

MS #5457

**TAXES, ORGANIZATIONAL FORM, AND THE DEAD WEIGHT LOSS
OF THE CORPORATE INCOME TAX**

**Austan Goolsbee
University of Chicago**

ABSTRACT

Corporate taxation can play an important role in a firm's choice of organizational form by changing the relative attractiveness of incorporating. Recent general equilibrium models have shown that with substantial shifting between corporate and noncorporate activity in response to taxation, the dead weight loss of the corporate income tax can be very high. This paper tests the empirical importance of this idea by estimating the impact of taxes on the noncorporate share of capital for various sectors using data from 1900-1939--a period of large and frequent changes in both corporate and personal tax rates. The results indicate that taxes do matter for organizational form decisions but the magnitude of the effect is small. An increase in the corporate rate of .10 raises the noncorporate share of capital between .2 and 3 percentage points. At this magnitude, the dead weight loss of the corporate income tax is less than 10% of revenue.

JEL Classification: H25 Business Taxes
L22 Firm Organization and Market Structure
Keywords: Corporate Taxation, Organizational Form, Taxation, Dead Weight Loss

Austan Goolsbee, University of Chicago, GSB, 1101 E. 58th St., Chicago, IL 60637. Phone: (773) 702-5869 Fax: (773) 702-0458 e-mail: goolsbee@gsb.uchicago.edu.

1. Introduction

Partly in response to rate changes of the last fifteen years, new interest has emerged in the interaction between the tax system and the organizational form decisions of firms. An early discussion can be found in Feldstein and Slemrod (1980). Scholes and Wolfson (1990, 1991, 1992) show how tax rates changed incentives for various types of organizational restructuring. Gordon and Mackie-Mason (1990, 1994, 1997) look at the role of tax decisions and how large the nontax benefits of incorporation must be given the observed incorporation rates. Other work includes Ayers et al. (1995), Carrol and Joulfaian (1995), Gentry (1994) and Fullerton and Rogers (1993).

Gravelle and Kotlikoff (1988, 1989, 1993) merge the analysis of organizational form with the study of the dead weight loss (DWL) of corporate taxation. Their simulations differ from standard work, like Harberger (1966), Shoven (1976) or Ballard et al. (1985), by allowing both corporate and noncorporate production within sector. In conventional models, one sector is corporate and the other not and the implied dead weight losses amount to 10-20% of tax revenue. Gravelle and Kotlikoff, by assuming a large elasticity of substitution within sector, find DWL greater than 100% of tax revenue. The critical issue in both strands of the literature is, empirically, the organizational form response to tax changes.

Gordon and Mackie-Mason (1991) use the share of capital in C corporations since 1957 as a function of the relative taxation of corporate to personal taxation and find evidence of only small substitution across organizational forms. The results, however, do not completely refute the Gravelle and Kotlikoff hypothesis: shifting due to corporate taxation because corporate taxes have changed little since 1957. Variation in relative taxation comes mainly from changes in personal

taxes.

This paper follows up on the work of Gordon and Mackie-Mason but with data from 1900-1939. During this period the corporate tax rate changed repeatedly, as did the personal, dividend and capital gains rates. The obvious disadvantages are that the period may not be comparable to the present. At the least, there were fewer organizational choices (there were no S corporations, LLCs and so on).

The results show that, although significant, taxes have only a small impact on organization form. A .10 increase in the corporate tax increases the noncorporate share of capital by only .002-.035 depending on the sector--much smaller than implied in the Gravelle and Kotlikof models and very close to the estimates of Gordon and Mackie-Mason for 1957-1986. Shifting this magnitude implies a DWL from corporate income taxation on the order of 5-10% of tax revenue.

The paper is divided into four sections. Section 1 presents historical background and describes the data. Section 2 gives a simple model of the organizational form decision based on the relative taxation of corporate and personal income and also presents the empirical specification. Section 3 gives the results for the various sectors, calculates the DWL of the tax, estimates the long- versus short-run impact of taxation and illustrates the impact for firms with and without taxable income. Section 4 concludes.

1. BACKGROUND AND DATA

A. CORPORATIONS

Following rapid industrialization in the U.S., the corporate form was widespread by the

turn of the century.¹ There are two major advantages to incorporation. First, corporations can issue public shares. Second, corporations have limited liability. These benefits help explain why the majority of business activity is done by corporations despite the corporate tax penalty. Given the data, though, it is impossible to account for these nontax benefits empirically so I follow Gordon and Mackie-Mason and assume that the nontax benefits of corporate status do not covary systematically with the time series changes in taxes. The 1900-39 sample begins before the corporate income tax started, giving a further control on the importance of the nontax factors.

The data on the capital stock by organizational form are published by the Bureau of Economic Affairs in U.S. Department of Commerce (1987) and are available for the manufacturing, non-manufacturing, and agricultural sectors.² A graph of the noncorporate share in manufacturing is presented in Figure 1 as an illustration.

B. TAXATION

The U.S. instituted the first corporate income tax of 1% in 1909 and the first personal income tax in 1913. The basic structure of the personal income tax was a "normal" tax paid on all income above the standard deduction and then "surtaxes" whose marginal rates rose with income, often quite rapidly. These rates are compiled in various *Statistics of Income* from 1916-1940 (U.S. Department of Treasury, various years).

Corporate and personal taxes remained low until WWI when congress raised the corporate rate to 6% and then 12%. Personal rates rose as well and there were "excess profits

¹ The early history of corporations is in Whitten (1983) and Sklar (1988).

² The BEA compiles the stock from investment data using the perpetual inventory method. A complete description of the BEA methods is presented in the introduction to U.S. Department of Commerce (1987).

taxes.” The corporate tax remained around 12% until well into the depression. On the personal side, rates on high income tax payers were high until the 1920s and then fell as part of Treasury Secretary Mellon's plan. Following this, from 1924 to 1931, there were small rate changes on the corporate side while the personal rates remained unchanged. By 1932, depression-era concern over income distribution led to big increases in the top personal tax rates but not the corporate rates.

Figure 2 shows the corporate income tax rate (listed in Pechman, 1987) and the personal marginal tax rate for an individual with \$30,000 of real (1917) income (approximately the top decile of tax filers in 1917). The changes in relative taxation are clear, though not extreme. I use \$30,000 rather than the maximum personal rate, as commonly used for current data, because in this period, the top bracket was *extremely* progressive. In 1918, for example, only four filers qualified for the top marginal rate. Further, people earning \$30,000 or more received approximately 90% of dividend payouts so this seemed like a reasonable choice for the marginal investor. The choice of personal did not, however, make much difference to the results.³

As for equity taxes, laws changed several times between 1909 and 1939. Dividends were consistently taxed at the surtax rate.⁴ Capital gains were taxed as regular income until 1921. After 1921, taxpayers could choose either their own personal tax rate or a rate of .125. During the period 1935-37, the rate on capital gains was the full personal rate but with a 70% exclusion

³ Using tax rates assuming \$20,000, \$50,000, or \$100,000 in income gave almost identical or even smaller results. It is not possible to use the tax rate for the top decile of taxpayers over time because of changes to exemption levels.

⁴ The Supreme Court occasionally declared that a "true stock dividend" should not be taxable income to shareholders so it is unclear how many people actually paid such taxes. Results assuming no equity taxation, however, were basically the same.

for long-term gains. From 1938-39, the exclusion fell to 50%. To calculate a single rate for equity, t_e , I use the equation

$$t_e = s_d t_d + (1 - s_d) \gamma \alpha t_{cg}, \quad (1)$$

where s_d is the share of gains distributed as dividends, α is the taxable share of long-term gains and γ is a factor to account for capital gains deferral and for basis step up at death. The *Statistics of Income* from 1916-1939 indicate that the ratio of dividends to capital gains was roughly two to one so I assume $s_d = 2/3$. Feldstein, Dicks-Mireaux and Poterba (1983) estimate γ to be .25 using modern data. It is not clear that this parameter is valid for this earlier period but it has little impact on the results.

The key point for the sample is that, although most of the changes were small, there were 14 corporate tax changes, 12 personal changes and at least three major changes on capital gains.

2. THEORY, DATA AND SPECIFICATION

A. A SIMPLE THEORY OF INCORPORATION

I present a stylized model of the firm's decision about whether to incorporate, following Gordon and Mackie-Mason (1991). Assume, for simplicity, that the income generated by a firm, Y , is the same regardless of organization type and that there is some relative nontax benefit G associated with being a corporation. Since this could be something like the value of limited liability, it would be more realistic to model G as a function of characteristics of the firm but there are no firm level data so I assume that it is the same for all firms within an industry and is not taxed. The after-tax income from operating as a corporation each period is then

$$I_c = G + Y(1 - t_c - (1 - t_c)t_e), \quad (2)$$

where t_e is the tax rate on equity income. That is, a firm gets G plus income net of corporate and equity taxes. A noncorporate firm gains no G but pays only personal taxes leaving it income

$$I_n = Y(1 - t_p). \quad (3)$$

The firm will prefer to incorporate when

$$G > Y(t_c + (1 - t_c)t_e - t_p). \quad (4)$$

Equation (3) shows that it is the relative taxation of corporate versus personal income that determines the incentive to incorporate. It also implies that the direction of the incentive will depend on whether taxable income is greater than zero.

B. SPECIFICATION

Motivated by (3), the relative tax term $(t_c + (1 - t_c)t_e - t_p)$ should empirically influence the organizational form decision and the noncorporate share of capital within a sector. The basic specification to be estimated is

$$S_{it} = \alpha_i + \gamma_i \text{tax}_{it} + \beta_{i1}(\text{time}) + \beta_{i2}(\text{time})^2 + \beta_{i3} \text{GNP}_t + \epsilon_{it}, \quad (5)$$

where S_{it} is the noncorporate share of capital for sector I in time t . Tax_{it} is the relative tax term listed on the right hand side of equation (3) and GNP is the GNP growth rate. The coefficient on the tax term should be positive implying that higher relative taxation of corporations leads to more noncorporate activity. The time trends account for changing value of nontax benefits or

other trends.⁵ This is the same equation estimated in Gordon and Mackie-Mason but with controls for GNP growth.⁶

To calculate the tax term, I use the maximum corporate tax rate listed in Pechman (1987) for t_c . A previous version of this paper used the corporate rate including war and excess profits taxes and the results were very similar.

3. RESULTS

A. BASIC RESULTS

The standard specification for the noncorporate share of capital is as follows for manufacturing (time and time squared are divided by 100 for ease of presentation):

$$NC_t = .071 + .030 * TAX + .037 * t - .0018 * t^2 + .0037 * (GNP GROWTH)$$

(.001)
(.015)
(.014)
(.0003)
(.0053)
 $R^2 = .79$

The coefficient on taxes indicates that raising the corporate rate significantly increases the noncorporate share of capital but the magnitude is small. An increase in the corporate income tax of .10 increases the noncorporate share of capital around .003. The tax coefficient from this specification for each of the three sectors is listed in column (1) of Table 1. All indicate effects that are significant but small. A .10 corporate tax increase raises the noncorporate share of non-manufacturing by .035 and of farming by .002. These regressions include GNP growth to deal with the Great Depression. Column (2) shows that restricting the sample to pre-1929 does not

⁵ The value of the insurance associated with limited liability grows with the likelihood of bankruptcy. Since the Great Depression comes at the end of the sample, the value of G is likely to be increasing in these data.

⁶ Including other macroeconomic variables such as the unemployment rate or the interest rate had no impact on the estimated tax results that follow so they are left out for simplicity.

increase the estimates. A .10 corporate increase raises the noncorporate share .003-.016.

Gordon and Mackie-Mason, using 1957-1986 data on the share of assets held by C corporations, get coefficients of .05-.10--very similar to the coefficients here. They have also shown that the Gravelle and Kotlikof model predicts that a .45 corporate tax should increase the noncorporate capital share by .63. Depending on the specification, applying the results in this paper suggests shifts 5 and 50 times smaller per unit.

B. LONG-RUN EFFECTS

With fixed costs to changing organizational form, temporary tax changes will have smaller effects than permanent ones. Since taxes changed frequently in this sample, this could explain the low estimates. To examine this, Table 2 includes lags and leads of tax policy in the regressions. Unfortunately, the variability of the relative tax term means that identifying “permanent” effects is difficult. The individual coefficients are imprecisely estimated as seen in the manufacturing regression (time, time squared and GNP growth are not reported):

$$NC_t = .072 - .029(\text{tax}_{t+1}) + .033 (\text{tax}_t) + .016 (\text{tax}_{t+1}) + .007 (\text{tax}_{t+2}) + .003 (\text{tax}_{t+3})$$

$$(.001)(.023) \quad (.035) \quad (.034) \quad (.033) \quad (.029)$$

The point estimates indicate that anticipated increases to the corporate rate reduce the noncorporate share today followed by gradual increases upon passage. The sum of the coefficients for the contemporaneous tax change and then the sum of all the tax coefficients are reported for each sector in Table 2. The *p*-value is for an *F*-test of whether the sum equals zero.

For manufacturing and farming, the impact of tax changes after three years is larger than in the contemporaneous period. For nonmanufacturing the sum is, oddly, smaller in the long run.

In each of the specifications, however, the long-run effects are still small.

C. DEAD WEIGHT LOSS

We can approximate the excess burden in an industry arising from the corporate tax by $-.5 * TAX_i * \Delta K_{ni}$, where ΔK_{ni} is the change in the noncorporate share of capital induced by eliminating corporate taxation and TAX is the relative tax term. Doing this using the coefficients above, the long-run DWL is approximately 3-5% of revenue rather than the 110% in Gravelle and Kotlikof.⁷ Even using the largest estimates of form shifting for each sector, the DWL is less than 3% for manufacturing and agriculture and 15% for nonmanufacturing.

D. TAXABLE GAINS AND LOSSES

The theory indicates that the impact of tax rates should depend on the income status of firms. When the corporate rate rises, firms have an incentive to get taxable gains out of corporate form. There are no good data to explore this issue for 1900-39 as there are very little data on noncorporate firms. There are data from 1916-1934, though, on the share of corporate returns with taxable income. When the relative taxation of corporate income rises, there should be shifting to the noncorporate sector but it should be concentrated among firms *with taxable income*. The remaining corporate sector should then have a higher share of firms with no taxable income.

⁷ Two reasons the DWL is so large in Gravelle and Kotlikof (1993) are (1) they use the full corporate rate as the tax distortion rather than the smaller, relative tax term and (2) they assume that corporate and noncorporate firms produce slightly different products and that the elasticity of substitution between the two is 30. A previous version of this paper, available on request, structurally estimated the Gravelle and Kotlikof model and estimated this elasticity to be less than 2 (implying less shifting and smaller DWL).

The share of corporate returns reporting no taxable income depends critically on the macro economy, so I estimated regressions including as control variables the GNP growth rate, the real level of GNP and the real interest rate (the commercial paper rate minus the rate of inflation) and sometimes restricted the sample to before the depression. The coefficients were significant or borderline significant and ranged from -.5 to -.9, indicating that increasing the corporate tax by .10 reduces the fraction of corporate returns reporting taxable income by .05-.10, substantially larger than the estimated impacts on capital.

4. CONCLUSIONS

This paper has presented evidence on the question of how tax rates affect the decision to incorporate. The evidence indicates that taxes played a statistically significant role in organizational form decisions from 1900-39 but the magnitude was quite small. A .10 increase in the corporate income tax increases the noncorporate share of capital by .001-.007 for farming and manufacturing and .002-.04 for nonmanufacturing; the magnitudes do not appear to be much larger in the long run. There is also evidence that firms with taxable income are more responsive to changes in the corporate rate than those without taxable income--as the theory would predict.

Overall, these small effects on organizational form imply that the excess burden from the corporate income tax is around 5% and not more than 100% as calculated in Gravelle and Kotlikoff (1993) and likely mean that issues of organizational form are not of first-order importance in discussions about corporate income taxation.

I wish to thank Josh Angrist, Chip Case, Roger Gordon, Jerry Hausman, Steve Levitt, Jack Porter, Jim Poterba and participants in the NBER Summer Institute for helpful comments and to thank the National Science Foundation for financial support.

References

- Ayers, B., C. Cloyd, and J. Robinson, 1995, Organizational form and taxes: an empirical analysis of small businesses (Austin: University of Texas, mimeograph).
- Ballard, C., J. Shoven, and J. Whalley, 1985, The total welfare cost of the United States tax system: A general equilibrium approach, *National Tax Journal* 38, 125-140.
- Congressional Record, 1894, June 27, 26:6888
- Feldstein, M., J. Dicks-Mireaux, and J. Poterba, 1983, The Effective tax rate and the pretax rate of return, *Journal of Public Economics* 21, 129-158.
- Feldstein, M., and J. Slemrod, 1980, Personal Taxation, portfolio choice, and the effect of the corporate income tax, *Journal of Political Economy* 21, 129-158.
- Fullerton, D., and D. Rogers, 1993, Who bears the lifetime tax burden. (Brookings, Washington D.C.).
- Gentry, W., 1994, Taxes, financial decisions and organizational form: evidence from publicly traded partnerships *Journal of Public Economics* 33, 223-244.
- Gordon, R., and J. Mackie-Mason, 1990, Effects of the tax reform act of 1986 on corporate financial policy and organizational form, in: J. Slemrod, ed., *Do taxes matter* (MIT Press, Cambridge, MA), 91-131.
- Gordon, R., and J. Mackie-Mason, 1991, Taxes and the choice of organizational form, NBER Working Paper #3781.
- Gordon, R., and J. Mackie-Mason, 1994, Tax distortions to the choice of organizational form, *Journal of Public Economics* 55, 279-306.
- Gravelle, J., and L. Kotlikoff, 1988, Does the Harberger model greatly understate the excess

- burden of the corporate income tax? NBER Working Paper # 2742.
- Gravelle, J., and L. Kotlikoff, 1989, The incidence and efficiency costs of corporate taxation when corporate and noncorporate firms produce the same good, *Journal of Political Economy* 97, 749-780.
- Gravelle, J., and L. Kotlikoff, 1993, Corporate tax incidence and inefficiency when corporate and noncorporate goods are close substitutes, *Economic Inquiry*, vol #, pp
- Harberger, A., 1966, Efficiency effects of taxes on income from capital, in: M. Krzyzaniak, *Effects of the corporation income tax.* (Wayne State University Press, Detroit, MI), 107-117.
- Pechman, J., 1987, *Federal tax policy*, 5th ed. (Brookings, Washington D.C.).
- Ratner, S., 1967, *Taxation and democracy in America* (John Wiley and Sons, New York).
- Scholes, M., and M. Wolfson, 1990, The effects of changes in tax laws on corporate reorganization activity, *Journal of Business* 63, S141-S164.
- Scholes, M., and M. Wolfson, 1991, The role of tax rules in the recent restructuring of U.S. corporations, in: D. Bradford ed. *Tax policy and the economy v 5* (Publisher, City), 1-25.
- Scholes, M., and M. Wolfson, 1992, *Taxes and business strategy: A planning approach.* (Prentice-Hall, Englewood Cliffs, NJ).
- Shoven, J., 1976, The incidence and efficiency effects of taxes on income from capital, *Journal of Political Economy* #, 1241-1283.
- Sklar, M., 1988, *The corporate reconstruction of american capitalism, 1890-1916.* (Cambridge University Press, Cambridge).
- United States Department of Commerce, 1987, *Fixed reproducible tangible wealth in the united*

states 1925-1985 (U.S. Government Printing Office, Washington, D.C.).

United States Department of the Treasury, 1913-1941, Statistics of income: Corporate income tax returns (U.S. Government Printing Office, Washington, D.C.).

Whitten, D., 1983, The emergence of giant enterprise, 1860-1914. Greenwood Press, Westport, CT).

TABLE 1:
TAX COEFFICIENTS FOR SHARE OF CAPITAL IN NON-CORPORATE FORM

| | (1) 1900-1939 | (2) 1900-1928 |
|------------------|------------------|------------------|
| Manufacturing | .0304 (.0152) | .0459 (.0145) |
| Nonmanufacturing | .3567 (.1521) | .1615 (.1103) |
| Farming | .0209 (.0094) | .0340 (.0103) |

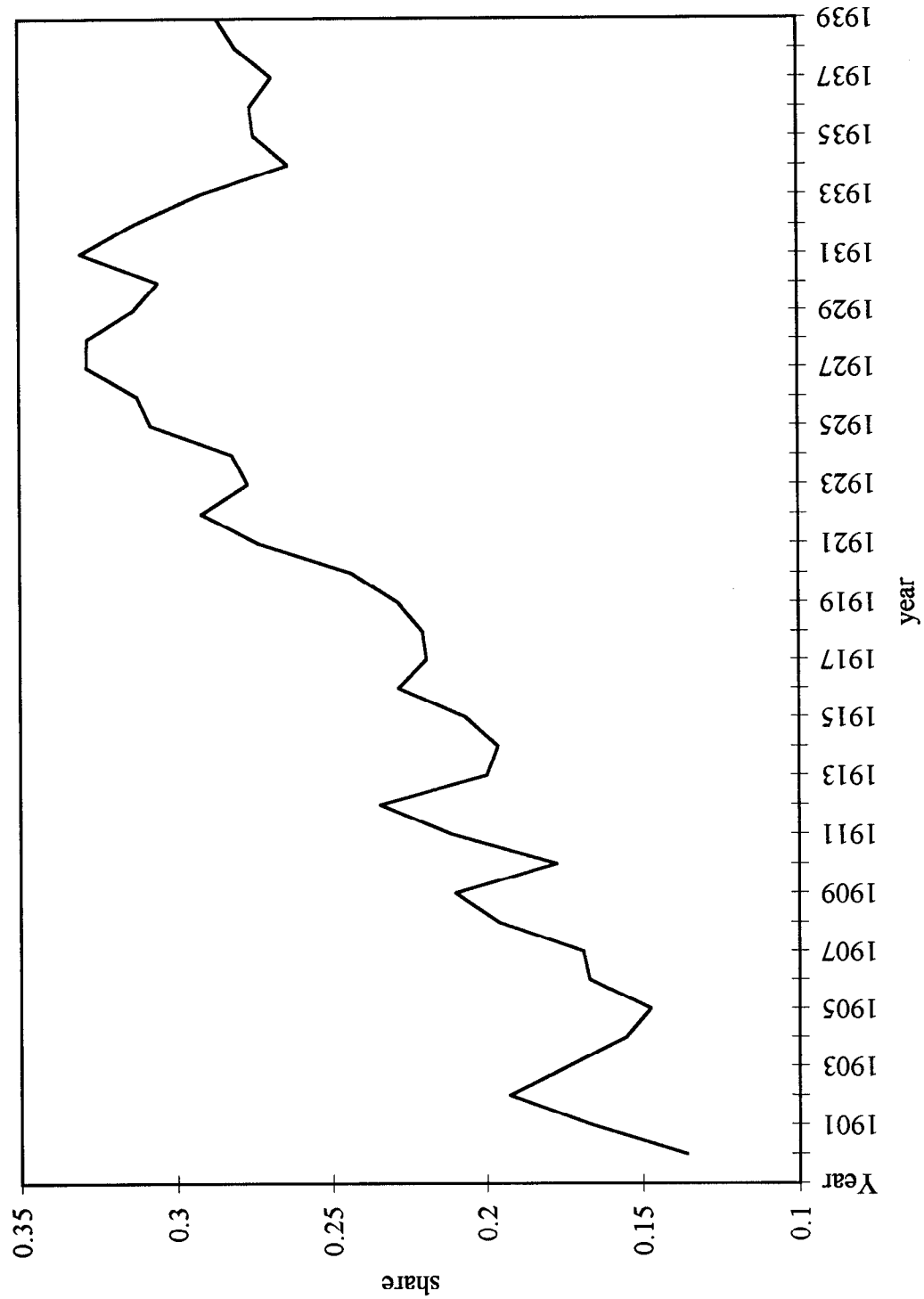
TABLE 2:

SUM OF THE TAX COEFFICIENTS IN LONG-RUN REGRESSIONS

| | (1) τ_{30Kt+e} | |
|-------------------------|------------------------|--------------------|
| | Contemp | Three Years |
| Manufacturing | .0031 | .0230 |
| F-test (p-value) | .91 | .19 |
| Nonmanufacturing | .3922 | .2283 |
| F-test (p-value) | .005 | .21 |
| Farms | .0077 | .0473 |
| F-test (p-value) | .45 | .0001 |

Notes: The dependent variable in each case is the share of noncorporate to total capital. Each entry is the sum of the coefficients on the tax terms of various lag lengths, as described in the paper. The first column sums the contemporaneous and one lead coefficients while the second column adds coefficients from one, two and three lags. The sample is 1900-1939. The p-value listed is from an F-test that the sum of the coefficients is equal to zero.

**Figure 1: Non-Corporate Share of Capital
for Non-Manufacturing Industries**



**Figure II: Individual and Corporate Tax Rates
(Assuming \$30,000 Real Income for Individual)**

