INCOME TAXATION AND BUSINESS INCORPORATION: EVIDENCE FROM THE EARLY TWENTIETH CENTURY

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A differential between the corporate income tax rate and the personal income tax rates applied to non-corporate income 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 design of efficient tax policies. In this paper I exploit the variation in income taxes across U.S. states in the early 20th century to estimate these sensitivities. The potential endogeneity of state taxes is addressed using an instrumental variables 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 ten percentage point increase in the corporate tax rate is associated with a 0.2 to 0.3 percent decrease in the corporate share of economic activities, while a ten percentage point increase in the personal income tax rates applied to non-corporate income raises the corporate share of economic activities by 0.5 to 0.6 percent.

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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 taxed to the lower taxed organizational form. A 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 the overall efficiency cost of these behavioral responses.

Taxes can affect the choice of organizational form through changes in either the personal or corporate tax system. Many countries, including the United States, use the “classical” approach to tax firms. Profits generated by non-corporate businesses, including sole proprietorships and partnerships, are passed through and taxed as personal income of the business owner. By comparison, profits generated by corporate
businesses are first liable to corporation taxation, and then taxed a second time 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 the incorporation decisions of U.S. firms. However, most of these studies — with the exception of Goolsbee (2004) — rely on time-series data, where identification of the tax effects is limited by small variation in statutory tax rates over time.

In this paper I overcome the problem of limited variation in tax rates by turning to the early period of income taxation — the first two decades of the 20th century, a time that witnessed tremendous changes in the income tax regimes in the United States. The federal corporate income tax was introduced in 1909 and the federal personal income tax was introduced in 1913, and the marginal tax rates under both taxes have moved frequently and dramatically since then. In 1909 the top marginal corporate rate was 1 percent, but by 1919 it had risen to 10 percent. In 1913 there were seven personal income tax brackets, and the marginal rate ranged from 1 to 7 percent. By 1919, the number of personal tax brackets had increased to 56 percent and marginal rates ranged from 4 to 73 percent. Major shifts in the scope and structure of income taxation as a result of World War I introduced additional variation in the relative taxation of corporations. It was also during this period that many states enacted modern income taxes for the first time, with considerable differences in the tax structures across individual states. As a result, both time-series and cross-sectional variations in tax rates contributed to identification of the tax effect on business incorporation in this study.

There are some other advantages of focusing on this early period of income taxation. First, the data on organizational forms are free of measurement errors caused by the hybrid entities that emerged in the second half of the 20th century. Second, this was a period before the enactment of state regulations designed to curb aggressive state-tax avoidance behavior of companies. 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. The anti-passive investment company provisions, which disallow interest deduction and intangible expenses paid to related parties, were first adopted by Ohio in 1991. Therefore, the early 20th century offers a context relatively free of complications in relation to studying tax effects on incorporation decisions.

The dataset utilized in this study contains details of corporate and personal tax rates for the U.S. 48 continental states in 1909, 1914, and 1919, with 1919 being the last year the Census of Manufacturers published establishment characteristics by organizational form and state. To analyze how the relative taxation of corporate income affects the

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1 On October 17, 1967, Alabama became the first state to enter UDITPA, although the act was not effective until in 1968, when the U.S. Congress enacted legislation specifically giving its consent for the States to enter into the Compact.
choice of organizational form, I first calculate a measure of the tax cost of incorporation, which captures the differences among corporate and personal income taxes at both the federal and state levels. I then analyze the effects of corporate and personal income tax rate differentials on 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 the tax effects on real economic activities.

Controlling for macroeconomic effects 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 taxes 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 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 instrumental variable (IV) approach. The results remain qualitatively the same, with the magnitudes of the IV estimates being slightly larger than the OLS results. An increase of 1 percentage point in the corporate tax rate decreases the corporate share of establishments 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 establishments by 0.055 percent, employment by 0.061 percent, and the value of production by 0.048 percent. The magnitudes of these tax coefficients are comparable to the largest existing estimates of responsiveness — such as those found by Goolsbee (2004), although he studies the responsiveness of firms in a much more mobile sector (the retail trade sector) with more recent data (a special tabulation of 1992 Census of Retail Trade data). The empirical findings remain robust to a wide variety of checks, with similar conclusions reached 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 this early period of income taxation, as pointed out by Romer and Romer (2013), is that the economic environment was very different
from that today. Nevertheless, historical experience can still shed some light on the implication of tax policies today. Almost a century after the introduction of the corporate income tax in the United States, the UK government introduced a zero starting tax 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 incentive for incorporation by small businesses with taxable income below £50,000 (roughly U.S. $83,000). As a result, the 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 II reviews the existing literature on incorporation. Section III uses a simple discrete choice model to illustrate how taxes may affect firms’ choice of organizational form. Section IV discusses the tax system and some broad trends in incorporation in the first two decades of the 20th century. Section V summarizes the data and presents some descriptive evidence on the effect of taxes on incorporation. Section VI reports the basic regression results and findings from the IV estimation as well as a variety of robustness checks. Section VII 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 form 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) extend their analysis by analyzing asset allocation between corporate and non-corporate firms from 1959–1986. Although their 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 statutory income tax rates, both corporate and personal, were negligible over the sample period analysed in these studies. More importantly, the earlier work is based on time-series analysis, which is likely to confound the tax effect with changes in other aspects of tax legislation and the macroeconomic 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 rate 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 estimates are five to 10 times larger than the largest measure of responsiveness
found in previous time-series studies. Gordon and Slemrod (2000) study income shifting from the corporate to the personal tax base as a result of the closing gap between personal and corporate tax rates in the United States, and find strong evidence of such shifting since 1965.

At the same time, non-U.S. evidence suggests that corporate tax systems have a much larger impact on the choice of organizational forms than previously thought. de Mooij and Nicodème (2008) exploit differences in corporate and personal tax systems among European countries and show that the effect of a tax on business incorporation increases significantly with the disparity between personal and corporate tax rates. Their simulation suggests that between 12 percent and 21 percent of corporate tax revenue can be attributed to income shifting between the corporate and the personal tax base: they find that a corporate tax rate that costs €1.00 of corporate tax revenue in the absence of behavioral effects costs only €0.76 if income shifting toward the corporate tax base is taken into account.

Da Rin et al. (2011) examine 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 the 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 consider the effect of taxes on the incorporation decisions of small businesses in the United Kingdom. Their study presents clear graphical evidence that the 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.

Romer and Romer (2013) analyze 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 impact of taxes on the non-corporate share of capital using aggregate time-series data for 1900–1939. The empirical results suggest that taxes do matter for organizational form decisions, but the magnitude of the effect is small. A 10 percentage point increase in the corporate tax rate raises the non-corporate share of capital by 0.2 to 3 percentage points.

2 The starting rate of the corporation tax was initially set at 10 percent, reduced to 0 percent in 2002–2003, and finally abolished in 2006–2007 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 were lowered.
III. THEORETICAL FRAMEWORK

I start with a simple model in which 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 used in MacKie-Mason and Gordon (1997), Goolsbee (2004), and de Mooij and Nicodème (2008). The tax treatment of business income differs by organizational form. An owner of a non-corporate firm in state \( i \) earns gross income \( I_{i \text{gross}, p} \) and is taxed at the ordinary personal income rate \( \tau_p \). The entrepreneur can also organize the business as a corporation, with gross income \( I_{i \text{gross}, c} \), taxed first at the company level as corporate profit and subsequently at the shareholder level. After-tax net income \( I_{i \text{net}} \) is:

\[
I_{i \text{net}} = (1 - \tau_c) (1 - \tau_e) I_{i \text{gross}, c}
\]

where \( \tau_c \) is the corporate tax rate in state \( i \), and \( \tau_e \) is the effective annual accrued personal income tax rate applied at the shareholder level to equity income due to taxes on dividends and realized capital gains. Dividends paid to the shareholder are taxable at a rate of \( \tau_d \). Capital gains from the disposal of shares are taxable at a rate of \( \tau_{cg} \). Unrealized income is not subject to tax at the shareholder level. Assuming a share of the realized income \( s_d \) is paid out as dividends and the fraction of the annual increase in the value of shares that is sold on the capital market is \( g \), the tax rate \( \tau_{e} \) on equity income at the shareholder level is:

\[
\tau_e = s_d \tau_d + (1 - s_d) \gamma_t \tau_{cg}
\]

Each profit-maximizing firm chooses the organizational form that delivers higher profit, i.e. \( I^* = \max(I_{i \text{net}, p}, I_{i \text{net}, c}) \) In particular, a firm will incorporate if net corporate profit is higher than net non-corporate income in state \( i \), or

\[
(1 - \tau_c) (1 - \tau_e) I_{i \text{gross}, c} > (1 - \tau_p) I_{i \text{gross}, p}
\]

Assuming that \( I_{i \text{gross}, c} \) is proportional to \( I_{i \text{gross}, p} \), we have

\[
I_{i \text{gross}, c} = (1 + G_i) I_{i \text{gross}, p}
\]

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

\[
(1 + G_i) > \frac{(1 - \tau_p)}{(1 - \tau_c)(1 - \tau_e)}.
\]

The sign of \( G_i \) is theoretically ambiguous. 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), opportunities to invest and the demands for capital are the key purposes of incorporation as listed in purpose statements in corporate charters since the late 19th century. Finally, a corporation has a 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 was 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 bases and to minimize the overall tax liability. Extensive evidence and the implications of income shifting in various forms are discussed in Gordon and Slemrod (2000). For example, given an increase in the corporate tax rate relative to the personal rate, 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 form of compensation for the owner/director, such as substituting between stock options 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 structurally more 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. In summary, a wide range of non-tax factors also play an important role in the choice of organizational form for small business owners.

IV. INCOME TAXES AND INCORPORATION TRENDS IN THE EARLY 20TH CENTURY

In this section I explain some essential features of federal and state income taxation in the early 20th 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 a 1 percent rate.⁴ The Supreme Court affirmed the validity of the 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. Tables A2 and A3, available in an online appendix,⁵ list all the acts that affected corporate and personal income taxes, respectively, between 1909–1919.

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.
⁴ The Payne-Aldrich Tariff Act, 1909, ch. 6, 36 Stat. 11.
⁵ The online appendix is available at https://sites.google.com/site/liulieconomics/.
Figure 1 plots a 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 from 1909–1919. Over time, there is a clear upward trend in both the corporate and the personal tax rates, although the two rates diverged in 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 the excess profits tax, both targeted at the income of corporations. Though temporary in nature, these war taxes imposed clear disincentives on corporate activities. For example, Schmidt and Young (1943) document that the number of manufacturing corporations reporting to the Bureau of Internal Revenue was significantly lower in 1918–1919 than in 1916–1917, a drop reflecting the disincentives that these taxes imposed.

The war profits tax was eliminated in January 1919, while the excess-profits tax remained in place until 1921.

corporation movement that emerged to avoid the excess-profits tax.\textsuperscript{7} 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.\textsuperscript{8} 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.\textsuperscript{9}

Movement of the three personal tax series in Figure 1 shows frequent and large increases in statutory personal income tax rates 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.

The 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.\textsuperscript{10}

Income from realized capital gains was taxed at the same rate as regular personal income.\textsuperscript{11}

\textbf{B. State Income Taxes}

The 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. Tables A.4 and A.5 in the online appendix 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).
- Personal income tax laws and distinct corporate income tax laws: Massachusetts (1917), New York (1917).

\textsuperscript{7} Schmidt and Young (1943) mainly consider the effect of World War I on business financing but they also note that the excess profits tax might have decreased the number of manufacturing and trade corporations between 1914–1920.

\textsuperscript{8} Initially, only limited offsets against corporate income could be applied for interest payments.

\textsuperscript{9} For a discussion of the historical impact of the corporate interest deduction, see Warren (1974).

\textsuperscript{10} 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.

\textsuperscript{11} This was the case until the Revenue Act of 1921 introduced a preferred capital gains rate of 12.5 percent (Auten, 1999).
- Personal income tax laws with no corporate income tax laws: Delaware (1917), Oklahoma (1913).
- A corporation income tax, but no personal income tax: Connecticut (1915), Montana (1917), and West Virginia (1915).

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

Figure 2 illustrates the relative taxation of corporate income at the state level in 1919 by plotting corporate income tax rates against personal income tax rates. Six states are

![Figure 2](image)

Source: Author’s summary of state tax rates based on National Industrial Conference Board (1930); for more information, see Table A.3 and A.4 in the online appendix.
above the 45 degree line, indicating that they tax corporate income more heavily than 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 the incorporation rate.\textsuperscript{12}

C. Business Incorporation in the United States: 1880–1920

To illustrate the broad trend in business incorporation during this period, I collected annual incorporation data for nine individual states (Evans, 1948).\textsuperscript{13} Despite their limited coverage, these statistics provide a good overview of general patterns of incorporation throughout the United States.

Figure 3 shows the number of business units incorporated in nine states between 1880–1920. A few patterns are noteworthy. First, throughout the 1880s and the first few years of the 1890s, the annual number of incorporations 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 incorporation: (1) common restrictions on limited liability were removed in this period; (2) states revised their corporate laws in order to increase benefits and lower the costs of incorporation; and (3) the advantages of the corporate form became 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, and incorporation numbers continued 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 statute to allow for horizontal mergers and the creation of holding companies in 1888, operations outside the state in 1889, and the autonomy of directors to define the power of corporations in 1896. As a result, since 1890 the number of business incorporations in New Jersey has exceeded those in Pennsylvania, the second largest industrial state in the union, and every other state for which we have statistics during this period.

\textsuperscript{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 1920s, significant property tax delinquencies in the 1930s, 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).

\textsuperscript{13} These data were mostly complied from published state documents and official records located in the offices of state incorporating agencies.
Note: This figure displays the annual number of business incorporations in nine states in the United States between 1880 and 1920. Source: Evans (1948)
Other states entered into the competition around 1900 in an effort to attract more companies from New Jersey. Between 1899–1902, 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 compete actively with New Jersey in the charter market. Others, like Massachusetts, had the 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 1897–1917, small firms account for 92 percent and 85 percent of total business incorporation in Illinois and Pennsylvania, respectively. 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 clear heterogeneity in incorporation across states. For example, while Connecticut and Maryland had almost steady upward trends, incorporation in Maine rose sharply until 1903 but declined steadily afterwards.

V. DATA AND DESCRIPTIVE ANALYSIS

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. 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”.

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 million or more.
15 The Census of Manufacturers (U.S. Census Bureau, 1919) 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” (U.S. Census Bureau, 1919, p. 5). The Census excluded establishments with an annual product value of $500 or less.
16 See U.S. Census Bureau (1919).
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 the state level. This is because formula apportionment requires the tax rate for firms with multiple plants in different states to be a weighted average of tax rates, generating measurement noise in the tax variables. By contrast, an establishment is located in the state where it is actually taxed since its location is closely related to the factors used to determine income allocation such as property and sales. As a result, the tax variables are free of measurement noise from taking the weighted average of tax rates for multi-state firms. Conceivably, the incorporation considerations of single-establishment firms can be quite different from those of multi-establishment firms with the latter normally choosing to incorporate despite disadvantageous 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 establishments, 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:

- The corporate share in the number of establishments,
- The corporate share in employment measured by the number of wage earners, and
- The corporate share in the value of new products.

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 United States. 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

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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; as a result, the data in our study are the most extensive public record of ownership characteristics at the state level.

19 It is not entirely clear how the income of “all other business forms” was 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.
have a large share of corporations, as indicated by the percentage of corporate returns and gross income computed using Statistics of Income (SOI) tax return data (U.S. Internal Revenue Service, 1919).

**B. Tax Variables**

To compute the tax cost of incorporation, I first calculate the total income tax rate as the sum of federal and effective state tax rates, 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 were taken from tables compiled by the Tax Foundation (Figure 1). Data on state income tax rates were 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 calculated using SOI tax return data (U.S. Internal Revenue Service, various years). The average excess-profits tax rate was 15.21 percent in 1919.

Some assumptions are required to measure the marginal personal tax rate. Unlike recent analyses that use the maximum personal rate, this study cannot rely on changes in the top marginal rate since the marginal rate structure 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 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.

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 the 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 to be zero, on the grounds that deferral and exemption at death imply a very low effective annual accrual tax rate. Estimation results using a weighted average of dividend and actual tax rates applied to realized capital gains were very similar and hence not reported.

---

21 For comparison, one needs a household income of $100,000 or above to get to the same percentile of the income distribution in 2007.
C. Control Variables

A few variables are included to capture non-tax reasons to incorporate. I use the size of the manufacturing sector, which is measured by percentage of workers in manufacturing, as an indicator for the quality of infrastructure and the presence of industrial policies. Better infrastructure and industrial policies may enable firms to generate agglomeration rents, implying relatively 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 taken from Fishback and Kantor (2000).

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 incorporation, I include the average size of establishment as an independent variable, measured by the average number of workers per establishment in manufacturing. In addition, I include capital intensity in manufacturing as a proxy for the demand for external finance, which is often considered more important for corporations than for non-corporate firms. The capital intensity variable is computed as the ratio of capital input to the sum of capital input and wage and salary payments, using data from the Census of Manufacturers (U.S. Census Bureau, various years). Definitions of control variables are provided 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 1909–1919. Table 1 gives the summary statistics for all variables. As noted above, the economic importance of corporations is indicated by their share of employment (85.17 percent) and their share of the value of production (87.93 percent), rather than their share of the number of establishments (34.38 percent). On average, the effective tax rates for corporate, personal and dividend income are 9.26 percent, 6.52 percent, 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.

Figure 4 offers descriptive evidence that a high 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 which thus favor the non-corporate form, (2) states with no income taxes by 1919 which neutral to the choice of organizational form, and (3) states with corporate taxes that are lower than personal taxes and thus favor the 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 1914 levels. Each bar indicates the sample average. The figure shows a clear association between low tax

---

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

23 The time period is restricted to 1914–1919 to reflect changes in corporate activities driven by fiscal policy.
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 states higher tax costs of incorporating.

VI. EMPIRICAL ANALYSIS

A. Econometric Model

The empirical specification is derived by taking the log of both sides of (3)

\[ \log(1 + G^i_c) > \log(1 - \tau^i_p) - \log(1 - \tau^i_c - \tau^i_e + \tau^i_c \tau^i_e). \]

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

\[ G^i_c > \tau^i_c + (1 - \tau^i_c)\tau^i_e - \tau^i_p. \]

The tax differential term, \( \tau^i_c + (1 - \tau^i_c)\tau^i_e - \tau^i_p \), in (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 of incorporating. At the state level, the fraction of corporations is modeled as a function of the tax cost to incorporate (\( T^i_c \)). The basic specification of interest is

\[ S^i_t = \alpha^i + \beta^i T^i_{c,t} + Z^i_t \gamma^i + \lambda^i + \varepsilon^i_t, \]

where \( S^i_t \) is the corporate share of firms in state \( i \) in year \( t \), and \( Z^i_t \) is a vector of non-tax factors that may influence the incorporation decision. The year dummies \( \alpha^i \) capture the
potential impact of macroeconomic shocks on corporate activities that are common in all states. The state dummies (the $\lambda_i$ s) capture the unobserved factors that vary across states but can reasonably be thought as constant during the sample period (e.g., the legal and regulatory environments). Note that states with no income taxes are also included in the regression, controlling for 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., controlling for changes in general incorporation patterns that are independent of the tax incentives to incorporate.
B. Within-Group Regressions

Table 2 presents the regression results from estimating (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 the inclusion of state-level covariates. Note that 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, in which case the estimates of the tax effects would be biased toward zero. To the extent that I still find significant tax effects, the direction of bias reinforces 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 operating scale of new corporations is larger than the average firm in the economy but slightly smaller than their existing counterparts.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Establishment (1)</th>
<th>Employment (2)</th>
<th>Production (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax cost to incorporate</td>
<td>–2.882**</td>
<td>–3.426*</td>
<td>–3.085*</td>
</tr>
<tr>
<td></td>
<td>(1.239)</td>
<td>(1.793)</td>
<td>(1.788)</td>
</tr>
<tr>
<td>Size of manufacturing sector</td>
<td>0.006</td>
<td>0.010</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.007)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Average establishment size</td>
<td>0.005**</td>
<td>0.002</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Capital intensity</td>
<td>0.013</td>
<td>0.129</td>
<td>0.126</td>
</tr>
<tr>
<td></td>
<td>(0.130)</td>
<td>(0.112)</td>
<td>(0.156)</td>
</tr>
<tr>
<td>State fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R²</td>
<td>0.618</td>
<td>0.474</td>
<td>0.433</td>
</tr>
</tbody>
</table>

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

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 income taxes on shareholders and personal income tax rates. 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.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Establishment (1)</th>
<th>Employment (2)</th>
<th>Production (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate income taxes</td>
<td>–2.130***</td>
<td>–2.402**</td>
<td>–2.109*</td>
</tr>
<tr>
<td></td>
<td>(0.480)</td>
<td>(1.070)</td>
<td>(1.091)</td>
</tr>
<tr>
<td>Personal income taxes</td>
<td>4.652***</td>
<td>5.836***</td>
<td>5.383***</td>
</tr>
<tr>
<td></td>
<td>(0.418)</td>
<td>(0.802)</td>
<td>(0.862)</td>
</tr>
<tr>
<td>Size of manufacturing sector</td>
<td>0.001</td>
<td>0.003</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Average establishment size</td>
<td>0.005***</td>
<td>0.002*</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Capital intensity</td>
<td>–0.161</td>
<td>–0.108</td>
<td>–0.100</td>
</tr>
<tr>
<td></td>
<td>(0.136)</td>
<td>(0.108)</td>
<td>(0.174)</td>
</tr>
<tr>
<td>State fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R²</td>
<td>0.812</td>
<td>0.746</td>
<td>0.711</td>
</tr>
</tbody>
</table>

Notes: N=145. Corporate income taxes account for dividend taxes at the shareholder level. Robust standard errors are in parentheses. Asterisks denote significance at the 1% (***) , 5% (**), and 10% (*) levels.
The personal income tax coefficient is statistically different from the corporate income 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 tax evasion being easier at the personal level, in which case unincorporated firms are more likely to underreport their activities when facing a higher personal tax rate, and may even stop filing tax returns. If this is the case, the higher share of corporations could be a mere artifact of fewer reported unincorporated firms.

Second, given that the personal income tax is progressive while the corporate tax is largely 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). 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. The relocation response is however less likely in context of frequent renewals of state income tax legislation because tax savings from relocation are likely to be temporary and insignificant compared to the cost of doing so.

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 than those implied by the 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 to 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...

---

24 Precisely, Gentry and Hubbard (2005) estimate the effect of progressive personal taxation on entering self employment or business ownership.

25 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) consider the roles that the corporate and the personal income tax play in the location and employment of firms in Swiss cantons, but do not distinguish firms by organizational forms. They find that corporate and personal income taxes affect the regional distribution of firms and regional difference in employment in Switzerland.
Table 4
The Effect of Income Taxes on Business Incorporation: Alternative Specifications

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Establishment (1)</th>
<th>Employment (2)</th>
<th>Production (3)</th>
<th>Establishment (4)</th>
<th>Employment (5)</th>
<th>Production (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate income taxes</td>
<td>–2.260***</td>
<td>–2.521***</td>
<td>–2.365**</td>
<td>–0.869***</td>
<td>–0.659</td>
<td>–0.173</td>
</tr>
<tr>
<td></td>
<td>(0.509)</td>
<td>(0.903)</td>
<td>(0.985)</td>
<td>(0.282)</td>
<td>(0.700)</td>
<td>(0.768)</td>
</tr>
<tr>
<td>Personal income taxes</td>
<td>4.691***</td>
<td>5.828***</td>
<td>5.496***</td>
<td>1.659**</td>
<td>0.968</td>
<td>–0.161</td>
</tr>
<tr>
<td></td>
<td>(0.452)</td>
<td>(0.757)</td>
<td>(0.842)</td>
<td>(0.660)</td>
<td>(1.653)</td>
<td>(1.838)</td>
</tr>
<tr>
<td>Size of manufacturing sector</td>
<td>–0.005*</td>
<td>–0.002</td>
<td>–0.002</td>
<td>–0.019</td>
<td>0.015</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.015)</td>
<td>(0.020)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Average establishment size</td>
<td>0.003***</td>
<td>0.002***</td>
<td>0.002**</td>
<td>0.004</td>
<td>0.000</td>
<td>–0.001</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Capital intensity</td>
<td>–0.062</td>
<td>–0.021</td>
<td>–0.099</td>
<td>–0.049</td>
<td>–0.050</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.115)</td>
<td>(0.094)</td>
<td>(0.106)</td>
<td>(0.159)</td>
<td>(0.074)</td>
<td>(0.084)</td>
</tr>
<tr>
<td>State fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>State-specific linear trend</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.417</td>
<td>0.462</td>
<td>0.439</td>
<td>0.975</td>
<td>0.974</td>
<td>0.977</td>
</tr>
</tbody>
</table>

Note: N=145. Corporate income taxes account for dividend taxes at the shareholder level. Robust standard errors are in parentheses. Asterisks denote significance at the 1% (***) , 5% (**), and 10% (*) levels.
state-specific linear trends. In addition, the large $R^2$ in Table 4 suggests the potential problem of perfect fit in this setting.

D. Addressing the Endogeneity of Taxation

An important issue for estimating the causal impacts of tax rates on incorporation is the exogeneity of changes in income tax rates. Any observed correlation between tax rates and tax bases can be driven by reverse causality, as states may enact an income tax or change its 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 20th 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.26 One of the clearest statements of this motivation can be found in Wisconsin State Tax Commission (1907, p. 30):

> 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 exemption, have brought about the pending constitutional amendment authorizing a graduated income tax.

Intuitively, declines in the revenue-generating capacity of the property tax are directly linked to a state’s propensity to increase income taxes. Alternatively, per-capita property tax bills also reflect the long-run revenue needs of state governments. Therefore, I use the 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*.27

The fiscal conditions of the state can also shed light on the legislative motivation behind income taxation. Romer and Romer (2013) point 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 expenditures exceeding revenues and equal to zero for those states with current-year expenditures below revenues. Data on state revenue and expenditure are collected from Sylla, Legler, and Wallis (1993). In contrast with per-capita property tax revenue, the deficit dummies are most likely to capture the short-run revenue needs of states.

---

26 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).

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 and other public improvements and did not initiate significant corporation taxes (Pegram, 2004). Such differences reflected fundamental differences 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 interests in each state.28

In this framework, it is important that the proposed instruments be valid, in the sense that: they (1) significantly explain part of the variation in both the corporate and the individual income tax rates and (2) 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.29

The proposed instruments directly address the potential endogeneity of tax rate levels. I am less concerned about the endogeneity of the difference between the corporate and 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 $t^*$. Accounting for the deductibility of federal income tax, the effective state corporate and personal rates are $(1 - t_c^* f^*) t^*$ and $(1 - t_p^* f^*) t^*$, respectively. The difference in the effective tax rates $(t_p^* - t_c^* f^*) t^*$ is a byproduct of the difference in federal tax rates augmented by the level of income tax across different states.

E. Instrumented Regressions and Additional Robustness

Table 5 presents the IV regressions with state and year fixed effects. Columns 1 to 2 present first-stage results using the instruments described above. The strength of the

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28 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.

29 For example, Missouri continued with a policy of deficit spending during the first two decades of the 20th century and considered various new sources of revenue to cope with its deteriorating financial condition. However, between no significant tax legislation or reform occurred in 1905 and 1909. 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.
Table 5
The Causal Effect of Income Taxes on Business Incorporation

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>First Stage</th>
<th>IV-2SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Corporate Income Taxes</td>
<td>Personal Income Taxes</td>
</tr>
<tr>
<td>Property tax per capita</td>
<td>0.019***</td>
<td>0.009***</td>
</tr>
<tr>
<td>Deficit dummy</td>
<td>0.052***</td>
<td>0.015*</td>
</tr>
<tr>
<td>Size of agricultural sector</td>
<td>–0.015***</td>
<td>–0.008***</td>
</tr>
<tr>
<td>Corporate income taxes</td>
<td></td>
<td>–2.512***</td>
</tr>
<tr>
<td>Personal income taxes</td>
<td></td>
<td>5.495***</td>
</tr>
<tr>
<td>Size of manufacturing sector</td>
<td>0.014*</td>
<td>0.007**</td>
</tr>
<tr>
<td>Average establishment size</td>
<td>0.002</td>
<td>0.005***</td>
</tr>
</tbody>
</table>
Table 5 (Continued)
The Causal Effect of Income Taxes on Business Incorporation

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>First Stage</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Corporate Income Taxes</td>
<td>Personal Income Taxes</td>
<td>IV-2SLS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital intensity</td>
<td>–0.643</td>
<td>–0.253</td>
<td>–0.194</td>
<td>–0.006</td>
</tr>
<tr>
<td></td>
<td>(0.389)</td>
<td>(0.177)</td>
<td>(0.137)</td>
<td>(0.139)</td>
</tr>
<tr>
<td>State fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R²</td>
<td>0.878</td>
<td>0.894</td>
<td>0.802</td>
<td>0.740</td>
</tr>
<tr>
<td>Hansen J statistics p value</td>
<td>0.810</td>
<td>0.021</td>
<td>0.145</td>
<td></td>
</tr>
<tr>
<td>Weak identification statistic</td>
<td>18.830</td>
<td>18.830</td>
<td>18.830</td>
<td></td>
</tr>
</tbody>
</table>

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 are 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 with a one-year lag.
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 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.\textsuperscript{30}

Columns 3 to 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.

Table 6 provides some evidence on the robustness of the findings. The regression in panel A recognizes that the panel data setting restricts tax incentives resulting in the same effect across states, although 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 that 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 panels 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 in the lower income bracket. This is reasonable if the net advantage of incorporation is larger for potential entrepreneurs with higher incomes. 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

\textsuperscript{30} It is possible that political ideology has a direct effect on incorporation decisions through other channels 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.
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 allows 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 and personal income plays an important role in determining the corporate share of establishments, employment and

Table 6
IV Robustness Checks

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Corporate Share of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Establishment (1)</td>
</tr>
<tr>
<td>Panel A: Manufacturing Importance Weighting</td>
<td></td>
</tr>
<tr>
<td>Corporate income taxes</td>
<td>–2.609***</td>
</tr>
<tr>
<td></td>
<td>(0.368)</td>
</tr>
<tr>
<td>Personal income taxes</td>
<td>5.715***</td>
</tr>
<tr>
<td></td>
<td>(0.719)</td>
</tr>
<tr>
<td>Panel B: $30,000 Income Bracket</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.495)</td>
</tr>
<tr>
<td>Personal income taxes</td>
<td>6.205***</td>
</tr>
<tr>
<td></td>
<td>(0.758)</td>
</tr>
<tr>
<td>Panel C: $10,000 Income Bracket</td>
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</tr>
<tr>
<td>Corporate income taxes</td>
<td>–1.757***</td>
</tr>
<tr>
<td></td>
<td>(0.249)</td>
</tr>
<tr>
<td>Personal income taxes</td>
<td>5.103***</td>
</tr>
<tr>
<td></td>
<td>(0.600)</td>
</tr>
</tbody>
</table>

State fixed effects: Yes
Year fixed effects: Yes

Note: N=145. 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 are in parentheses. Asterisks denote significance at the 1% (***) and 5% (**), and 10% (*) levels.
production. The incentive effects of corporate and personal income taxes are precisely estimated. Further, I demonstrate the robustness of the results to alternative specifications and investigate potential reverse causality between tax rates and the income tax base.

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 over time. I leave the pursuit and analysis of such data to future research.

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DISCLAIMERS

All errors and omissions are my own.

DISCLOSURES

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REFERENCES


