TAXATION AND THE STRUCTURE OF LABOR MARKETS: THE CASE OF CORPORATISM

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ABSTRACT

We propose an explanation for the wide variation in rates of taxation across developed economies, based on differences in labor market institutions. In "corporatist" economies, which feature centralized labor markets, taxes on labor input will be less distortionary than when labor supply is determined individually. Since the level of labor supply is set by a small group of decision-makers, these individuals will recognize the linkage between the taxes that workers pay and the benefits that they receive. Labor tax burdens are indeed higher in more corporatist nations, and non-labor taxes are lower, which is consistent with this theory. There is also some evidence that the distortionary effects of labor taxes are lower in more corporatist economies.

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From 1980-1984, Sweden's total tax revenues amounted to over 50% of its Gross National Product. Over this same period, tax revenues in the United States and Japan were less than 30% of GNP.[1] This wide variation in rates of taxation across developed economies with market structures that are otherwise similar is striking. Yet, while there have been many studies of the effects of differences in tax rates on economic behavior, there has been relatively little work trying to understand the origins of divergences in national tax structures. This paper proposes an economic explanation for these divergences, based on differences in labor market institutions.

In a Robinson Crusoe economy with an all-comprehending Robinson, taxes would not be distortionary. In just the same way, taxes on labor input will not be distortionary (or will be less distortionary) when labor supply is determined collectively rather than individually. If the level of labor supply is set by a small group of decision-makers, then these individuals will recognize the linkage between the taxes that workers pay and the benefits that they receive. We argue therefore that under corporatism, defined by Bruno and Sachs (1985) as "a mode of social organization in which functional groups rather than discrete individuals wield power and transact affairs", taxes will have a smaller distorting effect than they have in situations where individual workers make labor supply decisions. Because taxes are less distortionary, higher levels of taxation are selected.

Our argument is closely related to Olson's (1982) discussion of encompassing coalitions. Olson argues that, while a proliferation of interest groups is in general likely to retard economic progress, sufficiently large interest groups will internalize the effects of their actions, and may actually

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[1]Data on tax revenues if from the OECD's Revenue Statistics; GNP is from OECD National Accounts.

improve economic performance. Olson draws much of the support for his hypothesis from the Scandinavian countries which play an important role in our empirical analysis as well.

We develop our argument in three steps. Section I highlights the basic empirical regularity which motivates our analysis: more corporatist economies have higher levels of taxation. The relationship between corporatism and taxation is quite robust. Our findings are not sensitive to the choice of different proxies for corporatism, to the measure of tax burdens, to the time period selected, or to controls for the presence of "left wing" governments. We also note that since savings decisions are not made more collectively in corporatist countries, one would not expect corporatism to reduce the deadweight loss from capital taxation. In fact, while corporatism appears to be associated with higher levels of labor income taxation, corporatist nations have somewhat <u>lower</u> levels of capital taxation. This mitigates against the "corporatism-socialism correlation" explanation for our results and suggests the need for a theory explaining why corporatism will be associated with reduced deadweight loss from labor taxation.

Section II considers the role of taxation in union bargaining models and contrasts the impact of taxation in situations where unions are more/less "encompassing", to use Olson's phrase. We model the bargaining game between unions and employers to show that as unions are more encompassing, the distorting effects of labor taxes declines, encouraging their use. Essentially, the argument is that encompassing unions recognize that their members bear the cost of reductions in the size of the tax base and internalize the government budget constraint in choosing wage and labor input levels.

We test our theory in Section III, by examining the role of corporatism in reducing the distortion from labor taxation. We show that higher marginal and average tax rates on labor have a less adverse impact on labor supply in more corporatist economies. The findings are robust to

variations in the measures of tax rates and labor supply used, and to controls for alternative hypotheses. While it is difficult to draw strong conclusions from our limited sample of countries, the results suggest that our theory may have some validity for explaining cross-national tax differences. Section IV concludes by discussing a number of implications of the results for future work.

SECTION I: CORPORATISM AND NATIONAL TAX STRUCTURES
Measuring Corporatism

While the relationship between corporatism and macroeconomic performance has been extensively studied (by Bruno and Sachs (1985), Calmfors and Driffill (1988), Freeman (1988), and others), to our knowledge the relationship between corporatism and taxation has not been examined. In studying this relationship, we make use of scales of corporatism that have been developed in the context of this earlier work on economic performance. This has the virtue of objectivity: the scales were not developed with our dependent variable in mind.

A number of measures of corporatism have been put forward in recent years, by Schmitter (1981), Cameron (1984), Bruno and Sachs (1985), Calmfors and Driffill (1988), and Alvarez et al. (1991). These measures are quite similar; the lowest cross-correlation is 0.69.[2] While we explore other indexes, we rely primarily on the ranking developed by Calmfors and Driffill, for two reasons. First, this index captures the feature of labor market structure which is key to our theory: centralization. Previous discussions of

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[2] These measures are presented in the data appendix. Calmfors and Driffill also refer to an "index" used by Blyth (1979); however, Blyth does not discuss his method for ranking countries in the schematic diagram which is presented in his article.

corporatism have highlighted two features of labor markets: centralization and union-employer consensus.[3] For our purposes, only the former is relevant, as our bargaining models require no consensus between the contracting parties. This is an important consideration. While the Calmfors and Driffill index places Switzerland and Japan at the non-corporatist end of the scale, due to very decentralized contract settlements, Bruno and Sachs consider these to be fairly corporatist nations, due to cooperation between unions and employers. In general, the indices developed by Schmitter, Cameron, Alvarez et al., and Calmfors and Driffill attempt to measure centralization, while that of Bruno and Sachs measures consensus as well. In our sensitivity analysis below, we will therefore rely on the alternative centralization indices.[4]

Second, Calmfors and Driffill are concerned specifically with the "extent of inter-union and inter-employer cooperation in wage bargaining with the other side . . . This definition differs from others that are concerned more with the formal than the behavioural content of wage setting" (p. 17). While we are not concerned with cooperation across bargaining parties, intra-party cooperation is key. For our purposes, the level at which bargaining takes place (establishment/industry/federal) is not the only consideration; internal coordination is equally important, and Calmfors and Driffill account for this, while the other centralization indices do not.

Corporatism and The Level of Taxation

Figure 1 illustrates the strong relationship between corporatism and national levels of taxation. It plots the ratio of total tax revenues to GNP for

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[3]See Bruno and Sachs (1985) and Francesco Giavazzi's discussion of Calmfors and Driffill (1988).

[4]The results using the Bruno and Sachs index without Japan and Switzerland are similar to those for the other indices.

17 countries, averaged over the 1980-1984 period, against the Calmfors and Driffill index, which appears to have been devised to apply to approximately the same period. The relationship is heavily influenced by the high tax and corporatist Scandinavian economies, as well as the low tax and non-corporatist United States, Japan, and Switzerland. However, the results are not sensitive to the exclusion of any one country.

The first three columns of Table 1 demonstrates that the corporatism-taxation relationship is robust to several definitions of the tax burden. We employ three different measures of taxation: total tax revenue over GNP, and the marginal and average tax rates on labor income.[5] In all cases there is a striking positive correlation. In results not reported, we have also considered the sensitivity of this finding to the three alternative indices of centralization discussed above. As would be expected by the high cross-correlation, the results are quite similar across the other measures, and are not sensitive to the sample selection rules used by the different rankings.

"Left-Wing" Ideology and The Composition of Taxes

One interpretation of these results is that corporatism and the extent of taxation are both consequences of a country's social attitudes. That is, "leftist" countries may have both higher taxes and a corporatist economic structure, and that all Table 1 may be capturing is this correlation. This view could be supported by noting that the high tax countries include the traditionally "left" Scandinavian countries, and that the low tax countries include traditionally conservative countries such as Japan and Switzerland.

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[5]The revenue measure is from the OECD's Revenue Statistics, and is an average over the 1980-84 period. The marginal and average effective tax rates on labor are from McKee et al. (1986); the marginal rate is an average over 1979, 1981, and 1983, and the average rate is for 1983. All tax variables are presented in the data appendix.

We attempt to address this hypothesis in two ways. In columns (4) and (5) of Table 1, we include two proxies for "left-wing" political ideology. First, we use the level of income inequality, which should help to proxy for "egalitarian" attitudes that may lead to both higher taxation and more corporatism.[6] In column (5), we use an index which ranks countries according to the fraction of time a "left wing" government was in power over the 1965-1982 period, from Cameron (1984). In both cases, the correlation between taxation and corporatism remains strong; this result is robust to alternative definitions of tax rates as well. The "leftist controls" are never significant.[7]

This "left-wing ideology" hypothesis also differs from our theory in an important, and testable, way. While both theories predict higher levels of total taxation in corporatist economies, our argument implying that taxes are "cheaper" in collectively organized labor markets applies only to labor taxes. Although labor decisions are made more collectively in corporatist economies than in non-corporatist ones, there is no clear pattern of more collective savings decisions in these types of economies. Savings decisions could be made more collectively in corporatist nations if the majority of savings were done by pensions, and if pensions were also collectively bargained over. However, private pensions are subject to widespread collective bargaining only in corporatist Sweden and (relatively) non-corporatist France. Furthermore,

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[6]The inequality measure, which is the share of income accruing to the top quintile divided by the share accruing to the bottom quintile, is from the World Bank (1989).

[7]In results not reported, we have also tried including in our regressions the share of national income which accrues to labor. Once again, it entered insignificantly and did not affect the correlation of interest. The wage share was created by dividing the total labor compensation for each country by national income, from OECD National Accounts.

pensions cover more than 70% of the population in both corporatist countries such as Sweden and Finland and non-corporatist ones such as Switzerland and the United Kingdom; they are legally mandated in both Finland and Switzerland (Presidents Commission on Pension Policy, p. 24-27). And pension saving as a fraction of gross household saving is uncorrelated with the degree of corporatism across our sample of OECD countries.[8]

Thus, it appears that there is no correlation between collective savings decision-making and the degree of corporatism, so that high levels of corporate and wealth taxes will be as distorting in corporatist economies as elsewhere. Therefore, while we predict higher levels of the "cheaper" labor income taxes in these economies, we would not expect to see a positive relationship between corporatism and other forms of taxation. On the other hand, the "leftist government" view would predict higher levels of all taxes. In fact, given the strong redistributional bent of leftist governments, the relation between corporatism and capital/wealth taxation should be even stronger than the relation between corporatism and labor taxation under this view.

Table 2, and the accompanying Figures 2(a) through 2(c), investigate the relation between corporatism and several different categories of taxation: labor income taxation, non-labor income taxation, corporate taxation, and property and wealth taxation. Each measure is defined as the revenues from

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[8]Pension saving as a fraction of gross personal saving over the 1980-1984 period is calculated using data from OECD (1989); it is only available for seven countries (Canada, United States, Japan, Italy, United Kingdom, France, and Sweden). We attempted to expand the sample by using data on pension saving for Belgium and Germany, from the OECD's National Accounts; it did not affect the result.

that form of taxation over GNP.[9] The first column reveals the basic positive relationship between corporatism and labor income taxation that was demonstrated in Table 1; the relation is plotted in Figure 2(a), which is quite similar to Figure 1. Our measure of labor income taxation includes income taxes, payroll taxes, and indirect (consumption) taxes, under the assumption that the second and third categories are shifted backwards to wages. To test the robustness to this shifting assumption, we have excluded indirect taxes from our measure of labor income taxation. The correlation remains strong and significant.

The second column looks at the correlation between corporatism and all other (non-labor) tax revenues over GNP, which is plotted in Figure 2(b). While it is not significant, there is in fact a negative relationship between corporatism and non-labor taxation.[10] We explore this relationship further in columns (3) and (4), where we break non-labor income taxation into corporate taxation and property/wealth taxation. Here we see that there is no relation between corporatism and corporate taxation, and a strong negative relation between corporatism and property/wealth taxation.

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[9]Averaged over 1980-1984. All revenue data are from the OECD's Revenue Statistics: corporate tax revenue is category 1200 (plus other taxes paid solely by business, category 6100, and excise taxes on investment goods, category 5125); wealth tax revenue is category 4000 (plus individual capital gains, category 1120); and labor tax revenue is total minus these two (and minus excise taxes on exports, category 5124). None of the results are sensitive to the use of Gross Domestic Product as the denominator.

[10]Norway is a large outlier in this regression due to the growth in their reliance on corporate tax revenues from North Sea oil. Over earlier periods, and for the rate of wealth taxation, Norway looks much more similar to its corporatist counterparts.

However, our measure of corporate taxation is problematic in two respects. First, we count dividend taxation as labor income taxation, since we are unable to separate dividend tax revenues from other personal tax revenues using the OECD data. Second, governments in more corporatist economies may own a higher fraction of the capital stock of the country; this would lead to lower corporate tax revenues as a fraction of GNP.[11]

We address these criticisms in three ways in Table 3. In column (1), we proxy for government ownership of the capital stock by including the fraction of investment that was done by the government over the 1970-1985 period, from Barro (1991). This measure actually enters positively, indicating an increase in corporate tax revenues where a larger fraction of investment is done by the government, but it is not significant. There is no effect on our coefficient of interest; the relation remains negative and insignificant. In column (2), we use corporate tax revenues over corporate profits, rather than GNP, as the dependent variable.[12] This should also help to account for the problem of government ownership of the capital stock. Once again, there is no relation between corporatism and corporate tax revenues.   Finally, we use measures of the marginal effective tax rates on equipment and structures, from McKee et al. (1986).[13] While the coefficient on corporatism

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[11]We are grateful to Andrei Shleifer for noting these points. The latter criticism may apply to wealth taxation as well. However, the results for wealth taxation are the same when we control for government investment (parallel to column (1) of Table 3).

[12]Profits are defined as operating surplus of the corporate sector, from OECD National Accounts.

[13]These rates are the average of those on debt, new shares, and retained earnings. They account for the interaction between corporate and individual tax systems (ie. dividend taxation at the individual level).

does become positive in these regressions, it is both statistically and substantively insignificant. We have also tried adding country size (population) to these regressions, on the theory that corporatist countries are small and can't afford deviant capital tax structures. It entered insignificantly, and did not affect the main result.[14]

Thus, we have found little evidence to support the "leftist government" hypothesis. Not only do corporatist economies not have higher levels of non-labor taxes, they actually have lower levels of property/wealth taxes, a finding which is distinctly at odds with the idea that these governments are simply serving redistributional goals. Figure 2c, and the final column of Table 2, which compare the ratio of labor income tax revenues to total tax revenues, summarize the primary point of this section: more corporatist countries rely relatively heavily on labor taxes in financing government expenditure. Our study has thus far focused on the period 1980-84, both due to the fact that this is the period over which the effective tax rate data are available and the fact that the Calmfors and Driffill index was designed based on current descriptions of labor market structure.[15] However, it is important to consider whether the relations which we present are stable over time or are specific to the subperiod we have chosen. Table 4 therefore presents the coefficient on the Calmfors-Driffill index from our basic set of tax structure regressions, where tax revenues have been averaged over several subperiods: 1965 to 1973, 1974 to 1979, 1965 to 1984, and 1985 to 1988. The results are quite consistent with those from Tables 1 and 2. For both total tax revenues and labor tax

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[14]Country size could also affect the level of labor taxation if labor is highly mobile; its inclusion had no effect on our labor tax results either.

[15]Furthermore, the total hours data, used in Section III, end in 1984.

revenues, there is a very strong positive correlation with corporatism. For non-labor tax revenues, the relationship is negative, and even stronger than that which existed over the 1980-84 period. Finally, the ratio of labor taxation to total taxation is positively related to corporatism at all times, as our theory would have predicted.

To summarize, not only does the existence of "cheap" labor taxes lead to higher levels of total taxation in corporatist economies, it also leads to a shift in the structure of taxes towards the "cheapest" form of revenue raising. This does not appear to be a consequence of these countries being smaller, having more leftist government, or having differing degrees of inequality. Nor is it a consequence of capital mobility's forcing equalization of capital tax rates across countries; capital tax rates vary as much as labor tax rates in our sample.[16] And this finding is not solely a product of the Calmfors-Driffill ranking. In results not reported, we have estimated the relation between the composition of taxes and the alternative corporatism indices. The results are quite similar; in all cases there was a relatively high reliance on labor taxation.

SECTION II: TAXES AND UNION LABOR SUPPLY SETTING

In this section we present a simple exposition of the theory described above. As the review by Oswald (1985) points out, there are primarily two competing models of the union wage bargaining process: the efficient bargaining model and the monopoly union model. The distinguishing feature of the efficient bargaining model is that employers and unions bargain over both wages and labor supply (hours of work and employment); this stands in contrast to the monopoly union model, where the union sets the level of wages

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[16]Indeed, the coefficient of variation for corporate tax revenues over GNP is over twice that of labor tax revenues over GNP.

and the level of labor input is set unilaterally by the employer. Our theory is one of union bosses in corporatist nations who set hours of work for their members to reflect the linkage which they perceive between taxes and benefits. The efficient bargaining model seems a more natural framework for expressing this idea, but our results can be obtained through the monopoly union model as well, since the union can set the wage to obtain its desired level of labor supply.[17]

Our model features three types of agents: unions, employers, and the government. The government sets taxes, and the unions and employers then bargain over wages and labor supply. We assume a linear utility function for the union. This allows a clear exposition of our key result: that the more corporatist the economy, the smaller the deadweight loss from taxation. We model the extent of corporatism through a variable "g", the degree of encompassment. Increases in g represent increases in centralization through increases in the coordination of the union bargaining parties. The higher is g, the greater is the extent to which a few individuals (union bosses) determine the level of labor supply. Thus, according to our theory, higher g will lead to a greater perception of the link between taxes paid and benefits received. In an economy with decentralized bargaining between many unions and many employers, g approaches zero, and there is no perceived link between the taxes that the members of a given union pay and the benefits that they receive. When there is one encompassing union which negotiates with employers, g approaches one, and there is full perception by the union leaders that the taxes paid by their workers will come back to these same workers as the benefits of government spending.

The Distortionary Effects of taxation - the Efficient Bargaining case.

Assume a representative union with the following utility function:

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[17]The proof is available on request.

$$V = w(1\text{-}\tau)L + (N\text{-}L)b + g\tau wL \qquad (1)$$

where: w = wage rate
L = labor supply
τ = tax rate
N = members of the union
g = degree of encompassment, $0 < g < 1$
b = value of leisure

Assume also a representative firm with profits: $\pi = F[L] - wL$. The locus of points of tangency between the unions' indifference curves and the firms' isoprofit curves is the "contract curve", along which efficient bargains are struck. This condition yields the equation:

$$F'[L] = \frac{b}{1 - \tau(1\text{-}g)} \qquad (2)$$

Equation (2) describes a vertical contract curve. For $\tau = 0$ this equation yields the condition $F' = b$. This represents an efficient outcome, since people are working until the point where the marginal product of labor equals the marginal utility of leisure. Given the linear utility function of the union, the intuition behind (2) is clear: the union wants to set labor supply at the level which maximizes social surplus, and then garner its portion of that surplus by setting the wage appropriately. Regardless of union bargaining power, the level of labor input is set as above; the relative strength of the union at the bargaining table simply serves to determine the wage.[18]

From (2) it is easy to prove that:

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[18]The outcome would be the same with a non-linear utility function as well, so long as the union can redistribute among its employed and unemployed members. If union utility is non-linear and redistribution is not possible, as in McDonald and Solow (1981), then the contract curve will be upward sloping, and one needs to posit a bargaining mechanism in order to obtain an explicit outcome for the level of labor supply.

$$\frac{dL}{d\tau} = \frac{(1-g)F'}{(1 - \tau(1-g))^2 F''} < 0 \quad \text{and} \quad \frac{\delta(dL/d\tau)}{\delta g} > 0$$

When taxes increase the contract curve shifts leftwards, so labor supply drops. However, the more encompassing the union, the smaller the leftward shift (supply decreases by less).

We can define the total surplus of this economy as: $W = V + \pi +$ REV, where REV $= wL\tau(1-g) =$ government revenue.[19] The deadweight loss due to taxes is the difference between the surplus with taxes and the surplus without taxes, which can be shown to equal:

$$DWL = F[L_0] - F[L_1] - b(L_0 - L_1) \tag{3}$$

Where L_0 is the level of labor supplied at $\tau = 0$, and L_1 is supplied at $\tau_1 > 0$. Intuitively, the deadweight loss from taxes will be equal to the loss in production due to the decline in labor supply, less the value of the additional leisure. Using a Taylor expansion and the fact that $F'[L_0] = b$, and starting from $\tau = 0$, we get:

$$DWL = -\frac{1}{2} \frac{b^2(1-g)^2\tau^2}{(1 - \tau(1-g))^2 F''} \quad ; \quad \frac{\delta DWL}{\delta g} < 0 \tag{4}$$

This result has the usual feature that the deadweight loss rises with the square of the tax rate, and that the deadweight loss at $\tau = 0$ is zero. However, it has the additional feature that the deadweight loss falls with g. At g=0, we obtain the traditional result; at g=1, however, the deadweight loss is zero. If individuals perceive fully the benefits of taxation, then there is no deadweight loss from that taxation; the "net" (of benefits) tax rate has fallen to zero.

It can also be shown that the marginal deadweight loss from taxation

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[19]In practice, we are assuming that unions receive back $g\tau wL$, so we have to subtract that amount from the government's revenue.

is:

$$MDWL = -(F' - b) \frac{(1-g)F'}{(1 - \tau(1-g))F''} \quad ; \quad \frac{\delta MDWL}{\delta g} < 0 \qquad (5)$$

The marginal deadweight loss therefore declines with g as well. This is important in considering the implications of corporatism for the optimal size of the government.

Optimal Size of the Government

The first section of this paper noted the strong correlation between the degree of encompassment (corporatism) and the level of taxation. In this subsection, we complete the theoretical argument, by showing that, given that the costs of taxes is smaller in more corporatist economies, these economies will have larger governments.

Let H[G] be the production function of the government, where $G = wL\tau$. To simplify matters we assume that the government's production function is linear. We also assume $(1-gH')>0$.[20] The unions' utility function becomes:

$$V = w(1-\tau)L + gH[wL\tau] + (N-L)b \qquad (6)$$

Thus, the more encompassing unions are, the more they see the link between their taxes and government production. Once again, we obtain $\delta L/\delta \tau < 0$ from (6).

For the social planner the problem is to choose the optimum tax rate so as to maximize total surplus. However, the planner sees all the benefits derived from government production, not just the fraction perceived by

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[20]If $gH' \geq 1$, then individuals would desire an infinitely large government.

workers.[21] Thus, the planner faces the following problem:

$$\text{Max W} = w(1-\tau)L + H[w\tau L] + (N-L)b + F[L] - wL \tag{7}$$
$$\text{wrt } \tau$$

Maximizing social welfare, given the union's response to taxes, the following condition is obtained:

$$H' = 1 + \frac{\delta L/\delta\tau(b - F')}{\delta(REV)/\delta\tau} \tag{8}$$

Expression (8) says that, at the optimum, the marginal productivity of a unit of revenue is set equal to one plus the marginal deadweight loss from raising that unit of revenue. The marginal deadweight loss is equal to the difference between the value of leisure and the marginal productivity of labor, times the decrease in labor supply due to taxes; this is what the economy loses as supply drops due to higher taxes. This is divided by marginal revenue, leaving us with an expression for the marginal deadweight loss in terms of revenue. As we demonstrated above (equation (5)), the marginal deadweight loss decreases with the degree of encompassment. Therefore, the optimal size of the government increases as corporatism increases.[22]

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[21]This is not a necessary assumption. However, if the planner only perceived the benefits to the same extent as workers, then with a linear government production function, we would either get zero or infinite production. In this case, we would need to introduce a non-linear production function.

[22]Proving explicitly that the optimal size of the government increases with the degree of encompassment ($d\tau^*/dg > 0$) also requires the assumption that the elasticity of labor demand with respect to wages is greater than one. As individuals perceive more fully the link between taxes and benefits (g rises), their wages will fall more for a given rise in taxes, and labor supply will fall less. For the optimal tax rate to rise with g, the incremental fall in wages must be less than the incremental rise in supply, so that the total wage bill rises.

SECTION III: TESTING THE MODEL

In this section we use data on our sample of 17 OECD nations to test the key prediction of the theoretical model derived above: that more corporatist economies have a lower deadweight loss from taxation. We conduct this test within a very simple empirical framework. Note that another way to phrase this prediction is that, for a given level of taxes, a tax increase will reduce labor supply by less in a more corporatist economy.[23] Since unions in these economies perceive that some portion of their taxes is coming back to them, the disincentive to work is reduced. When they bargain with employers they take into account this effect, making it implicit in the contracts that are negotiated. We thus estimate equations of the form:

$$\text{Log(LABOR SUPPLY)} = \alpha\text{TAX} + \beta\text{CORPORATISM} + \gamma\text{TAX*CORP} \quad (9)$$

We focus on the interaction term γ, which captures the <u>differential</u> effect of taxes on labor supply as corporatism changes. Our theory predicts that the coefficient on the interaction term should be positive; for a given level of taxes, taxation is less distortionary the more corporatist is the economy.

The ideal measure of labor supply for testing this theory is total hours worked as a fraction of potential hours of work, for contracts written in the union sector. Total hours should be used because the theory does not offer strong predictions about the tradeoff between hours per worker and the level of employment in setting total union labor input. Contractually negotiated labor input should be used because, in reality, it is not the individual workers

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This is true if the elasticity of labor demand is greater (in absolute value) than one.

[23]In our theoretical model the deadweight loss from taxes is directly related to the reduction in labor supply, so we use the terms interchangeably.

who are perceiving the benefits of taxation but their union bosses. For the individual worker, the typical "free rider" problem remains; they do not see that more labor input from them raises the tax base upon which the public goods which they use is financed. However, the linkage is seen by the union bosses, who establish the level of employment and hours of work in the negotiation of the union contract. To the extent that individuals can circumvent contractual obligations, actual hours of work may deviate from their negotiated level. Finally, union hours should be used because the non-union sector is not centralized, and we would not expect the non-union workers to perceive tax-benefit linkages.

Unfortunately, this ideal measure is not available; we do not have data on either actual or "potential" union hours of work. In its place, we use total economy-wide hours over total potential hours.[24] To address the problem of non-contractual hours deviating from their negotiated level, we also use data on contractual hours of work in manufacturing (from Weiss, 1987), which we multiply by the employment to population ratio.[25] However, we are not able to address the problem of including non-union labor supply in our dependent variable, so we assume that total labor supply is a proxy for union labor supply. This will bias the coefficient if either union density or labor supply in the non-union sector is correlated with corporatism and/or taxation.[26]

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[24]This is calculated as hours per worker times the employment to population ratio. The data are from Gordon (1987).

[25]The hours data is for 1985. It is from a survey by a German Employers Association

[26]That is, we measure a weighted average of union and non-union labor supply:
$L^*_t = dL^*_u + (1-d)L^*_{nu}$, where L^* is labor supply for: t (total economy), u (union), and nu (non-union); d is union density.

Table 5 runs regressions of the form of equation (9). In the first three columns, the dependent variable is total hours worked over total potential hours.[27] Corporatism is measured by the Calmfors and Driffill index. There is a positive and statistically significant interaction term in column (1), where taxation is measured by total labor tax revenues over GNP. At the bottom of the table, we present the implied partial effects of corporatism and taxation. They indicate that, for a high corporatist country, the positive interaction between taxes and corporatism is strong enough to counteract other effects of taxation on labor supply; for a low corporatist country, taxes remain distortionary. In columns (2) and (3), we use the effective labor tax rate measures; the results are quite similar. In columns (4)-(6), we use contractual hours of work per year times the employment to population ratio as the dependent variable. The results are similar; the interaction is positive and highly significant. Thus, the basic results are supportive of our theory of reduced deadweight loss from taxation in more corporatist economies.

Specification Checks

One problem with this specification, discussed above, is that there may be systematic measurement error in the dependent variable. This error will be correlated with union density, which in turn will be correlated with the degree of corporatism. We attempt to control for this in the first column of Table 6, where we include average union density over the 1965-1980 period,

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This mismeasurement will bias the coefficient of interest if either d or L^*_{nu} is correlated with corporatism or taxation. We attempt to control for this below.

[27]Missing data for Australia, New Zealand, and Finland reduce the sample size to 14 countries. None of the labor supply results which follow are sensitive to the sample selection induced by missing values. In all cases, the corporatism index is renumbered so that the ranking does not skip values where data on labor supply are missing.

from Cameron (1984). Density does not enter significantly, nor does not affect our result of interest.[28]

A more natural specification for our labor supply equation would include the wage rate, and we do so in column (2) of Table 6. The wage measure used is the log of the average real manufacturing wage, from the International Labor Organization (1988).[29] The result is still supportive of our basic theory. In fact, the interaction coefficient rises when wages are included.

Thus far, we have assumed that the positive interaction of corporatism and taxation indicates reduced deadweight loss from taxation. An alternative interpretation, however, would be that the corporatist nations in our sample have stronger preferences for public sector employment, which would both necessitate higher levels of taxation and lead to an overall increase in labor supply. To control for this possibility, we have used data on the fraction of employment which was represented by "producers of government services" over the 1980-1984 period, from the OECD's National Accounts. As column (3) shows, this measure does enter positively into the labor supply regressions,

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[28]This result, along with the others discussed in this section, is robust to the use of contractual hours in the place of actual hours worked, as well as to alternative measures of labor taxation.

[29]The average real wage over the 1980-85 period is created by deflating by the consumer price index from the International Monetary Fund (1988). This average wage is then expressed in international dollars for comparability; the conversion factors are from the latest version of the United Nations International Comparison Project. The values of the conversion factors for 1980 and 1985 are averaged to get a conversion factor for the average wage.

although it is not significant. It has little effect on the coefficient of interest.[30]

As above, we also consider timing evidence in the next five columns. Over the 1965-1973 period, the interaction term is zero. Over the 1974-1979 period it is positive and significant; over the entire 20 year period, it is positive, but not significant. The failure of this hypothesis test in the early period is troubling, given that the taxation/corporatism correlation is strong over these years.

This failure in the early years suggests the value of further tests of the labor supply specification. One reason for a spurious correlation would be time invariant factors in more corporatist countries which are correlated with both higher levels of taxation and higher levels of labor supply. We control for this in column (7) of Table 6, where we pool the data for each of the 14 countries in the sample across all twenty years, and include 13 country fixed effects. We also include a cyclical indicator, the "GNP gap", to control for cyclical correlation between hours worked and taxes collected.[31] The interaction is positive and significant; deviations in tax rates from their average level in more corporatist countries are found to lead to higher than average levels of labor supply.

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[30]Another hypothesis would be that corporatist nations decided to spend more on education and training, which could once again raise labor supply while necessitating increased taxation. Including the fraction of government spending on education, or the fraction on both education and social services, as a covariate does not affect the results.

[31]The GNP gap is created by taking the residual from a regression of log real GDP on a time trend. The result is not sensitive to the use of the level of GDP, or to the use of nominal GNP.

The results reported here are quite similar when the alternative centralization indices are used. However, each of these measures suffers from the problem of assigning relative rankings to countries which have fairly similar labor market structures. As a further specification check, we have therefore grouped some of the countries into two categories: "high corporatism" (Austria, Norway, Sweden and Denmark), and "low corporatism" (Canada, U.S., Switzerland, and Japan). This allows us to create a corporatism "dummy", which equaled one for the high corporatist countries and zero for the low corporatist countries.[32] In column (8), we show that the interaction between this dummy and labor tax revenues over GNP, in a regression which includes the country dummies, is significant over the 1965-1984 period.

To summarize, we have found some evidence in support of our hypothesis that the deadweight loss from taxation is reduced in more corporatist economies. The result is robust to alternative measures of corporatism and taxation, to the inclusion of wages, and to controls for country fixed effects. However, it is weak in the early years of the sample, and we have not definitively established a causal relation between corporatism and reduced deadweight loss. A more definitive test of our theory would be an examination of the correlation between changes in taxation and changes in corporatism. Unfortunately, none of the authors who have classified corporatism have attempted to quantify changes in their measures. Given our goal of using objective indices of corporatism for this paper, we feel reticent to make such an attempt on our own.

We have, however, been able to undertake case studies of the changes in taxation and labor market institutions in two of our sample nations. The

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[32]We are grateful to Larry Katz for suggesting this approach.

point that there is variance in the growth of taxation to be explained is highlighted by figures 3a and 3b. Figure 3a shows the growth in tax revenues over GNP in Sweden and the United States over the 1955 to 1988 period. The interesting fact which emerges is that levels of taxation in the two nations were similar until 1960, and have only diverged in the last 30 years. The source of this divergence has been the growth of labor taxation in Sweden; non-labor taxes have actually fallen over this period (both absolutely and relative to the U.S.).[33] Figure 3b shows a different path for the most corporatist nation in our sample, Austria. Austria's level of taxation has been much higher than that of the U.S. since 1955, and taxes have risen at approximately the same rate as those in the U.S..[34]

These divergent pictures point to a possible test of our theory, which draws a causal link between labor market centralization and levels of taxation. Under this hypothesis, the data would imply that Austria had featured a centralized labor market throughout the post-WWII period, while Sweden's was a development of the 1950s. In fact, this is the inference which emerges from a study of the development of labor market institutions in these countries. As T.L. Johnston (1962) points out, Sweden's national union confederation (the LO) did not begin centralized wage negotiations until 1956. Prior to that year, individual unions had control over their own bargaining, under little central control from the confederation. In contrast, the ILO (1986) writes of

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[33]The figure would be similar if a different non-corporatist nation had been used as the baseline.

[34]Austria and Sweden were chosen because they provided the most interesting contrast over this period, and because there is a large literature discussing the development of their labor market institutions. We constructed more detailed case studies in an earlier version of this paper; they are available upon request.

Austria that "the OeGB [the Austrian union confederation] has been the only major Austrian union since the end of the Second World War" (p. 26).

If the central union body doesn't have control over the negotiating process, then it cannot impose its perception of tax-benefit linkages on the resulting agreement. Thus, while we would have expected relatively high labor taxes in Austria in 1955, when that nation had the highest level of labor taxes in our sample, we would not have expected especially high taxes in Sweden, which was only the sixth highest at that point. By contrast, Sweden had the highest level of labor taxation in our sample in 1988. While these case studies are only casual, they do suggest that the evolution of centralized bargaining in Sweden may have been an important factor in the growth of labor taxation in that country.[35]

SECTION IV: CONCLUSIONS

In a Robinson Crusoe economy with an all-comprehending Robinson, taxes would not be distortionary. In just the same way, taxes on labor input will not be distortionary, or will be less distortionary, when labor supply is determined collectively. The results in this paper suggest that this consideration may have considerable relevance for interpreting national differences in tax policies. At a minimum they highlight the need to move beyond the standard assumption of a competitive labor market in assessing the efficiency consequences of labor income taxation.

While it is tempting to draw the inference from our results and some of

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[35]Given the alternative "leftist government" hypothesis, it is interesting to note that, as Kent Weaver (1987) points out, the Social Democrats have held power "almost continuously from 1932" (p. 294). Thus, there does not seem to be a political reason for the growth in taxes starting only in the 1960s.

Olson's (1982) discussion that corporatism is in some sense good, because it reduces the cost of raising taxes, this would be premature without a firmer understanding of what lies behind differences in the extent of corporatism. Part of the logic of socialism was the idea that a wise government could internalize everything and so generate efficient economic outcomes. This has proven wrong, and should give pause about excessively benign view of negotiated alternatives to market resolutions.

In future research, the ideas put forward here could be tested in several ways. First, it would be useful to extend the mechanism of Section III, by looking at changes in effective tax rates, rather than tax revenues, over time. Second, it would be valuable to examine further case study evidence on individual countries. This would permit an assessment of the realism of our premise that encompassing unions recognize and internalize the fiscal consequences of their actions. Third, it would be interesting to explore time series variations in political conditions and their relation to tax decisions. Finally, the arguments made here have implications for union-nonunion differences in the intensity of work in different countries, which could be examined. Further work could help to confirm our basic conclusion that differences in national choices about taxation reflect both differences in the benefits and the costs of taxation, and that realistic analysis of the effects of labor taxes require taking account of labor market institutions.

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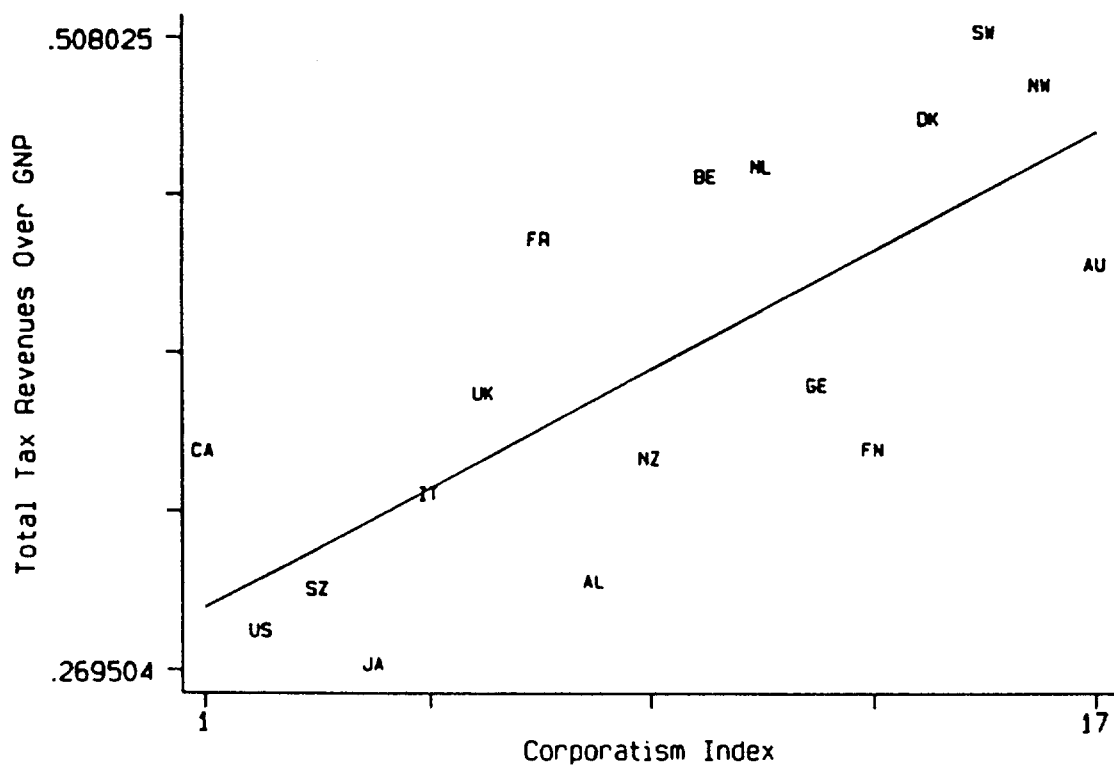
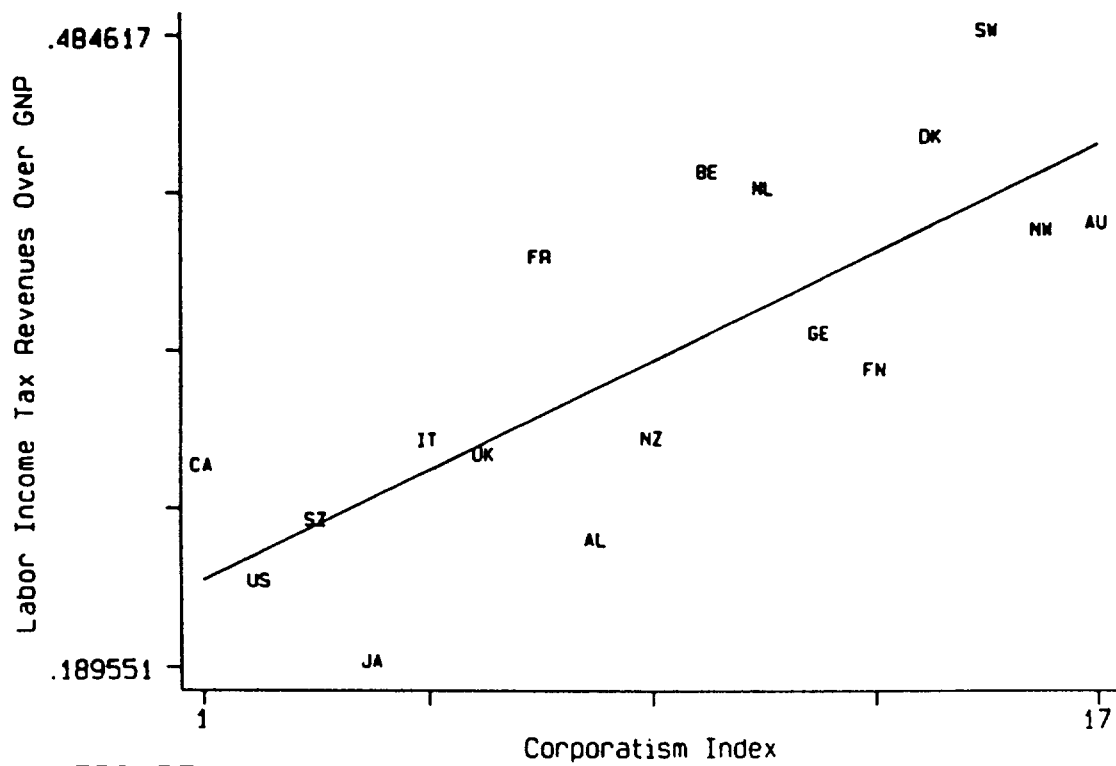World Bank (1989). World Development Report.

FIGURE 1:TAXATION AND CORPORATISM
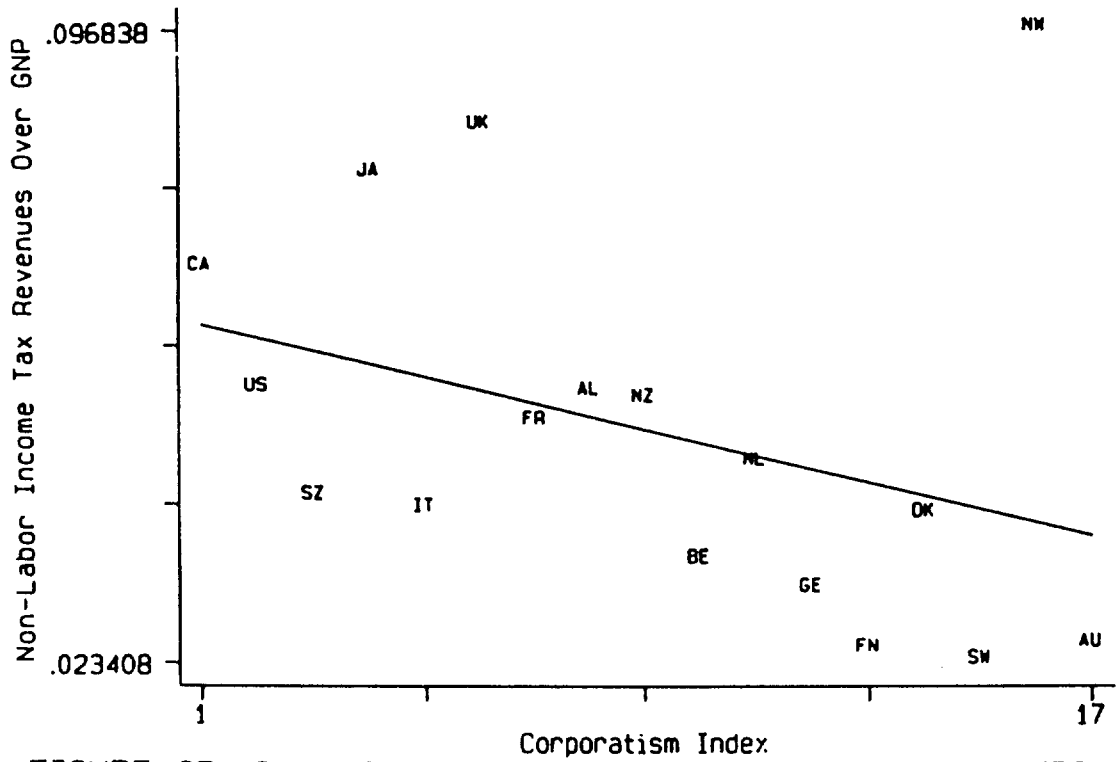
FIGURE 2A:LABOR INCOME TAXATION AND CORPORATISM
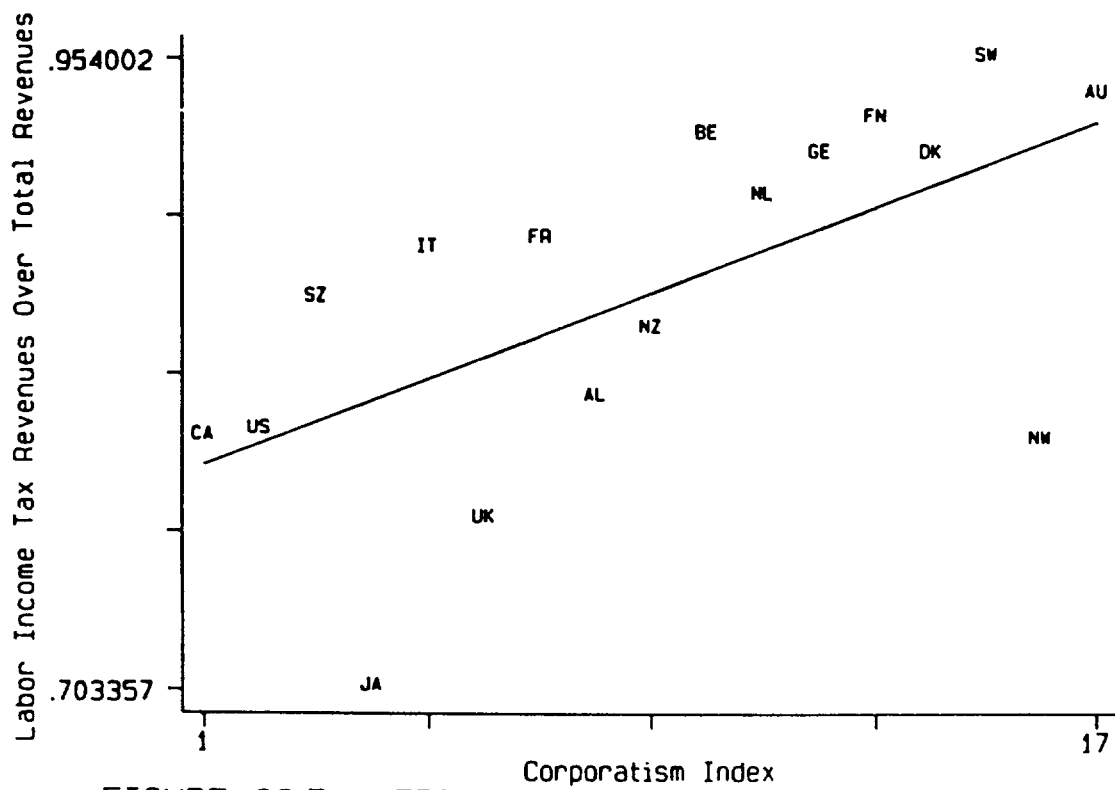
FIGURE 2B:NON-LABOR INCOME TAXATION AND CORPORATISM
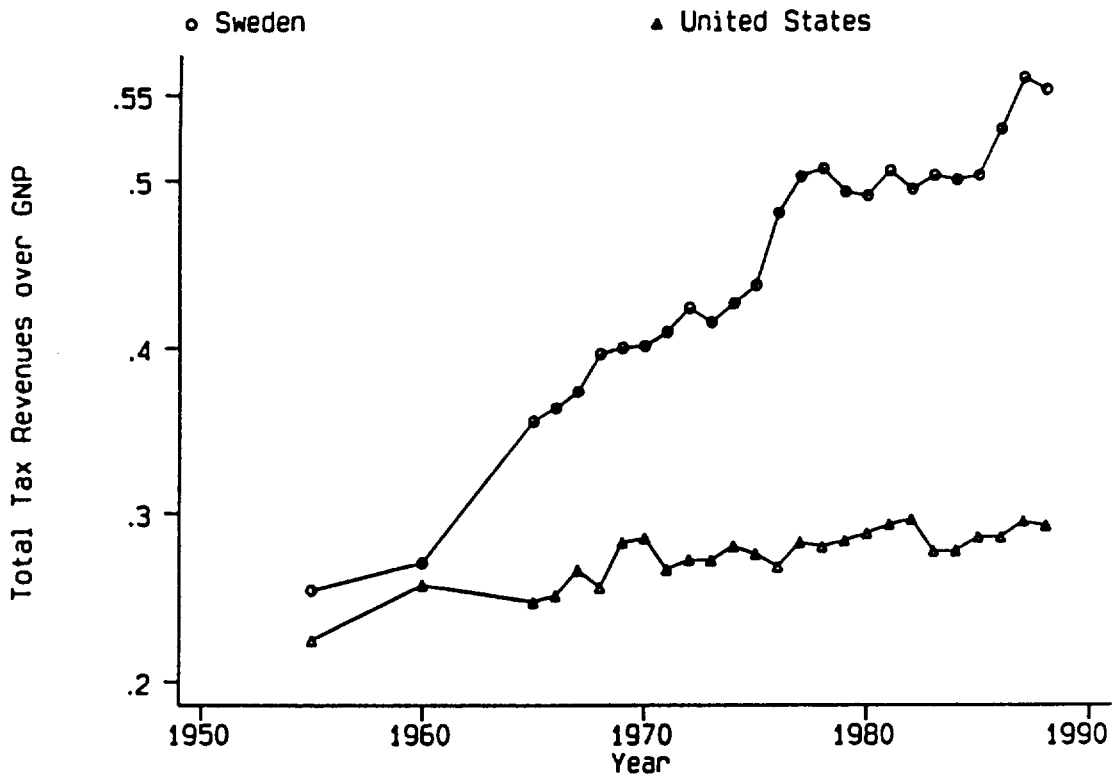
FIGURE 2C:TAXATION STRUCTURE AND CORPORATISM
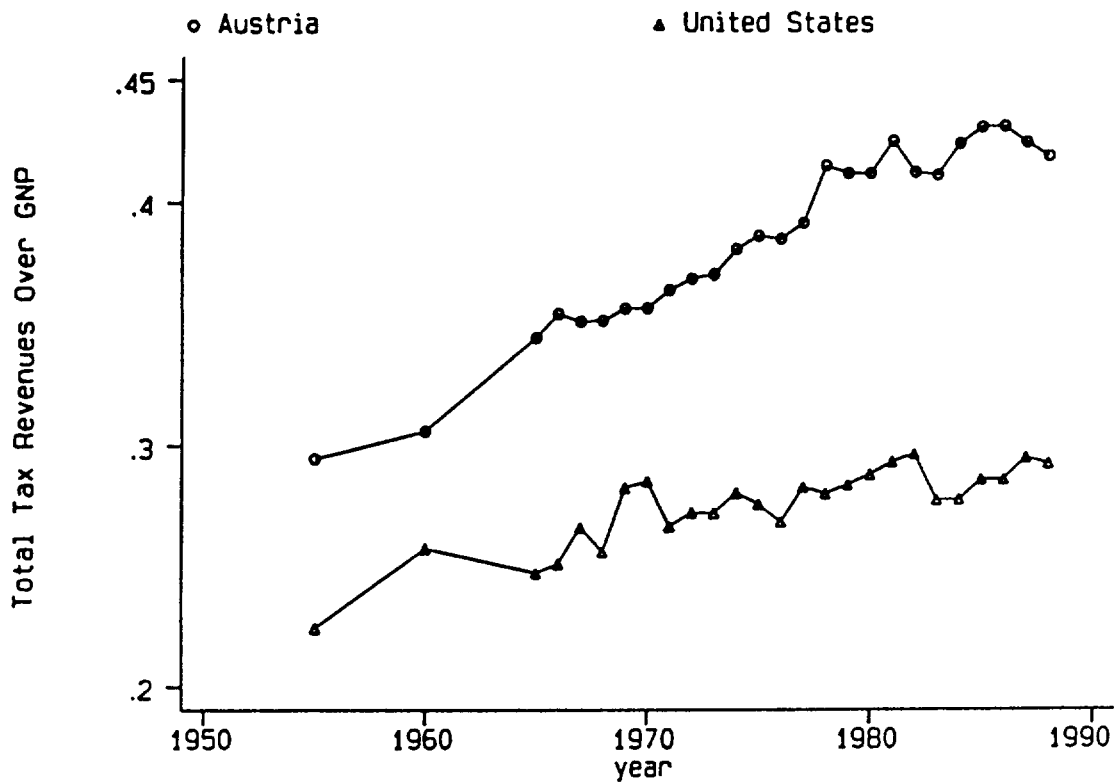
FIGURE 3A:THE GROWTH OF TAXES – SWEDEN VS. U.S.

FIGURE 3B:THE GROWTH OF TAXES – AUSTRIA VS. U.S.

Table 1: Corporatism and the Level of Taxation - 1980-1984					
Column	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Tax Revenue (% of GNP)	Marginal Rate on Labor Inc	Average Rate on Labor Inc	Marginal Rate on Labor Inc	Marginal Rate on Labor Inc
Constant	28.168 (2.651)	39.669 (3.369)	25.647 (4.496)	43.481 (9.003)	41.088 (3.653)
Corporatism	1.122 (0.259)	1.818 (0.329)	1.528 (0.439)	1.965 (0.367)	1.680 (0.769)
Inequality				-0.718 (1.202)	
Leftist Index					-0.207 (0.842)
Adjusted R^2	0.53	0.65	0.41	0.66	0.65
# of Countries	17	17	17	16	16

Notes:

1) Standard errors in parentheses.
2) Tax variables are defined in the text, and are presented in the data appendix.
3) Corporatism is measured by the Calmfors-Driffill (1988) index.
4) Inequality is the share of income accruing to the top quintile divided by the share to the bottom quintile, from World Bank (1989).
5) Leftist index is the fraction of time a "left wing" government was in power over the 1965-1982 period, from Cameron (1984).

Table 2: Corporatism and the Composition of Taxes					
Column	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Labor Inc Tax Revs (% GNP)	Non-labor Inc Tax Revs (% GNP)	Corp Inc Tax Revs (% GNP)	Wealth Tax Revs (% GNP)	Labor Inc Tax Revs (% Tax Revs)
Constant	21.760 (2.656)	6.408 (1.061)	3.102 (0.959)	3.261 (0.449)	0.784 (0.029)
Corporatism	1.274 (0.266)	-0.153 (0.104)	-0.008 (0.094)	-0.142 (0.044)	0.009 (0.003)
R^2	0.58	0.07	-0.07	0.37	0.35
Number of Countries	17	17	17	17	17

Notes:
1) Standard errors in parentheses.
2) Corporatism is measured by the Calmfors-Driffill index.
3) Tax variables are defined in the text, and are presented in the data appendix.

Table 3: Corporatism and Corporate Income Taxes				
Column	(1)	(2)	(3)	(4)
Dependent Variable	Corp Tax Revs (% of GNP)	Corp Tax Revs (% of Op Surp)	Marginal Rate on Equip	Marginal Rate on Structures
Constant	0.111 (2.322)	13.651 (3.356)	-7.922 (15.089)	5.614 (12.452)
Corporatism	-0.072 (0.101)	-0.104 (0.327)	0.081 (1.472)	0.259 (1.215)
Gov Investment/ Total Investment	0.257 (0.183)			
R^2	-0.001	-0.06	-0.07	-0.06
Number of Countries	17	17	17	17

Notes:

1) Standard errors in parentheses.
2) Corporatism measure is Calmfors-Driffill index.
3) Government investment over total investment is 1970-1985 average, from Barro (1991).
4) Operating Surplus is for corporate sector, from OECD National Accounts.
5) Marginal tax rate on equipment and structures are from McKee et al. (1986); see text for description.

Table 4: Corporatism and Taxation - Timing Evidence Coefficient is that on Corporatism Index						
Column	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Total Tax Revs (% GNP)	Labor Tax Revs (% GNP)	Non-Labor Tax Revs (% GNP)	Corporate Tax Revs (% GNP)	Wealth Tax Revs (% GNP)	Labor Tax Revs (% Tot Revs)
1965-1973	0.889 (0.222)	1.150 (0.225)	-0.261 (0.071)	-0.112 (0.044)	-0.272 (0.104)	0.012 (0.003)
1974-1979	1.146 (0.231)	1.379 (0.233)	-0.233 (0.069)	-0.081 (0.046)	-0.142 (0.047)	0.011 (0.002)
1965-1984	1.025 (0.225)	1.250 (0.228)	-0.225 (0.069)	-0.077 (0.047)	-0.146 (0.046)	0.011 (0.002)
1985-1988	1.193 (0.270)	1.378 (0.271)	-0.185 (0.093)	-0.039 (0.076)	-0.146 (0.046)	0.009 (0.003)

Notes:

1) Standard errors in parentheses.
2) Coefficient is that on Calmfors-Driffill index in a regression including the index and a constant.
3) Dependent variable is averaged over the period which is indicated in first column.

Table 5: Corporatism and the Deadweight Loss from Labor Taxation All Dependent Variables in Logs						
Column	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Hours per person	Hours per person	Hours per person	Contrac Hr per person	Contrac Hr per person	Contrac Hr per person
Constant	8.223 (0.246)	8.287 (0.283)	7.797 (0.177)	8.109 (0.103)	8.523 (0.283)	7.899 (0.154)
Labor Inc Tax Revs (% GNP)	-0.044 (0.009)			-0.037 (0.010)		
Marginal Rate on Labor Inc		-0.028 (0.006)			-0.029 (0.006)	
Average Rate on Labor Inc			-0.024 (0.005)			-0.024 (0.004)
Corporatism	-0.126 (0.040)	-0.104 (0.045)	-0.092 (0.026)	-0.109 (0.044)	-0.168 (0.052)	-0.117 (0.025)
Corporatism* Taxes	0.0042 (0.0011)	0.0022 (0.0008)	0.0025 (0.0006)	0.0038 (0.0012)	0.0032 (0.0008)	0.0031 (0.0006)
R^2	0.64	0.62	0.59	0.47	0.65	0.69
# Countries	14	14	14	14	14	14
Marginal Effect of Taxes - Most Corp	0.015 (0.009)	0.0045 (0.0088)	0.011 (0.009)	0.016 (0.009)	0.016 (0.009)	0.020 (0.009)
Marginal Effect of Taxes - Least Corp	-0.040 (0.008)	-0.027 (0.008)	-0.023 (0.008)	-0.033 (0.007)	-0.026 (0.007)	-0.021 (0.007)

Notes:

1) Standard errors in parentheses.

2) Corporatism is measured by Calmfors-Driffill index.

3) Dependent variable in columns (1)-(3) is the log of average hours per worker per year times the employment to population ratio; in column (4)-(6), it is the log of average hours per year for contractual workers in manufacturing times the employment to population ratio.

4) Tax variables are defined in the text.

5) Missing data for Australia, New Zealand, and Finland; corporatism index is recalibrated to run from 1 to 14.

6) Marginal effect of taxes in most and least corporatist countries is evaluated at corporatism = 14 and corporatism = 1; standard error accounts for covariance between the coefficient on taxes and that on the interaction.

Table 6: Varying the Specification of Labor Supply Dependent Variable is log of Hours Worked/Person								
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years	1980-84	1980-84	1980-84	1965-73	1974-79	1965-84	1965-84	1965-84
Constant	8.240 (0.279)	8.554 (0.560)	8.073 (0.293)	7.531 (0.261)	7.788 (0.294)	7.773 (0.268)	7.423 (0.341)	7.480 (0.044)
Labor Inc Tax Revs (% GNP)	-0.044 (0.009)	-0.048 (0.011)	-0.044 (0.010)	-0.024 (0.011)	-0.030 (0.011)	-0.030 (0.010)	-0.023 (0.003)	-0.017 (0.002)
Corporatism	-0.128 (0.042)	-0.139 (0.048)	-0.095 (0.048)	0.023 (0.052)	-0.065 (0.046)	-0.047 (0.046)		
High/Low Corp Dummy								
Corporatism* Revs/GNP	0.0043 (0.0012)	0.0046 (0.0013)	0.0036 (0.0013)	0.0003 (0.0016)	0.0025 (0.0013)	0.0022 (0.0014)	0.00054 (0.00027)	
Corp Dummy* Revs/GNP								0.0050 (0.0021)
Union Density	- 0.062 (0.251)							
Log Hrly Wage in Manufac		-0.135 (0.179)						
% Government Employment			0.493 (0.700)					
GNP GAP							-0.042 (0.076)	- 0.018 (0.075)
R^2	0.60	0.61	0.63	0.28	0.27	0.34	0.86	0.88
# Countries	14	13	12	14	14	14	280	160

Notes:

1) Standard errors in parentheses.
2) Corporatism is measured by the Calmfors and Driffill index.
3) Union density is for the 1965-1980 period, from Cameron (1984).
4) Log hourly wage in manufacturing is calculated as described in the text.
5) Percent government employment is employment in production of government services over total employment.
6) Each regression is run over the period indicated at the top of the column.
7) Regression in column (7) is a pooled cross-section for 14 countries over 20 years; it includes 13 country dummies.
8) Regression in column (8) uses a dummy for high/low corporatism, as defined in text; it is pooled over 20 years.

DATA APPENDIX FOR SUMMERS, GRUBER, AND VERGARA

I) CORPORATISM INDICES

COUNTRY	LABEL	C & D INDEX	SCHMITTER	CAMERON	ALVAREZ	BRUNO-SACHS
Canada	CA	1	4	4	3	2
United States	US	2	5	3	4	1
Switzerland	SZ	3	6	6	.	12
Japan	JA	4	.	1	1	8
Italy	IT	5	1	5	5	4
United Kingdom	UK	6	2	8	9	6
France	FR	7	3	2	2	5
Australia	AL	8	.	7	7	3
New Zealand	NZ	9	.	.	.	7
Belgium	BE	10	8	13	10	9
Netherlands	NL	11	9	10	8	15
Germany	GE	12	7	9	6	16
Finland	FN	13	10	12	11	10
Denmark	DK	14	11	11	12	11
Sweden	SW	15	12	16	15	13
Norway	NW	16	13	15	14	14
Austria	AU	17	14	14	13	17

II) TAX MEASURES

LABEL	TAX REVS/GNP 80-84	LABOR TAXES/GNP 80-84	MARG. RATE ON LABOR - 79-83	AVG. RATE ON LABOR 83
CA	34.9631	28.0662	42.27	29.17
US	28.1983	22.704	42.68	28.21
SZ	29.7723	25.5313	40.96	22.61
JA	26.9504	18.9551	38.42	19.05
IT	33.3389	29.2422	59.49	48.88
UK	37.1206	28.57	53.17	38.97
FR	42.9165	37.8106	58.11	47.57
AL	30.0508	24.5996	43.39	31.01
NZ	34.6716	29.3077	51.23	31.98
BE	45.2936	41.7893	61.96	48.12
NL	45.6772	41.0404	69.73	37.51
GE	37.4241	34.2464	56.76	36.62
FN	35.0069	32.533	62.9	44.03
DK	47.5065	43.4683	69.59	53.41
SW	50.8025	48.4617	73.64	61.67
NW	48.7918	39.1079	65.31	50.36
AU	41.9879	39.4546	62.92	40.64

II) TAX MEASURES, CONTINUED

LABEL	NON-LABOR REVS/ GNP - 80-84	CORPORATE REVS/ GNP - 80-84	PROPERTY REVS/ GNP - 80-84	LABOR REVS/ TOTAL REVS 80-84
CA	6.8968	3.4699	3.2431	.802497
US	5.4942	2.1688	3.3253	.805213
SZ	4.2409	1.7684	2.4724	.857569
JA	7.9953	5.5896	2.4056	.703357
IT	4.0966	2.9212	1.1754	.877316
UK	8.5506	3.757	4.7936	.769922
FR	5.1058	3.4563	1.6313	.881017
AL	5.4511	3.1171	2.2818	.818407
NZ	5.3639	2.6116	2.7523	.845339
BE	3.5042	2.6323	.8718	.922641
NL	4.6367	3.0746	1.562	.898478
GE	3.1777	1.9511	1.2265	.915091
FN	2.4739	1.5743	.8995	.929366
DK	4.0382	1.6708	2.3674	.915138
SW	2.3408	1.6015	.7392	.954002
NW	9.6838	8.8088	.8567	.801565
AU	2.5333	1.3303	1.1741	.939671

II) TAX MEASURES, CONTINUED, AND III) LABOR SUPPLY MEASURES

LABEL	MARG RATE ON EQUIP 1983	MARG RATE ON STRUC 1983	CORPORATE REVS/ OPERATING SURPLUS 1980-1984	HOURS PER PERSON 1980-1984	CONTRACTUAL HOURS PER PERSON 1980-84
CA	.9	4.4	13.1	1136.398	.
US	-15.1	25.8	12	1107.952	1286.776
SZ	19.9	23	8.5	1222.1	1401.664
JA	26.4	29.4	22.5	1462.644	1529.196
IT	-22.5	-24.5	8.2	952.3815	975.024
UK	-85.3	-53.9	23.2	994.5114	1178.814
FR	-4	-.1	11.1	972.4921	1080.719
AL	-9.6	32.7	15.2	.	.
NZ	35.5	25.1	8.6	.	.
BE	-41.5	-1.2	11.4	824.1009	997.408
NL	-8.2	16.9	11.7	846.0098	920.46
GE	17.1	33.6	9.5	1014.571	1047.004
FN	-26.2	-21.5	7.6	.	1331.128
DK	1.4	2.6	8.1	1117.75	1329.312
SW	-17.9	-.9	9.2	1140.964	1416.6
NW	20.2	24.7	29.5	1135.575	1368.96
AU	-13.4	18.9	6.7	1066.102	1143.736

IV) OTHER COVARIATES

LABEL	INEQUALITY MEASURE	CAMERON LEFTIST INDEX	GOV'T INVESTMENT/ TOTAL INVESTMENT	UNION DENSITY	LOG HOURLY WAGE IN MANUFACTURING
CA	7.55	1	.1275	.27	1.938742
US	7.53	2	.09522	.21	1.985131
SZ	5.76	7	.10931	.24	.
JA	4.31	3	.14633	.16	1.846879
IT	7.08	4	.13927	.41	1.530395
UK	5.67	14	.16941	.45	1.547562
FR	7.67	5	.12609	.24	1.311032
AL	8.72	9	.16661	.4	1.631199
NZ	8.76	.	.08525	.	1.327075
BE	4.56	8	.13976	.55	1.652497
NL	4.36	6	.14712	.28	1.813195
GE	5	13	.12985	.32	1.673351
FN	5.97	10	.12507	.47	1.34025
DK	7.15	11	.13506	.54	1.798404
SW	5.64	15	.19687	.7	1.508512
NW	6.37	12	.17077	.65	1.642873
AU		16	.14899	.5	1.699279

LABEL	GOVERNMENT EMPLOYMENT/ TOTAL EMPLOYMENT	GOV'T EDUCATION EXPEND/ GOV'T TOTAL EXPEND
CA	.	.
US	.163209	.252264
SZ	.	.
JA	.06636	.3672
IT	.14832	.289972
UK	.218848	.196825
FR	.229513	.287469
AL	.047362	.248214
NZ	.	.
BE	.19324	.385847
NL	.15683	.32856
GE	.155102	.201029
FN	.18827	.25656
DK	.300401	.221531
SW	.318912	.200565
NW	.229619	.260571
AU	.213691	.217611