Income Taxation and Business Incorporation: Evidence from the Early Twentieth Century

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WP 12/05

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If the corporate income tax is set at a different rate from non-corporate in-come tax, it can play an important role in a firm's choice of organizational form. The impact and interdependency of income tax incentives are crucial factors in the formation of designing efficient tax policies. In this paper I exploit the variation in income taxes across U.S. states in the early twentieth century to estimate these sensitivities. Potential endogeneity of state taxes is addressed using an IV approach. The results demonstrate that the relative taxation of corporate to personal income has a significant impact on the corporate share of economic activities. On average, a one percent increase in corporate taxes is associated with 0.2-0.3 percent decreases the corporate share of economic activities, whereas a one per-cent increase in personal taxes raises the corporate share of economic activities by 0.5-0.6 percent.

Keywords: Income Taxes, Business Incorporation, Early Twentieth Century

JEL Codes: H25, H32, H71

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I. INTRODUCTION

The interplay between corporate and personal income taxes lies at the heart of tax policy design. As entrepreneurs face a choice between corporate and non-corporate forms of organization, any divergence between corporate and personal tax rates creates incentives to shift taxable income from the higher to the lower taxed organizational form. A careful study of the effect of income taxes on business incorporation helps us to understand the implications of income taxes on the organization of real economic activities and overall efficiency cost of incorporation behavioral responses.

Taxes can affect the choice of organizational form through changes in either the personal or corporate tax system. Many countries including the US use a classical approach to tax firms. While profits generated by non-corporate businesses, including sole proprietorships and partnerships, are passed through and taxed as personal income of the business owner; profits generated by companies are first liable to corporation tax. Therefore, corporate profits are taxed twice at the shareholder level as distributed dividends or realized capital gains from shares when sold on the capital market.

Existing empirical evidence based on a small number of studies, including Gordon and MacKie-Mason (1994), Mackie-Mason and Gordon (1997), Gordon and Slemrod (2000) and Goolsbee (1998, 2004), suggests a small but significant effect of taxes on incorporation decisions of U.S. firms. Most of these studies however—with the exception of Goolsbee (2004)—rely on time-series data, where identification of the tax effects is limited by a small variation in the statutory tax rates over time.

In this paper I overcome the problem of limited variation by turning to the early period of income taxation-- the first two decades of the twentieth century; a time that witnessed

tremendous changes in the United States' income tax regimes. Federal corporate income tax was introduced in 1909 and the federal personal income tax was introduced in 1913 with marginal tax rates in both schedules having moved frequently and dramatically since then. In 1901, the top marginal corporate rate was one percent in 1909, by 1919 it had risen to ten percent. In 1913 there were seven personal income tax brackets, and the marginal rate ranged from one to seven percent. By 1919, the number of personal tax brackets had increased to 56 and the marginal rate ranged from 4 to 73 percent. Major shifts in the scope and structure of income taxation as a result of the First World War introduced additional variation in the relative taxation of corporation. It was also during this period that many states enacted modern income tax legislations for the first time, with considerable differences in the tax structure across individual states. As a result, both time-series and cross-sectional variations in tax rates contributed to this study's identification of the tax effect on business incorporation.

There are some other advantages of focussing on this early period of income taxation. First the data on organizational forms is free of measurement errors caused by the hybrid entities that emerged in the second half of the twentieth century. Secondly it was a period before state regulations that were designed to curb aggressive state-tax avoidance behavior of companies, which were developed at a much later stage. For example, the Uniform Division of Income Tax Purpose Act (UDITPA), which provides standardized guidelines for interstate taxation including the throwback rule, was not developed until July 19, 1957.[1] The anti-passive investment company provisions, which disallow interest deduction and intangible expenses paid to related parties, was first adopted by Ohio in 1991. Therefore, the early 20th century offers a context relatively clear of complications in relation to studying incorporation decisions.

[1] Alabama was the first state to enter UDITPA on October 17, 1967, although it was not effective until the United States Congress enacted legislation specifically giving its consent for the States to enter into this Compact in 1968.

The dataset contains details of corporate and personal tax rates for the 48 continental states of the U.S. in 1909, 1914 and 1919 -- with 1919 being the last year Census of Manufacturers published establishment characteristics by organizational form and state. To analyze how the relative taxation of corporate income affects the choice of organizational form, I first calculate a measure of the tax cost of incorporation, which captures the differences among corporate, personal and equity taxes at both the federal and state levels. I then analyze responses of three different indicators of corporate activity -- the corporate share of establishment, employment and production in the manufacturing sector. Conceivably, if only very small enterprises respond to tax incentives, income taxes may change the corporate share of establishment without affecting its share of employment or production. Looking at three different measures of corporate activities therefore provides a more comprehensive picture of a firm's real economic activities.

Controlling the macro-economic effect and unobserved state heterogeneity, the fixed-effect estimation results suggest that the larger the difference between corporate and personal tax rates, the greater the decrease in corporate shares of establishment, employment, and production in the manufacturing sector. Firms that respond to incorporation incentives are, in general, larger than the average firm but slightly smaller than existing corporations in the economy. The relative importance of corporate and personal taxes is explored in a specification that includes each tax separately. Compared to corporate taxes, personal income taxes have a stronger effect on business incorporation. One possible explanation is that personal income tax may affect incorporation rates through additional channels. A higher personal income tax may also induce tax evasion by non-corporate firm owners and reduce the reported number of unincorporated firms in the sample. Alternatively, the progressive nature of the personal tax schedule can also

discourage risk-taking by pass-through entities. As a result, entrepreneurs may opt to incorporate rather than develop a non-corporate business form.

In a period of frequent and rapid tax changes, state governments may change the tax rates in response to an expanding tax base. If this is the case, OLS estimates are likely to be biased. To check the robustness of my findings I address the possibility of reverse causality with an IV approach. Subsequent findings remain qualitatively the same with the magnitude of IV estimates being slightly larger than the OLS results. An increase of one percentage point in the corporate tax rate decreases the corporate share of establishment by 0.025 percent, employment by 0.027 percent, and the value of production by 0.021 percent. An increase of one percentage point in the personal tax rate, on the other hand, increases the corporate share of establishment by 0.055 percent, employment by 0.061 percent, and the value of production by 0.048 percent. The size of tax coefficients is comparable to the largest existing estimates of responsiveness as in Goolsbee (2004), although he studies the responsiveness of firms in a much more mobile sector (the retail trade sector) with more recent data (special tabulation of 1992 Census of Retail Trade data). The empirical findings remain robust to a wide variety of checks, with similar conclusions being reached by using alternative specifications, weighting observations by the size of manufacturing sector, and allowing for the possibility that marginal investors may face different tax rates.

The obvious disadvantage of studying the early period of income taxation, as also pointed out by Romer and Romer (2013), is that the economic environment was very different from that of today. Nevertheless, historical experience can still shed some light on the implication of tax policies today. Almost a century after the introduction of corporate income tax in the United States, the UK government introduced a zero starting rate for the first £10,000 corporate income in 2002. The zero starting rate remained in place for four years until March 2006, and created a

considerable tax gain to incorporate for small businesses with taxable income below £50,000. As a result, incorporation rates of small businesses surged in subsequent years. As the UK experience suggests, conclusions drawn from historical data remain informative in the current economic environment.

The paper is organized as follows. Section two reviews existing literature on incorporation. Section three uses a simple discrete choice model to illustrate how taxes may affect firms' choice of organizational form. Section four discusses the tax system and some broad trends of incorporation in the first two decades of the twentieth century. Section 5 summarizes the data and presents some descriptive evidence on the effect of tax on incorporation. Section 6 reports the basic regression results and findings from the IV estimation and further substantiated robustness checks. Section 7 concludes the study.

II. PREVIOUS RESEARCH ON TAXES AND THE CHOICE OF ORGANIZATIONAL FORM

Existing empirical evidence suggests that taxation plays an important role in the choice of organizational forms in the United States, but there is no consensus on the magnitude of the tax effects. By estimating the size of the non-tax benefits of incorporation, Gordon and MacKie-Mason (1994) conclude that non-tax factors appear to be dominant in the choice of organizational form. Non-corporate firms however are concentrated in industries with low non-tax costs, which they interpret as indirect evidence of very limited tax responsiveness of incorporation decisions. Mackie-Mason and Gordon (1997) contributed further using the time-series behavior of asset allocation between corporate and non-corporate firms in 1959-1986. Though evidence suggests that profitable firms move out of the corporate sector when the tax distortion is large, the size of the behavioral response is rather small: cutting the tax rate on non-

corporate income by 10 percentage points causes only 0.2 percent of total assets to be shifted out of the corporate sector.

One possible explanation for the small estimated tax effect is that changes in the statutory tax rates, both corporate and personal, were negligible over the sample period in these studies. More importantly, the earlier work focuses on time-series analysis, which is likely to confound the tax effect with changes in other aspects of tax legislation and the marco-economic environment. To address these issues, Goolsbee (2004) turns to the interstate tax rate difference in 1992 to show that relative taxation of corporate to personal income has a significant impact on the corporate share of real economic activity in the retail trade sector. On average, a 0.01 rise in the corporate income tax reduces the corporate share of firms by 0.025, that of establishments by 0.019, that of employment by 0.015 and that of payroll and sales by around 0.01. These tax effect estimates are five to ten times larger than the largest measure of responsiveness found in previous time-series studies. Gordon and Slemrod (2000) further studies income shifting from corporate to personal tax base as a result of the closing gap between personal and corporate tax rates in the United States, and documents strong evidence of such shifting since 1965.

At the same time, non-US evidence suggests that corporate tax systems have a much larger impact on the choice of organizational forms than previously thought. de Mooij and Nicodeme (2008) exploits differences in corporate and personal tax systems among European countries and shows that the effect of tax on business incorporation increases significantly with the disparity between personal and corporate tax rates. Their simulation suggests that between 12% and 21% of corporate tax revenue can be attributed to income shifting between the corporate and the personal tax base: a one euro ex-ante relief in corporate tax rate costs only 76

eurocents in corporate tax revenue ex-post if income shifting toward the corporate tax base is taken into account.

Da Rin et al. (2011) examines the effect of corporate taxation on incorporation decision by analyzing tax-induced changes in the number of new companies in 17 European countries. To the best of my knowledge, this is the only other existing paper that directly addresses the possible endogeneity of taxation using instruments drawn from political economy literature. The authors find a significant negative effect of corporation tax on the entry rate of corporations, although the impact of corporate or personal taxation on the entry rate of unincorporated firms is left out of the analysis. Therefore their study only answers part of the question of the impact of income taxes on organizational form. Freedman and Crawford (2010) specifically considers the effect of taxes on the incorporation decisions of small businesses in the United Kingdom. The study presents clear graphical evidence that incorporation rates of small businesses surged after the reduction in the average corporate tax rate for companies with profits of £50,000 or less in 2002.[2]

Romer and Romer (2013) analyzes the responsiveness of reported taxable income to changes in marginal personal tax rates in the later inter-war period. The estimated elasticity of income with respect to the change in the log after-tax share is 0.2. This shows that large swings in marginal personal tax rates have an impact on the number of business incorporations in the inter-war era. Goolsbee (1998) is the only existing paper I am aware of that utilizes the rich variation in U.S. federal tax rates at the early stage of income taxation. This paper estimates the

[2] The starting rate of the corporation tax was initially set at 10 percent, reduced to 0 percent in 2002/03, and finally abolished in 2006/07, because the tax incentive caused self-employed individuals to incorporate for tax reasons rather than for entrepreneurship or real growth (Freedman and Crawford, 2010). The starting rate applied to the first £10,000 of corporate income and the average tax rate for corporate profit up to £50,000 was lowered.

impact of taxes on the non-corporate share of capital using aggregate time-series data in 1900-1939. The empirical results suggest that taxes do matter for organizational form decisions but the magnitude of the effect is small. A ten percentage point increase in the corporate tax rate raises the non-corporate share of capital by 0.2 to 3 percentage points.

III. THEORETICAL FRAMEWORK

I start with a simple model that the owner/manager of a small firm decides whether to incorporate by comparing the expected profits of the two organizational forms. The framework is developed from the stylized model developed in Mackie-Mason and Gordon (1997), Goolsbee (2004), and de Mooij and Nicodeme (2008). Tax treatment of business income differs by organizational form. An owner of a non-corporate firm in state i earns gross income $I^i_{gross,p}$and is taxed at the ordinary personal income rate τ_p . The entrepreneur can also organize the business in a corporation, with gross income ($I^i_{gross,c}$) taxed first at the company level as corporate profit and subsequently at the shareholder level. The after-tax net income (I^i_c) is

$$I^i_c = \left(1-\tau^i_c\right)\left(1-\tau^i_e\right)I^i_{gross,c},$$

where τ^i_c is the corporate tax rate in state i, and τ^i_e is the tax rate on equity income. The shareholder pays taxes on the invested equity in the form of dividends or realized capital gains. Dividends paid to the shareholder are taxable at a rate of t_d. Capital gains from the disposal of shares are taxable at a rate of t_{cg}. Unrealized income is not subject to tax at the shareholder level. Assuming a share of the realized income s_d is paid out as dividend and the present value of share sold on the capital market is γ, the tax rate t_e on equity income at the shareholder level is

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

Each profit-maximizing firm chooses the organizational form that delivers higher profit, i.e. $I^* = \max\left(I^i_p, I^i_c\right)$. In particular, a firm will incorporate if the net corporate profit is higher

than the net non-corporate income in state i,

(1) $\left(1-\tau_c^i\right)\left(1-\tau_e^i\right)I_{gross,c}^i > (1-\tau_p^i)I_{gross,p}^i$.

Assuming that $I_{gross,c}^i$ is proportional to $I_{gross,p}^i$, we have

(2) $I_{gross,c}^i = (1+G_c^i)I_{gross,p}^i$.

where G_c^i is the non-tax costs and benefits associated with incorporation in state i. Combining equations (1)-(2), a firm will choose to incorporate in its current state if

(3) $\left(1+G_c^i\right) > \frac{(1-\tau_p^i)}{(1-\tau_c^i)(1-\tau_e^i)}$.

Ex ante, the sign of G_c^i is unclear. Compared to the non-corporate form, there are clear advantages associated with incorporation. The primary non-tax advantage of incorporation is limited liability. Generally, corporate shareholders are not personally liable for business debts and obligations, whereas owners of sole proprietorships or partnerships are. Another advantage of incorporation is that firms can raise external funds on equity markets. In fact, as recognized in Evans (1941), purpose statements in corporate charters since the late 19th century listed opportunities to invest and the demands for capital as key purposes of incorporation. Thirdly, a corporation has continuous life. When a shareholder dies or wishes to sell his or her interest, the company can still exist, unlike a partnership or a sole proprietorship which would have to dissolve even if it is otherwise profitable (Lamoreaux and Rosenthal, 2005).[3]

Incorporation may also open a wider range of opportunities to shift income between corporate and non-corporate tax base and minimize overall tax liability. Extensive evidence and the implications of income shifting in various forms are discussed in Gordon and Slemrod

[3] The U.S. legal system did not grant limited liability to general partners until in the 1992 Revised Uniform Partnership Act. Before that, at least one general partner in the partnership (either general or limited) had to assume unlimited liability.

(2000). For example, recognizing an increase in the corporate tax rate relative to the personal, small owner-managed companies can increase the use of corporate debt finance by borrowing from the directors, increasing interest deductions for firms and interest income for individuals at the same time. Alternatively, income can be shifted by changing the compensation form for the owner/director, such as substituting between stock option and wage compensation.

Incorporation also comes with a cost. Besides the double taxation of corporate income as illustrated in the theoretical model, a corporation is often more structurally complex than other forms of businesses, entailing more extensive record keeping and higher administrative expenses. Minimum capital requirement and high legal expenses may also deter incorporation. As a result, a wide range of non-tax factors are also at play in shaping the choice of organizational form for small business owners.

IV. INCOME TAXES AND INCORPORATION TRENDS IN THE EARLY TWENTIETH CENTURY

In this section I explain some essential features of federal and state income taxation in the early twentieth century. I also provide a brief review of incorporation trends during this period.

A. Federal Income Taxes

The Tariff Act of 1909 introduced the federal corporate income tax. It was first formatted as a special tax on the privilege of conducting business as a corporation, taxing the net profit of corporations over $5,000 at one percent.[4] The Supreme Court then affirmed the validity of corporate income tax in 1911. Shortly after the ratification of the Sixteenth Amendment, which allowed Congress to levy an income tax without apportionment among the states, the federal personal income tax was introduced in the Revenue Act of 1913. The following decade was a period of major and frequent changes in income tax legislations. Table A.2 and A.3 list all the

[4] The Payne-Aldrich Tariff Act, 1909, ch. 6, 36 Stat. 11.

acts that affected corporate and personal income taxes, respectively, during 1909-1919. Each table gives a detailed description of the tax schedule.

<Insert Figure 1 Here>

Figure 1 plots the time-series of the top statutory corporate tax rate, top personal tax rate, and marginal personal rates at incomes of $20,000 and $10,000 during 1909-1919. The left vertical axis represents the scale of top statutory corporate rate and marginal personal rates at incomes of $20,000 and $10,000, and the right vertical axis represents the top personal rate on a larger scale. Over time, there is an evident upward trend in both the corporate and the personal tax rates, although the two had diverged since 1916.

In addition to the general trend of income taxes depicted in Figure 1, two other changes in corporation taxes are worth mentioning. First, the Revenue Act of 1917 introduced the war profits tax and excess profits tax, both targeted at the income of corporations.[5] Though temporary in nature, these war taxes imposed clear disincentives on corporate activities. For example, Schmidt and Young (1943) documented that the number of manufacturing corporations reporting to the Bureau of Internal Revenue was significantly lower in 1918-19 than in 1916-17, a drop reflecting the disincorporation movement emerging to avoid excess-profits tax.[6] Second, unlimited deduction for corporate interest payments was introduced in 1918. This was a temporary measure to compensate for effects of the excess profits tax.[7] When the excess profits tax was repealed in 1921, however, full interest deduction remained part of the corporate income tax regime without any formal justification from Congress.[8]

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[5] The war profits tax was eliminated in January 1919, and the excess-profits tax remained in place until 1921.
[6] Schmidt and Young (1943) mainly considered the effect of World War I on business financing but they also noted that the excess profits tax might have decreased the number of manufacturing and trade corporations between 1914 and 1920.
[7] Before then, only limited offsets against corporate income could be applied for interest payments.
[8] For a discussion of the historical impact of corporate interest deduction, see Warren (1974).

Movement of the three personal tax series in Figure 1 shows that statutory personal income tax experienced frequent and large increases during this period. Both components of the personal tax rate -- a flat normal rate for income above an exemption threshold and a progressive surtax ranging from 2 to 73 percent -- contributed to this increasing gap between corporate and personal tax rates.

Personal income tax was extremely progressive at the federal level, especially between 1913 and 1919 when the number of income tax brackets increased from 7 to 56, and the top marginal rate increased from 7 to 73 percent. Dividend income was also exempt from normal tax but not from surtax so corporate income was not shielded from double taxation.[9] Income from realized capital gains was taxed at the same rate as regular personal income.[10]

B. State Income Taxes

Passage of a permanent federal income tax law encouraged many states to enact income taxes as well. Wisconsin passed the first modern state income tax law in 1911 and many other states followed in the next few years.[11] Tables A.4 and A.5 list all the state income laws that were enacted between 1911 and 1919. Five states had imposed income taxes by 1913; by 1919, 14 states had either corporate, or personal, or both income taxes in place. State income tax legislation can be categorized as follows:

- Combined personal and corporation income tax laws: Alabama (1919), Mississippi (1912), Missouri (1917), New Mexico (1919), North Dakota (1919), Virginia (1916), Wisconsin (1911).

[9] Retained earnings were not subject to the progressive surtax until distributed as a dividend. The dividend exemption remained in effect until the Revenue Act of 1936 mandated that corporate dividends paid to individuals should be taxed as ordinary personal income.

[10] Until the Revenue Act of 1921 introduced a preferred capital gains rate of 12.5% (Auten, 1999).

[11] Laws of Wisconsin, 1911, ch. 658.

- Personal income tax laws and distinct corporate income tax laws: Massachusetts (1917), New York (1917).
- Personal income tax laws, but no corporate income tax laws: Delaware (1917), Oklahoma (1913).
- Corporations taxed on income basis, but no personal income tax: Connecticut (1915), Montana (1917) and West Virginia (1915).

For companies operating across different states, each state set its own rule to determine the proportion of taxable income attributable to its jurisdiction. At the early stage of income taxation, two common approaches were applied. In Mississippi, Missouri, Montana, Virginia and Wisconsin, companies could rely on separate accounting to report their business and income. In all other states, consolidated accounts are used to work out the apportionment of taxable income based on the distribution of property, cost of production and gross sales across states.

<Insert Figure 2 Here>

Figure 2 illustrates the relative taxation of corporate income at state level in 1919 by plotting corporate tax rate against personal tax rate. Six states are above the 45 degree line, taxing corporate income more heavily relative to personal income. Delaware and North Dakota are below the 45 degree line, implying lighter taxation of corporate income. The rest of the states are on the 45 degree line, taxing corporate and personal income at the same rate. Within each state, there were frequent tax legislation changes related to the exemption threshold and marginal tax rates. The additional variation in state tax code not only adds cross-sectional variation in income taxes but also allows for controlling unobserved state heterogeneity that may relate to incorporation rate.[12]

[12] In fact, variation in state rates can be extreme in the cross section since 34 states did not impose a tax on income during the sample period. Lutz (1920), Bigham (1929), and Blakey and Johnson (1941) discuss the progress of the state income taxation since 1911. Rising property tax rates in the 1920's, significant property tax delinquencies in the 1930's, and further efforts to reach intangibles prompted more states to adopt income taxes. 33 states had an individual and/or corporate income tax by 1940 (Blakey and Blakey, 1940, p. 131).

C. Business Incorporation in the US: 1880-1920

To better understand the broad trend in business incorporation during this period, I collected annual incorporation data for nine individual states from Evans (1948), Appendix 3.[13] Despite their limited coverage, these statistics provide a good overview of general patterns of incorporation throughout the United States.

<Insert Figure 3 Here>

Figure 3 shows the number of business units incorporated in nine states between 1880 and 1920. A few patterns are worth noting. First, throughout the 1880s and the first few years of the 1890s, the annual number of incorporation gradually increased in every state. This trend then slowed during the remaining years of the decade. As explained in Evans (1941, 1948), several factors contributed to the rising popularity of corporation: common restrictions on limited liability were removed in this period; states revised their corporate laws in order to increase benefits and lower costs of incorporation; the advantages of the corporate form were increasingly known to the public and consumers and other market participants became more familiar with doing business with companies.

For many states the first wave of incorporation started around the mid-1890s, incorporation numbers then continue to rise until the mid-1900s. Noticeably, this period marks the first wave of great mergers in U.S. history (1895-1904). It is also known as the period of "corporate charter mongering", when many states liberalized their company laws to attract large businesses (Grandy, 1989). New Jersey was the leading state in this competition, liberalizing its statue to allow for horizontal mergers and the creation of holding companies (1888), operations outside the state (1889), and the autonomy of directors to define the power of corporations

[13] These data were mostly complied from published state documents and official records located in the offices of state incorporating agencies.

(1896). As a result, since 1890 the number of business incorporation in New Jersey has overtaken those in Pennsylvania, the second largest industrial state in the union, and every other state for which we have statistics during this period.

Other states entered into the competition around 1900 in an effort to attract more companies from New Jersey. Between 1899 and 1902, Delaware, Maine, New York, West Virginia, Massachusetts, and Connecticut all made major revisions to their corporate laws. Some of the states that enacted such legislation, like Delaware and Maine, sought to actively compete with New Jersey in the charter market. Others, like Massachusetts, had a modest ambition of deterring local businesses from incorporating out of the state (Evans, 1941).

State competition in private company laws explains, in particular, the first wave of incorporation. Most companies incorporated at the time were large businesses operating in multiple states. Businesses incorporated after the first wave of incorporation, however, were mainly small companies. For the states with available data on incorporation by firm size, the percentage of small corporations in total incorporation is very high. Between 1897 and 1917, small firms account for 92 and 85 percent of total business incorporation in Illinois and Pennsylvania, respectively.[14] In this regard, incorporation during the first two decades of the 20th century mainly involved small businesses operating in their home states.

The incorporation series closely followed business cycles, suggesting the importance of macroeconomic conditions in driving business incorporation. There is evident heterogeneity in incorporation across states. For example, while Connecticut and Maryland had an almost steady upward trend, incorporation in Maine rose sharply until 1903 and declined steadily afterwards.

V. DATA AND DESCRIPTIVE ANALYSIS

[14] A company is defined as small if it had an authorized capital stock of less than $100,000. A company is defined as large if it had an authorized capital stock of $50,000,000 or more.

A. Degree of Incorporation

The quinquennial Census of Manufacturers provides state-level data on the organizational form of manufacturing enterprises for 1904, 1909, 1914, and 1919.[15] An establishment is categorized in three forms: (1) individual ownership with no limit to personal liability, (2) corporations with limited liability, and (3) all other forms including establishments operated by firms, cooperative associations, and miscellaneous forms of ownership that could not be classified as "Individuals" or "Corporations".[16]

Aggregate information by organizational form is available on the number of active establishments, number of wage earners, value of production, and value-added by manufacturing. Counting ownership at the establishment level ensures an accurate measurement of tax treatment at state level. This is because formula apportionment requires the tax rate for firms with multiple plants in different states to be a weighted average, generating measurement noise in the tax variables. By contrast, an establishment is located in the state where it is actually taxed since its location ties closely to the common measures of income allocation such as property and sales.[17] As a result, the tax variables are free of measurement noise from taking the weighted average of tax rates for multi-state firms.[18] Conceivably, incorporation considerations of single-establishment firms can be quite different from those of multi-establishment firms with

[15] The *Census of Manufacturers* classifies data by establishment which is defined as follows: "As a rule, the term 'establishments' signifies a single plant or factory. However, in some cases, it refers to two or more plants operated under a common ownership and located in the same city, or in the same county but in different municipalities or in unincorporated places having fewer than 10,000 inhabitants. On the other hand, separate reports are occasionally obtained for different lines of manufacturing carried on in the same plant, in which event a single plant is counted as two or more establishments. In every industry, however, the difference between the number of establishments and the actual number of plants or factories is negligible" (Census of Manufacturers, 1919, p.5). The Census excluded establishments with an annual product value of $500 or less.

[16] Census of Manufacturers, 1919, p. 340.

[17] For example, Wisconsin attributed the following two classes of sales as in-state income: (1) goods manufactured within the state, sold to customers outside the state, and delivered from the factory within the state; and (2) goods manufactured within the state, shipped to branches outside the state, sold to customers outside the state, and delivered to these customers from the branches outside the state.

[18] Unfortunately, after 1921 questions about the ownership status by establishment are removed from the Census schedule, and the data in our study is the most extensive public record of ownership characteristics at the state level.

the latter normally choosing to incorporate despite the tax treatment. However, as discussed above, these multi-establishment firms were the target of charter mongering between 1895 and 1904, so most of them were incorporated by the turn of the 20th century. This analysis focuses on the incorporation decision of small businesses.

To measure the corporate share of the establishment, I divide the number of corporate establishments by the sum of individual and corporate establishments. Similarly, three indicators for the share of corporate activities in the economy are derived as follows:[19]

- The corporate share in the number of establishments.
- The corporate share in employment measured by the number of wage earners.
- The corporate share in the value of new products.[20]

In 1919, the manufacturing sector accounted for 21.9 percent of the total number of corporations and more than 50 percent of corporate income in the US. Within the manufacturing sector, corporations played an important role as measured by their share of economic activities. However, manufacturing is not the only sector dominated by corporations. Trade, finance, banking and insurance, as well as mining and quarry all have a large share of corporations, as indicated by the percentage of corporate returns and gross income computed using the 1919 SOI tax return data.

B. TAX VARIABLES

[19] It is not entirely clear how income of "all other business forms" were taxed. To avoid measurement noise in the degree of incorporation, I do not use businesses of all other forms in the construction of the dependent variables.
[20] Regression results based on the additional indicator, the corporate share in the value added of new products, are very similar to those using the corporate share in the value of new products as dependent variable.

To compute the tax cost of incorporation, I first calculate the total income tax rate as the sum of federal and effective state tax rate, where the effective state rate accounts for the deductibility of federal income taxes at the state level. The state-specific tax cost to incorporate (T_c) is

$$T_c = t_c + (1 - t_c)t_e - t_p.$$

Specifically, t_c is the total federal and state corporate tax rate constructed as $t_c^f + (1 - t_c^f)t_c^s$, where t_c^f is the federal corporate tax rate and t_c^s the state top corporate rate. Similarly, t_p is the total federal and state personal tax rate $t_p^f + (1 - t_p^f)t_p^s$, and t_e is the total effective tax rate on equity income $t_e^f + (1 - t_e^f)t_e^s$.

Data on federal income tax rates is from *U.S. Federal Individual and Corporate Income Tax Rates History* tables.[21] Data on state income tax rates is compiled from state income tax legislations in various years. The total corporate tax rate is computed as the sum of the top statutory federal corporate tax rate, the average excess-profits tax rate, and the top statutory state rate. The average excess-profits tax rate is computed as the ratio of the excess-profits tax paid by corporations to the sum of net income and excess-profits using the SOI tax return data.[22] The average excess-profits tax rate was 15.21% in 1919.

Some assumptions are required to measure the marginal personal tax rate. Unlike analyses that use the maximum personal rate for contemporary data, this study cannot rely on changes in the top marginal rate since the top bracket was extremely progressive in this period. In 1919, for example, only 65 filers were subjected to the 73 percent top marginal rate. Instead, I use the marginal tax rate for filers with a net income of $20,000. This threshold is the lowest

[21] available at: http://www.taxfoundation.org/research/show/151.html.

[22] For instance, the excess profits tax were assessed as 20 percent of net income above the excess-profits credits, which is a fixed $3,000 plus 8 percent of invested capital in the current year.

income bracket above which the surtax rates apply. In 1914, the first year when personal returns were collected, individuals with an annual income of $20,000 and above were at approximately the top 9 percent of income distribution and received more than 80 percent of dividend payouts.[23]

For robustness, personal tax rates at $10,000 and $30,000 income levels are also considered. As discussed in the previous section, dividend income was exempt from normal personal income tax but not from surtax. I calculate the dividend tax rate in each case accordingly and include it as part of the tax burden for shareholders. Following Goolsbee (2004), the effective capital gains tax rate is assumed as zero. This is to take into account deferral, exemption at death, and the lack of inflation adjustment in the basic specification. Estimation results using a weighted average of dividend and capital gains tax are very similar and hence not reported.

C. CONTROL VARIABLES

A few variables are included to capture the non-tax reasons to incorporate. I use the size of the manufacturing sector as an indicator for infrastructure and industrial policies. Better infrastructure and industrial policies may enable firms to generate agglomeration rents, implying ceteris paribus an easier access to external finance. The size of the industrial sector is measured by the percentage of employment in manufacturing relative to employment in agriculture and mining. Information on employment by state and sector is available in the *Workers' Compensation Data Set* compiled by Fishback and Kantor (2000).

Secondly, it is well known that firms tend to incorporate as they grow larger and become more complex. This size effect is recognized by Fama and Jensen (1983 a, b) and empirically tested by Gordon and Mackie-Mason (1994). To control for the effect of firm size on

[23] For comparison, one needs a household income of $100,000 or above to get to the same percentile of the income distribution in 2007.

incorporation, I include the average size of establishment as an independent variable: measured by the average number of workers per establishment in manufacturing. Lastly, I include capital intensity in manufacturing as a proxy for demand for external finance, which is often considered more important for corporations than for non-corporate forms (Egger et al., 2009). The capital intensity variable is computed as the ratio of capital input to the sum of capital input and wage and salary payment, using data from the *Census of Manufacturers* in relevant years. Definitions of control variables are summarized in Table A.1.

D. SUMMARY STATISTICS AND DESCRIPTIVE ANALYSIS

The final dataset for regression analysis contains 148 state-year observations in 48 continental states between 1909 and 1919.[24] Table 1 gives the summary statistics for all variables. As noted above, the economic importance of corporations is indicated by their portion of employment (85.17%) and value of production (87.93%) rather than the share of establishment (34.38%). On average, the effective tax rate for corporate, personal and dividend income is 9.26, 6.52 and 3.70 percent, respectively. Accounting for double taxation, one dollar of corporate income was taxed about six cents more than non-corporate income during the sample period.

<Insert Table 1 Here>

Figure 4 offers descriptive evidence that the tax cost to incorporate discourages corporate activities. The figure groups the corporate share of economic activities by the tax cost to incorporate in (1) states with higher corporate taxes than personal taxes and hence favoring non-corporate form, (2) states with no income taxes by 1919 and neutral to the choice of organizational form, and (3) states with lower corporate taxes than personal taxes and favoring

[24] The 1904 data are helpful only to establish pre-existing trends in incorporation, thus are excluded from the regression analysis (with the exception of Virginia).

corporate form. Percentage changes in corporate activities are measured as changes in the average number of establishments, employment, and value of production in 1914-1919, all relative to the 1914 levels.[25] Each bar indicates the sample average. The figure shows a clear association between low tax costs to incorporate and large increases of corporate activity with the largest increases in corporate activity occurring in states that favor the corporate form and the least growth in the corporate sector occurring in higher tax-cost states.

<Insert Figure 4 Here>

VI. EMPIRICAL ANALYSIS

A. Econometric Model

The empirical specification is derived by taking log on both sides of equation (3):

$$\log\left(1+G_c^i\right) > \log\left(1-\tau_p^i\right) - \log\left(1-\tau_c^i-\tau_e^i+\tau_c^i\tau_e^i\right).$$

Since log(1+t)≃t, a firm will incorporate in state i if

(4) $$G_c^i > \tau_c^i + \left(1-\tau_c^i\right)\tau_e^i - \tau_p^i \ .$$

The differential term, $\tau_c^i + \left(1-\tau_c^i\right)\tau_e^i - \tau_p^i$, in equation (4) summarizes the relative taxation of corporate to non-corporate income, namely, the tax cost to incorporate. At the firm level, a lower tax cost to incorporate is associated with a higher probability to incorporate. At the state level, the fraction of corporations is modeled as a function of the tax cost to incorporate (T_c). The basic specification of interest is

(5) $$S_{it} = \alpha_t + \beta_1 T_{c,it} + \boldsymbol{Z_{it}\gamma} + \lambda_i + \varepsilon_{it} \ ,$$

where S_{it} is the corporate share of firms in state i in year t, and $\boldsymbol{Z_{it}}$ is a vector of non-tax factors that may influence the incorporation decision. The year dummies α_t capture the potential impact of progressive movement and macroeconomic shocks on corporate activities. The state dummies

[25] The time period is restricted to 1914 - 1919 to reflect changes in corporate activities driven by fiscal policy.

(the λ_is) represent the unobserved factors that vary across states but can reasonably be thought as constant during the sample period (e.g. legal and regulatory environment). Note that states with no income taxes are also included in the regression, allowing control of changes in incorporation patterns that are driven by non-tax factors. To the extent that incorporation is also driven by non-tax factors, the non-tax states contribute to identification as a control group, i.e. allowing for controlling changes in the general incorporation pattern that are independent of the tax incentives to incorporate.

B. Within-group Regressions

<Insert Table 2 Here>

Table 2 presents regression results from estimating equation (5) with standard errors robust to heteroskedasticity of arbitrary form. There is a strong relationship between business incorporation and income taxes. A larger difference between corporate and personal tax rates reduces the fraction of economic activities undertaken by corporations, presenting evidence that firms shift from the corporate to non-corporate sector in response to a higher tax cost to incorporate. The significance of the tax variable is robust to inclusion of state-level covariates. Note that there is some limitation in the timing of the data. Several states had reforms in 1919, contemporaneous with the last year of data. It is likely that firms would take time to respond to tax incentives, and if they do so it would bias the tax effects toward zero. To the extent that I still find significant tax effects, the direction of bias helps strengthen my findings.

Taken at face value, a 0.01 decrease in the tax cost to incorporate increases the corporate share of establishment/employment/production by 0.029/0.034/0.031 percent. Firms that incorporate in response to tax incentives have a higher share of employment and production

relative to the share of establishment. The operation scale of new corporations is larger than the average firm in the economy but slightly smaller compared with their existing counterparts.

Coefficient estimates of non-tax factors have the expected sign, but are often estimated with imprecision. The presence of a large manufacturing sector seems to encourage incorporation as well as hiring and production in the corporate sector. A higher capital intensity is associated with more corporate production; consistent with the hypothesis that firms with high investment demand benefit more from incorporation. The establishment size coefficient is positive and significant in the establishment equation, consistent with the stylized fact that large companies tend to incorporate for better monitoring and governance scheme.

C. **Alternative Specifications**

To separately identify the individual contribution of corporate and personal income taxes to business incorporation, Table 3 reports coefficients from a regression that separately includes corporate taxes on shareholders and the personal tax rate. Both tax coefficients have the right signs and are statistically significant: a higher corporation tax discourages incorporation while a higher personal income tax encourages it.

<Insert Table 3 Here>

The personal tax coefficient is statistically different from the corporate tax coefficient, implying a stronger effect of personal income taxes on business incorporation. This finding is consistent with three possible channels through which personal income taxes may affect incorporation. Unfortunately, none of these possibilities can be tested rigorously using the current dataset. First, a large personal tax coefficient is consistent with the existence of tax evasion. In fact, as it is easier to evade personal income tax, unincorporated firms are more likely to underreport their activities when facing a higher personal tax rate. They may stop filing tax

returns and other related government surveys; disappearing from the data. If this is the case, the higher share of corporations could be a mere artifact of fewer reported unincorporated firms.

Second, given that personal income is progressive while corporate tax is flat, corporations enjoy an advantage in tax savings once they grow over a certain scale. This is a hypothesis theoretically formalized in Cullen and Gordon (2007) and empirically tested in Gentry and Hubbard (2005).[26] When facing a progressive tax schedule, firms would require a higher pre-tax expected return on more risky projects to offset a higher expected tax payment. If so, a large personal tax coefficient would capture the additional impact of personal tax progressivity on incorporation. Lastly, given a higher personal tax rate in the current state of residence, a non-corporate firm can move to a neighboring state and stay unincorporated. As a result, the personal tax variable may also capture potential tax savings from moving to a low-tax jurisdiction.[27] The relocation response is however less likely in context of frequent renewals of state income tax legislations because tax savings from relocation are likely to be temporary and insignificant compared to the cost of doing so.

<Insert Table 4 Here>

The first three columns of Table 4 present the estimated coefficients from a random-effects regression specification. In this specification, the unobserved state heterogeneities are assumed to be drawn randomly from a given distribution and to be uncorrelated with all non-tax factors of incorporation. Estimated tax effects are slightly smaller compared to those implied by

[26] Precisely, Gentry and Hubbard (2005) estimates the effect of progressive personal taxation on entering self employment or business ownership.

[27] Recent studies analyzing the effect of state taxation on the location of economic activities include Hines (1996), Goolsbee and Maydew (2000), and Feld and Kirchgassner (2003). In particular, Feld and Kirchgassner (2003) considers the roles that the corporate and the personal income tax play in the location and employment of firms in Swiss cantons, but does not distinguish firms by organizational forms. It finds that corporate and personal income taxes contribute significantly to the rationale behind the regional distribution of firms and the regional difference in employment in Switzerland.

fixed-effects specifications in Table 2. A panel-robust Hausman test suggests that the fixed-effects model is preferred to the random-effects approach. To further control for time-varying differences across states, column 4-6 of Table 4 present estimated coefficients from a specification that replaces state fixed effects with state-specific linear trends. The estimated tax coefficient remains statistically significant in the establishment equation, though it is much smaller than the fixed-effects coefficients. This is intuitive because part of the variation in the tax term is subsumed within state-specific linear trends. In addition, the large R^2 at the bottom of Table 4 suggests the potential problem of perfect fit in this setting.

D. Addressing the Endogeneity of Taxation

An important issue for estimating causal impacts of tax rates on incorporation is the exogeneity of changes in income tax rates. Any observed correlation between tax rate and tax base can be driven by reverse causality; that is, when states enact an income tax, or change the tax rate, in response to an expanding tax base. To identify the causal effect of income taxes on incorporation, I exploit changes in tax rates that are unlikely to be correlated with contemporaneous changes in the corporate tax base.

At the turn of the twentieth century, property taxes were increasingly ineffective at tapping new forms of wealth. In response, state legislature started to consider alternative tax revenue sources such as franchise and income taxes.[28] One of the clearest statements of this motivation can be found in the 1907 *Wisconsin State Tax Commission Annual Report*:

> "The very inefficient manner in which the personal property tax has been assessed and the resulting gross inequalities in taxation, as well as the agitation of the subject of credit

[28] Property taxes remained the most important source of state and local finance. By 1902, property taxes accounted for 57 percent of all state revenues and 73 percent of all revenues raised at the local level (Wallis, 2000).

exemption, have brought about the pending constitutional amendment authorizing a graduated income tax (p. 30)".

Intuitively, the revenue-generating capacity of property tax is directly linked to a state's propensity to increase income taxes. Alternatively, the per-capita property tax bill also reflects the long-run revenue need of state governments. Therefore, I use one-year lagged per-capita property tax as an instrument for the income tax variables. Annual data on property taxes are collected from the *Statistical Abstract of the United States*.

Fiscal conditions of the state can also shed light on the legislative motivation behind income taxation. Romer and Romer (2013) points out that most federal income tax changes during the inter-war period were tied to spending changes. Conceivably, states with budget deficits should also be more likely to raise income tax rates to fund spending. Following this argument, I construct a deficit dummy variable equal to one for states with current-year expenditure exceeding revenue and equal to zero for those states with current-year expenditure below revenue. Data on state revenue and expenditure are collected from *Sources and Uses of Funds in State and Local Government in the United States*, 1790-1915 (ICPSR9728). In contrast with per-capita property tax revenue, the deficit dummies are most likely to capture the short-run revenue needs of states.

Between 1880 and 1907, agricultural and industrial states developed distinctive approaches to taxing corporations. While urban and industrial states taxed corporations to fund increased public spending, agricultural states in the South and Great Plains spent far less on schools, asylums, and other public improvements and did not initiate significant corporation taxes (Pegram, 2004). Such differences reflected fundamental difference in political ideology between the north and the south. To capture the impact of political ideology in shaping income

tax policies, I use the share of employment in agriculture to measure the strength of agricultural interest in each state.[29]

In this framework, it is important that the proposed instruments are valid, in the sense that: they (i) significantly explain part of the variation in both the corporate and the individual income tax rates, and (ii) are uncorrelated with unobserved determinants of incorporation rates. The first issue is a statistical one that, as shown below, is satisfied since each individual instrument is a strong predictor of the tax variables and the instruments are jointly significant as indicated by weak identification statistics. Regarding the second issue, it is unlikely that any of these instruments are critical determinants of the decision to incorporate by individual firms. Companies in a deficit state might well anticipate the passage of new tax measures, but there is no clear evidence that firms would expect the passage of income tax laws in particular.[30]

The proposed instruments directly address the potential endogeneity of the tax rate *levels*. I am less concerned about the endogeneity of the *difference* between the corporate and the personal tax rate. Such differences tend to arise from the deductibility of federal income tax at the state level, which is exogenous from the state's perspective. To illustrate, suppose that in a given state corporate and personal income are taxed at the same flat rate t^s. Accounting for the deductibility of federal income tax, the effective state corporate and personal rates are $(1 - t_c^f)t^s$

[29] The party of the governor is a possible alternative instrument for this purpose: but this variable has limited variation within a state during this period.

[30] Take Missouri as an example: It continued with a policy of deficit spending during the first two decades of the twentieth century and considered various new sources of revenue to cope with its deteriorating financial condition. However, between 1905 and 1909, no significant tax legislation or reform occurred. In 1909, Governor Hadley asked the legislature to enact four major tax measures including a tax on corporate capital stock, increased inheritance taxes, an oil inspection tax and a tax on the inspection of spirits or liquors. The legislature acted only on the oil inspection tax. Income taxes were not in place until 1917, when the legislature approved six out of a package of nine major tax proposals including the corporation franchise tax, an individual tax, the first income tax, a general and revised inheritance tax, a secured debt tax, a soft drink inspection tax, and a wholesale liquor dealers tax.

and $(1 - t_p^f)t^s$, respectively. The difference in the effective tax rates $(t_p^f - t_c^f)t^s$ is a by-product of the difference in federal tax rates augmented by the level of income tax across different states.

E. Instrumented Regressions and Additional Robustness

<Insert Table 5 Here>

Table 5 presents the IV regressions with state and year fixed effects. Columns 1-2 present first-stage results using the instruments described above. The strength of the first stage is indicated by the relevant coefficients and the weak identification statistics for the set of instruments. The effects of instruments on income tax rates are consistent with previous discussions. The p-value of Hansen's J statistic in each specification exceeds the conventional significance level, suggesting that the instruments are exogenous with respect to the income tax rates.[31]

Columns 3-5 present the IV estimates. The signs of the tax coefficients remain unchanged. The IV estimates of tax coefficients are slightly larger than those obtained using ordinary least squares in Table 3, but the differences are not statistically significant. A 0.01 increase in the corporate tax rate decreases the corporate share of establishment by 0.025 percent, that of employment by 0.027 percent, and that of production by 0.021 percent. A 0.01 increase in the personal tax rate, on the other hand, increases the corporate share of establishment by 0.055 percent, employment by 0.061 percent, and value of production by 0.048 percent. The magnitude of these estimates is comparable to the largest existing estimates of responsiveness in Goolsbee (2004), although that study focuses on a more mobile sector and uses more recent data.

<Insert Table 6 Here>

[31] It is possible that political ideology has a direct effect on incorporation decisions through other chanels including the passage of other laws favoring a particular organizational form. I test the robustness of the IV results by excluding the political ideology variable from the regression. The tax coefficients remain almost the same with slightly larger standard errors, suggesting that there is no significant bias in the IV estimates due to the potential endogeneity of political ideology variable.

Table 6 provides some evidence on the robustness of the findings. Regression in panel A recognizes that the panel setting restricts tax incentives resulting in the same effect across states, however it is possible that firms are less sensitive to tax incentives in rural and less industrial states. To see if results are mainly driven by incorporation in urban and industrial states, I generate manufacturing importance weighted (MIW) estimates which place more weight on states with a large manufacturing sector. Specifically, each observation is weighted by the share of employment in manufacturing. The MIW results are given in panel A. The tax coefficients remain very similar to the main IV results.

In panel B and C I use alternative personal tax rates at incomes of $30,000 and $10,000. While the pattern of the results remains qualitatively the same, the tax effect is smaller at the lower income bracket. This is reasonable if the net advantage of incorporation is larger for potential entrepreneurs of higher income. When personal tax rates are more dispersed, those in the highest tax brackets face stronger tax incentives to become entrepreneurs while those in the lowest tax brackets face stronger tax disincentives (Gordon, 1998). As a result, during this period, entrepreneurs are more likely to come from the top tax brackets.

VII. CONCLUSION

In this paper I study the effect of income taxes on business incorporation in the early period of income taxation in the United States. I exploit variation in state-level tax changes to identify the impact of corporate and personal income taxes on the corporate share of economic activities within the United States. In particular, the availability of firm activities by organizational form and state with a longitudinal dimension, an attribute which allowed me to control for observed incorporation trend over time and unobserved heterogeneity across states. In

addition, I address the endogeneity of tax rates by surveying the historical background for unique instrumental variables during this period .

Results show that the relative taxation of corporate to personal income plays an important role in the share of corporate establishments, employment and production. The incentive effects of corporate and personal income taxes are precisely estimated. Further, their robustness to alternative specification and potential reverse causality between tax rates and income tax base has been demonstrated.

The significant effects of income taxes on business incorporation found in this study contribute to our understanding of the rising popularity of corporations in the U.S. more than a century ago. The findings also help explain the small business incorporation surge that happened more recently in the UK. However, despite these findings it is important to acknowledge the limitations in both data and time period used in this analysis. The ideal dataset to study the relation between income taxes and the choice of organizational form would be pooled personal tax data for individual entrepreneurs and corporate tax data for incorporated businesses. With such data one would be able to observe simultaneously incorporated and unincorporated businesses, tracking the businesses life path of those firms and tax position. I leave the pursuit and analysis of such data to future research.

ACKNOWLEDGMENTS

I am grateful to Michael Devereux for his invaluable discussions and advice. I thank Rosanne Altshuler, Steve Bond, Kimberly Clausing, Judith Freedman, Clemens Fuest, Jane Gravelle, Glen Loutzenhiser, Carolyn Moehling, Hilary Sigman, Hugh Rockoff, John Wallis, the editors Bill Gentry and George Zodrow, two anonymous referees, and seminar participants at the Oxford University Centre for Business Taxation, Tsinghua University, the 2012 NTA Conference, the

2012 EHA Conference, and the 2013 AEA Meeting for helpful comments. I acknowledge financial support from the ESRC (Grant No. RES-060-25-0033, "Business, Tax and Welfare"). All errors and omissions are my own.

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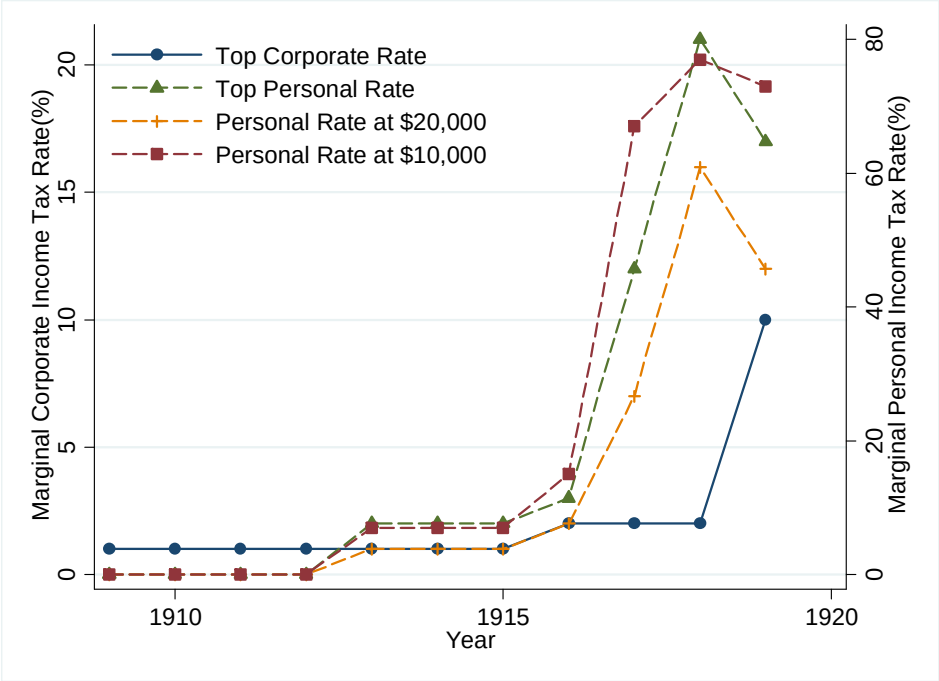
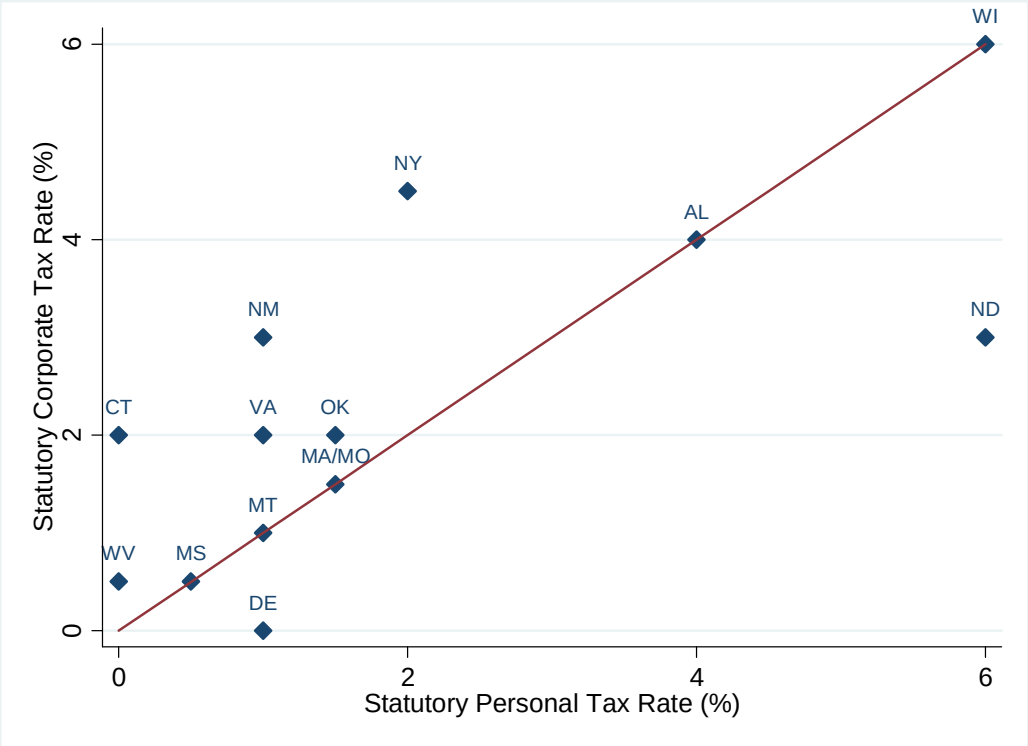
Figure 1
Marginal Federal Income Tax Rate, 1909-1919



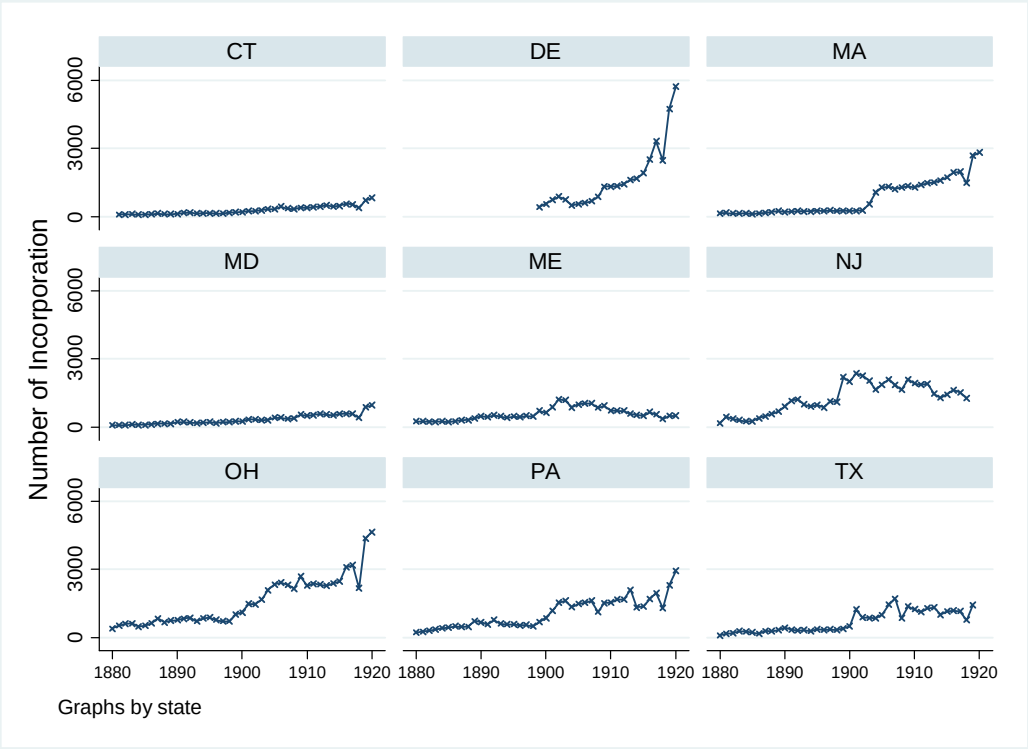
Source: *the U.S. Federal Individual Income Tax Rates History, 1913-2011* and *Federal Corporate Income Tax Rates, Income Years 1909-2008*, the Tax Foundation.

Figure 2
State Income Tax Rates in 1919



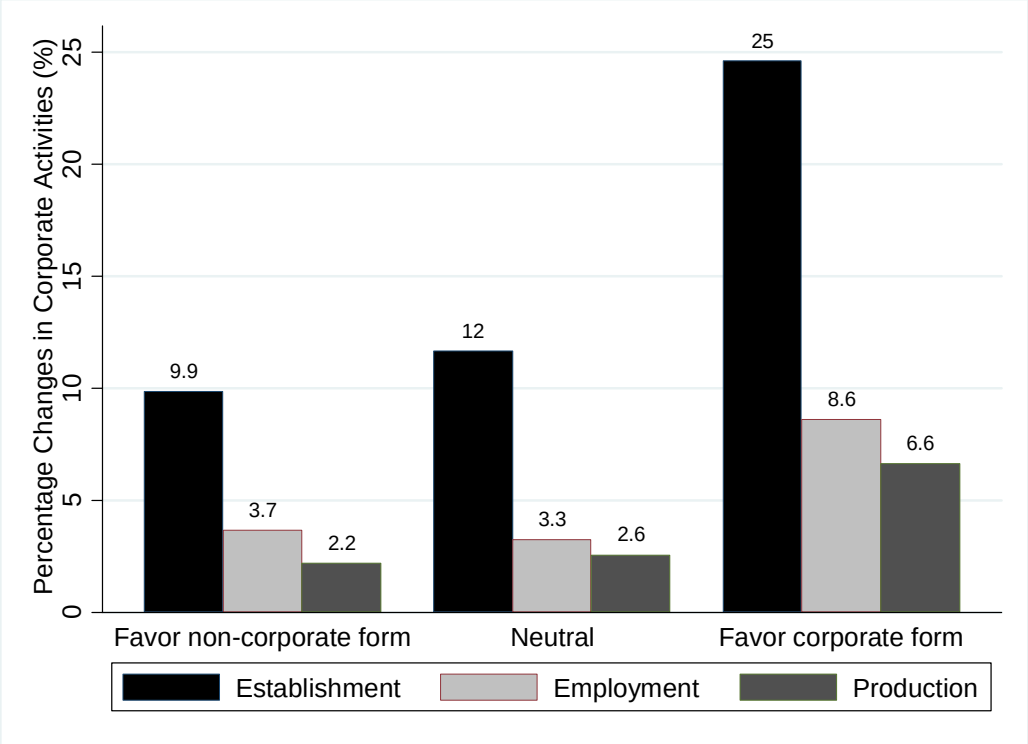
Source: the *State Income Tax Act*, various years.

Figure 3
Business Incorporation in the US: 1880-1920



Note: This figure displays annual number of business incorporation in nine states in the US between 1880 and 1920. Date for this graph is from Evans (1948), Appendix 3.

Figure 4
Corporate Activities and State Income Taxes



Note: This figure compares percentage changes in the mean corporate share of economic activities for (1) states with high tax cost to incorporate (Favoring non-corporate form), (2) states with no income taxes or tax the corporate and personal income at the same rate (Neutral) and (3) states with low tax to incorporate (Favoring corporate form). Percentage changes in the corporate share are measured by the difference between the 1914 and 1919 value of economic activities, relative to their 1914 value. Tax cost to incorporate is high/low if the corporate tax rate is above/below the persona tax rate at the state level.

Table 1
Summary Statistics

Variable	N	Mean	Standard deviation	Minimum	Maximum
Corporate Share of Establishment	148	0.344	0.083	0.181	0.646
Corporate Share of Employment	148	0.852	0.092	0.550	0.968
Corporate Share of Production	148	0.879	0.082	0.586	0.981
Tax Cost to Incorporate	148	0.064	0.083	0.000	0.204
Effective Corporate Income Tax	148	0.093	0.116	0.010	0.297
Effective Personal Income Tax	148	0.065	0.078	0.000	0.220
Effective Dividend Tax	148	0.037	0.045	0.000	0.130
% of Employment in Manufacturing	145	0.151	0.270	0.001	0.167
Avg. Establishment Size	148	23.465	12.807	3.531	60.073
Capital Intensity	148	0.510	0.077	0.297	0.777

Note: Please refer to Table A.1 for a complete list of variable definitions.

Table 2
The Effect of Income Taxes on Business Incorporation

Dependent variable:	Corporate Share of		
	Establishment	Employment	Production
	(1)	(2)	(3)
Tax Cost to Incorporate	-2.882**	-3.426*	-3.085*
	(1.239)	(1.793)	(1.788)
Size of Manufacturing Sector	0.006	0.010	0.011
	(0.005)	(0.007)	(0.008)
Avg. Establishment Size	0.005**	0.002	0.002
	(0.002)	(0.001)	(0.001)
Capital Intensity	0.013	0.129	0.126
	(0.130)	(0.112)	(0.156)
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.618	0.474	0.433

Note: N=145. The sample size dropped by 3 as there is no control available for the District of Columbia. Robust standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

Table 3
Separating the Effects of Corporate and Personal Income Taxes

Dependent variable:	Corporate Share of		
	Establishment	Employment	Production
	(1)	(2)	(3)
Corporate Income Taxes	-2.130***	-2.402**	-2.109*
	(0.480)	(1.070)	(1.091)
Personal Income Taxes	4.652***	5.836***	5.383***
	(0.418)	(0.802)	(0.862)
Size of Manufacturing Sector	0.001	0.003	0.004
	(0.003)	(0.004)	(0.004)
Avg. Establishment Size	0.005***	0.002*	0.001
	(0.002)	(0.001)	(0.001)
Capital Intensity	-0.161	-0.108	-0.100
	(0.136)	(0.108)	(0.174)
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.812	0.746	0.711

Note: N=145. Corporate income taxes account for dividend taxes at the shareholder level. Robust standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

Table 4
The Effect of Income Taxes on Business Incorporation: Alternative Specifications

Dependent variable:	Corporate Share of					
	Establishment	Employment	Production	Establishment	Employment	Production
	(1)	(2)	(3)	(4)	(5)	(6)
Corporate Income Taxes	-2.260***	-2.521***	-2.365**	-0.869***	-0.659	-0.173
	(0.509)	(0.903)	(0.985)	(0.282)	(0.700)	(0.768)
Personal Income Taxes	4.691***	5.828***	5.496***	1.659**	0.968	-0.161
	(0.452)	(0.757)	(0.842)	(0.660)	(1.653)	(1.838)
Size of Manufacturing Sector	-0.005*	-0.002	-0.002	-0.019	0.015	0.025
	(0.003)	(0.002)	(0.002)	(0.015)	(0.020)	(0.020)
Avg. Establishment Size	0.003***	0.002***	0.002**	0.004	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Capital Intensity	-0.062	-0.021	-0.099	-0.049	-0.050	0.001
	(0.115)	(0.094)	(0.106)	(0.159)	(0.074)	(0.084)
State RE	YES	YES	YES	NO	NO	NO
State-Specific Linear Trend	NO	NO	NO	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
R^2	0.417	0.462	0.439	0.975	0.974	0.977

Note: N=145. Corporate income taxes account for dividend taxes at the shareholder level.
Robust standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

Table 5
The Causal Effect of Income Taxes on Business Incorporation

	First Stage		IV-2SLS		
Dependent variable:	Corporate Income Taxes	Personal Income Taxes	Establishment	Employment	Production
	(1)	(2)	(3)	(4)	(5)
Property Tax Per Capita	0.019***	0.009***			
	(0.002)	(0.001)			
Deficit Dummy	0.052***	0.015*			
	(0.016)	(0.007)			
Size of Agricultural Sector	-0.015***	-0.008***			
	(0.006)	(0.003)			
Corporate Income Taxes			-2.512***	-2.704***	-2.051***
			(0.357)	(0.411)	(0.423)
Personal Income Taxes			5.495***	6.124***	4.811***
			(0.697)	(0.815)	(0.816)
Size of Manufacturing Sector	0.014*	0.007**	-0.000	0.000	0.001
	(0.008)	(0.004)	(0.002)	(0.004)	(0.005)
Avg. Establishment Size	0.002	0.000	0.005***	0.001	0.000
	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)
Capital Intensity	-0.643	-0.253	-0.194	-0.006	0.123
	(0.389)	(0.177)	(0.137)	(0.139)	(0.183)
State FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.878	0.894	0.802	0.740	0.685
Hansen J statistics p value			0.810	0.021	0.145
Weak identification statistic			18.830	18.830	18.830

Note: N=145. A constant is included in the first-stage regression. Corporate income taxes account for dividend taxes at the shareholder level. Robust standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels. Instruments included property tax revenue per capita, deficit dummy, and percentage of employment in agriculture, all in one-year lag.

Table 6
IV Robustness Checks

Dependent variable:	Corporate Share of		
	Establishment	Employment	Production
	(1)	(2)	(3)
Panel A: Manufacturing Importance Weighting			
Corporate Income Taxes	-2.609***	-2.791***	-2.305***
	(0.368)	(0.419)	(0.401)
Personal Income Taxes	5.715***	6.327***	5.331***
	(0.719)	(0.825)	(0.776)
Panel B: $30,000 Income Bracket			
Corporate Income Taxes	-3.747***	-3.965***	-3.057***
	(0.495)	(0.579)	(0.593)
Personal Income Taxes	6.205***	6.739***	5.318***
	(0.758)	(0.891)	(0.898)
Panel C: $10,000 Income Bracket			
Corporate Income Taxes	-1.757***	-1.836***	-1.360***
	(0.249)	(0.295)	(0.317)
Personal Income Taxes	5.103***	5.650***	4.436***
	(0.600)	(0.731)	(0.751)
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	145	145	145

Note: All regressions include a constant. Covariates included but not shown in this table are the size of manufacturing sector, average establishment size in manufacturing, and average capital-labor ratio in manufacturing. Instruments included in panel A-C are one-year lagged property tax per capita, deficit dummies, and percentage of employment in agriculture. Robust standard errors in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

APPENDIX

TABLE A1
Variable List

Variable	Definition	Sources
Measures of corporate activities		
Corporate share of establishment	Percentage of establishment operated by corporations	U.S. Census of Manufacturing
Corporate share of employment	Percentage of workers employed by corporations	
Corporate share of production	Percentage of production by corporations	
Corporate share of value added	Percentage of value added by corporations	
Tax variables		
Corporate income tax rate	Combined federal-state top marginal corporate tax rate	Federal Corporate/Personal Income Tax Rates History Tables;
Personal income tax rate at $30,000/ $20,000/$10,000	Combined federal-state marginal personal tax rate at $30,000/$20,000/$10,000	Revenue Acts of Individual States
Control variables		
Share of employment in manufacturing	Percentage of workers in manufacturing	Fishback and Kantor (2010)
Average establishment size	Average number of workers in a manufacturing establishment	U.S. Census of Manufacturing
Capital intensity	Cost of capital inputs relative to total cost of capital and labor	U.S. Census of Manufacturing
Instrumental Variables		
Property tax per capita (in $)	Per-capita general property taxes of state, municipal and local government	Statistical Abstract of the United States
Deficit dummy	Defined 1 if the current year revenues exceed expenditures and 0 otherwise	ICPSR 9728
Agriculture interest	Percentage of workers in agriculture	Fishback and Kantor (2010)

TABLE A2
Federal Corporate Income Tax Legislation, 1909-1919

Act	Normal Income Tax		Excess Profit Tax
	Exemption	Rate	(1917-1919 only)
Tariff Tax of 1909	$5,000	1%	
Revenue Act of 1913	the smaller of: (1) $3000 for domestic corporations only; (2) 8% of the invested capital	1%	
Revenue Act of 1916	the smaller of: (1) $3000 for domestic corporations only; (2) 8% of the invested capital	2%	
Revenue Act of 1917	1. Interest on U.S. obligations not excluded from net income. 2. War profits and excess profits taxes imposed for the same taxable year	6%	Rates applicable to 1918: Tax equal to sum of 1. 30% of net income in excess of excess profits credits but less than 20% of invested capital 2. 65% of net income in excess of 20% of invested capital Rates applicable to 1919 and 1920 Tax equal to sum of 1. 20% of net income in excess of excess profits credits but less than 20% of invested capital 2. 40% of net income in excess of 20% of invested capital
Revenue Act of 1918 (as Amended in 1919)	1. Interest on U.S. obligations not excluded from net income. 2. $2000 for domestic corporations only	12% in 1918 10% in 1919	

Note: The Revenue Act of 1918 also imposed a war profits tax in the amount of 80% net income in excess of war profits credits, applicable to taxable income in 1918 only.

TABLE A3

Federal Personal Income Tax Legislation, 1909-1919

Act	Exemption for Normal Tax	Rates	
		Normal Rates	Surtax Rates
Revenue Act of 1913 (applicable to incomes of 1913, 1914, 1915)	$ 4,000-Head of family $3,000-All others	All classes 1%	Minimum $20,000-50,000 1% Maximum over $50,000 6%
Revenue Act of 1916 (applicable to incomes of 1916)	$ 4,000-Head of family $3,000-All others	All classes 2%	Minimum $20,000-40,000 1% Maximum over $2,000,000 13%
Revenue Act of 1917 (applicable to incomes of 1917)	$ 2,000-Head of family $1,000-All others $200-Each dependent	$2,000 and under 2% Over $2,000 4%	Minimum $5,000-7,500 1% Maximum over $2,000,000 63%
Revenue Act of 1918 (applicable to incomes of 1918, 1919, 1920)	$ 4,000-Head of family $3,000-All others	Applicable to 1918: $4,000 and under 6% Over $4,000 12% Applicable to 1919, 1920 $4,000 and under 4% Over $4,000 8%	Minimum $5,000-6,000 1% Maximum over $1,000,000 65%

Note: Dividends of corporations remained taxable on personal net income during this period.

TABLE A4
State Corporate Income Tax Legislation, 1909-1919

State	Year of Enactment	Exemptions	Rate Structure	Notes
Wisconsin	1911	no exemption	2-6%	Soldier's surtax: 6% (1919) Educational bonus surtax: 1.2% (1919-1922)
Mississippi	1912	$2,500	0.50%	A combined personal and corporation income tax
Oklahoma	1913	$3,000	first $10,000 1% $10,000-25,000 2% $25,000-50,000 3% $50,001-100,000 4% above $100,000 5%	
	1917 (amended)		first $10,000 3/4% $10,000-25,000 1.5% above $25,000 2%	
Connecticut	1915	-	2%	Tax only on mercantile and manufacturing corporations; no personal income tax
West Virginia	1915	no exemption	0.5%	Tax only on corporate incomes derived from sources within the state; no personal income tax

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TABLE A4
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State	Year of Enactment	Exemptions	Rate Structure	Notes
Virginia	1870/1916	$ 600 (1870-1907) $1,000 (1908-1909) $2,000 (1910-1915) $1,200 (1916-1926)	1% flat till 1919 in 1919: 3%	Old type income tax: 1870 Modern corporate income tax: 1916
Massachusetts	1917	$3,000	1.50%	
Montana	1917	$10,000 (1917) $2,500 (1919)	1%	A license tax on the basis of net income; no personal income tax
Missouri	1917	$3,000 (1917) $1,000 (1919)	0.50% 1.50%	A combined personal and corporation income tax
New York	1917	-	3% in 1917 4.5% in 1919	A general franchise tax on manufacturing and mercantile corporations; value of franchise measured by net income
New Mexico	1919	$5,000	$5,000-10,000 0.5% over $50,000 3%	A combined personal and corporation income tax
North Dakota	1919	no exemption	3%	Indefinite allocation rule
Alabama	1919	-	4%	Ruled unconstitutional in 1920

Note: Author's summary based on National Industrial Conference Board (1930).

TABLE A5
State Corporate Income Tax Legislation, 1909-1919

State	Year of Enactment	Personal Exemptions	Rate Structure	Notes
Wisconsin	1911	$800	graduate rate the lowest bracket 1%	
Mississippi	1912	$2,500	0.50%	a combined personal and corporation income tax
Oklahoma	1908	$3,500	0.50%	
	1913 (amended)	$3,000	first $10,000 3/4% $10,000-25,000 1.5% above $25,000 2%	
	1917 (amended)		first $10,000 3/4% $10,000-25,000 1.5% above $25,000 2%	
Delaware	1917	$1,000	1%	tax only on personal income no corporate income tax
Massachusetts	1917	$3,000	1.50%	

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TABLE A5
Continued from previous page

State	Year of Enactment	Personal Exemptions	Rate Structure	Notes
Missouri	1917	$3,000 (1917) $1,000 (1919)	0.50% 1.50%	a combined personal and corporation income tax
New York	1919	$1,000	first $10,000 1% $10,000 - 50,000 2% above $50,000 3%	
New Mexico	1919	$1,000	$5,000-10,000 0.5% over $50,000 3%	a combined personal and corporation income tax
North Dakota	1919	$1,000	below $10,000 1/4% $10,000-20,000 5% $20,000-30,000 6% $30,000-40,000 8% above $40,000 10%	
Alabama	1919	-	4%	held unconstitutional in 1920
Virginia	1870/1919	$ 600 (1870-1907) $1000 (1908-1909) $2,000 (1910-1915) $1,200 (1916-1926)	1%	Old type income tax: 1870 Modern personal income tax: 1919

Note: Author's summary based on National Industrial Conference Board (1930).

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