The Effect of Market-Based Sourcing on Labor Outcomes

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October 2020

Abstract

This study examines how income tax sourcing rules affect employment and compensation. As technology has enabled companies to provide services to consumers globally, a growing number of governments seek to tax service companies based on the customer location ("market-based sourcing") rather than the location of the company's labor and capital. Because market-based sourcing reduces the tax cost of locating labor in a state, I predict employment and compensation increase in service industries in U.S. states that implemented market-based sourcing. I estimate two difference-in-differences models and find that market-based sourcing significantly and meaningfully increases total number of employees and total compensation in affected industries. Further, the positive effect only occurs in states that do not impose an additional rule that prevents taxpayers from avoiding taxation on a portion of their income. I also find some evidence consistent with employers passing on the benefit to their employees. This study can assist both U.S. state and international policymakers by demonstrating that sourcing rules affect companies' economic decisions. The evidence suggests the OECD/G20's recently proposed market-based taxing system will likely affect how firms allocate labor across jurisdictions.

Keywords: Business Tax, Tax Incidence, State Government, Labor Markets
JEL: E24, H22, H25, H71

I thank Lisa De Simone for her supervision on this paper as well as Lillian Mills and Brady Williams for their ongoing advisement. I thank Aruhn Venkat for sharing a hand-collected dataset of bank tax rates. I also thank Andrew Belnap, Elisa Casi-Eberhard, Ryan Hess, Laura Kettell, Tom Neubig, Abhishek Ramchandani, Christoph Spengel, Barbara Stage, Aruhn Venkat, and workshop participants at The University of Texas at Austin and the WHU Young Scholar Tax Conference for thoughtful comments and/or discussions. I appreciate funding from the Accounting Doctoral Scholars program of the AICPA.

1. Introduction

The purpose of this study is to examine if, and to what extent, incentives created by tax sourcing rules affect service companies' labor location and compensation decisions. Sourcing rules, which help determine where corporate income is taxed when a company performs services in one location for customers in another location, are increasingly important as the global economy shifts from manufacturing-based activities to service-based activities. Many companies now use technology to provide services remotely to customers all over the world. Because this "digital transformation" reshaped the way companies provide services, many parties argue that tax laws that originated in the "brick-and-mortar" environment of the early 1900s are unfit for the modern global economy (Huddleston and Sicilian 2009; OECD 2017; OECD 2019). Whereas manufacturing and mercantile companies generate value in the jurisdiction where they locate production facilities and labor, service companies with customers abroad can generate value based on where the customers or users are located (OECD 2020a).

To address concerns related to the economy's digital transformation, the Organisation for Economic Co-operation and Development and G20 Inclusive Framework on Base Erosion and Profit Shifting (OECD/G20 IF) proposes to reallocate certain profits of multinational enterprises to the market jurisdiction, which is generally the jurisdiction where the customer is located (OECD 2020a).[1] In 2014, the Multistate Tax Commission similarly acknowledged shortcomings of its model tax law for U.S. states and amended its rules to reflect a market-based system of taxation. This study examines whether the states' shift to market-based sourcing affects aggregate labor outcomes in affected industries. As such, it also empirically informs current international deliberations of similar proposals.

[1] See the OECD/G20 IF's discussion of Action 1, Pillar 1 and the proposed taxing right ("Amount A"): https://www.oecd.org/tax/beps/beps-actions/action1/ (retrieved May 2020).

I build upon the broad literature that examines the effect of taxes on labor and capital investment (Hall and Jorgenson 1967; Hines 1996; Devereux and Griffith 1998; Williams 2018; Lester 2019). A subset of this literature examines the economic effects of U.S. state tax law changes (Goolsbee and Maydew 2000; Gupta and Hofmann 2003; Edmiston and Arze del Granado 2006; Merriman 2015; Clausing 2016; Suarez Serrato and Zidar 2016 and 2018; Giroud and Rauh 2019). Although somewhat mixed, the evidence generally suggests that labor and capital investments in the state decrease in the income tax burden on labor and capital. However, these studies only examine variation in the extent to which states calculate a company's tax base using in-state sales versus in-state property and payroll (apportionment "weights"). These studies do not address an important nuance in how states determine in-state sales ("sourcing" rules). Because U.S. states tax companies based on their proportional income earned within the state, the measurement of in-state *sales* is a significant determinant of a company's in-state *taxable income*.

To fill this potentially material gap, I exploit the U.S. state setting where many states recently implemented rules to source service companies' sales based on customer location rather than the location of the company's labor and capital. States use one of two methods to determine in-state sales for service companies. The costs-of-performance method uses the location of the firm's income-producing activities, which is typically the location of the firm's employees and / or assets. The market-based method uses the location of the firm's customers, and thus generally disregards the location of employees and assets.

Because market-based sourcing (MBS) reduces the tax burden for in-state service companies selling to out-of-state customers (Gallagher 2014; Battin, Eberle, and LaCava 2014; Kasten 2018), I hypothesize that total employment, total compensation, and compensation per

employee increase after a state adopts MBS. Two non-mutually exclusive mechanisms should drive this effect. First, the state becomes a relatively more attractive place to locate new or existing labor, similar to evidence that labor and capital move to states that decrease corporate tax rates (Giroud and Rauh 2019). Second, in-state companies' tax burdens decrease, letting them increase compensation of employees, consistent with evidence that employees benefit from state and local corporate tax cuts (Suarez Serrato and Zidar 2016; Fuest, Peichl, and Siegloch 2018; Ljungqvist and Smolyansky 2018). I also hypothesize that "throwout" rules reduce the positive effect of MBS on labor outcomes. A "throwout" rule requires the taxpayer to exclude from its sales factor *denominator* any sales to states in which the taxpayer is not taxable, thereby increasing the proportion of in-state sales to total sales, and therefore increasing taxable income in the home state.

To test my hypotheses, I exploit the fact that 19 states implemented MBS from 2007 to 2018. Five of these states implemented a throwout rule at the time they implemented MBS. Because MBS only affects certain industries (i.e., service industries in which the customer location can differ from where the service is performed), I identify nine 3-digit NAICS industry codes affected by MBS after reviewing state legislation, information published by the Multistate Tax Commission, and information provided in the 2017 NAICS Manual. I rely on aggregate industry-level data from the U.S. Bureau of Economic Analysis (BEA) to examine the effect of MBS on total employment, total compensation, and compensation per employee.

In my primary specification, I estimate a matched-state generalized difference-in-differences model. I match each state that enacts MBS legislation to a state with similar demographic and economic characteristics that did not enact MBS before or during the sample period. I then compare the outcomes of affected industries before and after a state implements

MBS (first difference) to the outcomes of those same industries in matched states that did not implement MBS (second difference). I include a set of state-specific control variables drawn from the literature on state taxes and economic activity.

I find that after a state enacts MBS without a throwout rule, the total number of employees in affected industries increases by 7.0 percent, total compensation increases by 8.6 percent, and compensation per employee does not change. The increases are statistically significant and economically substantial. If a state simultaneously imposes a throwout rule, then total employment, total compensation, and compensation per employee do not change, suggesting that throwout rules have a significant and substantial negative effect.

To corroborate the findings in my primary specification and address concerns about inherent differences across states, I estimate a second generalized difference-in-differences model that compares the outcomes of treated industries before and after a state implements MBS (first difference) to the outcomes of unaffected industries with similar pre-event outcome trends *in the same state* (second difference). This approach exploits the fact that MBS only affects companies that provide services to out-of-state customers (e.g., providing digital content over the internet). To the extent the customer receives a tangible good (e.g., computer hardware) or receives the service at the same location where the employee performs the service (e.g., health care services), the company's tax burden remains unchanged after the state implements MBS. This approach also allows me to control for both time-variant and time-invariant factors that affect all industries in the state equally and helps alleviate concerns that the estimated effects are merely a function of the state-specific economic environment and/or other state policies implemented to boost economic activity.

Using the within-state approach, I find employment in affected industries increases by 3.8 percent, compensation increases by 6.5 percent, and compensation per employee increases by 2.8 percent relative to unaffected industries when the state imposes MBS without a throwout rule. As before, these changes are significant and economically substantial. If a state imposes a throwout rule, total employment does not significantly change while the effect on compensation and compensation per employee remains significantly positive. In tandem, the two difference-in-differences tests help rule out possible alternative industry- or location-based macroeconomic confounds.

Next, I explore how service industries in the "digital economy," as defined by the BEA, respond to MBS. The OECD/G20 IF warns that businesses "are able to provide digital services remotely to customers in markets using little or no local infrastructure," and that these businesses "benefit from exploiting powerful customer or user network effects and generate substantial value from interaction with users and customers" (OECD 2020a). As a solution, the OECD/G20 IF proposes a new market-based taxing system applicable to companies providing automated digital services.[2] I therefore narrow my treatment group to industries in the digital economy and find similar effects, suggesting that the OECD/G20 IF's proposed market-based taxing system will likely affect digital service companies' labor location decisions.[3]

To alleviate concerns that preexisting trends drive the results, I conduct two additional tests. First, I estimate a variant of each difference-in-differences model that captures the treatment dynamics by replacing the post indicator with an indicator for each year included in the

[2] The policy issue outlined by the OECD/G20 IF also has relevance to certain businesses that generate revenues from selling goods or services, whether directly or indirectly, to consumers.
[3] The primary purpose of the OECD/G20 IF's proposed market-based taxing system is to resolve the issue of determining what portion of profits should be taxed in jurisdictions where customers and/or users are located. The OECD/G20 IF recently acknowledged that the proposal would have a small impact on investment and economic growth (OECD 2020b).

sample. Plots of the coefficients provide evidence that preexisting trends do not drive the results. Next, I estimate each difference-in-differences model using a pseudo-event date, whereby I assign the treatment date to be three years earlier than the actual treatment date. Coefficients from these analyses are near zero and/or not statistically significant, which provides additional evidence that preexisting trends do not drive the results.

To mitigate policy endogeneity concerns, I employ a narrative approach in the spirit of Romer and Romer (2010) and Giroud and Rauh (2019). After conducting an online search for news articles and fiscal notes related to each MBS change, I separate states that enacted MBS for more "exogenous" reasons (e.g., conforming to the Multistate Tax Commission's model apportionment regulations) from states that enacted MBS for more endogenous reasons (e.g., as part of broader legislation intended to influence short-term fiscal or economic growth). I re-conduct both difference-in-differences tests on the more "exogenous" subsample and estimate similar or greater effects as the full sample. Further, the positive effect of MBS and the negative effect of throwback on compensation per employee become significant and meaningful in the matched-state sample. These results provide evidence that the MBS policy itself rather than the impetus of the policy explains the estimated effects.

This study makes two primary contributions. First, the longstanding literature that examines the economic consequences of state tax policy generally focuses on changes to state corporate tax *rates* and apportionment *weightings*.[4] I extend this literature by introducing the effect of *sourcing* rules on labor outcomes in a growing sector of the economy that has been of primary concern to intergovernmental organizations such as the OECD and the Multistate Tax

[4] For example, see Bartik 1991; Goolsbee and Maydew 2000; Gupta and Hofmann 2003; Edmiston and Arze del Granado 2006; Merriman 2015; Clausing 2016; Suarez Serrato and Zidar 2016; Suarez Serrato and Zidar 2018; Ljungqvist and Smolyansky 2018; and Giroud and Rauh 2019.

Commission. I provide evidence that differences in sourcing rules across jurisdictions affect companies' real economic decisions.

Second, these findings have clear policy implications. My results suggest that the implementation of the OECD's new tax proposal, which argues for all countries to adopt the same market-based taxing system for digital service companies, will likely affect how those companies allocate labor across jurisdictions. Shifting to a market-based taxing system reduces the effect of tax rate differentials on companies' labor location decisions. Therefore, a market-based taxing system simultaneously imposed by all jurisdictions may result in an initial re-allocation of labor and reduce future cross-jurisdictional tax competition and tax-motivated location decisions. Further, the difference in tax burdens between traditional and market-based tax systems becomes even greater as COVID-19 intensifies the growth of the remote workforce, resulting in more instances of customer location being different from employee location.

I acknowledge several limitations of this study. First, this study uses data aggregated at the 3-digit NAICS industry code level, which is the most detailed level of publicly available data. Because not all 6-digit NAICS industry codes within a particular 3-digit code may be affected, I expect this to bias against finding a result. Second, the estimated effects might not generalize to the international environment. As Clausing (2016) notes, companies likely find it easier to shift labor and capital within a country than between countries.[5] On the other hand, U.S. states have relatively low tax rate differentials compared to foreign countries. A switch to MBS by a foreign country could cause a larger reduction in a company's tax burden than a switch to

[5] Further, the OECD/G20 IF's proposal allocates only a portion of profits in excess of a threshold level of profitability to the market jurisdiction. In the U.S., a greater portion of multistate companies' income is affected when states adopt market-based sourcing, suggesting that the OECD/G20 IF's proposal may have smaller effects.

MBS by a state.[6] Regardless of these limitations, the evidence in this study suggests that differences in tax sourcing rules affect companies' real economic decisions.

2. Institutional Background, Prior Research, and Hypothesis Development

2.1. Institutional background – state taxation and market-based sourcing

When a company operates in multiple states, each state's tax law defines what portion of the company's total income is subject to the state's tax. Under formulary apportionment methods, a corporation (or affiliated group of corporations) aggregates and apportions its total profits to the state. Each state prescribes its own formula. Historically, most states used an equally weighted average of three ratios ("factors"): (i) property in the state divided by property everywhere, (ii) payroll in the state divided by payroll everywhere, and (iii) sales in the state divided by sales everywhere. Recently, states moved to weight the sales factor more heavily than the payroll and property factors, partially to attract labor and capital investments (Omer and Shelley 2004).[7] In 1986, only two states had a sales-only formula. As of 2020, 26 states require a sales-only formula.

A state's "sourcing" rules determine which sales are included in the numerator of the sales factor. States generally source sales of tangible personal property (e.g., tangible goods) to the state where the customer receives the goods. For sales of *services*, most states historically

[6] The estimated effects in this study may be greater after 2017 due to the drop in the U.S. federal tax rate from 35 percent to 21 percent. This drop effectively increases the state tax burden by approximately 20 percent. For example, suppose the state tax rate is 10 percent. Prior to U.S. tax reform, the effective state tax rate after the federal benefit of deducting state income taxes is 6.5 percent. Now, a 10 percent state tax rate results in an effective rate of 7.9 percent, representing a 22 percent increase in the state tax burden (7.9 percent / 6.5 percent = 1.22).

[7] As a brief example of apportionment, consider ABC Company, which conducts business in both Colorado and California. Assume Colorado requires ABC to apportion its income using an equally weighted three-factor formula based on property, payroll, and sales, while California requires a sales-only factor. ABC has 50 percent of its payroll in Colorado, 50 percent of its property in Colorado, and 20 percent of its sales in Colorado. ABC has 50 percent of its property and payroll in California and 80 percent of its sales in California. Colorado would tax 40 percent of ABC's income ((.5 + .5 + .2) / 3), while California would tax 80 percent of ABC's income.

utilized the costs-of-performance method, which sources sales to the location where the company performs the income-producing activities (typically, the location of payroll and / or assets).

Recently, many states implemented a market-based sourcing (MBS) method to replace the costs-of-performance method. Under the MBS method, a company sources sales to a state if and to the extent the company's market for the sales is in the state (i.e., to the location of the customer).[8] In 1986, only six states required MBS. As of 2020, 33 states require MBS. Appendix B lists all states that require MBS. Appendix E provides an example illustrating the effect of MBS on companies' labor location decisions.

States adopt MBS for at least one of four reasons. First, the "income-producing activity" and "costs-of-performance" determinations have been difficult to administer and sometimes produce anomalous results (Huddleston and Sicilian 2009). Second, the MBS method more accurately reflects the purpose of the sales factor, which is to measure the taxpayer's customer base within a state, and does not merely duplicate the property and payroll factors (Huddleston and Sicilian 2009; Pomp 2013; Schadewald 2017).[9] Third, MBS reduces the tax burden on in-state service companies selling to out-of-state customers and may incentivize multistate service providers to locate labor and capital in the state (Cronin et al. 2009; Pomp 2013; Schadewald 2017). Fourth, states may implement MBS to increase revenues by taxing a larger portion of

[8] In practice, the assignment of sales under MBS is somewhat nuanced. Each state may use slightly different statutory language. For example, sales may be assigned to the state where the "benefit of the service is received by the customer" (e.g. California), where the "service is received" (e.g. Illinois), where the "customer is located" (e.g. Georgia), or where the "service is delivered" (e.g. Alabama) (Battin et al. 2014).

[9] Further, MBS effectively uses a "destination" principle, which more closely aligns with the treatment of tangible personal property (Schadewald 2017). States implemented the costs-of-performance method when manufacturing and mercantile activities drove the economy and services were largely performed in the same location as the customer. Because companies now use advanced technology to provide services digitally or remotely to out-of-state customers, the costs-of-performance method fails to capture the location of the taxpayer's market for sales (Huddleston and Sicilian 2009).

income earned by out-of-state service providers selling to in-state customers (Battin et al. 2014).[10]

Several states have also adopted rules to tax income from sales to other states in which the taxpayer is not taxable (states in which the taxpayer does not have "nexus").[11] If the taxpayer is not taxable in the destination state, the home state may require the taxpayer to include those sales in the home state's numerator. This provision, which practitioners refer to as a "throwback" rule, practically only applies to sales of tangible personal property. However, for sales of services, several states have adopted a "throw*out*" rule, which requires the taxpayer to remove from the sales factor *denominator* any sales to states in which the taxpayer is not taxable. Both rules effectively increase the taxpayer's tax liability when it sells into states where it is not taxable. Five states implemented throwout rules at the time they implemented MBS: Illinois, Alabama, Massachusetts, Kentucky, and Louisiana.

2.2. Prior research

An extensive literature examines whether changes in state tax policies have real economic effects, such as changes in employment or capital investment.[12] Earlier work examining the 1980s and 1990s focused on the association between apportionment weightings and economic activity in the manufacturing industry. Gupta and Hofmann (2003) find that capital expenditures decrease in the income tax burden on property (measured as the product of the statutory tax rate and the property factor weight), and increase at a decreasing rate in

[10] In Section 5.3, I examine the effects of MBS only on those states that do not implement MBS as part of legislation to stimulate fiscal or economic growth.

[11] "Nexus" refers to a legally sufficient connection between a taxpayer (e.g., a corporation) and a taxing jurisdiction (e.g., a state) that allows the taxing jurisdiction to impose a tax on the taxpayer. Both constitutional and statutory provisions influence nexus thresholds in a given state.

[12] There is a much broader literature examining the effect of tax policies on economic activity. For example, see Hall and Jorgenson 1967; Hines 1996; Devereux and Griffith 1998; Williams 2018; Lester 2019.

investment-related tax incentives. Similarly, Goolsbee and Maydew (2000) examine the period 1978-1990 and find that reducing the payroll weight from one-third to one-quarter increases manufacturing employment around 1.1 percent, concentrated in durable goods manufacturing and with larger effects in the long run. Edmiston and Arze del Granado (2006) find that the switch from an equally weighted formula to a double-weighted sales formula in Georgia during 1995 positively affects capital and labor in the state and negatively affects sales into the state.

Subsequent work challenges some of the earlier findings. Merriman (2015) attempts to replicate the findings in Goolsbee and Maydew (2000) and notes that more recent data and alternative specifications (e.g., clustered standard errors at the state level) suggest smaller effects from payroll changes. Clausing (2016) examines the period 1986-2012 and finds limited evidence that state employment and manufacturing capital expenditures are sensitive to corporate tax rates and apportionment factor weights after she introduces additional control variables. Suarez Serrato and Zidar (2018) present evidence that increasing the sales factor is *negatively* associated with state GDP.

Giroud and Rauh (2019) use establishment-level data from the U.S. Census Bureau to examine how corporate tax rates, personal tax rates, and sales factor weightings impact firm location choices and employment reallocation from 1977-2011. They show that firms move employees and capital across states most when the physical location of a firm's employees and property carries a larger weight in assigning the tax burden to a given state. However, their research design does not consider the effects of recent technological advancements and states' efforts to tax remote service companies through MBS rules.

Although somewhat mixed, prior evidence generally supports the claim that state apportionment weights and tax rates influence economic activity. However, for services firms,

the *sourcing* rules of the sales factor may matter more than the sales factor *weight*. When the state imposes costs-of-performance sourcing, the sales factor at least partially duplicates the payroll and property factors. Therefore, increasing the sales factor weight under a costs-of-performance regime should provide less of an incentive to locate in the state for service firms than for manufacturing firms. In contrast, MBS uses a destination principle that disregards the location of payroll and property in determining taxable income. Therefore, *sourcing* rules should incentivize services firms to locate in the state more than the simple *weight* of the sales factor.

Further, the services sector represents a growing and significant portion of the economy. Figure 1 shows that services represent 69 percent of personal consumption expenditures in 2020, up from 47 percent in 1960. Similarly, services contributed 77 percent of U.S. GDP and 65 percent of global GDP in 2017, an increase from 72 percent and 59 percent in 1997.[13] I fill a potentially material gap in the literature by examining how sourcing rules affect labor outcomes in the services sector.

2.3. Hypothesis development

I predict that the reduced tax burden on in-state companies from MBS will increase employment and compensation in the state. The increased labor investment could arise through two mechanisms. First, the state becomes a relatively more attractive place to locate labor (i.e., lower tax cost) for companies positioned to expand or reallocate resources. Empirical evidence supports the notion that companies respond when states reduce their tax rates or decrease the tax burden on payroll and property (Goolsbee and Maydew 2000; Gupta and Hofmann 2003; Giroud and Rauh 2019). Consistent with this mechanism, I predict MBS increases total employment. Second, the tax burden of existing in-state service companies selling to out-of-state customers

[13] See the World Bank Data: https://data.worldbank.org/indicator/NV.SRV.TOTL.ZS and https://data.worldbank.org/indicator/NV.SRV.TOTL.ZS?locations=US (retrieved May 2020).

immediately decreases.[14] Because prior studies find employees benefit from state and local corporate tax cuts (Suarez Serrato and Zidar 2016; Fuest et al. 2018; Ljungqvist and Smolyansky 2018), I expect some firms will increase employees' compensation. I therefore predict MBS increases compensation per employee. Consistent with either mechanism, I predict MBS increases total compensation.

H1: *When a state replaces costs-of-performance sourcing with market-based sourcing, total employment, total compensation, and compensation per employee increase among affected industries.*

States can write MBS laws to constrain tax avoidance.[15] Five adopting states did so, imposing a "throwout" rule. Under a throwout rule, the company's sales to any state in which the company is not taxable will be removed from the sales factor altogether (i.e., subtracted from the denominator), thereby increasing the company's taxable income in the state. Appendix E provides a numeric example illustrating the potentially powerful effect of throwout rules to offset the incentive, or even provide a disincentive, of locating in an MBS state.

Although throwout rules are a recent phenomenon in the context of services, states have a history of using the "throw*back*" rule to constrain tax avoidance related to sales of tangible personal property. The "throw*back*" rule treats shipments from the home state to no-nexus states as in-state sales (included in the sales factor numerator). Prior empirical evidence suggests throwback rules constrain avoidance as intended, reinforcing my expectation that throw*out* rules

[14] I consider a company "in-state" if its proportion of in-state labor to total labor exceeds its proportion of in-state sales to total sales. "Out-of-state" service companies (those with a greater proportion of in-state sales than in-state labor) should experience an *increase* in taxes after MBS (assuming they had nexus in the state). To the extent most of the labor in the state is attributable to "in-state" service companies, I expect compensation per employee to increase after MBS.

[15] As in Dyreng, Hanlon, and Maydew (2008), I define "tax avoidance" as anything that reduces a company's taxes relative to its pretax accounting income. In this study, tax avoidance refers to situations in which differences in tax rules across jurisdictions result in less than 100% of a company's income being subject to tax, which may or may not be due to deliberate tax avoidance practices.

will reduce the incentive to conduct services from MBS states.[16] Both theory and empirical literature suggest that throwout rules reduce the tax incentive of MBS.

H2: *The presence of a throwout rule decreases or eliminates the predicted increase in total employment, total compensation, and compensation per employee among affected industries arising from states adopting market-based sourcing.*

Although I expect sourcing rules to affect service companies' labor location and compensation decisions, several studies using aggregate data do not find an increase in economic activity when states increase the sales factor weight (Merriman 2015; Clausing 2016; Suarez Serrato and Zidar 2018). These findings could suggest that state tax rates are low enough that economic activity is not responsive to apportionment rules and/or companies care more about other considerations (Clausing 2016). Further, if a company perceives tax policy changes as transitory or expects all states to adopt MBS in the near future, the company might not respond when a state implements MBS.

3. Research Design

3.1. Data sources and sample

My study examines the period 2002-2018 and exploits the fact that 19 states implemented MBS from 2007-2018. Appendix B highlights the 19 states in gray. Although 33 states have enacted MBS as of 2020, 5 implemented MBS before the sample period and 9 implemented MBS after the sample period. To assess preexisting trends and limit the influence of the recession in the early 2000s, I start the sample in 2002. I collect data for all 50 states from 2002

[16] Klassen and Shackelford (1998) find that manufacturing shipments from states that impose throw*back* rules are decreasing in corporate income tax rates on sales, and Giroud and Rauh (2019) find that throwback rules limit the extent to which increases in sales apportionment factors reduce the incentives for firms to relocate establishments and employees.

to 2018, which is the most recent year for which the BEA provides data on my dependent variables.

For each state that enacts MBS, I limit the pre-period to five years prior to the effective date and allow an unlimited post-period, because MBS appears to be a permanent change in the state's tax structure. No state has switched from MBS back to costs-of-performance sourcing.

Appendix A defines all variables and their data sources. For my dependent variables, I rely on industry-level data obtained from the BEA's Regional Economic Accounts. The BEA publicly reports data for each 3-digit NAICS industry code of the economy.[17] I acknowledge that 3-digit industry definitions likely include some firms whose sales do not benefit from MBS rules, but including untreated firms in the treatment sample should not bias in favor of finding results.[18]

I rely on Commerce Clearing House AnswerConnect[19] and state websites to obtain data for several state tax policy variables, including states' sourcing rules. For the remaining control variables and variables used for matching, I rely on publicly available data from the BEA, BLS, Department of Labor, National Bureau of Economic Research, U.S. Census Bureau, and *Site Selection* magazine.

3.2. Empirical methodology

I aim to estimate how sourcing rules affect labor outcomes in industries that derive revenues primarily from services to out-of-state customers. H1 predicts that labor outcomes in

[17] I use the term "industry" when referencing both the 3-digit and 6-digit code, which differs from the NAICS's definitions. The NAICS uses the following hierarchical structure: each "sector" is identified by the 2-digit NAICS code; each "subsector" by the 3-digit code; each "industry group" by the 4-digit code; each NAICS "industry" by the 5-digit code; and each "national industry" by the 6-digit code. Source: https://www.census.gov/programs-surveys/economic-census/guidance/understanding-naics.html

[18] I also acknowledge that BEA data is not limited to employees of C corporations. However, most states generally impose entity-level apportionment on the business income of partnerships and other pass-through entities (Disque and Hecht 2017). Therefore, MBS should still affect multistate pass-through entities.

[19] Commerce Clearing House AnswerConnect is an online collection of current and historical tax statutes, regulations, court cases, and other materials.

affected industries increase after the state enacts MBS, relative to if the state continued to impose costs-of-performance sourcing. Although I cannot observe the counterfactual in which the state does *not* enact MBS, I can observe outcomes for (1) similar states that do not pass MBS, and (2) similar industries within the same state. To achieve this, I use both a matched-state difference-in-differences test and a within-state difference-in-differences test. Obtaining similar estimates in each test would provide robust evidence consistent with MBS affecting labor outcomes.

I identify the sample of "treated" industries by reviewing state legislation and model apportionment rules and comments on the Multistate Tax Commission's website.[20] MBS primarily affects companies that derive revenues from services to out-of-state customers. To identify which 3-digit NAICS industry codes likely provide services to out-of-state customers, I review the 2017 NAICS Manual, which includes definitions and descriptions of every industry code.[21] I include in the treatment group all industries providing information services (except telecommunications and broadcasting), professional, scientific, and technical services, administrative and support services, management and organization planning services, and certain financial services. On average, treated industries comprise approximately 20 percent of national employment and 28 percent of national compensation during the sample period, representing a significant portion of the labor market. Appendix C lists the nine "treated" industries (for both tests) and "potential control" industries (used for the within state analysis in Section 3.2.2).

[20] The Multistate Tax Commission was created in 1967 as an intergovernmental state tax agency working on behalf of states and taxpayers to facilitate the equitable and efficient administration of state tax laws that apply to multistate and multinational enterprises. Regardless of membership in the Commission, U.S. states retain the authority to implement their own tax rules. See http://www.mtc.gov/The-Commission (accessed July 2020).
[21] The 2017 NAICS Manual can be found at https://www.census.gov/eos/www/naics/.

3.2.1. Matched-state difference-in-differences design

For the matched-state difference-in-differences test, I compare the outcomes of treated industries before and after a state enacts MBS (first difference) to the outcomes of those same industries in matched states that do not enact MBS (second difference). This specification requires two steps: (1) matching each treatment state with a control state, and (2) estimating a generalized difference-in-differences specification using the matched sample.

In the first step, I match each state that passed MBS to a state that did not pass MBS with similar economic and demographic characteristics in the year prior to the date MBS became effective. Like Langenmayr and Lester (2018) and Lester (2019), I use the Mahalanobis distance measure to match each MBS state to one control state, with replacement.[22] I select matching variables previously used to measure state similarity by Suarez Serrato and Zidar (2018) that capture industry composition, size, and citizen demographics. Specifically, I include the share of state GDP contributed by NAICS sectors 11 and 21 (natural resources and mining), 23 (construction), 31-33 (manufacturing), and 51 and 54 (information and professional, scientific, and technical services), the natural log of the state's population, and the share of the state's population aged 18 and older with a bachelor's degree. I also include the share of the population aged 65 and older and the share of the population aged 18 and younger (Ljungqvist and Smolyansky 2018; Clausing 2016), which provides additional information about the state's labor supply. The final matched sample includes 31 unique states. Appendix D lists each MBS state and its matched counterpart.

[22] Matching with replacement affords the benefit of reducing bias, especially in settings in which there are few control units comparable to the treated units (Stuart 2010). Additionally, when matching with replacement, the order in which the treated units are matched does not matter. Nonetheless, I test whether the results are robust to matching without replacement in Section 5.4.

In step two of the matched sample difference-in-differences design, I restrict the sample to treated industries and their matched counterpart. I exclude several industry-states and their matched counterpart that do not have complete data throughout the sample period.[23] I then estimate the following generalized difference-in-differences equation using OLS:

$$Labor_{ist} = \alpha_{is} + \alpha_{mt} + \beta_1 (MBS\ state_s * Post_{st}) + \lambda\ C_{st} + \varepsilon_{ist} \quad (1)$$

where $Labor_{ist}$ is the labor outcome industry i has in state s in year t, and takes one of the following values: (i) natural log of total number of employees, (ii) natural log of total compensation, or (iii) natural log of total compensation divided by total number of employees.

MBS state is an indicator variable that equals 1 if the state enacts MBS at any time during the sample period. *Post* is an indicator that equals 1 if MBS is in effect in state s in year t. For matched control states, *Post* equals 1 if MBS is in effect in the state's matched counterpart in year t. α_{is} and α_{mt} are industry-state fixed effects and matched pair-year fixed effects.[24]

Industry-state fixed effects control for factors driving the presence of a given industry in a given state on average over the sample period. Matched pair-year fixed effects allow me to compare the change in outcome of each treated state to the change in outcome of its matched counterpart, controlling for other events that affect the matched pair equally during the year.[25] Matched pair-year fixed effects subsume the separate *Post* variable included in a standard difference-in-differences design. Industry-state fixed effects subsume the *MBS state* variable.

[23] This restriction is necessary because the BEA does not display data for certain industry-state-years to avoid disclosure of confidential information. This restriction removes NAICS code 522 (credit intermediation and related activities) and 523 (securities, commodity contracts, and other financial investments and related activities) for Connecticut and Vermont, NAICS code 522 for Rhode Island and New Hampshire, and NAICS code 523 for Maine and New Hampshire.

[24] I estimate nearly identical coefficients and t-statistics if I add industry-year fixed effects, which control for time-varying shocks that uniquely affect certain industries.

[25] Cram, Karan, and Stuart (2009) recommend including matched pair fixed effects when one control observation serves as a match for each treated observation.

Because states could pass MBS legislation in conjunction with other tax legislation, I include C_{st}, a vector of time-varying state tax climate controls that largely follow the literature on the economic effects of state tax policy. First, I include an indicator equal to 1 if the state imposes mandatory combined reporting. Several studies find that combined reporting and other anti-income shifting policies are negatively associated with economic activity (Gupta and Hofmann 2003; Suarez Serrato and Zidar 2018; Liu and Mooij 2020). Next, I include the payroll weight and the corporate tax rate, as well as the interaction between the two variables (the payroll burden).[26] I also include the top personal income tax rate and the bank tax rate. Although prior evidence is somewhat mixed, I generally expect the payroll weight, payroll burden, and each tax rate to have a negative association with labor outcomes.[27]

I also include the natural log of the unemployment insurance contribution (the product of the top unemployment insurance rate in the state and the state's maximum base wage), which I expect to have a negative association with labor outcomes (Giroud and Rauh 2019). Finally, I include Giroud and Rauh's (2019) tax incentives index, which adds one index point for each of the 33 targeted business incentives identified by *Site Selection* magazine as influencing

[26] Several studies include only the interaction between the payroll weight and corporate tax rate (payroll burden), which assumes the individual components do not matter. However, the separate components may have differential effects on economic activity (Merriman 2015). For example, changes to apportionment factor weights are more persistent than changes to the corporate tax rate. A change to a sales only apportionment factor may therefore signal more certainty and business-friendliness than a temporary reduction in the corporate tax rate (tax rates change often).

[27] Helms (1985) and Mofidi and Stone (1990) provide evidence that state and local tax rate increases have a negative effect when revenues are devoted to transfer-payment programs and a positive effect when revenues are devoted to health, education, and public infrastructure. Reed and Rogers (2004) find that *personal* tax cuts in NJ during 1994-1996 did not enhance employment. Gale, Krupkin, and Rueben (2015) find that top income tax rates bear no stable relationships to economic growth or employment across states and over time, while Clausing (2016) finds that personal tax rates are *positively* associated with manufacturing employment. However, several recent studies find a negative association between corporate tax rates and labor outcomes (Suarez Serrato and Zidar 2016; Giroud and Rauh 2019; Ljungqvist and Smolyansky 2018) and bank tax rates and economic activity (Smolyansky 2019; Venkat 2020).

companies' location decisions.[28] I expect the tax incentives index to have a positive association with labor outcomes.

H1 predicts MBS positively affects labor outcomes, and H2 predicts that throwout rules reduce or eliminate the positive effect. To test H1 and H2 simultaneously, I estimate the following variant of equation (1) which includes a triple interaction term:

$$Labor_{ist} = \alpha_{is} + \alpha_{mt} + \beta_1 (MBS\ state_s * Post_{st}) + \beta_2 (MBS\ state_s * Post_{st} * Throwout_s) + \lambda C_{st} + \varepsilon_{ist,} \quad (2)$$

where *Throwout* is an indicator that equals 1 if an MBS state imposes a throwout rule that applies to service receipts. β_1 captures the effect of MBS for states that do not impose throwout rules, β_2 captures the incremental effect of MBS for states that impose throwout rules, and $\beta_1 + \beta_2$ captures the net effect of MBS for states that impose throwout rules.

H1 predicts β_1 will be positive and H2 predicts that β_2 will be negative. Because states in my sample impose the throwout rule at the same time they impose MBS, the term *Throwout * Post* is perfectly collinear with *MBS state * Post * Throwout* and is therefore excluded. Industry-state fixed effects subsume *Throwout* and *MBS state * Throwout*.

3.2.2. Within-state difference-in-differences design

One concern with my primary specification is that inherent differences across states may drive the results. For example, a state may pass MBS in conjunction with other incentives or business-favorable legislation in anticipation of declining economic activity. Although I match on economic and demographic characteristics and control for tax climate variables in my primary specification, I cannot fully rule out that some inherent characteristic of states that pass MBS

[28] The *Site Selection* data are not available in all years. Similar to Giroud and Rauh (2019), I use the latest available year to fill in missing years.

drive the results. To alleviate this concern, I estimate a separate difference-in-differences specification that exploits the fact that MBS affects only certain industries within a state.

For this test, I first restrict the sample to the 19 states that enact MBS legislation during the sample period. I then match each "treated" industry, as previously defined, to an industry in the same state exhibiting similar changes in outcomes during the pre-event period. Specifically, I use the Mahalanobis distance measure to match on the average change in total employment and compensation per employee during the five years before a state enacts MBS. Because treated industries may have been growing more rapidly than many other industries, matching on pre-event trends limits the possibility that preexisting trends drive the results.[29] Imai, Kim, and Wang (2020) recommend matching before applying the difference-in-differences estimator so that the matched control observations become similar to the treated observations in terms of outcome and covariate histories.[30] Because my data does not include covariates that vary at the industry-state level, I am constrained to matching only on outcomes.

The potential control group consists of all other 3-digit NAICS codes within the state that did not undergo a change during the 2007, 2012, or 2017 NAICS code revisions and that have complete data throughout the sample period. I also exclude from the potential control group industries that have special apportionment rules, because those rules may have changed at the time MBS was enacted. Appendix C identifies the potential control industries. As before, I match

[29] For example, Barefoot et al. (2018) and Jolliff and Nicholson (2019) show that the digital economy has been growing more rapidly than the rest of the economy. From 2006 to 2016, the BEA estimates that real value added by the digital economy grew at an average annual rate of 5.6 percent, outpacing the average annual growth rate for the overall economy of 1.5 percent. While the "digital economy" as defined by the BEA includes several industries not included in the *Treated industry* variable (e.g., computer hardware production), the variable does include industries that provide digital media, digital data, and digital services.

[30] Langenmayr and Lester (2018) also match on pre-change outcomes before estimating a difference-in-differences model.

with replacement. The final sample includes 309 unique industry-states, consisting of 167 treated industry-states and 142 control industry-states.

I compare the outcomes of treated industries before and after a state implements MBS (first difference) to the outcomes of matched control industries in the same state (second difference) by estimating the following generalized difference-in-differences equation using OLS:

$$Labor_{ist} = \alpha_{is} + \alpha_{st} + \beta_1 \, (Treated\ industry_i * Post_{st}) + \varepsilon_{ist}, \quad (3)$$

where $Labor_{ist}$ is defined as in equation (1). *Treated industry* is an indicator that equals 1 if the industry derives its revenues primarily from services and the location of the customer can be different from the location where the service is performed. *Post* is an indicator that equals 1 if MBS is in effect in state s in year t. α_{is} and α_{st} are industry-state fixed effects and state-year fixed effects. Industry-state fixed effects control for factors driving the presence of a given industry in a given state on average over the sample period. State-year fixed effects control for other changes at the state-level in a given year that affect the presence of all industries, thus controlling for any legislation accompanying MBS legislation that could drive labor outcomes in all industries (e.g., changes to apportionment factor weights, corporate tax rates, personal tax rates, unemployment insurance rules, tax incentives, etc.). State-year fixed effects also control for tax policies and general economic conditions that vary at the state level from year-to-year and affect all industries equally. State-year fixed effects subsume the controls included in equation (1) and the *Post* variable.[31] Industry-state fixed effects subsume the *Treated industry* variable.

[31] I estimate nearly identical coefficients and t-statistics if I include matched pair-year fixed effects instead of state-year fixed effects. Similarly, inferences are unchanged if I add industry fixed effects to equation (4). I refrain from adding industry-year fixed effects as it would remove some of the variation I intend to capture – this is because I estimate equation (4) only on states that enact MBS. For example, in 2018 (the last year in the sample), each state in the sample would have enacted MBS, and industry-year fixed effects would therefore capture the average effect of MBS on treated industries.

To provide corroborating evidence for my hypotheses, I estimate the following variant of equation (3) which includes a triple interaction term:

$$Labor_{ist} = \alpha_{is} + \alpha_{st} + \beta_1 \, (Treated\ industry_i * Post_{st}) +$$

$$\beta_2 \, (Treated\ industry_i * Post_{st} * Throwout_s) + \varepsilon_{ist}, \qquad (4)$$

where *Throwout* is an indicator that equals 1 if state *s* imposes a throwout rule. β_1 captures the effect of MBS for states that do not impose throwout rules, β_2 captures the incremental effect of MBS for states that impose throwout rules, and $\beta_1 + \beta_2$ captures the net effect of MBS for states that impose throwout rules. H1 predicts that β_1 will be positive and H2 predicts that β_2 will be negative. I exclude *Throwout * Post* because it is perfectly collinear with *MBS state * Post * Throwout*. Industry-state fixed effects subsume *Throwout* and *Treated industry * Throwout*.

3.3. Descriptive statistics

Table 1, Panel A describes the matching variables used for the matched-state sample for MBS states in the year before MBS became effective. Panel B describes the matching variables for the matched states in the year before their treated counterpart enacted MBS. Except for population, values represent the percent share. Panel C, which describes and tests the differences in means between the two samples, shows that the matching technique produced no statistically significant differences for each of the matching variables.

Table 2, Panels A-C describe the outcome variables in the years prior to MBS. Panel A shows the treated sample, Panel B shows the matched-state control sample, and Panel C shows the within-state control sample. Panels D and E describe the control variables for the MBS and matched states for the full sample period. Because I include state-year fixed effects in the within-state regression and no variables vary at the industry-year level, I do not present any control variables for the within-state control group. Except for *Combined reporting, Tax incentives*

index, and *ln(Unemployment insurance contribution*), the control variables represent percentages. The means and percentiles for most control variable are economically similar between MBS and matched states even though I did not match on these variables. MBS states are more likely to impose combined reporting. The mean tax rates range from 5 to 7 percent. The mean payroll factor weighting is 13 percent for MBS states and 17 percent for control states.

Table 3 presents Pearson correlations for the variables used in equation (1) and (2). As expected, total employment and total compensation have a strong positive correlation (0.97), and total compensation has a positive correlation with compensation per employee (0.39). By construction, the payroll burden is highly correlated with the payroll factor weighting (0.96).[32] Each of the three tax rates positively correlate with each other.

4. Results

4.1. Matched-state difference-in-differences results

Table 4 presents results from the matched-state difference-in-differences test. I highlight the rows of interest in gray. Columns 1-3 present results from estimating equation (1), which does not consider the effect of throwout rules. Columns 4-6 present results from estimating equation (2), which includes the effect of throwout rules and tests H1 and H2.

In Table 4, column 4, the coefficient on *MBS state x Post* of 0.070 (p-value < 0.01) suggests that MBS increases employment in affected industries by 7.0 percent when the state does not impose a throwout rule. Column 5 suggests MBS without a throwout rule increases total compensation in the state by 8.6 percent (p-value < 0.01), and column 6 suggests MBS has no significant effect on compensation per employee (p-value = 0.252).

[32] Inferences are unchanged if I exclude the payroll burden from the regressions.

The coefficients on *MBS state x Post x Throwout* in Table 4, columns 4 and 5 (but not 6) suggest throwout rules have a significant and substantial effect. Below the coefficient estimates, results from Wald tests suggest that throwout rules reduce the positive effect of MBS on total employment and total compensation to zero (p-values > 0.10).

The coefficients on the control variables in Table 4 are generally as expected, with a few exceptions. The positive and statistically significant coefficient on the payroll burden implies that decreasing the tax burden on labor is associated with lower employment and compensation. Although this is somewhat unexpected, Clausing (2016) finds that decreasing the payroll burden is associated with lower manufacturing employment in several specifications. Likewise, Suarez Serrato and Zidar (2018) find that increasing the sales factor weight is associated with lower state GDP.

The positive coefficient on the personal income tax rate in columns 1 and 2 is also in line with Clausing (2016) and may suggest that states are using incremental tax revenues to promote economic growth (Helms 1985; Mofidi and Stone 1990).[33] Higher unemployment insurance taxes are associated with higher employment. Because annual unemployment insurance tax rates are increasing in the number of prior year layoffs (Pavosevich 2020), higher unemployment insurance contributions may encourage employee retention. Another explanation is that higher unemployment insurance benefits stimulate demand and therefore encourage job retention and creation (Stone and Chen 2014). [34]

[33] Because the tax rates are expressed as percentages, a one percentage point increase in the tax rate corresponds to a percent increase in labor outcomes that equals the tax rate coefficients * 100. For example, in column 4, a one percentage point increase in the personal income tax rate is associated with a 4.0 percent increase in employment.
[34] Additionally, 35 states increased UI bases and rates during the early stages of the economic recovery, which could explain the positive association with employment (Henchman 2011).

4.2. Within-state difference-in-differences results

Table 5 presents results from the within-state difference-in-differences test. Columns 1-3 present results from estimating equation (3), and columns 4-6 present results from estimating equation (4).

The positive and significant coefficients on *Treated industry x Post* in columns 4-6 provide corroborating evidence supporting H1. In column 4, the coefficient of 0.038 (p-value = 0.045) suggests that MBS increases employment in affected industries by 3.8 percent when the state does not impose a throwout rule. Column 5 suggests MBS without a throwout rule increases total compensation in affected industries by 6.5 percent (p-value = 0.037), and column 6 suggests MBS without a throwout rule increases compensation per employee by 2.7 percent (p-value = 0.095).

The negative and significant coefficient on *Treated industry x Post x Throwout* in column 4 (p-value = 0.080) supports H2 when the outcome is employment. Further, results from the Wald test suggest that throwout rules reduce the positive effect of MBS on employment to zero, similar to the matched-state findings. In columns 5 and 6, the coefficient on *Treated industry x Post x Throwout* is not statistically significant, suggesting that throwout has no significant effect on total compensation or compensation per employee when the control group consists of matched industries within the same state.

4.3. Discussion

Results from Tables 4 and 5 are generally consistent with H1. MBS increases total employment and total compensation for affected industries relative to the same industries in matched states *and* to matched industries within the same state. MBS modestly increases

compensation per employee relative to industries in the same state, but not relative to the same industries in matched states.

Both tables also provide evidence that throwout rules eliminate the positive effect of MBS on employment. However, throwout rules eliminate the positive effect of MBS on total *compensation* only when the control group consists of matched states, but have no significant effect when the control group consists of matched industries within the same state. Throwout rules have no significant effect on compensation per employee relative to either control group. The different estimates of MBS on compensation per employee and of throwout on total compensation highlights the relevance of the control group when estimating the effects of MBS and throwout on labor outcomes. Although my focus has been on affected industries, I acknowledge there may be some other variable(s) in MBS states that affect compensation in unaffected industries. Further, the weaker results in the compensation per employee regression partially reflects the fact that not all treated companies operating in the state necessarily benefit from MBS. To the extent the company's proportion of in-state sales is higher than the company's proportion of in-state labor, the company's tax burden *increases* after MBS.

The estimated effects in the matched-state sample (Table 4) are generally greater than the effects in the within-state sample (Table 5). Part of the difference could be due to the reallocation of labor across states. Because states compete for labor and capital, the increase in employment in a treated state may correspond to a decrease in employment in other states (Giroud and Rauh 2019). Another explanation is that other legislation may accompany MBS that influences labor outcomes in control industries more than treated industries. I explore this possibility in Section 5.3.

To assess whether the estimated effects on employment of 3.8-7.0 percent seem reasonable, I rely on prior empirical work and underlying theory. Giroud and Rauh (2019) examine the interaction between the state tax rate and the sales factor weight, arguing that increasing the state tax rate should have a smaller effect on the firm's decision to relocate plants and employees when the sales factor weight is higher. They find that a switch from an equally weighted three-factor formula to a sales-only formula increases the number of employees per establishment by 2.4 percent.[35] However, I expect sourcing rules to affect service companies' labor location decisions *more* than apportionment weights affect labor location decisions of companies in Giroud and Rauh's sample. To the extent a company relies on local customers or incurs significant transportation costs to serve out-of-state customers, apportionment weights have minimal impact because the property, payroll, and sales factors are highly correlated. Giroud and Rauh's (2019) sample includes many industries that should exhibit a minimal response to an increase in the sales weight (e.g., construction, real estate, locally provided services such as health care, remote / digital services in costs-of-performance states, traditional retail industries, etc.). I examine industries that have minimal (if not zero) transportation costs and that do not rely heavily on local customers to generate revenue. These industries should respond more to destination or market-based taxation than Giroud and Rauh's sample.[36] Therefore, the estimated effects of 3.8-7.0 percent seem reasonable.

One of the limitations of this study is that it relies on aggregate industry-level data. My identification strategy using this data could produce measurement error, as not every 6-digit

[35] I estimate this effect size by multiplying the mean corporate state tax rate of 6.85 by the increase in the sales factor of 0.67 (1-0.33) and the coefficient of 0.0053. See Giroud and Rauh (2019), Table 11.
[36] I acknowledge that my sample likely includes some small firms that do not have the ability to expand or re-allocate labor across jurisdictions, whereas Giroud and Rauh's (2019) sample includes only establishments of multistate firms with more than 100 employees.

industry code included in the 3-digit subsector may be affected by a state's sourcing rules. However, any measurement error associated with including certain 6-digit industries that are not affected should bias *against* finding results. Further, if the effect is observed at the aggregate level, one would expect to observe the effect at the firm level. The primary incremental benefit of using firm level data would be refining the treatment group and the estimates. Nonetheless, this study uses more granular data than many prior studies that use aggregate state-level data or 2-digit industry code data, and provides directional estimates on the effect of sourcing rules.

5. Additional analyses

5.1. The effect on the digital economy

In my sample, "treated" industries include both digital service companies and other companies that provide remote services; however, only digital service companies are in-scope for the OECD/G20 IF's proposal.[37] To provide more applicable evidence for the OECD/G20 IF's proposed market-based taxing system, I explore whether the effect of MBS on labor outcomes in the digital economy differs from other treated industries. I create a new indicator variable, *Digital*, that equals 1 if the industry is treated by MBS *and* included in the BEA's definition of the "digital economy."[38] Figure 3 presents a matrix showing the relationship between treated and digital industries.

[37] The OECD has been in negotiations with more than 130 countries to reach a multilateral agreement requiring certain multinational businesses to pay some of their income taxes where consumers / users are located. The OECD/G20 IF lists several "automated digital services" that are in-scope for its proposed market-based taxing system, including business models that involve online search engines, social media platforms, digital content streaming, online gaming, cloud computing services, and online advertising services. As of October 2020, the OECD/G20 IF plans to conclude negotiations and finalize an agreement by mid-2021.

[38] The BEA selected over 200 goods and services categories for inclusion in the "digital economy" (Barefoot et al. 2018). The BEA lists the specific 6-digit NAICS code of each industry as well as the broader 3-digit subsector. The BEA includes several service-based industries that were not included in my original treatment sample, because the services are generally provided on-site or the industry has separate apportionment provisions.

Table 6, columns 1-3 present results from re-estimating equation (1) only for *Digital* industries in non-throwout states. I also re-estimate equation (2) for non-throwout states, replacing *Throwout* with *Digital*, and present the results in columns 4-6. For parsimony, I do not present the control variables. I estimate similar effects in columns 1-3 as the full sample and find that the effect of MBS in digital service industries does not significantly differ from the effect in non-digital service industries (p-values from Wald tests > 0.10). Table 6 therefore provides evidence that digital service companies respond to MBS in a similar manner as other treated industries, suggesting that the OECD/G20 IF's proposed taxing system will likely affect the allocation of labor across jurisdictions for industries in the digital economy.

Table 6 also provides evidence that sourcing rules affect the labor location decisions of other treated industries. One potential inference is that companies beyond the digital economy engage in tax-motivated location decisions and derive revenues from customers in jurisdictions in which the companies have a minimal presence. Because the intent behind the OECD/G20 IF's proposed market-based taxing system is to more accurately assign profits to jurisdictions in which the firm extracts value, the OECD/G20 IF might consider expanding the list of "in-scope" businesses.[39]

5.2. Assessing preexisting trends

One concern with my analyses is that preexisting trends may drive the results. I address this concern in two ways. First, I estimate the treatment dynamics, which captures the difference in outcomes between treatment and control industries in each of the five years before and each of the years after MBS goes into effect. I estimate the treatment dynamics for equations (2) and (4)

[39] The policy issue outlined by the OECD/G20 IF explicitly identifies regulated financial activities and certain professional services as out-of-scope, but acknowledges that consideration might be given to unregulated elements of the financial services sector, and that further work will be required on the definition of within-scope services.

and plot the coefficients in Figure 2 with their 95 percent confidence intervals. I omit year *t-1*, which serves as the benchmark year, because including all event-year indicators results in perfect collinearity.

Figure 2, Panel A plots the trends for the matched-state sample, while Panel B plots the trends for the within-state sample. Both panels display no noticeable upward trend in labor outcomes in the five years leading up to the event date. Figure 2, Panel B shows that the effects for the within-state sample are strongest in the later years. One explanation is that other legislation accompanied MBS that uniquely affected short-term labor outcomes in non-treated industries (e.g., manufacturing tax incentives, credits for capital investment, changes in government spending, etc.). The effects of such legislation may have subsided after a few years, revealing a stronger positive effect of MBS relative to non-treated industries in later years.

To further address the possibility that preexisting trends drive the results, I conduct a pseudo-event date analysis, whereby I assign the treatment date to be three years earlier than the actual treatment date. I include the three years leading up to the pseudo-event date and end the sample in the year before the actual event date. If preexisting differences drive my results, I should observe the same effect when using a different time period that does not include the treatment date. I present the results in Table 7. Panel A shows the matched-state test and Panel B shows the within-state test. The estimated effects are relatively small compared to my main analyses and only reach marginal significance in the compensation per employee within-state regression.

Taken together, results from estimating the treatment dynamics and the pseudo-event date specifications provide evidence that preexisting trends do not drive the results.

5.3. Addressing policy endogeneity

One of the primary challenges to interpreting the effects in this study as causal and generalizing them to other settings is that MBS is not randomly implemented. States endogenously choose their tax policies and the treatment effects estimated in this study might differ for other states or foreign countries. This concern is partially alleviated by the fact that my design exploits 19 different treatment events across an eleven-year period for states with varying economic and demographic characteristics. Additionally, I draw similar inferences using the matched-state design and the within-state design.

Nonetheless, I attempt to further alleviate endogeneity concerns using a "narrative approach" (Romer and Romer 2010; Giroud and Rauh 2019). Romer and Romer (2010) separate legislated tax rate changes into those taken for reasons related to prospective economic conditions and those taken for more "exogenous" reasons. In this spirit, I conduct an online search for news coverage and legislative fiscal notes to identify the impetus for each MBS policy change. I separate states that enacted MBS for more "exogenous" reasons (such as conforming to the Multistate Tax Commission's model apportionment regulations) from states that enacted MBS for more endogenous reasons (such as coupling MBS with broader legislation intended to influence short-term fiscal or economic growth).

I re-estimate equations (2) and (4) on the more exogenous sample and present the results in Table 8. Panel A presents results from re-estimating equation (2) and Panel B presents results from re-estimating equation (4). Generally, I estimate similar or *greater* effects. Further, the effect of MBS on compensation per employee becomes significant and meaningful in the matched-state sample (coefficient of 0.040; p-value < 0.01), and the effect of throwout on total compensation becomes significant and meaningful in the within-state sample (coefficient of -

0.094; p-value = 0.017). Finally, the coefficients between the two samples are more similar than the full sample, in line with excluded "endogenous" states implementing concurrent legislation uniquely affecting labor outcomes of within-state control industries. These results provide evidence that the MBS policy itself rather than the impetus of the policy explains the estimated effects.

5.4. Robustness tests

I conduct several untabulated robustness tests on my primary specification. First, I address concerns about influential observations by excluding one matched-pair at a time and re-estimating equation (2). I also exclude one treated industry at a time and re-estimate equation (2). The positive effect of MBS on total employment and compensation remains substantial and significant in all circumstances. The negative effect of throwout remains substantial and significant in all circumstances, except for the exclusion of the Utah matched pair, the Alabama matched pair, and NAICS code 561 (management of companies and enterprises), where the effect loses significance in the total compensation regression.[40] Overall, inferences remain unchanged that MBS positively affects employment and throwout rules reduce the effect.

Next, I expand the pool of potential control states to include states that implemented market-based sourcing prior to the start of the sample period. Inferences are unchanged after making this modification and re-estimating equation (2).

Next, I explore whether the results are sensitive to the matching procedure by re-estimating equation (2) after matching with*out* replacement. The positive effect of MBS on

[40]The exclusion of the Maine matched pair produces *greater* estimates. The positive effect of MBS on employment, compensation, and compensation per employee increases to 9, 12, and 3 percent (p-values<0.01). Likewise, the exclusion of Maine from the within-state analysis increases the estimated effect of MBS on employment, compensation, and compensation per employee to 5, 8, and 4 percent (p-values<0.01). To the extent a unique event negatively affected labor outcomes in Maine post-MBS, the estimated effects may be understated.

compensation and the negative effect of throwout on compensation remain statistically significant at the 0.05 level. Further, the positive effect of compensation per employee becomes significant at the 0.05 level. These results provide robust evidence that MBS affects labor outcomes.

Finally, I expand the treatment group to include additional industries potentially affected by MBS. Approximately half of the MBS states have separate apportionment rules for NAICS codes 515 (broadcasting) and 517 (telecommunications). Inferences are unchanged when I re-estimate equation (2) after including NAICS codes 515 and 517 in the treatment group for MBS states that do not have separate apportionment rules for these industries.

6. Conclusion

This study exploits changes in U.S. state tax rules to estimate the effect of tax sourcing rules on labor outcomes. With recent advancements in technology, U.S. states and foreign governments face issues related to the taxation of digital and remote service providers. State and international organizations advocate taxing service companies using a market-based approach. However, the literature does not provide evidence on the economic consequences of shifting to a market-based tax system.

Using both a matched-state and within-state generalized difference-in-differences design, I find that sourcing rules affect aggregate labor outcomes. Once a state taxes service companies based on customer location rather than the location of labor and capital, total employment and total compensation increase by a significant and meaningful amount relative to unaffected industries. I find that throwout rules, which prevent the taxpayer from avoiding taxation on a portion of its income, can completely offset the positive effect of MBS on labor outcomes. I also find that MBS and throwout rules affect compensation per employee when the control group

consists of matched industries in the same state and when I restrict the sample to more "exogenous" law changes, consistent with companies passing on the benefit to their employees.

This study introduces *sourcing* rules to the literature that shows U.S. state corporate tax *rates* and apportionment factor *weights* influence economic activity. This study can assist both U.S. state and international policymakers in understanding the effects of taxing profits based on customer location instead of the location of labor and capital. I provide evidence that differences in sourcing rules across jurisdictions affect companies' real economic decisions. The results suggest that the implementation of the OECD's new tax proposal will likely affect how firms allocate labor across jurisdictions. This is consistent with the notion that a market-based taxing system simultaneously imposed by all jurisdictions may prevent cross-jurisdictional tax competition and reduce tax-motivated location decisions.

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Appendix A: Variable Definitions and Data Sources

Variable Name	Definition	Source(s)
Dependent Variables		
Employees	Average annual number of full-time and part-time jobs (all jobs for which wages and salaries are paid are counted).	BEA's Regional Economic Accounts, Table SEAMP27N
Compensation	Compensation of employees (the total remuneration, both monetary and in kind, payable by employers to employees in return for their work during the period). Consists of wages and salaries and of supplements to wages and salaries.	BEA's Regional Economic Accounts, Table SAINC6N
Comp/emp	Total compensation divided by total number of employees.	Constructed
Explanatory Variables		
Treated industry	Indicator equal to 1 for all service industries in which the customer's location can be different from where the service is performed by employees.	Constructed
MBS state	Indicator equal to 1 for all states that enacted market based sourcing rules at any point during 2008-2018.	CCH AnswerConnect and state legislatures' websites
Throwout	Indicator equal to 1 for all MBS states that require the taxpayer to "throwout" or exclude from the sales factor denominator any sales to states in which the taxpayer is not taxable.	CCH AnswerConnect and state legislatures' websites
Digital	Indicator equal to 1 for all *Treated* industries included in the BEA's definition of the "digital economy."	Barefoot et al. (2018)
Post	Indicator equal to 1 for all treated and control observations in year t, including and following the year MBS went into effect.	CCH AnswerConnect and state legislatures' websites
Combined reporting	Indicator equal to 1 for all states that require combined reporting in year t.	CCH AnswerConnect
Payroll burden	Product of the payroll factor weight and corporate tax rate.	CCH AnswerConnect
Payroll factor weighting	Weight of the payroll factor in the state's apportionment formula.	CCH AnswerConnect
Corporate tax rate	State corporate tax rate (top rate).	CCH AnswerConnect
Personal income tax rate	State personal income tax rate (top rate).	National Bureau of Economic Research
Bank tax rate	State bank tax rate (top rate).	Dataset shared by Aruhn Venkat
Tax incentives index	Index of state tax incentives that adds one index point for each of the 33 tax incentives offered in the state, as identified by *Site Selection* magazine.	*Site Selection* magazine and Giroud and Rauh (2019) online dataset (http://www.columbia.edu/~xg2285/)
Unemployment insurance contribution	The top unemployment insurance rate in the state multiplied by the state's maximum base wage.	Department of Labor's "Significant Provisions of State UI Laws" and Giroud and Rauh (2019) online dataset (http://www.columbia.edu/~xg2285/)

Appendix A: Variable Definitions and Data Sources (continued)

Matching Variables		
Natresmine share GDP	Natural resources and mining share of state GDP.	BEA's Regional Economic Accounts
Const share GDP	Construction share of state GDP.	BEA's Regional Economic Accounts
Mfg share GDP	Manufacturing share of state GDP.	BEA's Regional Economic Accounts
Service share GDP	Information and professional, scientific, and technical services' share of state GDP.	BEA's Regional Economic Accounts
Log population	Natural log of state's total population.	U.S. Census Bureau
Bach share	Share of state's population aged 18 and older with a bachelor's degree.	U.S. Census Bureau
Senior share	Share of state's population aged 65 and older.	U.S. Census Bureau
Young share	Share of state's population aged 18 and younger.	U.S. Census Bureau

Appendix B: State Adopting MBS

State	Date MBS Legislation Passed	Date MBS Became Effective	Comment
Georgia		pre-2000	excluded from pool of potential control states
Iowa		pre-2000	excluded from pool of potential control states
Maryland		pre-2000	excluded from pool of potential control states
Oklahoma		pre-2000	excluded from pool of potential control states
Minnesota		pre-2000	excluded from pool of potential control states
Maine	6/7/2007	1/1/2007	*MBS state*
Michigan	7/17/2007	1/1/2008	*MBS state*
Illinois*	8/16/2007	1/1/2008	*MBS state*
Utah	3/14/2008	1/1/2009	*MBS state*
Wisconsin	2/19/2009	1/1/2009	*MBS state*
Alabama*	6/9/2011	1/1/2011	*MBS state*
California	2/20/2009	1/1/2011	*MBS state.* Eff. in 2011 if taxpayer elects single sales factor.
Massachusetts*	7/24/2013	1/1/2014	*MBS state*
Nebraska	4/10/2012	1/1/2014	*MBS state*
Pennsylvania	7/9/2013	1/1/2014	*MBS state*
Arizona	2/21/2012	1/1/2014	*MBS state.* Election. Phased in 2014-2017.
New York	3/31/2014	1/1/2015	*MBS state*
Rhode Island	6/19/2014	1/1/2015	*MBS state*
Connecticut	6/2/2016	1/1/2016	*MBS state*
Louisiana*	6/28/2016	1/1/2016	*MBS state*
Tennessee	6/3/2015	7/1/2016	*MBS state*
Kentucky*	4/3/2018	1/1/2018	*MBS state*
Montana	5/3/2017	1/1/2018	*MBS state*
Oregon	7/3/2017	1/1/2018	*MBS state*
Colorado	6/4/2018	1/1/2019	included in pool of potential control states
Indiana	4/29/2019	1/1/2019	included in pool of potential control states
New Jersey	7/1/2018	1/1/2019	included in pool of potential control states
North Carolina	11/8/2019	1/1/2020	included in pool of potential control states
New Mexico	4/4/2019	1/1/2020	included in pool of potential control states
Hawaii	6/12/2019	1/1/2020	included in pool of potential control states
Missouri	6/1/2018	1/1/2020	included in pool of potential control states
Vermont	6/10/2019	1/1/2020	included in pool of potential control states
New Hampshire	9/9/2019	1/1/2021	included in pool of potential control states

*Illinois, Alabama, Massachusetts, Louisiana, and Kentucky also enacted a throwout rule that applies to service revenues.

Appendix C: Treated and Potential Control Industries

Selected Services-Producing Industries	Most Detailed NAICS Code in BEA Data	Included in Sample as:
Trade, Transportation, and Utilities		
Wholesale Trade (NAICS 42)	42	Potential Control
Merchant Wholesalers, Durable Goods (NAICS 423)	N/A	N/A
Merchant Wholesalers, Nondurable Goods (NAICS 424)	N/A	N/A
Wholesale Electronic Markets and Agents and Brokers (NAICS 425)	N/A	N/A
Retail Trade (NAICS 44-45)		
Motor Vehicle and Parts Dealers (NAICS 441)	441	Potential Control
Furniture and Home Furnishings Stores (NAICS 442)	442	Potential Control
Building Material and Garden Equipment and Supplies Dealers (NAICS	444	Potential Control
Food and Beverage Stores (NAICS 445)	445	Potential Control
Health and Personal Care Stores (NAICS 446)	446	Potential Control
Gasoline Stations (NAICS 447)	447	Potential Control
Clothing and Clothing Accessories Stores (NAICS 448)	448	Potential Control
General Merchandise Stores (NAICS 452)	452	Potential Control
Miscellaneous Store Retailers (NAICS 453)	453	Potential Control
Nonstore Retailers (NAICS 454)	454	Potential Control
Utilities (NAICS 22)	22	Potential Control
Information		
Information (NAICS 51)		
Publishing Industries (except Internet) (NAICS 511)	511	Treated
Motion Picture and Sound Recording Industries (NAICS 512)	512	Treated
Broadcasting (except Internet) (NAICS 515)	515	Excluded
Telecommunications (NAICS 517)	517	Excluded
Data Processing, Hosting, and Related Services (NAICS 518)	518	Treated
Other Information Services (NAICS 519)	519	Treated
Financial Activities		
Finance and Insurance (NAICS 52)		
Monetary Authorities - Central Bank (NAICS 521)	521	Potential Control
Credit Intermediation and Related Activities (NAICS 522)	522	Treated
Securities, Commodity Contracts, and Other Financial Investments and Related Activities (NAICS 523)	523	Treated
Insurance Carriers and Related Activities (NAICS 524)	524	Potential Control
Funds, Trusts, and Other Financial Vehicles (NAICS 525)	525	Excluded
Real Estate and Rental and Leasing (NAICS 53)		
Real Estate (NAICS 531)	531	Potential Control
Rental and Leasing Services (NAICS 532)	532	Potential Control
Lessors of Nonfinancial Intangible Assets (except Copyrighted Works) (NAICS 533)	533	Potential Control
Professional and Business Services		
Professional, Scientific, and Technical Services (NAICS 54)	54	Treated
Management of Companies and Enterprises (NAICS 55)	55	Treated
Administrative and Support and Waste Management and Remediation Services (NAICS 56)		
Administrative and Support Services (NAICS 561)	561	Treated
Waste Management and Remediation Services (NAICS 562)	562	Potential Control

Appendix C: Treated and Potential Control Industries (continued)

Education and Health Services		
Educational Services (NAICS 61)	61	Potential Control
Health Care and Social Assistance (NAICS 62)		
Ambulatory Health Care Services (NAICS 621)	621	Potential Control
Hospitals (NAICS 622)	622	Potential Control
Nursing and Residential Care Facilities (NAICS 623)	623	Potential Control
Social Assistance (NAICS 624)	624	Potential Control
Leisure and Hospitality		
Arts, Entertainment, and Recreation (NAICS 71)		
Performing Arts, Spectator Sports, and Related Industries (NAICS 711)	711	Potential Control
Museums, Historical Sites, and Similar Institutions (NAICS 712)	712	Potential Control
Amusement, Gambling, and Recreation Industries (NAICS 713)	713	Potential Control
Accommodation and Food Services (NAICS 72)		
Accommodation (NAICS 721)	721	Potential Control
Food Services and Drinking Places (NAICS 722)	722	Potential Control
Other Services (except Public Administration)		
Other Services (except Public Administration) (NAICS 81)		
Repair and Maintenance (NAICS 811)	811	Potential Control
Personal and Laundry Services (NAICS 812)	812	Potential Control
Religious, Grantmaking, Civic, Professional, and Similar Organizations (NAICS 813)	813	Potential Control
Private Households (NAICS 814)	814	Potential Control

Appendix C: Treated and Potential Control Industries (continued)

Selected Goods-Producing Industries	Most Detailed NAICS Code in BEA Data	Included in Sample as:
Natural Resources and Mining		
Agriculture, Forestry, Fishing and Hunting (NAICS 11)		
Forestry and Logging (NAICS 113)	113	Potential Control
Fishing, Hunting and Trapping (NAICS 114)	114	Potential Control
Support Activities for Agriculture and Forestry (NAICS 115)	115	Potential Control
Mining, Quarrying, and Oil and Gas Extraction (NAICS 21)		
Oil and Gas Extraction (NAICS 211)	211	Potential Control
Mining (except Oil and Gas) (NAICS 212)	212	Potential Control
Support Activities for Mining (NAICS 213)	213	Potential Control
Construction		
Construction (NAICS 23)		
Construction of Buildings (NAICS 236)	236	Potential Control
Heavy and Civil Engineering Construction (NAICS 237)	237	Potential Control
Specialty Trade Contractors (NAICS 238)	238	Potential Control
Manufacturing		
Manufacturing (NAICS 31-33)		
Food Manufacturing (NAICS 311)	311	Potential Control
Beverage and Tobacco Product Manufacturing (NAICS 312)	312	Potential Control
Textile Mills (NAICS 313)	313	Potential Control
Leather and Allied Product Manufacturing (NAICS 316)	316	Potential Control
Paper Manufacturing (NAICS 322)	322	Potential Control
Printing and Related Support Activities (NAICS 323)	323	Potential Control
Petroleum and Coal Products Manufacturing (NAICS 324)	324	Potential Control
Chemical Manufacturing (NAICS 325)	325	Potential Control
Nonmetallic Mineral Product Manufacturing (NAICS 327)	327	Potential Control
Primary Metal Manufacturing (NAICS 331)	331	Potential Control
Fabricated Metal Product Manufacturing (NAICS 332)	332	Potential Control
Electrical Equipment, Appliance, and Component Manufacturing (NAICS	335	Potential Control

Notes: These classifications were obtained from https://www.bls.gov/iag/tgs/iag_index_naics.htm. The NAICS makes revisions to the structure every 5 years (e.g., 2007, 2012, and 2017). Several industries experienced a change during the 2007, 2012, or 2017 NAICS code revisions that either removed or added one or more 6-digit industry codes. These industries are removed from the sample of potential control industries because the year-to-year change in outcomes would be tainted by the addition or removal of 6-digit industries. With respect to treatment industries, the only substantial and relevant changes during my sample period occurred during 2007 when NAICS code 516 (internet publishing and broadcasting) was combined with 519 (other information services), and 518 (data processing, hosting, and related services) was split into 517 (telecommunications), 518, and 519. To address this issue for my dependent variables, I add together data for 516 and 519 for all periods before 2008. Additionally, I take the separate ratio of 517, 518, and 519 to the total amount of 517, 518, and 519 in 2008 and apply those ratios to the total amount of those codes for the periods before 2008.

Appendix C: Treated and Potential Control Industries (continued)

Notes (continued): I exclude from the treatment group NAICS 521 (central banks) and NAICS 524 (insurance carriers) because these industries are generally not subject to state corporate income taxes. I exclude NAICS 525 (funds, trusts, and other financial vehicles) because California is the only state that has data on this industry across the full sample period. NAICS 522 (credit intermediation and related activities) and 523 (securities, commodity contracts, and other financial investments and related activities) may be subject to an alternative tax base calculation or tax rate, depending on the state. However, the sourcing rules for these industries are generally updated to reflect MBS principles at the time the state enacts MBS. Therefore, I include these industries in the treatment group. Inferences are unchanged if I exclude 522 and 523 from the treatment group.

I exclude industries in the transportation sector because states generally have separate apportionment provisions for this sector that may or may not have changed at the time states pass MBS. I exclude NAICS 517 (telecommunications) and NAICS 515 (broadcasting) from the treatment group, because states generally have separate apportionment provisions for these industries that remain unchanged following MBS.

Per the 2017 NAICS manual, entities operating in NAICS code 525 have little or no employment and no revenue from the sale of services. CA is the only state with complete data for this industry throughout the sample period. Therefore, this industry is excluded.

Appendix D: Matched-state Sample

MBS State	Date MBS Legislation Passed	Date MBS Became Effective	Year of Match	Matched State
Maine	6/7/2007	1/1/2007	2006	New Hampshire
Michigan	7/17/2007	1/1/2008	2007	Ohio
Illinois	8/16/2007	1/1/2008	2007	Ohio (2)
Utah	3/14/2008	1/1/2009	2008	Idaho
Wisconsin	2/19/2009	1/1/2009	2008	North Carolina
Alabama	6/9/2011	1/1/2011	2010	Arkansas
California	2/20/2009	1/1/2011	2010	New Jersey
Massachusetts	7/24/2013	1/1/2014	2013	Colorado
Nebraska	4/10/2012	1/1/2014	2013	South Dakota
Pennsylvania	7/9/2013	1/1/2014	2013	Missouri
Arizona	2/21/2012	1/1/2014	2013	Missouri (2)
New York	3/31/2014	1/1/2015	2014	New Jersey (2)
Rhode Island	6/19/2014	1/1/2015	2014	New Hampshire (2)
Connecticut	6/18/2016	1/1/2016	2015	New Jersey (3)
Louisiana	6/28/2016	1/1/2016	2015	South Carolina
Tennessee	6/3/2015	7/1/2016	2015	Missouri (3)
Kentucky	4/3/2018	1/1/2018	2017	Mississippi
Montana	5/3/2017	1/1/2018	2017	North Dakota
Oregon	7/3/2017	1/1/2018	2017	North Carolina (2)

Appendix E: Examples of Market-Based Sourcing and Throwout Rules

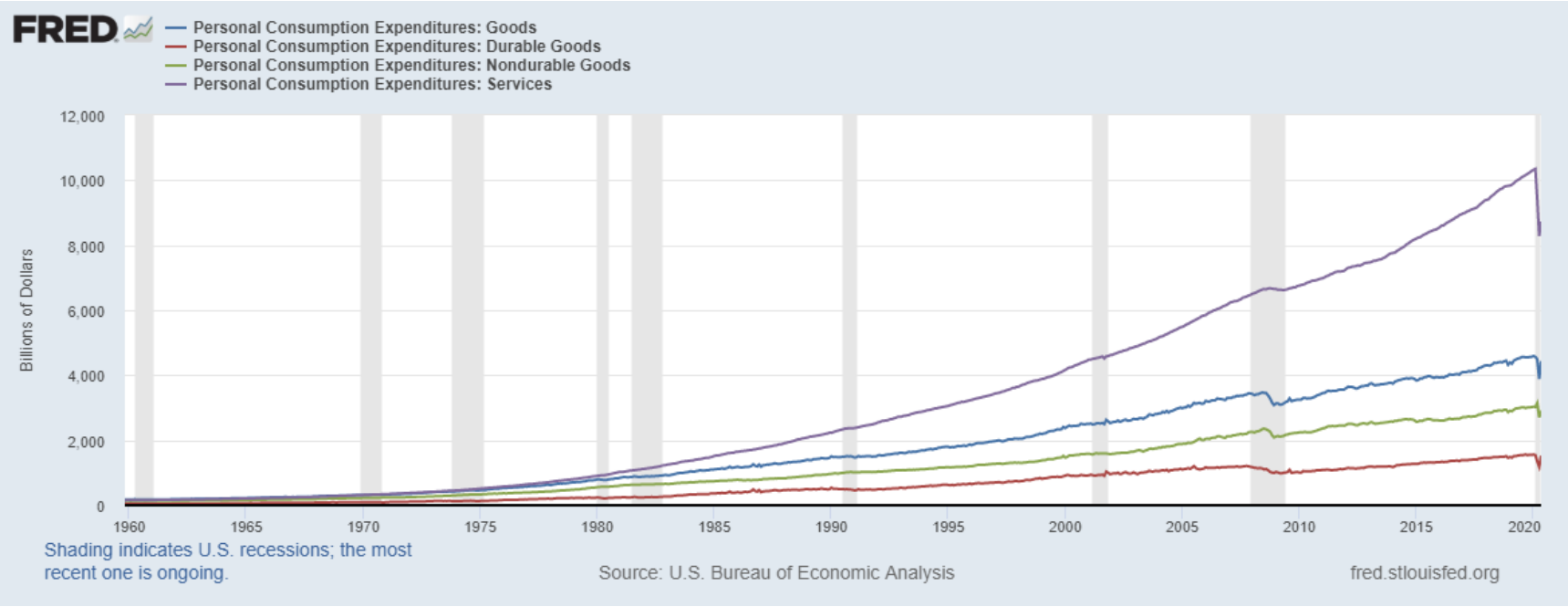
Example: Market-based sourcing: To illustrate the relevance of sourcing rules on labor location decisions, consider Facebook, a company that earns almost all of its $71 billion in revenues from selling advertising placements to marketers. Facebook's direct customers (i.e., advertisers) purchase ads that can appear in multiple places, including on end users' Facebook, Instagram, and Messenger accounts as well as third-party applications and websites.[41] Users are located all over the world. Imagine Facebook plans to expand operations by hiring skilled labor in either Austin, Texas or Palo Alto, California. In Texas, the costs-of-performance rule applies. The costs of performing Facebook's income-producing activities include labor costs associated with sales solicitation, contracting, and maintaining a technical infrastructure. Any ad revenue generated by the work performed in Texas is sourced to Texas, *regardless* of where the end user is located. On the other hand, California is an MBS state and requires sourcing to the location where the customer receives the benefit of the service. In the case of online advertising, California requires sourcing to the location of the viewers or ultimate users (where the "eyeballs" are located). The only ad revenue sourced to California is revenue associated with California Facebook users. Because both states use a sales-only apportionment factor, an expansion in Texas will increase Facebook's Texas tax liability, while an expansion in California will *not* increase Facebook's California tax liability.[42] All else equal, Facebook will choose to expand in an MBS state instead of a costs-of-performance state. If Texas adopts MBS, the state becomes relatively more attractive to Facebook than when the state imposed costs-of-performance sourcing.

Example: Throwout rules: Consider a company that has $20 of income-producing labor in State A that generates $10 of sales to customers in each of States A, B, C, and D. The company only has labor in State A (the only state in which the company is currently taxable). The company is considering investing an additional $10 of income-producing labor in State B or State C that will generate an additional $5 of sales to customers in each of States A, B, C, and D. State B imposes a sales-only apportionment factor with costs-of-performance sourcing, while State C imposes a sales-only apportionment factor with MBS *and* a throwout rule. Regardless of where the company locates, it has $15 of sales to customers in each of States A, B, C, and D. If the company locates in State B, it will owe tax in State B on 33 percent of its income ($20 of sales attributable to State B labor / $60 of total sales = 33 percent). If it instead locates in State C, the company excludes from its denominator all of its sales to States B and D (no-nexus) and owes tax in State C on 50 percent of its income ($15 of sales to State C customers / $30 of total sales = 50 percent). Assuming each state imposes the same tax rate, State B (a costs-of-performance state) becomes *more* attractive than State C (an MBS state).

[41] See Facebook, Inc.'s 2019 Form 10-K: http://d18rn0p25nwr6d.cloudfront.net/CIK-0001326801/45290cc0-656d-4a88-a2f3-147c8de86506.pdf (retrieved June 2020).

[42] Because each state enacts its own apportionment formula and sourcing rules, companies do not necessarily apportion 100 percent of their income to the states. If a company performs services in a costs-of-performance state for customers in an MBS state, the company will potentially face double taxation on its revenue. On the other hand, if a company performs services in an MBS state for customers in a costs-of-performance state, the company will avoid taxation altogether on that revenue.

Figure 1: Percent of Total Personal Consumption Expenditures



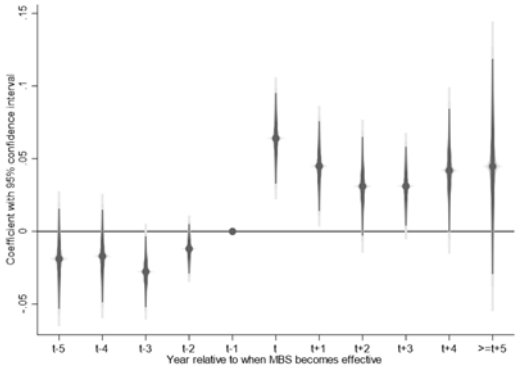
Notes: This figure presents personal consumption expenditures in the United States from 1960-2020. Source: https://fred.stlouisfed.org/graph/?g=sDyy (retrieved July 2020).

Top Line: Personal consumption expenditures - Services
Second Line from Top: Personal consumption expenditures - Goods
Third Line from Top: Personal consumption expenditures - Nondurable Goods
Bottom Line: Personal consumption expenditures - Durable Goods

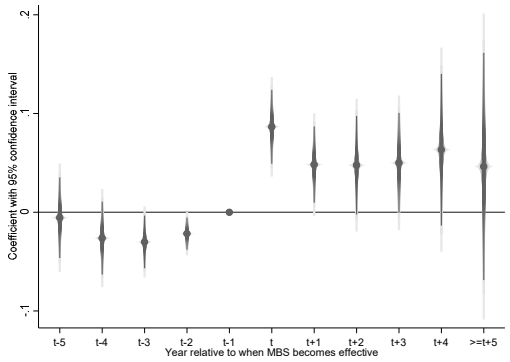
Figure 2: Treatment Dynamics

Panel A – Matched-state

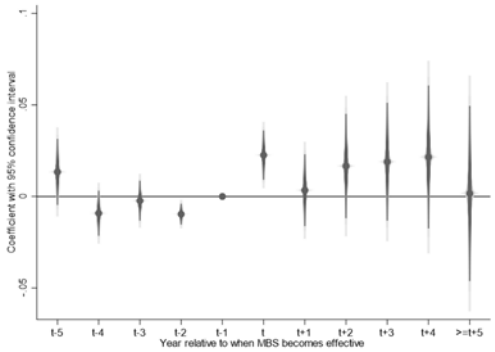
Total Employees



Total Compensation

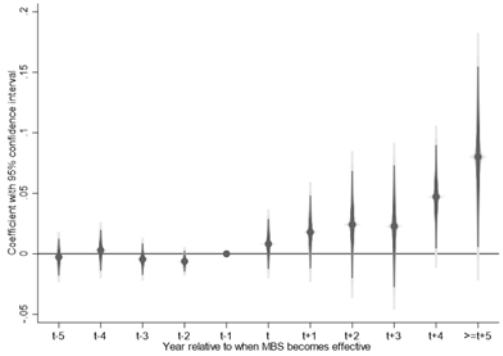


Compensation per employee

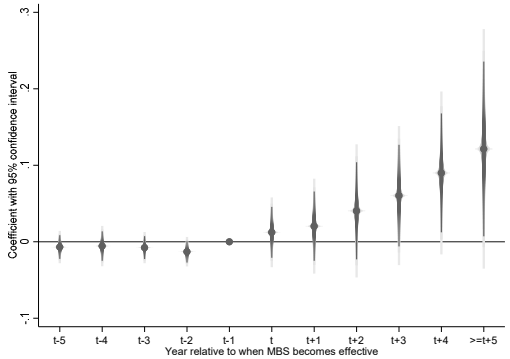


Panel B: Within-state

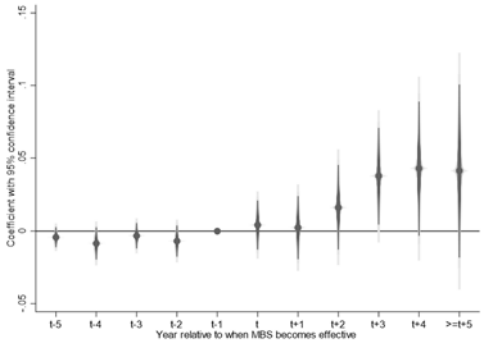
Total Employees



Total Compensation



Compensation per employee



Notes: This figure presents the difference in outcomes between the treatment and control groups pre- and post-treatment for each year relative to the excluded period of *t-1*, which serves as the benchmark year (including all event-year indicators results in perfect collinearity). Panel A presents the point estimates and 95% confidence intervals on *MBS state x Post* from equation (2), where *Post* is replaced with an indicator for each year included in the sample, except *t-1*. Panel B presents the point estimates and 95% confidence intervals on *Treated industry x Post* from equation (4), where *Post* is replaced with an indicator for each year included in the sample, except *t-1*.

Figure 3: Relationship between Treated and Digital Industries

		In MBS state	In non-MBS state
"Treated" industry type	Digital (in-scope)	A	B
	Non-Digital (out-of-scope)	C	D

Notes: This figure presents the relationship between treated industries and digital industries. Industries "treated" by MBS, as defined in Appendix A, include both digital industries and non-digital industries. Digital industries are in-scope for the OECD/G20 IF's proposed market-based taxing system while non-digital industries are out-of-scope. The indicator variable *Digital* in Table 6 equals 1 if an industry is treated *and* included in the BEA's definition of the digital economy (quadrants A and B). Table 6, columns 1-3 compare labor outcomes of digital industries in MBS states (quadrant A) before and after the state implements MBS to digital industries in non-MBS states (quadrant B). Table 6, columns 4-6 show whether labor outcomes in quadrant A relative to labor outcomes in quadrant B before and after the state implements MBS is different from labor outcomes in quadrant C relative to the labor outcomes in quadrant D before and after the state implements MBS.

Table 1: Descriptive Statistics – Matched-state matching variables

Panel A: Matching variables in MBS states (year prior to MBS effective date)

Variable	N (states)	Mean	Std. Dev.	p10	p25	p50	p75	p90
Natmine share GDP	19	2.87	2.79	0.27	0.77	2.08	3.46	7.70
Const share GDP	19	4.66	1.17	3.18	3.61	4.43	5.26	6.85
Mfg share GDP	19	14.58	5.06	7.04	11.44	13.79	19.14	21.91
Service share GDP	19	11.69	3.62	8.15	8.76	10.65	13.10	18.46
Log population	19	15.43	0.96	13.87	14.79	15.38	16.12	16.79
Bach share	19	27.13	4.58	21.16	23.67	26.65	29.76	35.37
Senior share	19	14.47	2.15	11.43	13.40	14.77	15.97	17.11
Young share	19	24.65	2.62	22.29	22.67	23.97	26.19	26.47

Panel B: Matching variables in matched states (year prior to MBS effective date)

Variable	N (states)	Mean	Std. Dev.	p10	p25	p50	p75	p90
Natmine share GDP	19	3.52	4.62	0.23	0.48	1.33	5.77	13.67
Const share GDP	19	4.60	1.07	3.39	3.86	4.27	5.20	7.00
Mfg share GDP	19	14.82	5.03	8.41	9.88	14.53	20.06	21.30
Service share GDP	19	11.15	3.32	6.52	9.09	11.38	12.86	15.58
Log population	19	15.25	0.91	13.64	14.24	15.61	16.00	16.26
Bach share	19	26.85	5.20	19.86	23.40	25.53	32.22	34.75
Senior share	19	14.38	1.36	12.23	13.52	14.79	15.47	16.00
Young share	19	24.81	1.50	23.58	23.78	24.77	25.71	26.01

Panel C: Difference in means between treated and matched states

Variable	Treated Mean	Matched Mean	Difference	t-stat
Natmine share GDP	2.87	3.52	-0.66	0.53
Const share GDP	4.66	4.60	0.06	-0.16
Mfg share GDP	14.58	14.82	-0.24	0.15
Service share GDP	11.69	11.15	0.54	-0.48
Log population	15.43	15.25	0.18	-0.58
Bach share	27.13	26.85	0.28	-0.17
Senior share	14.47	14.38	0.09	-0.16
Young share	24.65	24.81	-0.16	0.23

Notes: This table presents descriptive statistics for the matching variables used in the matched-state sample. Panel A describes MBS states in the year before MBS became effective. Panel B describes matched states in the year before their treated counterpart enacted MBS. Except for population, values represent the percent share. Panel C describes and tests the differences in means between the two samples. Appendix A defines all variables. *** p<0.01, ** p<0.05, * p<0.10 (two-tailed).

Table 2: Descriptive Statistics – Outcome and control variables

Panel A: Outcome variables in MBS states for treated industries (prior to MBS)

Variable	N (industry-state-years)	Mean	Std. Dev.	p10	p25	p50	p75	p90
ln(Employees)	835	9.68	1.84	7.19	8.40	9.73	11.19	11.98
ln(Compensation)	835	13.98	1.98	11.36	12.58	14.16	15.55	16.36
ln(Comp/Emp)	835	4.30	0.52	3.58	3.97	4.33	4.66	4.91

Panel B: Outcome variables in matched states for same industries treated in MBS states (prior to MBS)

Variable	N (industry-state-years)	Mean	Std. Dev.	p10	p25	p50	p75	p90
ln(Employees)	835	9.38	1.96	6.71	8.17	9.42	10.96	11.87
ln(Compensation)	835	13.62	2.09	10.59	12.13	13.86	15.38	16.15
ln(Comp/Emp)	835	4.25	0.52	3.42	3.91	4.29	4.64	4.88

Panel C: Outcome variables in MBS states for control industries (prior to MBS)

Variable	N (industry-state-years)	Mean	Std. Dev.	p10	p25	p50	p75	p90
ln(Employees)	835	9.70	1.54	7.78	8.67	9.82	10.71	11.63
ln(Compensation)	835	13.54	1.57	11.57	12.46	13.53	14.55	15.54
ln(Comp/Emp)	835	3.83	0.53	3.15	3.52	3.81	4.24	4.46

Panel D: Control variables in MBS states (full sample period)

Variable	N (state-years)	Mean	Std. Dev.	p10	p25	p50	p75	p90
Combined reporting	205	0.66	0.48	0.00	0.00	1.00	1.00	1.00
Payroll burden	205	0.90	0.98	0.00	0.00	0.10	1.74	2.23
Payroll factor weighting	205	13.02	13.85	0.00	0.00	5.00	25.00	33.33
Corporate tax rate	205	7.18	1.67	5.00	6.13	7.10	8.84	9.00
Personal income tax rate	205	5.84	2.77	3.02	3.95	5.30	7.11	8.97
Bank tax rate	205	5.22	3.64	0.00	1.00	6.50	7.75	9.00
Tax incentives index	205	25.73	4.06	22.00	24.00	26.00	28.00	30.00
ln(Unemployment insurance contribution)	205	2.23	0.53	1.56	1.87	2.23	2.62	3.03

Panel E: Control variables in matched states (full sample period)

Variable	N (state-years)	Mean	Std. Dev.	p10	p25	p50	p75	p90
Combined reporting	205	0.43	0.50	0.00	0.00	0.00	1.00	1.00
Payroll burden	205	1.21	0.95	0.00	0.00	1.63	2.08	2.13
Payroll factor weighting	205	17.06	13.02	0.00	0.00	25.00	25.00	33.33
Corporate tax rate	205	6.01	2.82	0.26	5.00	6.50	8.50	9.00
Personal income tax rate	205	5.55	2.93	0.00	4.77	6.08	7.50	8.97
Bank tax rate	205	5.57	3.17	0.00	4.31	6.90	8.50	9.00
Tax incentives index	205	22.98	3.57	18.00	20.00	24.00	25.00	27.00
ln(Unemployment insurance contribution)	205	2.43	0.43	1.97	2.10	2.35	2.68	3.02

Notes: This table describes outcome variables for both samples and control variables used in the matched-state sample. Panels A-C describe the outcome variables in the years prior to MBS. Panel A describes the treated sample, Panel B describes the matched-state control sample, and Panel C describes the within-state control sample. Panels D and E describe the control variables for the MBS and matched states for the full sample period. Because I include state-year fixed effects in the within-state regression and no variables vary at the industry-year level, I do not present any control variables for the within-state control group. Except for *Combined reporting*, *Tax incentives index*, and *ln(Unemployment insurance contribution)*, the control variables represent percentages. Appendix A defines all variables.

Table 3: Correlation Table

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. ln(employees)	1.00													
2. ln(compensation)	0.97	1.00												
3. ln(comp/emp)	0.14	0.39	1.00											
4. MBS state	0.08	0.09	0.05	1.00										
5. Post	0.05	0.08	0.13	0.00	1.00									
6. MBS state x Post	0.08	0.10	0.10	0.60	0.56	1.00								
7. Combined reporting	-0.01	-0.01	0.01	0.23	0.23	0.32	1.00							
8. Payroll burden	-0.16	-0.18	-0.11	-0.16	-0.33	-0.35	-0.12	1.00						
9. Payroll factor weighting	-0.14	-0.17	-0.13	-0.15	-0.28	-0.31	-0.15	0.96	1.00					
10. Corporate tax rate	0.01	0.03	0.09	0.25	-0.13	0.15	0.01	0.33	0.20	1.00				
11. Personal income tax rate	0.22	0.23	0.10	0.05	-0.01	0.06	0.01	-0.13	-0.13	0.29	1.00			
12. Bank tax rate	0.09	0.14	0.20	-0.05	-0.04	-0.05	-0.05	0.37	0.31	0.45	0.22	1.00		
13. Tax incentives index	0.13	0.16	0.12	0.34	-0.07	0.15	-0.24	-0.12	-0.17	0.17	0.09	-0.15	1.00	
14. ln(Unemployment insurance contribution)	-0.09	-0.07	0.03	-0.20	0.04	-0.10	-0.05	0.16	0.20	0.05	0.11	0.24	-0.22	1.00

Notes: This table presents Pearson correlations for the variables used in equations (1) and (2). Appendix A defines all variables.

Table 4: Regression Results - Matched-state DiD

Variable	(1) ln(employees)	(2) ln(compensation)	(3) ln(comp/emp)	(4) ln(employees)	(5) ln(compensation)	(6) ln(comp/emp)
MBS state x Post	0.0428***	0.0580***	0.0152	0.0701***	0.0862***	0.0161
	(0.0146)	(0.0206)	(0.0096)	(0.0172)	(0.0255)	(0.0138)
MBS state x Post x Throwout				-0.0762***	-0.0786**	-0.0024
				(0.0227)	(0.0337)	(0.0174)
Combined reporting	-0.0133	-0.0235	-0.0102	-0.0472*	-0.0585*	-0.0113
	(0.0207)	(0.0257)	(0.0135)	(0.0237)	(0.0338)	(0.0183)
Payroll burden	0.0675***	0.1068***	0.0393***	0.0709***	0.1103***	0.0394***
	(0.0219)	(0.0292)	(0.0118)	(0.0228)	(0.0299)	(0.0115)
Payroll factor weighting	0.0010	-0.0006	-0.0016**	0.0005	-0.0011	-0.0016***
	(0.0017)	(0.0020)	(0.0006)	(0.0017)	(0.0019)	(0.0005)
Corporate tax rate	-0.0249***	-0.0339***	-0.0090***	-0.0219***	-0.0308***	-0.0089***
	(0.0047)	(0.0059)	(0.0026)	(0.0051)	(0.0068)	(0.0030)
Personal income tax rate	0.0423***	0.0557***	0.0134**	0.0397***	0.0530***	0.0133**
	(0.0057)	(0.0096)	(0.0049)	(0.0060)	(0.0099)	(0.0053)
Bank tax rate	-0.0410***	-0.0419***	-0.0008	-0.0395***	-0.0403***	-0.0008
	(0.0076)	(0.0086)	(0.0033)	(0.0076)	(0.0088)	(0.0036)
Tax incentives index	0.0028	0.0078**	0.0050***	0.0031	0.0081***	0.0050***
	(0.0023)	(0.0033)	(0.0018)	(0.0019)	(0.0029)	(0.0018)
ln(unemployment insurance contribution)	0.1120***	0.1015**	-0.0105	0.1247***	0.1146***	-0.0101
	(0.0280)	(0.0425)	(0.0204)	(0.0259)	(0.0390)	(0.0182)
Constant	9.3511***	13.5689***	4.2178***	9.3200***	13.5368***	4.2168***
	(0.0771)	(0.1314)	(0.0697)	(0.0680)	(0.1240)	(0.0664)
Wald Test *MBS state x Post + MBS state x Post x Throwout* = 0						
F-stat:				0.16	0.13	1.70
P-value				0.692	0.722	0.202
Industry-State FE	Y	Y	Y	Y	Y	Y
Matched Pair-Year FE	Y	Y	Y	Y	Y	Y
Clustered at State	Y	Y	Y	Y	Y	Y
Obs. (industry-state-years)	3,606	3,606	3,606	3,606	3,606	3,606
Adjusted R-squared	0.995	0.994	0.987	0.995	0.994	0.987

Notes: This table presents results from the matched-state difference-in-differences test. I highlight in gray the rows of interest, which estimate the effect of MBS and throwout rules on labor outcomes. Columns 1-3 present results from estimating equation (1), and columns 4-6 present results from estimating equation (2), which includes the effect of throwout rules. Appendix A defines all variables. Standard errors clustered by state are in parentheses. *** p<0.01, ** p<0.05, * p<0.10 (two-tailed).

Table 5: Regression Results - Within-state DiD

Variable	(1) ln(employees)	(2) ln(compensation)	(3) ln(comp/emp)	(4) ln(employees)	(5) ln(compensation)	(6) ln(comp/emp)
Treated industry x Post	0.0267*	0.0560**	0.0293**	0.0378**	0.0652**	0.0275*
	(0.0143)	(0.0222)	(0.0121)	(0.0175)	(0.0290)	(0.0156)
Treated industry x Post x Throwout				-0.0424*	-0.0354	0.0070
				(0.0228)	(0.0331)	(0.0212)
Constant	9.7940***	13.9127***	4.1187***	9.7940***	13.9127***	4.1187***
	(0.0039)	(0.0059)	(0.0033)	(0.0036)	(0.0059)	(0.0033)
Wald Test *Treated industry x Post* + *Treated industry x Post x Throwout* = 0						
F-stat:				0.10	3.44*	5.77**
P-value:				0.757	0.080	0.027
Industry-State FE	Y	Y	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y	Y	Y
Clustered at State	Y	Y	Y	Y	Y	Y
Obs. (industry-state-years)	3,606	3,606	3,606	3,606	3,606	3,606
Adjusted R-squared	0.994	0.994	0.991	0.994	0.994	0.991

Notes: This table presents results from the within-state difference-in-differences test. I highlight in gray the rows of interest, which estimate the effect of MBS and throwout rules on labor outcomes. Columns 1-3 present results from estimating equation (3), and columns 4-6 present results from estimating equation (4), which includes the effect of throwout rules. Appendix A defines all variables. Standard errors clustered by state are in parentheses. *** p<0.01, ** p<0.05, * p<0.10 (two-tailed).

Table 6: Regression Results – Digital Economy

Variable	(1) ln(employees)	(2) ln(compensation)	(3) ln(comp/emp)	(4) ln(employees)	(5) ln(compensation)	(6) ln(comp/emp)
MBS state x Post	0.0744***	0.0934**	0.0190	0.0682*	0.0720*	0.0037
	(0.0227)	(0.0339)	(0.0178)	(0.0346)	(0.0405)	(0.0144)
MBS state x Post x Digital				0.0014	0.0271	0.0257
				(0.0628)	(0.0785)	(0.0203)
F-stat: Wald test *MBS state x Post = MBS state x Post x Digital*				0.50	0.15	0.53
P-value:				0.488	0.700	0.473
Controls	Y	Y	Y	Y	Y	Y
Industry-State FE	Y	Y	Y	Y	Y	Y
Matched Pair-Year FE	Y	Y	Y	Y	Y	Y
Clustered at State	Y	Y	Y	Y	Y	Y
Obs. (industry-state-years)	1,520	1,520	1,520	2,652	2,652	2,652
Adjusted R-squared	0.992	0.992	0.979	0.995	0.994	0.987

Notes: This table presents results from testing whether the effect of MBS on labor outcomes differs for industries in the "digital economy." Columns 1-3 present results from re-estimating equation (1) for *Digital* industries in non-throwout states. *Digital* is an indicator equal to 1 for all *Treated* industries included in the BEA's definition of the "digital economy." Columns 4-6 present results from estimating equation (4), replacing *Throwout* with *Digital*. The equation is estimated only on matched pairs that do not include a throwout state. Appendix A defines all variables. Standard errors clustered by state are in parentheses. *** p<0.01, ** p<0.05, * p<0.10 (two-tailed).

Table 7: Regression Results – Pseudo-event DiD

Panel A: Matched-state pseudo-event DiD

Variable	(1) ln(employees)	(2) ln(compensation)	(3) ln(comp/emp)	(4) ln(employees)	(5) ln(compensation)	(6) ln(comp/emp)
MBS state x Post	0.0054	-0.0026	-0.0080	0.0099	0.0070	-0.0029
	(0.0117)	(0.0137)	(0.0083)	(0.0158)	(0.0153)	(0.0047)
MBS state x Post x Throwout				-0.0155	-0.0328	-0.0174
				(0.0172)	(0.0292)	(0.0225)
Controls	Y	Y	Y	Y	Y	Y
Industry-State FE	Y	Y	Y	Y	Y	Y
Matched Pair-Year FE	Y	Y	Y	Y	Y	Y
Clustered at State	Y	Y	Y	Y	Y	Y
Obs. (industry-state-years)	1,988	1,988	1,988	1,988	1,988	1,988
Adjusted R-squared	0.998	0.998	0.989	0.998	0.998	0.989

Panel B: Within-state pseudo-event DiD

Variable	(1) ln(employees)	(2) ln(compensation)	(3) ln(comp/emp)	(4) ln(employees)	(5) ln(compensation)	(6) ln(comp/emp)
Treated industry x Post	-0.0010	0.0053	0.0062*	-0.0058	0.0002	0.0060*
	(0.0088)	(0.0088)	(0.0031)	(0.0115)	(0.0114)	(0.0034)
Treated industry x Post x Throwout				0.0180	0.0186	0.0007
				(0.0138)	(0.0144)	(0.0078)
Industry-State FE	Y	Y	Y	Y	Y	Y
State-Year FE	Y	Y	Y	Y	Y	Y
Clustered at State	Y	Y	Y	Y	Y	Y
Obs. (industry-state-years)	1,988	1,988	1,988	1,988	1,988	1,988
Adjusted R-squared	0.998	0.998	0.996	0.998	0.998	0.996

Notes: This table presents results from estimating a pseudo-event date difference-in-differences test. Panel A, columns 1-3 present results from estimating equation (1) and columns 4-6 present results from estimating equation (2), using *t-3* as a pseudo-event date. Panel B, columns 1-3 present results from estimating equation (3) and columns 4-6 present results from estimating equation (4), using *t-3* as a pseudo-event date. The sample period ends in the year prior to the actual enactment of MBS. Appendix A defines all variables. Standard errors clustered by state are in parentheses. *** p<0.01, ** p<0.05, * p<0.10 (two-tailed).

Table 8: Regression Results – "Exogenous" sample

Panel A: Matched-state DiD

Variable	(1) ln(employees)	(2) ln(compensation)	(3) ln(comp/emp)
MBS state x Post	0.0782**	0.1180***	0.0399***
	(0.0337)	(0.0282)	(0.0123)
MBS state x Post x Throwout	-0.0853**	-0.1421***	-0.0568***
	(0.0349)	(0.0313)	(0.0179)
Combined reporting	-	-	-
Payroll burden	0.0865***	0.0871***	0.0006
	(0.0151)	(0.0260)	(0.0197)
Payroll factor weighting	-0.0001	-0.0000	0.0001
	(0.0011)	(0.0014)	(0.0007)
Corporate tax rate	-0.0171***	-0.0046	0.0125**
	(0.0059)	(0.0063)	(0.0054)
Personal income tax rate	0.0114	-0.0070	-0.0184**
	(0.0139)	(0.0171)	(0.0082)
Bank tax rate	-0.0261**	-0.0310***	-0.0049**
	(0.0101)	(0.0096)	(0.0023)
Tax incentives index	0.0018	0.0081**	0.0064***
	(0.0026)	(0.0038)	(0.0016)
ln(unemployment insurance contribution)	0.1007**	0.0462	-0.0545***
	(0.0420)	(0.0402)	(0.0150)
Constant	9.1432***	13.4453***	4.3022***
	(0.0918)	(0.0973)	(0.0321)
Industry-State FE	Y	Y	Y
Matched Pair-Year FE	Y	Y	Y
Clustered at State	Y	Y	Y
Obs. (industry-state-years)	1,692	1,692	1,692
Adjusted R-squared	0.996	0.995	0.989

Table 8: Regression Results – "Exogenous" sample (continued)

Panel B: Within-state DiD

Variable	(1) ln(employees)	(2) ln(compensation)	(3) ln(comp/emp)
Treated industry x Post	0.0735***	0.1273***	0.0537***
	(0.0167)	(0.0263)	(0.0131)
Treated industry x Post x Throwout	-0.0761**	-0.0944**	-0.0183
	(0.0232)	(0.0316)	(0.0206)
Constant	9.6026***	13.7050***	4.1024***
	(0.0030)	(0.0040)	(0.0028)
Industry-State FE	Y	Y	Y
State-Year FE	Y	Y	Y
Clustered at State	Y	Y	Y
Obs. (industry-state-years)	1,692	1,692	1,692
Adjusted R-squared	0.995	0.995	0.994

Notes: This table presents results from testing whether MBS and throwout rules affect labor outcomes in states that enact MBS legislation for more "exogenous" reasons. The sample excludes states that enact MBS as part of a broader tax package to spur fiscal or economic growth. Panel A presents results from estimating equation (2) and Panel B presents results from estimating equation (4). Appendix A defines all variables. Standard errors clustered by state are in parentheses. *** p<0.01, ** p<0.05, * p<0.10 (two-tailed).