor is viewed in this paper as the consequence of lobbying for more high wage (and high-rent) employment." The fact that public-sector employment has expanded the most in Africa and in Latin America, regions most associated with pervasive rent-seeking behavior, is certainly consistent with this view. Anecdotes of public-sector jobs being used as part of a political spoils system are widespread.

Upon closer look, there are reasons to suspect that rent-seeking is not the entire (or even a large part) of the story. Consider three examples: Mauritius, Botswana, and Barbados are countries that stand out in their respective regions as having extremely high levels of government employment. The shares of the labor force employed by the general government (i.e., central and local governments, but excluding para-statals) stood at 16 and 8 percent in the early 1980s in Mauritius and Botswana, respectively, compared to a sub-Saharan median of 3 percent. In

Barbados, the same figure was 23 percent, almost three times the Latin American median of 8 percent. None of these countries is known for high levels of rent-seeking or political corruption. In fact, Botswana and Mauritius are Africa's two success stories in terms of good governance and economic growth.

What these three countries have in common is that they are all small open economies, with a high degree of susceptibility to shocks of an external origin. This suggests an alternative hypothesis for government employment practices: relatively safe government jobs represent partial insurance against the undiversifiable external risk faced by the domestic economy. By providing a larger number of "secure" jobs in the public sector, a government can counteract the income and consumption risk faced by the households in the economy. While only those employed in the public sector are direct beneficiaries of such insurance, the benefits can be spread throughout the economy through informal risk-sharing arrangements within extended families.[1]

There are some hints in the literature that government employment programs have often been targeted explicitly on income security and that they have been used as a form of social insurance. Governments, particularly those in Africa, have frequently provided guaranteed employment for school graduates. Countries where governments have acted as employers of last resort in this fashion include Mauritius, as well as Benin, the Central African Republic, Cote d'Ivoire, Egypt, the Congo, Guinea, Mali, Rwanda, Somalia, Sri Lanka, and Sudan (van

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[1]There is a fair bit of casual evidence on the importance of risk-sharing arrangements within extended households in developing countries. See Rosenzweig and Stark (1989) for evidence from rural India on how marriage patterns reflect risk-sharing considerations.

Ginneken 1990; Gelb et al., 1991). Agenor (1996), among others, notes that public-sector employment has been used in many countries to offset the negative employment effects of adverse shocks. There is also evidence that government jobs tend to be safe, at least relative to jobs in the informal sector or in export activities. As Robinson (1991, 25) notes:

> The permanent status that many, in some cases the majority of, civil service employees enjoy means that apart from dismissal for grave disciplinary reasons they are assured of employment until retirement, providing a degree of protection and privilege not found in the private sector.

During the 1980s and 1990s, when public-sector retrenchment became a global phenomenon, reduced expenditure on the wage bill has typically been achieved through erosion of real earnings rather than layoffs (Robinson 1991).

But in general existing studies have paid little attention to the social insurance motive in government employment. Two recent collections of essays on public-sector employment practices in the developing countries (van Ginneken 1991 and Lindauer and Nunberg 1996) provide interesting case studies, but say little about income security issues. Neither have cross-national statistical studies put much emphasis on public employment as social insurance, except fin the context of short-term counter-cyclical efforts to reduce unemployment (see Kraay and van Rijckeghem 1995 for a recent study which undertakes cross-country and panel regressions on employment in the public sector). Agenor's (1996) excellent recent survey on labor markets in developing countries is also silent on this. One consequence of this oversight is that the importance of putting alternative social insurance mechanisms in place as government payrolls are slashed has not been sufficiently emphasized.

In this paper, I provide some cross-national evidence that suggests income security motives have been an important determinant of government employment levels. In particular, I will show that countries that are greatly exposed to external risk have higher levels of government employment and have experienced faster rates of growth of government consumption. Strikingly, once exposure to external risk is controlled for, the experience of sub-Saharan Africa with public-employment expansion turns out to be statistically indistinguishable from that of other regions. Our basic finding on the (partial) correlation between government employment and exposure to external risk appears to be robust. It is robust, in particular, against the alternative hypothesis that government employment has been driven by considerations of rent-seeking and rent distribution.

II. A Model

We begin with a model that shows how public employment can play a welfare-enhancing social insurance role in an economy buffeted by external shocks. The model, taken from Rodrik (1997), is the simplest framework in which the central assertion of this paper can be demonstrated.

For the purposes of the model, we assume that volatility in the word prices of the goods traded by the economy is the only source of risk. In particular, we assume that employment and incomes in the public sector are completely non-stochastic. This is an extreme assumption, which facilitates the algebra. In practice what matters is that the public sector be the "safer" sector relative to the private sector. There is some anecdotal evidence in support of this (mentioned in the introduction). There is also systematic statistical evidence suggesting the same

(see Rodrik 1997).[2]

In a model in which the government sector's expansion comes at the expense of

production for world markets (and in which government consumption is non-stochastic), the risk-

reducing effect of government employment would be direct and immediate. Standard portfolio

arguments suggest that an increase in the riskiness of exports would call for a reallocation of the

economy's labor force towards the safe activity (government), even when the return to

government activities lies below the (mean) return to other activities. The presence of a

complete set of state-contingent markets at home would not affect this conclusion as long as the

technology employed in government production is not available to the private sector. This is

because external risk is not diversifiable domestically. Moreover, the same logic holds even

when the public sector does not compete for resources with the export sector, provided that trade

risk spills over to other sectors with which public production does compete for resources.

Hence consider an economy with a fixed endowment x of an export good, and which

produces two additional goods: a publicly-provided good and a private good. The economy also

has a fixed labor supply normalized to unity, with λ employed in the public sector and 1-λ in the

private sector. Let π denote the (stochastic) price of the export good in terms of the import good

(i.e., the terms of trade). We assume that the export good is not consumed at home, and that the

import good is not produced domestically. Trade is balanced continuously, so the home

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[2]In Rodrik (1997), I analyzed the time-series of the components of national accounts for 147 countries. Based on the historical pattern of variances and covariances of these components, I calculated that a small increase in the share of government consumption in GDP would result in a reduction in the variance of the growth rates of aggregate income in the vast majority of countries (119 out of 147).

economy can purchase πx quantity of imports.

We treat imports as intermediate goods (which accords with reality) and assume that they increase the productivity of private production domestically. This allows us to write the output of the private good as πx(1-λ). Note that by making domestic productivity a function of the level of imports, we have captured one plausible channel through which trade risk spills over to the domestic economy.[3] There is strong evidence of such spillovers in the data, as shown in Rodrik (1997). (Expressing private production as a linearly homogeneous production function of the form f(πx, 1-λ) would not alter any of the qualitative results below, but would add several terms to the algebra.) Finally, the supply of the publicly-provided good is given by h(λ), with h'> 0 and h"<0.

The government determines the size of the public sector (λ) before the specific realization of π is known. We can regard this as the optimal determination of the size of the public sector in view of the underlying variability of the terms of trade. For simplicity, let the publicly-provided good and the private good be perfect substitutes in consumption. The government's problem is the following:

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[3]See also the applied general equilibrium model of Bourguignon, Lambert and Suwa-Eisenmann (1996), calibrated to data from the C'ôte d'Ivoire, which studies the transmission of terms-of-trade risk to the domestic economy and to various income groups under alternative "closure" assumptions.

$$\underset{\lambda}{\text{Max}} \quad V(\lambda) \equiv E[u(h(\lambda) + \pi x(1-\lambda))]$$

where u(.) stands for the utility function of the representative household, with u'(.) > 0 and u"(.) < 0. Note that the use of a representative household in this context is legitimate as long as there is risk sharing among members of the extended family. With this assumption, we can think of λ as the proportion of family members that are employed in the public sector.

Let π be distributed normally with mean π_m and variance σ^2. Taking a second-order Taylor approximation to u(h) + πx(1-λ)) around π_m, and taking expectations, we can express V(λ) as follows:

$$V(\lambda) \approx u(h(\lambda) + \pi_m x(1-\lambda)) + \frac{1}{2}u''(h(\lambda) + \pi_m x(1-\lambda)) (1-\lambda)^2 x^2 \sigma^2$$

Expected utility is decreasing in the variance of the terms of trade. Define R = xσ as our measure of exposure to external risk. The associated first-order condition is:

$$[u'(.) + \frac{1}{2}u'''(.) (1-\lambda)^2 R^2] (h'(\lambda) - \pi_m x) - \frac{1}{2}u''(.) R^2 = 0.$$

A sufficient condition for the first term in square brackets to be positive is that the representative household exhibit "prudence" in consumption (i.e., that u'''(.) > 0), which we assume. A direct

implication is that exposure to external risk ($R > 0$) results in the optimal level of λ to be <u>larger</u>.

Hence consider two economies A and B, with $R_A = 0$ and $R_B > 0$, but identical in all other respects. The first-order condition for the A-economy simplifies to $h'(\lambda_A) = \pi_m x$. For the B-economy, $h'(\lambda_B) < \pi_m x$. Since $h''(.) < 0$, we have $\lambda_B > \lambda_A$.

As the model makes clear, it is critical to the argument that the technologies for private and public production be different. This difference can derive in practice from the distinct nature of the goods that are typically considered to be public goods--public administration, law and order, and national defense. It can also result from the divergent incentive and governance structures that characterize production in the two sectors. But ultimately whether public production exhibits different stochastic properties than private production is a question that can be settled only empirically (Rodrik 1997).

III. The Evidence

I will use four measures of government employment. The first three come directly from labor-force statistics, and refer to employment by (a) general government (GOVEMPL); (b) total public sector (PSEMPL); and (c) central government (CGEMPL). These data come from the World Bank's newly-assembled Labor Market Data Base, which has been pieced together from a variety of national and international sources (Rama 1996). It is difficult to obtain comparable cross-country data on employment for a large sample of countries. Hence, the maximum sample size for any of these variables is 76 countries for the mid-1980s in the case of GOVEMPL. In view of this shortcoming, I will supplement my analysis on employment with data on real

government consumption (as a share of GDP) from the Penn World Tables (GOVCONS). The latter are available for more than 130 countries and have the added benefit that they can be used to analyze changes over time.

Descriptive statistics on these four measures are shown in Table 2. Note that in sub-Saharan African countries public employment constitutes a very small fraction of total employment (4.6 percent, versus 14.7 percent in the OECD, 9.5 percent in Latin America and 8.0 percent in East Asia). But government consumption is extremely high as a share of GDP. This reflects the low relative productivity of agriculture in Africa, where a majority of the labor force resides.

Table 3 shows the correlation structure among our four measures. The simple correlation between government consumption and the employment-based indicators is weak (and generally negative). This may suggest that my use of government consumption as a proxy for public employment will be misleading. However, controlling for per-capita income, government consumption does turn out to be a good predictor of government employment. Regressing GOVEMPL on GOVCONS, per-capita, income and a sub-Saharan Africa dummy yields the following results:

$$\log \text{GOVEMPL} = \underset{(1.01)}{-4.12} + \underset{(0.08)}{0.53 \log (\text{income/cap.})} - \underset{(0.18)}{0.44 \text{ SSA}} + \underset{(0.18)}{0.68 \log \text{GOVCONS}}$$

$$R^2 = 0.68 \quad N = 75$$

(standard errors are in parenthesis). The fit of the regression is high, and the coefficient on log(GOVCONS) is statistically indistinguishable from unity by conventional statistical

standards. Since the regressions below will all include per-capita income and a sub-Saharan

Africa dummy on the right-hand side, using GOVCONS as an indicator of public employment

seems to be an acceptable way of enlarging the sample size that is available to us.

The measure of exposure to external risk that I will use is the one suggested by theory

(and the model above). The product of the volume of trade with the unanticipated component of

variability in the external terms of trade is the theoretically appropriate measure of external risk,

as it yields the unpredictable variation in the streams of incomes associated with foreign trade.

Hence let x, m, and y stand for the volumes of exports, imports, and GDP respectively, and π

represent the terms of trade. Let π follow a random walk (possibly with drift). My measure of

exposure to external risk is:

$$R = \frac{x+m}{y} \; x \; st.dev \; (d \; \log \; \pi).$$

(Strictly speaking, this is twice the appropriate measure, as I sum the volume of exports and

imports to eliminate the effect of trade imbalances.) The measure that I will use in the

regressions below is calculated using terms-of-trade data for the period 1971-90. Trade shares

are averaged over a ten-year period (generally 1975-84) prior to the date corresponding to public

employment. The results reported below are not sensitive to these choices over timing, as terms-

of-trade instability and trade shares tend to be persistent over time.

The volume of trade which enters the calculation of R is endogenous, and it is arguably influenced by the scope of public-sector employment. So I will also use a different version of R, called R_{inst}, which uses an instrumented version of the volume of trade. I take this instrument from Frankel and Romer (1996), who have calculated the exogenous component of trade for a large cross-section of countries using a gravity model. Frankel and Romer's approach is to isolate the volume of trade that each country would be "naturally" undertaking based on geography and the income levels of itself and its trade partners. (Incomes are themselves instrumented by factor supplies.) This approach yields a volume of trade which in principle is not influenced by country-specific policy configurations. The measure R_{inst} substitutes the Frankel-Romer volume of trade (after multiplying it by two, to make it comparable to R) into the formula above.[4] R_{inst} can be interpreted as the exogenous component of exposure to external risk.

Table 4 shows a set of regressions where the dependent variables are the four indicators of public employment. For each indicator, results are reported separately for the two measures of external risk, R and R_{inst}. Aside from external risk, the explanatory variables included are per-capita income, urbanization, and regional dummies for sub-Saharan Africa and East Asia. Public employment tends to be increasing in per-capita income and decreasing in urbanization, whereas the opposite is true for government consumption expenditures. The coefficient on the East Asian dummy is staistically significant and positive in the regression for CGEMPL but negative in the regression for GOVCONS. The dummy for sub-Saharan Africa is not statistically significant in any of the specifications. I have tried other explanatory variables and a larger set of regional

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[4]The correlation between the actual volume of trade and the Frankel-Romer instrument is between 0.5 and 0.6.

dummies (including one for Latin America), but did not find any that enter with a statistically significant coefficient. Note that the fit of the regressions, once exposure to external risk is included, is quite good. The R^2 for the GOVEMPL regressions is 0.65-0.66.

The coefficient on the risk variables is positive and statistically significant at either the 99 percent or 95 percent level in all of the regressions. The magnitude of the coefficient varies from 0.02 to 0.09 depending on the specification. By doing the appropriate transformations, we can gauge the economic significance of these estimates. These numbers imply that an increase in income risk due to trade of 1 percentage point of GDP is associated with an increase in the share of public employment of between 0.3 and 1.1 percentage points. Hence the estimated effects are large. Note moreover that the estimated coefficients are generally quite a bit larger when the instrumented version of external risk is employed. Hence there is little reason to suspect that our estimates are distorted by simultaneity bias. When our sample is restricted to lower-income countries, the estimated coefficients on the risk term generally become larger (results not shown). This last finding is consistent with the idea that richer countries can provide social insurance through mechanisms more efficient than public employment, such as income transfers.[5]

These results on the importance of external risk have recently been replicated in a paper by Rama (1997) using a somewhat different econometric specification. Rama uses the same measure of exposure to external risk as employed here, but increases the country sample by using up to three observations per country, when employment data are available for different decades. This yields a maximum sample size of 121. His base specification includes a squared term for

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[5]This idea receives support in the regressions on social security and welfare spending reported in Rodrik (1997).

per-capita GDP, and all variables enter in levels (rather than in logs). In all cases, he finds the coefficient on exposure to external risk to be positive and statistically significant at the 99 percent level.

A closer look at the underlying data reveals that the strong positive relationship revealed by the regressions is identified, at least in the case of the first three sets of regressions, by a relatively small number of economies with very high exposure to external risk. Figure 2 shows a scatter plot based on the regression in the second column of Table 4. The countries with large government employment levels not explained by other factors are small economies like Barbados, Jordan, Mauritius, Oman, and Syria with very high degrees of exposure to external risk. A recent paper by Alesina and Wacziarg (1997) has emphasized country size as a determinant of the size of the public sector. However, what seems to matter is exposure to risk rather than country size. When population and land area are added to the regressions in Table 4, these measures of country size do not enter significantly and neither the magnitude nor the statistical significance of the coefficients on R is affected (see Table 5). Moreover, it is reassuring that exposure to external risk continues to play an important determining role when government consumption expenditures is substituted for public employment, in which case the sample size becomes considerably larger (see the last two columns of Table 4). The scatter plot for government consumption is shown in Figure 3.

As noted in the introduction, a common explanation for high levels of public employment is the creation and distribution of rents by government officials. We can test for this possibility, and also check its validity against the social-insurance motive analyzed here, by controlling for the presence of natural-resource rents and asking whether this affects our conclusions and/or

increases the explanatory power of our regressions. Note that terms-of-trade risk tends to be highest in countries that rely on primary exports. If these are also the countries where governments have had easy access to rents, and where governments have chosen to distribute these rents through employment creation in the public sector, our results may well be capturing a very different, rent-related phenomenon.

I use four different indicators of natural-resource rents: (a) the share of primary products in exports (PRIMSHR); (b) a dummy for oil exporters (OIL); (c) the sum of positive terms-of-trade shocks (TOTPOS); and (d) the sum of positive terms-of-trade shocks, but excluding observations where the terms-of-trade improved by less than 25 percent per annum (TOT25POS). The interpretation of the first two variables is clear. The last two variables are meant to capture the idea that governments tend to treat positive income shocks as an opportunity to expand spending while negative income shocks have a much more muted effect in the opposite direction. If true, this asymmetry would suggest that it is mainly positive terms-of-trade shocks that matter for the expansion of public employment. The variable TOT25POS reflects a further refinement of this notion, and is motivated by the possibility that governments respond to improvements in the terms of trade in the hypothesized manner only when the positive shock is large (i.e., when the terms of trade improve by 25 percent or more). Each of these variables is entered in the regressions in interaction with the volume of trade as a share of GDP (TRADE), as this is the right scaling in this context.

Our four measures of resource rents are highly correlated with terms-of-trade risk. The correlation coefficients between st.dev.(dlog π), on the one hand, and PRIMSHR, OIL, TOTPOS, and TOT25POS, on the other, are 0.46, 0.42, 0.65, and 0.60, respectively. So our

ability to distinguish statistically between the social-insurance and resource-rents hypotheses is naturally limited. Nonetheless, the results reported in Table 6 are interesting. The magnitude of the estimated coefficient on external risk is not affected by the inclusion of any of the rent-related variables. If anything, this coefficient becomes larger when the other variables are added (see last column). Moreover, the external risk variable remains statistically significant in all of the specifications, despite the collinearity problem noted above. Finally, the resource-rent indicators are never statistically significant once exposure to external risk is controlled for, and their estimated coefficients tend to be negative. Perhaps surprisingly, the data reveal no indication that resource rents have contributed to bloated public sectors. The evidence that public employment is influenced by social insurance considerations is considerably stronger.

We next turn to the growth in government employment, which as discussed previously has been significant, particularly in many African countries. Due to data limitations, we focus on the increase in government consumption, rather than employment per se. Our specific measure is the log difference in average government consumption (as a share of GDP) between the periods 1960-64 and 1985-89.

The first column of Table 7 shows an initial regression with only regional dummies on the right-hand side. The estimated coefficients for sub-Saharan Africa and Latin America are both positive, with the first statistically significant at the 99 percent level. This reflects the fact that countries in these two regions have experienced faster growth in the public sector than other countries. The rest of the columns in the table show what happens as we include additional explanatory variables on the right-hand side. Before we discuss these additional regressors, it is worth noting that the effect of controlling for other determinants is to turn the dummies for Latin

America and sub-Saharan Africa insignificant. Meanwhile, the East Asian dummy, which is negative, becomes highly significant. Hence, once we have a fuller specification for the growth in the public sector, it is the behavior of East Asian countries that becomes anomalous; the experience of the other countries is fully explained by the economic variables in the regressions.

We first control for the initial level of government consumption in 1960-64 (column 2). This has the effect of greatly improving the fit of the equation, with the R^2 jumping from 0.07 to 0.44. The negative coefficient on the initial level of GOVCONS suggests a strong "convergence" effect. We then sequentially add initial per-capita income and urbanization. Initial income enters negatively, but is no longer significant once urbanization, which has a negative sign as well, is also included. Next, we add our measure of exposure to external risk (R), which enters with a positive and highly significant coefficient (column 5). Finally, we include one of the measures of resource rents used previously (TRADE x PRIMSHR). The collinearity between these last two variables is somewhat of a problem, as discussed previously. When they are both entered in the regression (see last column of Table 7), the estimated coefficient on R is reduced by half, and it remains statistically significant at the 90 percent level only. In this case, unlike previously, the coefficient on the resource-rent variable (TRADE x PRIMSHR) is also statistically significant, albeit at the 90 percent level.

Hence, we are unable to distinguish between the social-insurance and resource-rents hypotheses when it comes to explaining the growth of government consumption since the early 1960s. The evidence in Table 7 suggests that both motives have played a role.

IV. Concluding Remarks

To sum up, the statistical evidence is fairly suggestive. Exposure to external risk is closely, and apparently robustly, associated with levels of government employment across a broad cross-section of countries. The evidence on this appears stronger than the evidence for the hypothesis that public employment has been spurred by rent considerations. Moreover, exposure to external risk is also correlated with the expansion of government consumption (and presumably employment) since the 1960s, although in this case it is more difficult to discriminate between the social-insurance hypothesis and the rent-distribution hypothesis. Hence there is considerable support for the idea that social-insurance and job-security considerations have been an important determinant of public employment practices.

This conclusion is a useful counterweight to the view that the expansion of public employment in the developing countries has been driven largely by the desire to create and distribute rents to favored segments of the urban population. There is enough anecdotal evidence to suggest that the rent hypothesis cannot be dismissed easily. But a more benign motive, that of providing social insurance through job creation, accounts quite well for the cross-country differences in the extent of public employment. Hence, creating social safety nets may be an important prerequisite for achieving sustainable reduction in public-sector employment.

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Table 1: Growth of government consumption in different country groups

	Percent increase in government consumption as a share of GDP between 1960-64 and 1985-89		number of countries
	mean	median	
All countries	61	44	120
OECD	25	25	24
East Asia	27	37	10
Latin America	72	47	24
Sub-Saharan Africa	91	76	42

Source: Author's calculations from Penn World Tables data.

Table 2: Descriptive statistics on government employment

	general government employment, GOVEMPL (% of labor force)			public sector employment, PSEMPL (% of labor force)			central government employment, CGEMPL (% of labor force)			real government consumption, GOVCONS (% of GDP)		
	mean	median	n	mean	median	n	mean	median	n	mean	median	n
All countries	9.7	8.0	76	12.7	11.6	45	5.5	4.9	69	20.8	18.9	137
OECD	14.7	13.5	24	19.2	17.2	14	6.1	6.0	20	14.0	13.7	24
East Asia	8.0	6.9	6	10.5	10.5	2	7.3	6.5	4	18.7	16.9	14
Latin America	9.5	8.0	9	14.4	13.7	8	6.3	5.6	11	18.0	16.2	29
Sub-Saharan Africa	4.6	3.4	23	6.7	4.4	18	4.2	2.6	19	25.3	24.2	43

Source: Author's calculations from World Bank Labor Market Data Base and Penn World Tables. Data are from early 1980s for employment and from 1985-89 (average) for government consumption.

Table 3: Correlation matrix for measures of government employment/size

	general government employment	public sector employment	central government employment	government consumption
general government employment	1.00	0.93	0.46	-0.24
public sector employment		1.00	0.57	-0.18
central government employment			1.00	-0.10
government consumption				1.00

Source: Same as Table 2. All data refer to early 1980s.

Table 4: Determinants of public employment

	log GOVEMPL		log PSEMPL		log CGEMPL		log GOVCONS	
constant	-1.55*	-1.21**	-0.38	0.11	-1.88**	-1.46***	4.26*	4.32*
log per-capita income	0.33*	0.30*	0.11	-0.01	0.21**	0.17	-0.13*	-0.12*
log urbanization	0.24**	0.20***	0.47**	0.60*	0.35**	0.31	-0.12***	-0.14**
sub-Saharan Africa	-0.30	-0.24	-0.48	-0.25	0.07	0.32	-0.04	0.03
East Asia	-0.09	-0.05	-0.09	-0.14	0.30***	0.38*	-0.44*	-0.42*
external risk, R	0.02*		0.05**		0.04*		0.02*	
external risk, R_{inst}		0.04*		0.07**		0.09*		0.02**
Adj. R^2	0.66	0.65	0.62	0.59	0.32	0.33	0.43	0.35
n	71	72	44	44	65	66	115	118

Note: Estimated using heteroskedasticity-consistent (White) standard errors. Levels of statistical significance are indicated by asterisks:

*   significant at the 99% level
**   significant at the 95% level
***significant at the 99% level.

Table 5: External risk versus country size as a determinant of public employment

	log GOVEMPL			
constant	-1.55*	-1.46***	-1.63*	-1.43***
log per-capita income	0.33*	0.33*	0.34*	0.33*
log urbanization	0.24**	0.24***	0.24***	0.24***
sub-Saharan Africa	-0.30	-0.31	-0.30	-0.32
East Asia	-0.09	-0.09	-0.10	-0.08
external risk, R	0.02*	0.02**	0.02**	0.02**
log population		-0.01		-0.02
log land area			0.01	0.02
Adj. R^2	0.66	0.65	0.65	0.64
n	71	71	70	70

Note: Estimated using heteroskedasticity-consistent (White) standard errors. Levels of statistical significance are indicated by asterisks:

    *   significant at the 99% level
    **   significant at the 95% level
    ***   significant at the 99% level.

Table 6: Resource rents versus external risk as a determinant of public employment

	log GOVEMPL				
constant	-1.21**	-1.19**	-1.19**	-0.96***	-0.88
log per-capita income	0.30*	0.23**	0.30*	0.22**	0.21**
log urbanization	0.20***	0.36**	0.21***	0.32**	0.32**
sub-Saharan Africa	-0.24	-0.24	-0.24	-0.34	-0.32
East Asia	-0.05	-0.00	-0.04	0.01	-0.05
external risk, R_{inst}	0.04*	0.04**	0.04*	0.04***	0.05***
TRADE x PRIMSHR		-0.00			
TRADE x OIL			-0.00		
TRADE x TOTPOS				0.00	
TRADE x TOT25POS					-0.00
Adj. R^2	0.65	0.69	0.64	0.68	0.68
n	72	65	72	65	66

Note: Estimated using heteroskedasticity-consistent (White) standard errors. Levels of statistical significance are indicated by asterisks:

    *   significant at the 99% level
    **   significant at the 95% level
    ***   significant at the 99% level.

Table 7: Determinants of Expansion of Government Consumption

	Dependent variable: log GOVCONS (1985-89) minus log GOVCONS (1960-64)					
constant	0.26*	1.71*	3.00*	0.26*	2.97*	2.46*
East Asia	-0.07	-0.15	-0.26**	-0.07	-0.34*	-0.29*
Latin America	0.18***	0.06	0.01	0.03	-0.04	
sub-Sharan Africa	0.26*	0.31*	0.13	0.08	-0.06	
log GOVCONS (1960-64)		-0.56*	-0.62*	-0.63*	-0.64*	-0.63*
log per-capita income in 1960			-0.14*	-0.07	-0.06	
log urbanization				-0.13**	-0.18*	-0.20*
External risk, R					0.02*	0.01***
TRADE x PRIMSHR						0.002***
Adj. R^2	0.07	0.44	0.50	0.51	0.56	0.59
n	120	120	117	120	102	103

Note: Estimated using heteroskedasticity-consistent (White) standard errors. Levels of statistical significance are indicated by asterisks:

       *   significant at the 99% level
       **   significant at the 95% level
       ***   significant at the 99% level.

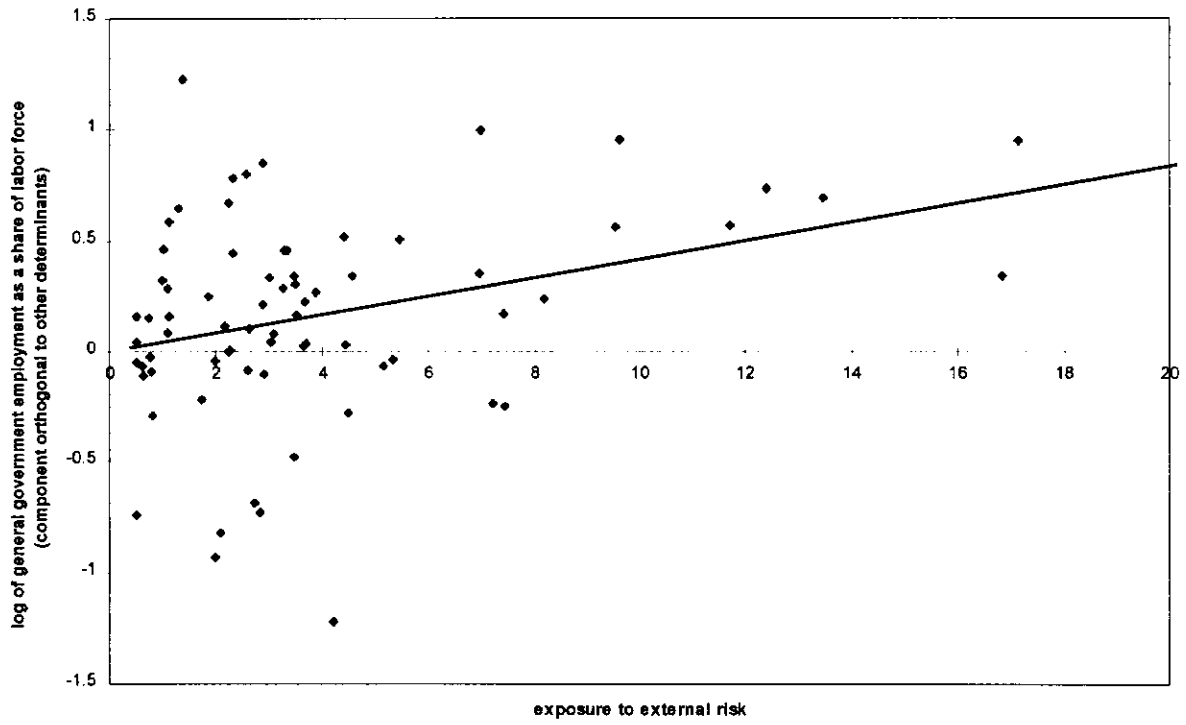# Relationship between government employment and exposure to external risk

Figure 2

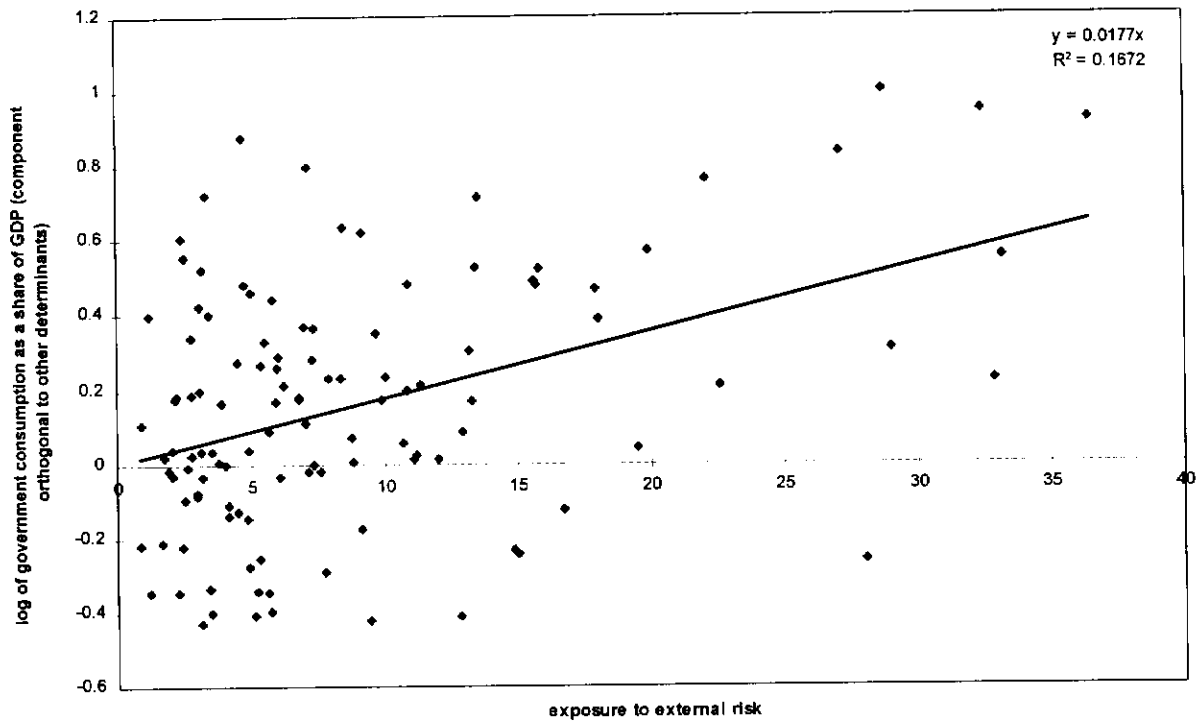**Relationship between government consumption and external risk**

figure 3