

Working paper series

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an Empirical Investigation**

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September 2023

<https://equitablegrowth.org/working-papers/the-rise-of-pass-throughs-an-empirical-investigation/>

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The Rise of Pass-Throughs: an Empirical Investigation*

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August 28, 2023

Abstract

Pass-through entities have emerged as the leading U.S. business organization form in recent decades. Using comprehensive confidential administrative data, this paper highlights five core findings: (1) the rise in pass-throughs is pervasive across industries and states; (2) the pass-through share converges unconditionally across both; (3) 60% of the rise is driven by entrants' organizational choices; (4) shifts in firm and organizational dynamics following the 1986 Tax Reform Act show continued effects through the 2000s; (5) organizational forms exhibit high persistence with little lifecycle variation. Our study implies that tax or regulatory policy changes might take decades to fully manifest.

Keywords: Legal Forms of Organization; Pass-Throughs; Business Taxation; Entrepreneurship; Firm Dynamics

JEL Codes: E60; H32; K2; D22; L2

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Over the past four decades, the organization of business activity in the United States has transformed. The traditional C corporation, once dominant, has been supplanted by a set of “pass-through” organizational structures, so named for the taxation of their business income. In these, the business income passes through to the owners’ personal income tax returns rather than being taxed first at the corporation and then again when distributed. Figure 1a shows that from 1982 to 2015, the share of businesses organized as pass-throughs has increased from roughly 40% to almost 70%; their share of employment tripled, rising from 15% to 47% during the same period. What accounts for this dramatic rise?

This paper uncovers the central role of firm dynamics, particularly the entry margin, in driving this trend. From an accounting standpoint, the growth in pass-throughs could arise from compositional effects such as faster growth in pass-through-intensive industries. Or it could arise from broad-based shifts in incumbent reorganization or differential entry and exit patterns. We document minimal compositional effects; instead, the rise in pass-throughs is pervasive. It is driven at first by reorganization following a large 1986 tax reform and then almost entirely by the organizational choices of entering businesses. Business organization is highly persistent, consistent with substantial reorganizational frictions, which makes the entry margin central in reallocation.

To reach these findings, we enhance the Longitudinal Business Database (LBD), which provides comprehensive administrative panel data on nearly all U.S. establishments with measures of each business’s taxable legal form. Using this dataset, we dissect the sources of the aggregate rise of pass-throughs. We document the following *new facts*: (1) the shift in organizational form is widespread across industries and geography; (2) early differences in pass-through shares across industries and states show unconditional convergence by 2015; (3) broad-based changes in entrant organization account for roughly 60% of the pass-throughs’ rise overall and nearly all since 1992; (4) The Tax Reform Act of 1986 (TRA86) explains the jump *and* continued rise in pass-throughs into the 2000s; (5) the business organization lifecycle is rather flat, with choices at entry being highly persistent.

Our findings reveal an important aspect of understanding the rise in pass-throughs and its economic implications. The long-run and broad-based growth in the pass-through share has been largely driven by shifting choices of legal forms for *entering* businesses. Spikes in the reorganization of incumbent firms, even during large tax reforms, are relatively short-lived. These patterns are consistent with the presence of *real reorganizational frictions* that significantly slow adjustment in the pass-through share. We identify two categories of such frictions: direct and opportunity costs. Direct costs encompass tangible expenditures, both in time and resources, associated with transitioning between organizational structures. In

contrast, opportunity costs capture the potential benefits a business may miss or forego following the transition. The presence of both forms of reorganizational frictions, along with slowly converging firm dynamics because of relatively low entry and exit rates, implies that changes in tax policy or the regulatory environment that affect the tradeoff between organizational forms may take *decades* to show their full effects.

Related literature. The surge in pass-throughs has reshaped the U.S. economy, with many studies tying it to increased top-income inequality and other macroeconomic shifts. [Smith, Yagan, Zidar, and Zwick \(2019\)](#) note that top earners' main income now stems from pass-through businesses, indicating a wealth in human capital over financial. Our findings resonate with this view on income inequality and top-tier income composition ([Dyrda and Pugsley, 2019](#)). [Kopczuk and Zwick \(2020\)](#) and [Auten and Splinter \(2022\)](#) suggest the rise in the top 1% income share since the 1980s mainly results from the increased categorization of business income as personal income due to the prevalence of pass-throughs, not an actual income rise. [Smith, Yagan, Zidar, and Zwick \(2022\)](#) relate the growth of pass-throughs to a drop in the corporate-sector labor share, as tax systems favor profit over salaries for owner-managers. In a related study [Kaymak and Schott \(2023\)](#) link labor share decline to decreased taxes for C corporations and pass-throughs. Meanwhile, [Bhandari and McGrattan \(2020\)](#) place the sweat equity value in the pass-through sector at about 1.2 times U.S. GDP, emphasizing its importance in tax policy evaluations. In another study, [Bhandari et al. \(2022\)](#) leverage U.S. administrative data to estimate and compare life-cycle income profiles and switching behavior of self-employed, primarily pass-through owners, showing they typically earn more and experience steeper income growth than their salaried counterparts.

Using over three decades of longitudinal data, our study is the first to uncover the importance of flows across legal forms for shaping the aggregate trend and their responses to tax and regulatory changes. We show that the decisions of new entrants and legal form adjustments by existing firms are pivotal for the rise of pass-throughs. State, sector, or age composition play almost no role. This emphasis on legal form selection holds implications for macroeconomics, public finance, and entrepreneurship. Reorganizational frictions and legal constraints inhibit incumbents from swiftly reacting to tax and regulatory changes, leading to the short-run elasticity driven by incumbents being smaller than the long-run elasticity driven by entrants. Incorporating these differing short- and long-run elasticities is vital for understanding public finance impacts and macroeconomic responses to tax and entrepreneurial policy shifts. Furthermore, acknowledging the gradual convergence in firm dynamics is crucial when assessing the outcomes of economic policies.

1 Business Organization and Taxation in the U.S.

In this section, we review the legal forms of business organization and forms of tax classification for federal income tax purposes in the United States as of 2023 as well as the costs of reorganizing.

1.1 Legal and Tax Classification Forms

Business owners in the United States must decide on the appropriate legal form of organization (LFO) for their venture. This decision is influenced by its needs for external finance, operational flexibility, and liability protection. Additionally, it affects federal taxation. Confusingly, LFO can refer to a business's legal status, its tax status, or both. For clarity, we differentiate between a business's actual legal form (ALFO) and its tax classification or taxable legal form (TLFO).

Actual Legal Form of Organization (ALFO). The ALFO layer of Figure 2 depicts the possible legal forms. An entrepreneur may decide to operate their business as a sole proprietor, which is an unincorporated form wholly managed by a single individual or married couple. For sole proprietors, there is no distinction between business and owner, because sole proprietors are not considered legal entities.

One means to establish a legal business entity is to incorporate. Corporations boast several advantages, including limited liability, centralized management, free transferability of interest and continuity of life. In contrast, partnerships and LLCs represent unincorporated legal business entities. A partnership, typically governed by state laws, is a profit-driven business organization formed by two or more 'persons,' which could include individuals, groups, companies, or even other corporations. Owing to this diversity, partnerships can vary widely in complexity. An LLC or limited liability company is a flexible legal entity that combines the advantages of a corporation and a partnership. Crucially, members of an LLC, who can be individuals, partnerships, trusts, or corporations, are shielded from personal liability for the actions of the LLC or its other members.

Taxable Legal Form of Organization (TLFO). As depicted in the TLFO layer of Figure 2, the choice of ALFO sets the default and possible alternative choices of TLFO that will determine the federal taxation of profits. We summarize the main distinctions across TLFO and provide further detail in Appendix A.

In the case of a sole proprietorship ALFO, the taxation process is straightforward, offering

only a single TLFO possibility (Figure 2 line 1). The proprietor’s income is subject to the individual income tax, with current rates ranging from 10% to 37% (Table A.2).

Turning our attention to corporations, they are subject by default to [Section C of the Internal Revenue Code](#) (referred to as C corporations) and are required to submit [Form 1120](#) (Figure 2 line 6). Alternatively, a corporation can choose to be taxed under [Internal Revenue Code Subchapter S \(S corporations\)](#) by filing [Form 2553](#) with the IRS (Figure 2 line 5). Once this election is enacted, the S corporation must still file a tax return using [Form 1120S](#).

C corporations pay a corporate income tax of 21% on profits (Table A.1). These corporations have the option of retaining their after-tax profits for future investment, enhancing the value of the company’s shares, or distributing the profits to shareholders as dividends. The individual income tax on dividends can reach up to 37% for ordinary dividends or up to 20% for qualified dividends. Furthermore, shareholders are subject to capital gains tax at rates up to 20% when they sell their firm’s stock. In either case, C corporation’s profits are subject to *double taxation*: first at the corporate level and again at the shareholder level.

On the other hand, S corporations bypass the corporate income tax on profits. Instead, profits are passed directly to the shareholders, who then report their earnings on their own [Schedules E and Form 1040](#). This income is subject to individual income tax at rates as high as 37%, regardless of whether the earnings are distributed. However, only corporations meeting specific criteria can choose taxation under Subchapter S (Figure 2).

The two other unincorporated LFOs, Partnerships and LLCs, offer the greatest flexibility when choosing a tax classification for federal purposes. By default, they are taxed as partnerships and must submit [Form 1065](#) (Figure 2 line 2). They retain their default classification unless the owner files [Form 2553](#) for treatment as an S corporation (Figure 2 line 3), or submits [IRS Form 8832, Entity Classification Election](#) for recognition as a C corporation (Figure 2 line 4).

This discussion leads us to a clear delineation in the classification of TLFOs. Sole proprietorships, partnerships, and S corporations are identified as *pass-through businesses*, as their profits are transferred to their owners and taxed according to the individual income tax code. In contrast, C corporations represent a tax classification where profits undergo double taxation at both the entity and owner levels. We adopt this definition of pass-through businesses in the LBD data, where we observe TLFOs rather than the underlying ALFOs.

1.2 Incumbent Reorganization

Businesses can change their TLFO, but the ease depends on their current federal tax classification. Switching TLFOs is costly because it requires complying with a set of legal and

accounting requirements. These economic costs take two forms: (i) direct pecuniary costs of managing the requirements and (ii) opportunity costs of any foregone benefits from the original TLFO. We summarize these types of reorganization costs and provide additional detail in Appendix A.

Reorganizing from a C corporation. In practice, an incumbent C corporation’s path to becoming a pass-through (Figure 2 line 7) involves keeping the corporation but electing to be taxed as an S corporation by filing Form 2553 with the Internal Revenue Service (IRC Sec. 1363) so long as the requirements for an S corporation (Figure 2) are met. Any other form of reorganization requires first liquidating the corporation before starting a new firm as a different (unincorporated) legal form. This is the case even when switching to an LLC.

The most important direct cost of switching is associated with the taxation of retained earnings accumulated while operating as a C corporation. These profits have been taxed as income at the corporate level, but because they are undistributed, they have not yet been taxed as dividends or capital gains. To prevent the business from distributing these *previously* accumulated earnings tax-free after conversion, the business must track them separately in an Earnings and Profits (E&P) account. If any E&P are distributed while the business is organized as an S corporation, they are taxed appropriately as C corporation distributions. After conversion, all S corporation profits, which pass through to its owners, are taxed only once at each owner’s respective individual income tax rates, regardless of whether they are distributed or retained. To distinguish the two sources of retained earnings, converted S corporations track separately the retained earnings accumulated as an S corporation in an Accumulated Adjustments Account (AAA) (IRC Section 1368). Until the E&P are completely distributed, the additional accounting imposes a real economic cost on the converting business. There are also additional costs. At the time of conversion, the business must appraise all its assets to determine their fair market value. This becomes the S corporation’s basis in the assets, but any “built-in gains” from the fair market value relative to the original basis as a C corporation must be tracked so that corporate tax can be paid if the gain is recognized within the first five years of the conversion (IRC Sec. 1374).

As for the opportunity costs, if the business had accumulated any net operating losses as a C corporation, they cannot be passed through to the shareholders of an S corporation, thus the business loses any tax benefit from carrying these losses after converting.¹ Finally, the conversion imposes a partial irreversibility: once a C corporation elects to be taxed as S corporation it cannot switch back for 5 years.

¹If the business had remained a C corporation, it could have used the carried net operating losses to offset its operating income and thus reduce its taxable income.

Reorganizing from a pass-through. We focus on conversion from S to C corporation, the conversion from partnerships works similarly. To revoke the S corporation election, business owners must submit a statement of revocation to the IRS. Then, they must file [IRS Form 8832, Entity Classification Election](#).

Starting with direct costs, first, an S corporation revoking its status may be required to change its accounting method from the cash to the accrual. That’s because a C corporation may not, generally speaking, use the cash method – it must determine its taxable income using the accrual method. The Tax Cuts and Jobs Act of 2017 exempted switching S corporations with average annual gross receipts less than \$25 million for the three prior taxable years from mandatory conversion ([IRC Sec. 1377\(b\)](#)). Still, large S corporations are facing an upfront cost following the switch. Moreover, if a revocation is effective during a tax year, the year is divided into two short tax years: a short S year and a short C year. The corporation’s income has to be allocated between the two short years. Another costly restriction is associated with distributions. All distributions of an S corporation not apportioned among shareholders are normally recorded in the AAA, independently on the switching decision ([Appendix A.3](#) contains more details). However, following conversion to C status, shareholders of a former S corporation would lose the tax-free benefit of its AAA following unless it is distributed to the shareholders during the post-termination transition period (PTTP), which is generally the one-year period after the S corporation election terminates ([IRC Sec. 1377\(b\)](#)). If the former S corporation fails to distribute all of its AAA within the PTTP, the corporation cannot recover that “unused” AAA if it re-elects S status sometime later.

Finally, there are opportunity costs associated with revoking an S corporation status. Once the corporation’s election has been revoked, the corporation cannot re-elect S status for a period of five years without the consent of the IRS ([IRC Sec. 1362\(g\)](#)). Also, typically shareholder’s “suspended losses” would be lost once the corporation’s S election is revoked ([Appendix A.2](#) contains more details).

2 Data and Coverage

To measure the distribution of businesses across taxable legal forms (TLFO) and the flows across these TLFOs, we use the Census Longitudinal Business Database (LBD) linked to its underlying source records in the Census Bureau’s Business Register (BR).² The LBD provides high-quality longitudinal linkages of cross-sectional establishment-level data sourced

²Because the administrative data are sourced from federal tax filings, they only record the taxable legal form or TLFO, which, as we discuss in [Section 1.1](#), could correspond to alternative actual legal forms of organization or ALFOs.

from administrative payroll tax records stored in the BR combined with records from Census Bureau surveys and quinquennial economic censuses (Jarmin and Miranda, 2002). Using these data, we build a data set, the LBD-TLFO, for the years 1982 to 2015, covering all establishments with employees outside of the public administration sector. We then use this data set to measure the distribution of TLFO (stocks) and the flows across TLFO types.

The LBD-TLFO data set. Starting with the LBD, we assign a TLFO to each establishment-year observation. This dataset covers nearly all private-sector employers. Although the LBD does provide a measure of taxable legal form, until 2007 it was not sufficiently granular to identify S corporations. To distinguish C and S corporations, we check in the linked BR whether a corporation filed an F1120-S, which is required for reporting corporate income when organized as a sub-chapter S corporation (Section 1.1). Appendix B.1 provides additional details on the TLFO assignment.

For every establishment-year observation, beyond the assigned TLFO, we measure an establishment’s age as the number of years since it first reported employment for the week containing March 12 as is standard (Haltiwanger et al., 2013). We also use the establishment’s state and its Fort and Klimek 6-digit NAICS 2012 assignment (Fort and Klimek, 2018). We drop any observations with missing state or NAICS codes as well as any observations in the public administration sector (NAICS 92).

Measuring stocks and flows across TLFOs. Using the LBD-TLFO dataset, we can measure the distribution in each year across legal forms. Panel A of Table B.1 summarizes the establishment share of C corporations (c), pass-throughs (p), and others (z) over the sample. We group all types of pass-throughs, i.e., S corporations, partnerships, and sole proprietors, together.³ The pass-through share of all establishments in Table B.1 is lower than in Figure 1a, which is the pass-through share of all non- z establishments. Since we are interested in the organizational choices of private for-profit businesses, our analysis of the pass-through share throughout the paper conditions out the z category. The shares in Table B.1 across TLFO types align with tabulations published in the Census Bureau’s Statistics of US Businesses, which began reporting data by LFO (TLFO) in 2007 (Appendix B.2).

Our decomposition and counterfactuals emphasize the importance of firm dynamics, which requires measuring establishment-level flows across TLFOs. To do this, we construct for each year t from 1983 to 2015, transition matrices across surviving incumbent TLFO

³In the stocks and flows used for the main decompositions and provided with this paper, we group all pass-throughs together. Within the RDC, we use a more granular TFLO that treats S corporations, partnerships, and sole proprietors separately, and the main decompositions are largely unchanged (Appendix C.1).

between $t - 1$ and t .⁴ We also measure the incumbent establishment exit rate by TLFO type as the number of $t - 1$ establishments in each TLFO that exit or report zero employment in t as a fraction of the number of $t - 1$ establishments for that TLFO (Appendix Figure D.5). Finally, we measure the establishment share of each TLFO among entering establishments. This includes all establishments that are age 0 in year t as well as incumbent establishments that reported 0 employment in year $t - 1$.⁵ Panel B of Table 2 reports the establishment share of each TLFO among entering establishments over the sample. The full set of stocks and flows across taxable legal forms for the years 1982 to 2015 are available with the supplemental files.

3 Examining Compositional Explanations

We begin our analysis by examining two plausible compositional explanations behind the rise of pass-throughs in the aggregate: structural transformation and heterogeneity in pass-through intensity across U.S. states.

3.1 Structural Transformation

Alongside the growing prominence of pass-throughs, the U.S. economy shifted from manufacturing to services (Herrendorf et al., 2014). From 1982 to 2015, manufacturing companies' share dropped from 7.1% to 4.4% and employment from 23.2% to 9.4% (Figure D.1), per the Business Dynamics Statistics (BDS). If pass-throughs were common in non-manufacturing sectors, this shift could influence their rise. Indeed, in the 1982-84 period, pass-through shares varied across industries, from 8.0% in Utilities and 20.3% in Manufacturing to 57.2% in Accommodation and Food Services. To measure the effects of industry compositional change, we first measure the pass-through share over the 1982 to 2015 period for each 4-digit NAICS industry. Then we calculate an aggregate pass-through share holding industry composition constant. Figure 1b compares the pass-through share to a counterfactual calculated with fixed 1982 industry weights. Contrary to expectations, industry composition barely influenced the growth of pass-throughs, adding only 1.9 percentage points (ppt) by 2015.

⁴In our analysis, we measure initial stocks and transitions across TLFO types $\{c, p, z\}$ and then condition out z from the resulting stocks. Because there is relatively little mixing between the c and p types and the z type, it makes little difference if we would instead condition out z entirely when measuring both stocks and flows (Appendix Figure C.1). We have also used a more narrow definition of z that drops all establishment-years with a missing or unknown TLFO to little effect.

⁵This more expansive definition of entry and exit has the benefit of ensuring consistency between actual stocks and those implied by the flows. Results are little changed when entry and exit are restricted to age 0 and establishment death, respectively.

3.2 Heterogeneous Pass-through Intensity across U.S. States

In 1982, pass-through business proportions also varied across U.S. states. Massachusetts and Rhode Island had around 33% as pass-throughs, while South Dakota and Indiana were higher at 60% and 65% (Figure D.2). This variation was shaped by state-specific factors: (i) population and GDP, (ii) state tax policies on pass-through income and corporate profits, and (iii) ALFO and TLFO regulations. Since 1982, these factors have evolved unevenly across states. For instance, states varied in individual income tax rates and corporate tax structures, impacting effective tax rates on pass-through income (Fleck et al., 2021) and C corporations (Suárez Serrato and Zidar, 2018). Regulatory changes also differed; Wyoming led with the LLC statute in 1977, but it took until 1997 for all states to follow. To gauge these variations, we construct a counterfactual time series, holding 1982 business counts constant across states. Surprisingly, state variations affected the pass-through rise less than industry shifts. The real and counterfactual trends are nearly identical in Figure 1b. The composition results yield our first new fact on the rise of pass-throughs.

***Fact 1:** The rise of pass-throughs is pervasive across industries and geography, and there is little to no contribution from compositional change.*

3.3 Unconditional convergence in pass-through shares

We also observe unconditional convergence in pass-through shares across U.S. states and industries. While pass-through rates varied widely early on, by 2015, nearly all states had 60% of businesses as pass-throughs (Figure D.2). A simple test for unconditional convergence compares each state’s 1982 pass-through share with its log change from 1982 to 2015. Figure 1c shows a correlation of -0.84. This pattern of unconditional convergence is also found across industries. Figure 1d displays each industry’s 1982 pass-through share against its log change up to 2015, with a correlation of -0.81 . For both states and industries, the growth in pass-through share has been inversely proportional to the early share.

***Fact 2:** Despite sizable early differences, there is unconditional convergence across states and industries in the pass-through share.*

4 Importance of Firm Dynamics

To understand the determinants of the increasing share of pass-throughs, we adapt and extend the dynamic decomposition from Pugsley and Şahin (2018) to capture the effects of

the entry, exit, and reorganization margins on the evolution of the distribution of firms across legal forms. For clarity, we present a scalar expression for the pass-through share. Appendix C provides the complete matrix-based decomposition and several extensions.

The pass-through share, ω_{pt} , in period t can be expressed in terms of its previous period share and the flows across legal forms using the following law of motion:

$$\omega_{pt} = \underbrace{s_t \theta_{pt}}_{\text{entrants}} + (1 - s_t) \underbrace{\left(\underbrace{\left((1 - \theta_{ct}^p) \frac{1 - x_t^p}{1 - x_t} \omega_{pt-1} + \theta_{pt}^c \frac{1 - x_t^c}{1 - x_t} (1 - \omega_{pt-1}) \right)}_{\text{stayers in } p \text{ and switchers from } c} \right)}_{\text{incumbents}}. \quad (4.1)$$

Equation (4.1) shows the period's share of pass-throughs ω_{pt} is composed of entering and incumbent pass-throughs. The entrants term is the entrant share of period t businesses, i.e., the startup rate s_t , times the share of entrants that organize as pass-throughs, θ_{pt} . The incumbents term is the incumbent share of period t businesses, i.e., $(1 - s_t)$, times the sum of the two sources: (i) stayers in p (ii) switchers from c . The first, stayers in p , is last period's pass-through share, ω_{pt-1} , adjusted for the survival of pass-throughs relative to all incumbents, $\frac{1-x_t^p}{1-x_t}$ (where x_t^p is the exit rate for last period pass-throughs and x_t is the overall exit rate for all firms), less the share θ_{ct}^p of surviving last period pass-throughs that converted to C corporations. The second element, switchers from c , is last period's corporate share, $\omega_{ct-1} = 1 - \omega_{pt-1}$, adjusted for the relative survival of corporations, $\frac{1-x_t^c}{1-x_t}$ (where x_t^c is the exit rate for last period C corporations), times the share of surviving last period corporates that convert to pass-throughs, θ_{pt}^c . We can measure the empirical counterparts of the objects in equation (4.1) directly in the LBD-TLFO data set.

4.1 Deconstructing the rise in pass-throughs

Equation (4.1) provides an exact decomposition of the pass-through share ω_{pt} over time. By keeping its terms constant, we can pinpoint key drivers behind the growth of pass-throughs. To do so we construct counterfactual sequences, $\tilde{\omega}_{pt}$ as follows:

1. **Convergence (G).** First, we hold fixed all sources of changes in the pass-through dynamics: reorganization probabilities, $\bar{\theta}_p^c$ and $\bar{\theta}_p^p$; initial organization shares, $\bar{\theta}_p$; size of the entrant share and exit rates, \bar{s} , \bar{x}^p and \bar{x}^c (and overall \bar{x}). We set each to its 1983-1984 average. This leads to the following law of motion:

$$\tilde{\omega}_{pt}^G = \bar{s} \bar{\theta}_p + (1 - \bar{s}) \left((1 - \bar{\theta}_p^c) \frac{1 - \bar{x}^p}{1 - \bar{x}} \tilde{\omega}_{pt-1}^G + \bar{\theta}_p^c \frac{1 - \bar{x}^c}{1 - \bar{x}} (1 - \tilde{\omega}_{pt-1}^G) \right). \quad (4.2)$$

Even with all the dynamics held fixed, the share of pass-throughs may still move toward long-run value implied by the constant parameters in (4.2) (see Appendix C.3).

2. **Adding firm dynamics (GF).** We add firm dynamics by allowing the startup share, s_t , exit rates, x_t^p , x_t^c , and x_t , to vary according to the data. We continue to hold reorganization probabilities and the pass-through share of entrants at their 1983-1984 average:

$$\tilde{\omega}_{pt}^{GF} = s_t \bar{\theta}_p + (1 - s_t) \left((1 - \bar{\theta}_c^p) \frac{1 - x_t^p}{1 - x_t} \tilde{\omega}_{pt-1}^{GF} + \bar{\theta}_p^c \frac{1 - x_t^c}{1 - x_t} (1 - \tilde{\omega}_{pt-1}^{GF}) \right) \quad (4.3)$$

This counterfactual captures any incremental effects from changes in entry and exit rates.

3. **Adding reorganizational dynamics (GFR).** Here, we capture the further effects of shifts in *incumbent* reorganization patterns over time but still constrain the pass-through share of new firms at its 1983-1984 time average:

$$\tilde{\omega}_{pt}^{GFR} = s_t \bar{\theta}_p + (1 - s_t) \left((1 - \theta_{ct}^p) \frac{1 - x_t^p}{1 - x_t} \tilde{\omega}_{pt-1}^{GFR} + \theta_{pt}^c \frac{1 - x_t^c}{1 - x_t} (1 - \tilde{\omega}_{pt-1}^{GFR}) \right) \quad (4.4)$$

This counterfactual captures the additional effects of any changes in the share of incumbents switching TLFOs.

Further allowing the entrant share of pass-throughs, θ_{pt} , to vary over time ($GFRE$) replicates the actual time series of the pass-through share, i.e., $\tilde{\omega}_{pt}^{GFRE} \equiv \omega_{pt}$. It captures the influence of the entrant organizational choice margin.

To quantify the most important sources of change underlying the rise in pass-throughs since 1982, we define the additive decomposition in terms of the above counterfactuals:

$$\underbrace{\omega_{pt} - \omega_{p1982}}_{\text{aggregate rise of pass-throughs}} \equiv \underbrace{\tilde{\omega}_{pt}^G - \omega_{p1982}}_{\text{convergence}} + \underbrace{\tilde{\omega}_{pt}^{GF} - \tilde{\omega}_{pt}^G}_{\Delta \text{firm dynamics}} + \underbrace{\omega_{pt}^{GFR} - \tilde{\omega}_{pt}^{GF}}_{\Delta \text{reorg dynamics}} + \underbrace{\omega_{pt}^{GFRE} - \tilde{\omega}_{pt}^{GFR}}_{\Delta \text{entry org}}. \quad (4.5)$$

We next calculate counterfactual sequences using (4.2)-(4.4) and apply the decomposition from equation (4.5) using the LBD-TLFO data set for the 1982–2015 period.

4.2 Applying the decomposition

Figure 3a shows actual and counterfactual trends from 1982 to 2015. Early on, shifting reorganization is vital, but patterns of entrants' organization dominate overall. The difference

between *GFRE* and *GFR* underscores this. Until 1990, the lines were similar, pointing to reorganization as the key factor for the pass-through rise. After 1990, the gap grew, emphasizing the importance of entrant organization in the aggregate trend. While firm dynamics (*GF*) plays a role, it's less significant than reorganization and initial TLFO choice. The convergence margin (*G*) has a slight negative impact.

Using the additive decomposition from equation (4.5), we quantify the factors driving the rise of pass-throughs. Table 3b displays results for 1982–2015 and three subperiods. From 1982-1990, the pass-through share grew by 6.3 ppt. Incumbent reorganization accounted for 4.4 ppt, and entrant organization for 2.6 ppt. From 1990-2015, it increased by another 21.4 ppt. Here, incumbent reorganization contributed 4.5 ppt, while entrant organization added a notable 14.2 ppt. Firm dynamics boosted the rise by 4.8 ppt until 2000. Without other factors, convergence would've lowered the pass-through share by 2.6 ppt.⁶ In light of this decomposition, we introduce a third new fact regarding the growth of pass-throughs.

***Fact 3:** Entrant organization accounts for 60% of the rise of pass-throughs. The rest is accounted for by reorganization and firm dynamics margins.*

5 Inspecting the flows and the effects of TRA86

We asserted that pass-through growth has been primarily influenced by entrant organization and, until 1990, by incumbent reorganization. Figure 4 tracks the evolution of these margins (flows) for our sample period. In 1982, half of the entrants chose the pass-through structure (Figure 4b). This number grew roughly 10 ppt post-TRA86 and then gradually reached 75.8% in 2015. Reorganizations from C corporations spiked to over 6% following TRA86 (Figure 4c). Two additional spikes are visible around 2001 and 2013, aligning in time with other major tax reforms (Appendix A.4). Lastly, the rate of pass-throughs switching to C corporations peaked at 6.5% in 1988 but dwindled to 0.5% by 2015 (Figure 4d).

5.1 Relative importance of TRA86

TRA86, a significant tax reform in U.S. history, is believed to have propelled the growth of pass-throughs by favoring them in tax regulations (Auerbach and Slemrod, 1997). We can quantify its dynamic effect on their rise using the LBD-TLFO dataset and the concise

⁶Our results assume equal reorganization and exit chances for each pass-through type. In Appendix C.1, we differentiate between S corporation, partnership, and sole proprietorship, revealing similar results. If we account for exit chances by pass-through type, firm dynamics become less important, while entry organization gains significance (Appendix Table C.1).

decomposition (4.1). We define the counterfactual pass-through share time series, $\tilde{\omega}_{pt}^{TRA}$, as follows:

$$\tilde{\omega}_{pt}^{TRA} = s_t \hat{\theta}_p + (1 - s_t) \left((1 - \hat{\theta}_c^p) \frac{1 - x_t^p}{1 - x_t} \tilde{\omega}_{pt-1}^{TRA} + \hat{\theta}_p^c \frac{1 - x_t^c}{1 - x_t} (1 - \tilde{\omega}_{pt-1}^{TRA}) \right) \quad (5.1)$$

where $\hat{\theta}_c^p$, $\hat{\theta}_p^c$ and $\hat{\theta}_p$ are averaged between 1990 and 1991 shares of, respectively, c reorganizing as p , p reorganizing as c , and share of p among entrants. Displayed alongside actual shares in Figure 4, if post-TRA86 averages remained constant, the 2015 pass-through share would be 63.7%, just 5.4 ppt below the actual level. Even with flow variations since the 90s, this emphasizes the enduring effect of the law of motion (4.1) influenced by entrant and incumbent flows (Appendix C.3 contains more details). This leads to our fourth observation on pass-through growth.

Fact 4: *Most of the continued rise of pass-throughs was already pre-determined from the shifts in entry organization and reorganization flows following TRA86.*

6 Effects of the startup deficit and age composition

The rise in pass-throughs coincides with a declining entry rate, s_t , or startup deficit (Pugsley and Şahin, 2018). This is crucial for two reasons: First, equation (4.1) shows that changes in the entry share, s_t , impact the pass-through share by influencing the organizational choices of new firms. To the extent that s_t has been declining, this attenuates the contribution from entering firms and, by implication, further slows the diffusion of changing entrant patterns. Second, if lower startup rates are not counteracted by survival changes, it shifts firm age composition. If firms' legal form choices change over their lifecycle, our primary findings in Section 4 could be distorted.

6.1 The impact of the falling entry rate

The entry rate s_t has fallen from above 14% in 1982 to around 10.0% by 2015 (Figure 5a). To measure the effect of this decline on the rise of the pass-throughs, we construct a counterfactual path for ω_{pt} using (4.1). We hold the startup rate constant at its 1983-1984 time average while allowing for all other shifts to vary:

$$\tilde{\omega}_{pt}^S = \bar{s} \theta_{pt} + (1 - \bar{s}) \left((1 - \theta_{ct}^p) \frac{1 - x_t^p}{1 - x_t} \tilde{\omega}_{pt-1}^S + \theta_{pt}^c \frac{1 - x_t^c}{1 - x_t} (1 - \tilde{\omega}_{pt-1}^S) \right). \quad (6.1)$$

The resulting path of $\tilde{\omega}_{pt}^S$ characterizes the counterfactual evolution of the pass-through share in the absence of the “startup deficit”. It turns out that its effect on the pass-through share has been small. Figure 5b plots the counterfactual path of the pass-through share $\tilde{\omega}_{pt}^S$ against its actual path. Had the startup rate stayed at its 1983-84 level the share of pass-through in 2015 would be 70.6% rather than 69.2%, a gain of mere 1.4 percentage points.⁷

6.2 Effects of shifts in incumbent age composition

A declining share of entrants leads to an increase in older incumbents (Pugsley and Şahin, 2018). If choices of legal form change during a firm’s lifecycle, it complicates our counterfactuals by mixing age composition effects with other changes in reorganizational probabilities. We first show there is a limited lifecycle pattern in the choice of organizational form. Figure 5c displays the reorganization probabilities based on business age, switching between pass-throughs and C corporations. There’s a notable spike in C corporations becoming pass-throughs in their first two years. After this period, the rate stabilizes. Meanwhile, pass-throughs maintain a consistent reorganization rate throughout their lifecycle.

Reorganization probabilities remain consistent throughout business lifecycles, implying minimal impact from age composition shifts. Each reorganization probability, e.g., θ_{pt}^c , in equation (4.1), can be expressed as a weighted average of probabilities that vary by business age. We evaluated these probabilities for business ages ranging from 0 to 6+ years, then calculated the overall reorganization probability with a fixed 1983-84 business age composition. Figure 5d illustrates the pass-through share evolution in this case. Due to the limited variability in legal form choices throughout a business’s lifecycle, age composition effects are minor. Without age structure changes, the pass-through share would be 71.4 percent, merely 2.2 percent above the actual value. We summarize our discussion in this section with our last new fact on the rise of pass-throughs.

Fact 5: *There is no discernible life-cycle pattern over choice of the legal form except possibly an early period of experimentation with elevated probabilities of reorganization.*

⁷The results treat exit and reorganization probabilities symmetrically across all incumbent ages. Even allowing each to depend on firm age so that the counterfactual also captures the effects of induced changes in firm age composition, the results are largely unchanged (Appendix Figure C.4).

7 Conclusion

We develop the LBD-TLFO data set with taxable legal form information for nearly all U.S. businesses. Examining these data over the 1982–2015 period, we identify new insights into the rise of pass-throughs. Despite initial differences across industry and geography, pass-through adoption converges unconditionally, leaving little scope for compositional effects to explain the rising pass-through share. Instead, applying a dynamic decomposition framework, we determine that shifting organizational choices of entrants explain 60% of the 1982–2015 rise and almost all since the mid-1990s. Most of the shift in reorganization and entrant organization patterns coincide with the TRA86, meaning almost two decades of continued rise in the pass-through share was pre-determined. We also see little lifecycle pattern to the choice of legal form, making the initial choice highly persistent. We document a number of legal and accounting requirements that constitute a significant source of real reorganization frictions. Our findings indicate that policy changes in the presence of these frictions take many years to fully diffuse through the entry margin. Incorporating the differing short- and long-run elasticities is important when studying public finance and macroeconomic responses to tax and entrepreneurial policy shifts.

References

- AUERBACH, A. J. AND J. SLEMROD (1997): “The Economic Effects of the Tax Reform Act of 1986,” *Journal of Economic Literature*, 35, 589–632.
- AUTEN, G. AND D. SPLINTER (2022): “Income Inequality in the United States: Using Tax Data to Measure Long-Term Trends,” Working Paper.
- BHANDARI, A., T. KASS, T. J. MAY, E. R. MCGRATTAN, AND E. SCHULZ (2022): “On the Nature of Entrepreneurship,” *SOI Working Papers*.
- BHANDARI, A. AND E. R. MCGRATTAN (2020): “Sweat Equity in U.S. Private Business*,” *The Quarterly Journal of Economics*, 136, 727–781.
- BORELLA, M., M. DE NARDI, M. PAK, N. RUSSO, AND F. YANG (2022): “The Importance of Modeling Income Taxes Over time. U.S. Reforms and Outcomes,” Working Paper 30725, National Bureau of Economic Research.
- DYRDA, S. AND B. PUGSLEY (2019): “Taxes, Private Equity, and Evolution of Income Inequality in the US,” Tech. rep.
- FLECK, J., J. HEATHCOTE, K. STORESLETTEN, AND G. L. VIOLANTE (2021): “Tax and Transfer Progressivity at the US State Level,” Unpublished Manuscript.
- FORT, T. AND S. KLIMEK (2018): “The Effects of Industry Classification Changes on US Employment Composition,” Working papers, U.S. Census Bureau, Center for Economic Studies.
- GALE, W. AND A. KRUPKIN (2018): “Navigating the New Pass-Through Provisions: A Technical Explanation,” <https://www.taxpolicycenter.org/publications/navigating-new-pass-through-provisions-technical-explanation>.
- HALTIWANGER, J., R. S. JARMIN, AND J. MIRANDA (2013): “Who Creates Jobs? Small versus Large versus Young,” *The Review of Economics and Statistics*, 95, 347–361.
- HERRENDORF, B., R. ROGERSON, AND VALENTINYI (2014): “Chapter 6 - Growth and Structural Transformation,” in *Handbook of Economic Growth*, ed. by P. Aghion and S. N. Durlauf, Elsevier, vol. 2 of *Handbook of Economic Growth*, 855–941.
- JARMIN, R. S. AND J. MIRANDA (2002): “The Longitudinal Business Database,” Working Papers 02-17, Center for Economic Studies, U.S. Census Bureau.

- KAYMAK, B. AND I. SCHOTT (2023): “Corporate Tax Cuts and the Decline of the Labor Share,” *Econometrica*, forthcoming.
- KOPCZUK, W. AND E. ZWICK (2020): “Business Incomes at the Top,” *Journal of Economic Perspectives*, 34, 27–51.
- PUGSLEY, B. W. AND A. ŞAHİN (2018): “Grown-up Business Cycles,” *The Review of Financial Studies*, 32, 1102–1147.
- SMITH, M., D. YAGAN, O. ZIDAR, AND E. ZWICK (2019): “Capitalists in the Twenty-First Century*,” *The Quarterly Journal of Economics*, 134, 1675–1745.
- (2022): “The Rise of Pass-Throughs and the Decline of the Labor Share,” *American Economic Review: Insights*, 4, 323–40.
- STERK, V., P. SEDLÁČEK, AND B. PUGSLEY (2021): “The nature of firm growth,” *American Economic Review*, 111, 547–579.
- SUÁREZ SERRATO, J. C. AND O. ZIDAR (2018): “The structure of state corporate taxation and its impact on state tax revenues and economic activity,” *Journal of Public Economics*, 167, 158–176.

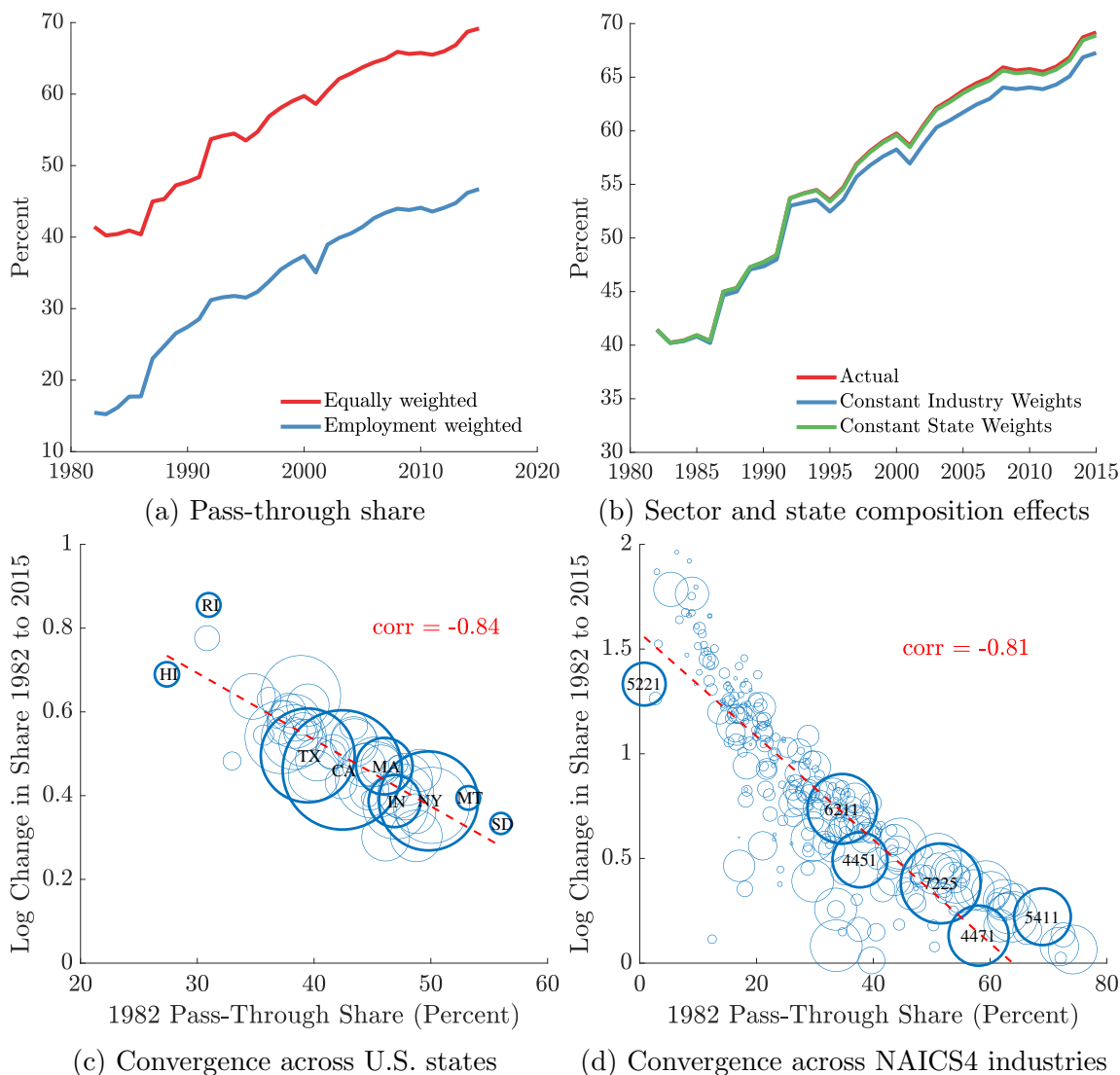


Figure 1: Pass-through shares, composition and unconditional convergence for 1982-2015.

Note: LBD-TLFO Data Set. Panel 1a plots equally and employment weighted pass-through share of businesses in the United States for 1982-2015. Panel 1b plots actual and counterfactual pass-through share series, where we keep industry weights and state weights fixed at their 1982 levels. Panels 1c and 1d illustrate the relationship between the initial pass-through share in 1982 and their growth until 2015 across U.S. states and industries.

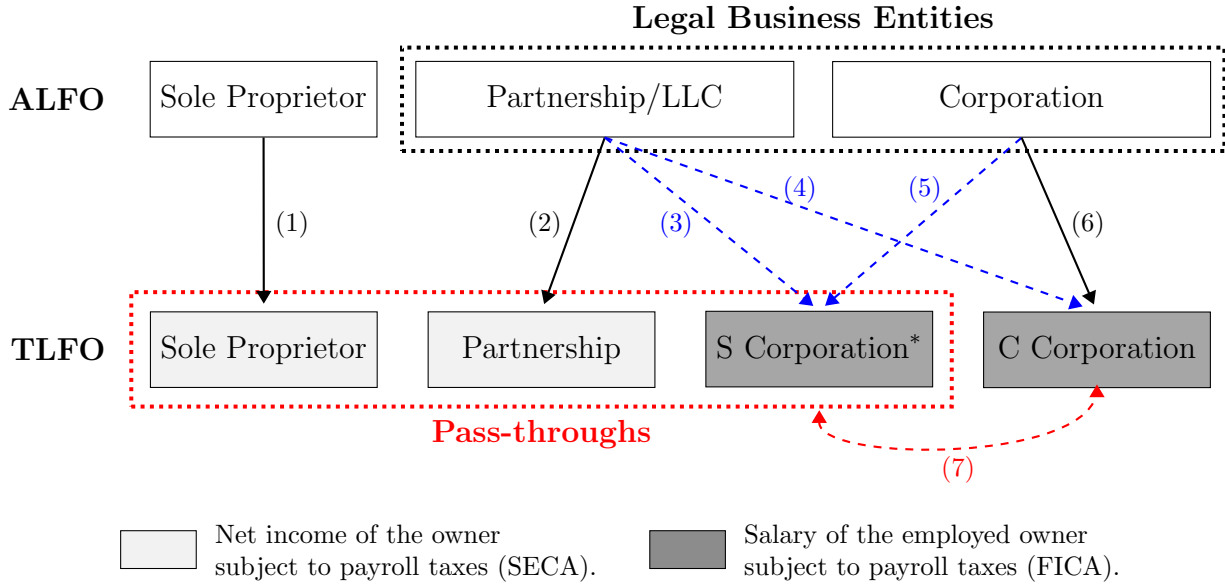
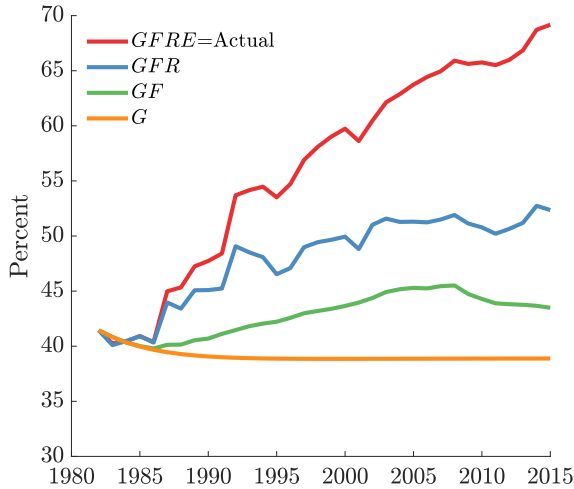


Figure 2: Actual and tax legal forms of organization of for-profit businesses in the U.S.

Note: ALFO: Actual Legal Form of Organization; TLFO: Tax Legal form of Organization; LLC: Limited Liability Company; SECA: Self-Employment Contributions Act; FICA: Federal Insurance Contributions Act. Solid black lines (1),(2) and (6) denote "default" classification of legal business entities for federal tax purposes by the IRS. Dashed lines (3), (4), (5) and (7) indicate elective classifications of business entities for federal tax purposes, which require submitting [Form 8832](#) or [Form 2553](#). The dotted box and label in red indicate pass-through businesses subject to individual income tax code. *To qualify for S corporation status the entity must: (i) be a domestic corporation (ii) have only allowable shareholders (not partnerships, corporations or non-resident aliens) (iii) have no more than 100 shareholders (iv) have only one class of stock (v) Not be an ineligible corporation ([IRC Sec. 1361](#)). For more details on SECA and FICA see [Appendix A.1](#).



(a) Counterfactual pass-through shares

	Time periods			
	82-90	90-00	00-15	82-15
Convergence	-2.4	-0.2	0.0	-2.6
Δ Firm dynamics	1.6	3.2	-0.2	4.6
Δ Reorg	4.4	1.9	2.6	8.9
Δ Entry org.	2.6	7.2	7.0	16.8
Total	6.3	12.0	9.4	27.7

(b) Elements of the Additive Decomposition

Figure 3: Decomposition of the Pass-through Rise.

Note: LBD-TLFO Data Set. The figure in the left panel [3a](#) plots the counterfactual pass-through series defined in [\(4.2\)](#)–[\(4.4\)](#) and the actual one defined in [\(4.1\)](#). The table in the right panel reports the elements of an additive decomposition defined in [\(4.5\)](#) for three time subperiods and for the entire sample period 1982-2015.

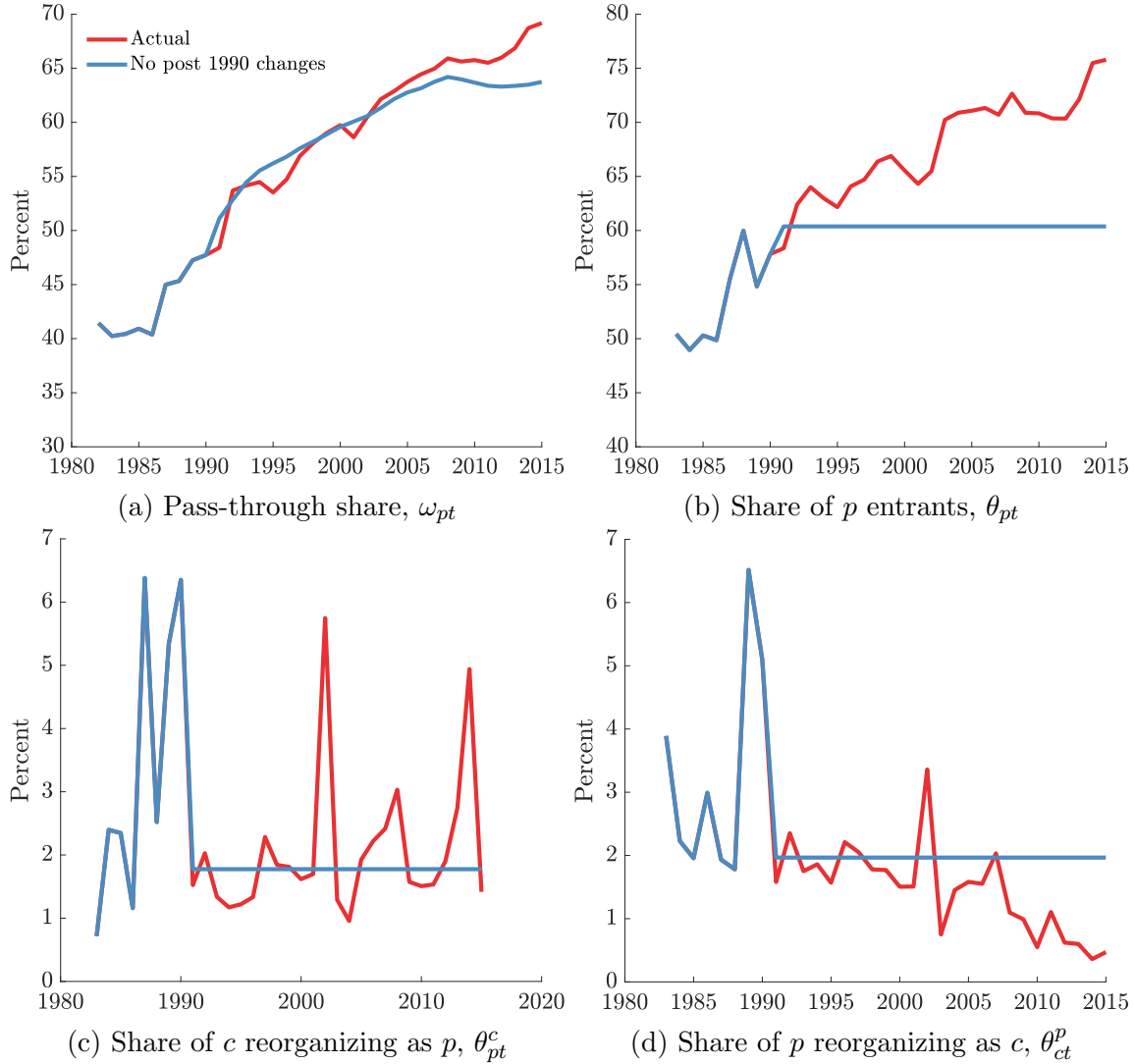


Figure 4: Pass-through share and flows across TFLOs: actual and TRA86 counterfactual

Note: LBD-TLFO Data Set. Panel 4a plots the actual and the counterfactual pass-through share defined in (5.1), which assumes flows stay at their post TRA86 levels. Panel 4b plot the actual share of pass-through entrants for the sample period and the counterfactual one, which freezes the share of pass-through entrants at its post-TRA86 averages (1990-1991). Panel 4c plots the share of C corporations reorganizing as pass-throughs and the counterfactual series which sets it to the post-TRA86 averages. Panel 4d plots the share of pass-throughs reorganizing as C corporations and the counterfactual series which sets it to the post-TRA86 averages.

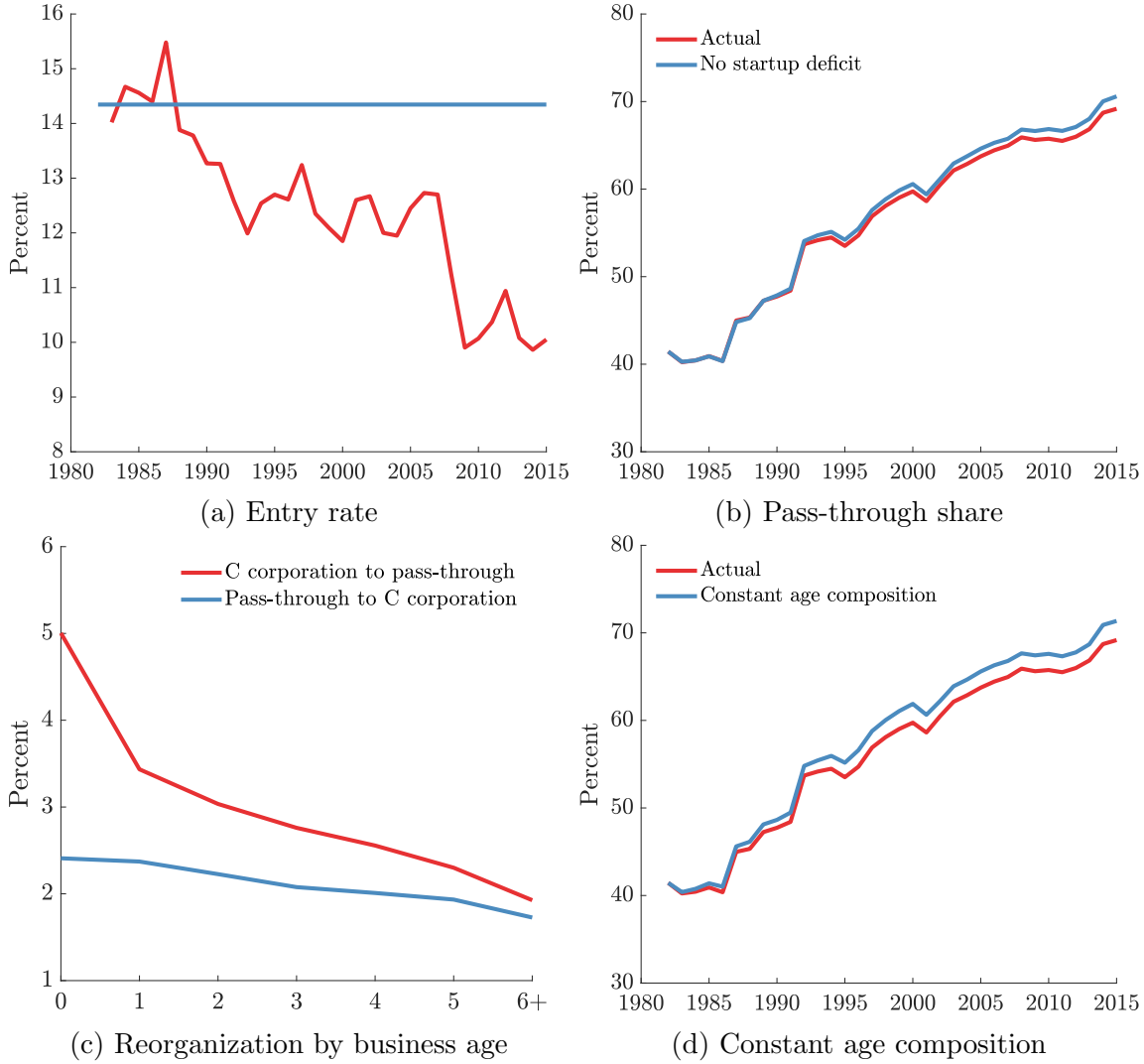


Figure 5: Effects of the startup deficit and of business age on rise of pass-throughs.

Note: LBD-TLFO Data Set. Panel (a) plots the entry rate, s_{pt} from equation (4.1) that determines the pass-through share ω_{pt} as measured in the data. Panel (b) plots the actual and counterfactual path of the pass-through share ω_{pt} when the entry rate is held constant as shown in equation (6.1). Appendix Figure C.4 shows that the counterfactual path ω_{pt}^S remains similar even when further adjusting for the changes in relative survival and reorganization from the change in business age composition induced by holding the entry rate constant. Panel (c) is fraction of C corporation or pass-throughs that reorganize by establishment age. Time-averaged over the sample for $t = 1983, \dots, 2014$. Establishment age is in base ($t - 1$) year. Panel (d) panel is the rise of pass-throughs holding age composition constant when calculating reorganization probabilities.

Online Appendix

A Business Organization and Taxation in the U.S.

This section discusses in more detail issues of choosing ALFO and TLFO in the United States, as well as describes the key changes in federal business taxation and regulations that have been implemented since 1982.

A.1 Social Security and Medicare Payroll Taxes

The regulations for Social Security and Medicare payroll taxes vary by business entity type, though not in the same way as those governing income taxes. Under the tax code, owners of both C and S corporations who provide services to their firms are deemed employees and are subject to the Federal Insurance Contributions Act (FICA). Consequently, their compensation incurs the same Social Security and Medicare payroll taxes as any other worker.⁸ Crucially, owners of S corporations must pay themselves a "reasonable compensation" for services they provide to the firm. This compensation is subject to FICA taxes, akin to a salary. In contrast, the tax code typically views owners of unincorporated businesses as self-employed, meaning they fall under the Self-Employment Contributions Act (SECA). The SECA tax rate is equal to the combined FICA tax rate paid by both employees and their employers. In order to align with the taxes that employers pay under FICA, which are deducted when calculating their taxable profits, self-employed individuals may deduct half of their SECA taxes from their taxable income. All net income from sole proprietorships is considered self-employment income and is therefore subject to SECA taxes. This rule applies even if the income includes the return on any capital the business has invested. In partnerships, the definition of self-employment income varies based on whether an owner is a general or a limited partner. For general partners, both net income and guaranteed payments (i.e., compensation for services due even if the partnership has no net income) are classified as self-employment income; for limited partners, only guaranteed payments are subject to SECA tax. We summarize these differences in the main body of the paper in Figure 2.

⁸FICA taxes comprise old-age, survivors, and disability insurance taxes (Social Security) in addition to the hospital insurance tax (Medicare). For 2023, the total Social Security tax rate stands at 12.4%, while the total Medicare tax rate is 2.9%. Both are equally divided between the employee and employer.

A.2 Stock and Debt Basis for S Corporation

The shareholder's stock and debt basis in an S corporation holds significant importance. Basis refers to the amount of investment the taxpayer has in the business. As of 2023, shareholders are required, under certain circumstances, to file [Form 7203 S Corporation Shareholder and Debt Basis Limitations](#), and report their stock and debt basis. Contrary to a C corporation, a shareholder's stock and debt basis in an S corporation fluctuates annually based on the corporation's activities. Each year, the S corporation provides its shareholders with a [Schedule K-1](#). It indicates the income, loss, and deduction items from the S corporation that are allocated to the shareholder for that year. While the K-1 details the non-dividend distribution received by the shareholder, it does not specify its taxable portion. The shareholder's stock basis determines the taxable value of a distribution.

Stock basis. When calculating stock basis, a shareholder begins with their initial investment in the S corporation or the original price of the stock they acquired (similar to a C corporation). This value is then adjusted based on the amounts passed through from the S corporation. Income items will raise the stock basis, whereas a loss, deduction, or distribution will reduce it ([IRC Section 1367](#)). Adjusted basis is thus the result of the shareholder's initial basis after increasing and decreasing it appropriately.

A shareholder has the option to let the S Corporation's pass-through losses diminish the basis before it's reduced by expenses that are non-deductible and non-capital. Choosing this option could enable the shareholder to claim more pass-through losses. This choice must be made during tax return filing and can only be undone with consent from the IRS. If reductions surpass the adjusted basis value, the basis cannot become negative. Any excess loss is suspended and carried forward to the next tax year. These held-over losses and deductions from the previous year are considered as part of the current year, and are combined with the shareholder's losses and deduction items for that year. The examples of how to compute stock basis provided by the IRS can be found [here](#).

Typically distributions from an S corporation are non-dividend, tax-free distributions. Distributions in excess of stock basis are treated as a gain from the sale or exchange of property and reported as a capital gain. The capital gain is long-term or short-term depending upon the shareholder's holding period in the stock. Dividend distributions can also occur in a company that was previously a C corporation or acquired C corporation attributes in a non-taxable transaction (i.e., merger, reorganization, etc.). When evaluating the tax implications of a non-dividend distribution, a shareholder refers exclusively to their stock basis without considering the debt basis.

Debt basis. When a shareholder directly lends money to the S Corporation, they establish a debt basis. Crucially, debt basis only arises when the S Corporation has a direct obligation to the shareholder. Merely guaranteeing the S Corporation’s loan to external parties doesn’t create a debt basis for the shareholder. If the shareholder’s stock basis is entirely depleted, they can still deduct pass-through losses and deductions, provided they have an existing debt basis. If the S corporation pays back the basis debt, the repayment can be taxable for the shareholder.

A.3 Accumulated Adjustments Account of S Corporation

The accumulated adjustments account (AAA) is used to compute the tax effect of distributions made by an S corporation with accumulated earnings and profits. Essentially, the AAA tracks the company’s total income minus its expenses that haven’t been distributed yet ([IRC Section 1368\(e\)](#)). On the inaugural day of a corporation’s initial S corporation tax year, the AAA stands at zero. This value increases by: (i) all corporate income items, other than tax-exempt income items, that are separately stated and passed through to shareholders; (ii) nonseparately computed corporate income; and (iii) the excess of deductions for depletion over the basis of the property subject to depletion. The AAA is decreased by: (i) certain non-taxable corporate distributions; (ii) all corporate loss and deduction items that are separately stated and passed through, other than items that are not deductible in computing taxable income and not properly chargeable to capital account; (iii) the nonseparately computed loss of the corporation; (iv) nondeductible amounts that are unrelated to the production of tax-exempt income.

A.4 Changes in Federal Business Taxation and Regulations

A detailed description of the evolution of the U.S. individual income tax system, corporate taxation, and business regulations is well beyond the scope of this paper, see meticulous work by [Borella, De Nardi, Pak, Russo, and Yang \(2022\)](#) with that regard. Thus, we provide only a summary of the most significant modifications of the tax code and regulations, which had a first-order effect on the firms’ selection into different ALFOs and TLFOs. TRA86 has introduced several key provisions, which tilted the tax code and regulatory environment to a more favorable toward pass-throughs. First and foremost, it reduced the top rate in individual and corporate income taxes by different amounts. It reduced the top individual rate from 50% before the law was enacted, to 38.5% in 1987 and 28% in 1988. In addition, it reduced the top corporate rate—46% before the law was enacted—to 40% in 1987 before

dropping it to 34% the following year (Table A.1). As a result, the top rate in the individual income tax dropped 1.5 percentage points below the top rate in the corporate income tax in 1987 and 6 percentage points below that in 1988.

Aside from lowering the top tax rates, other provisions of TRA86 created additional disincentives to remaining a C corporation. First, TRA86 introduced a new corporate Alternative Minimum Tax, which made it more difficult for a C corporation to reduce its taxes or avoid paying a corporate tax altogether. Second, TRA86 repealed the General Utilities doctrine. Under certain circumstances, the doctrine stated that C corporations could distribute assets worth more than the value the company had reported on its balance sheet to shareholders without realizing the excess value as taxable income. Repealing the doctrine meant that more firms that made such distributions had to pay corporate income tax on the appreciated value, subjecting that portion of the asset's value to the same two-level tax levied on other corporate profits. However, another provision of TRA86 sought to recover the revenues lost through direct conversions to S corporation status. A C corporation that converts to an S corporation must determine whether its assets have increased in value between the time they were acquired and the time of the conversion. If so, the corporation must pay a tax on any such gains realized (by selling the assets) over the next ten years (according to TRA86). However, any year's tax cannot exceed what would have been owed if the firm had remained a C corporation. That provision substantially reduced the incentive for existing C corporations with significant amounts of appreciated assets to convert to a pass-through form. However, to speed up a decision-making process, for conversions that took place prior to 1987, there remained a three-year rather than a newly-enacted 10-year recognition period for these gains.

The impact that tax laws other than TRA86 had on businesses' organizational form are less clear. The gap of 6 percentage points between the top rate in the corporate income tax and the top rate in the individual tax lasted only three years. In 1991, lawmakers increased the top individual rate to 31%, reducing the gap by half. In 1993, they increased it again, to 39.6%—4.6 percentage points higher than the top corporate rate (which they simultaneously increased to 35%). The top rate in the individual income tax remained higher than the top rate in the corporate income tax through 2002. In enacting the Economic Growth and Tax Relief Reconciliation Act (EGTRRA) in 2001, lawmakers once again reduced the top rate in the individual income tax. Initially, they scheduled it to decline to 35% (the same as the top corporate rate at the time) over a six-year period. But then, in the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA), they implemented the 35% rate immediately. The prospect of a reduction in the top rate in the individual income tax and neutrality between the top rates of the individual and corporate income taxes coincides in

time with the further growth of pass-through entities. In fact, the years with the greatest shift in the share of business receipts toward pass-through firms after 1987 and 1988 were 2001 and 2002—the first two years since 1993 in which the tax code reflected the prospect of such neutrality. Finally, The American Taxpayer Relief Act of 2012 (ATRA) made the tax cuts introduced by EGTRRA permanent for individual taxpayers whose taxable income is at or below a \$400,000 threshold amount (\$450,000 for married couples filing a joint return). ATRA also retained 15% tax rates on long-term capital gains and qualified dividends (0 percent for those who would otherwise be in the bottom two tax brackets) for taxpayers in all but the top income tax bracket; the law also sets a 20% rate for those in the top bracket. We demonstrate in Section 5 that the timing of the last visible jump in the share of pass-throughs aligns in time with these provisions.

Federal and states regulations also made pass-throughs and C corporations more alike over time. Initially, an S corporation could have a maximum of 10 shareholders. Subchapter S Revision Act of 1982 expanded this limit to 35. Lawmakers increased the maximum number of S corporation shareholders twice after 1986. The number rose from 35 to 75 in 1997 through the Small Business Job Protection Act of 1996, and from 75 to 100 in 2005, through the American Jobs Creation Act of 2004. A second important line of regulations was introducing a limited liability company (LLC). Wyoming passed the first LLC statute in 1977, and by 1997 all states enacted LLC statutes. Finally, a third line of regulations that increased pass-through popularity was the rise of so-called “check the box” rules, which, starting in 1997, allowed LLCs and other unincorporated entities to elect whether they would be taxed as partnerships or corporations (line 3 and 4 in Figure 2).⁹

⁹The exception to the check-the-box option is the publicly traded partnership. Such firms must receive 90% of their income from qualified sources (such as interest, dividends, rents, capital gains, and income associated with natural resources) to avoid being taxed as a corporation.

Table A.1: Historical Corporate Tax Rates and Brackets in the United States 1982-2020

Year	Taxable Income Brackets	Rates (%)
2018-2020	All taxable income	21
1993-2017	First \$50,000	15
	\$50,000-\$75,000	25
	\$75,000-\$100,000	34
	\$100,000-\$335,000	39
	\$335,000-\$10,000,000	34
	\$10,000,000-\$15,000,000	35
	\$15,000,000-\$18,333,333	38
Over \$18,333,333	35	
1988-1992	First \$50,000	15
	\$50,000-\$75,000	25
	\$75,000-\$100,000	34
	\$100,000-\$335,000	39
	Over \$335,000	34
1987	First \$25,000	15
	\$25,000-\$50,000	16.5
	\$50,000-\$75,000	27.5
	\$75,000-\$100,000	37
	\$100,000-\$335,000	42.5
	\$335,000-\$1,000,000	40
	\$1,000,000-\$1,405,000	42.5
Over \$1,405,000	40	
1984-1986	First \$25,000	15
	\$25,000-\$50,000	18
	\$50,000-\$75,000	30
	\$75,000-\$100,000	40
	\$100,000-\$1,000,000	46
	\$1,000,000-\$1,405,000	51
	Over \$1,405,000	46
1983	First \$25,000	15
	\$25,000-\$50,000	18
	\$50,000-\$75,000	30
	\$75,000-\$100,000	40
	Over \$100,000	46
1982	First \$25,000	16
	\$25,000-\$50,000	19
	\$50,000-\$75,000	30
	\$75,000-\$100,000	40
	Over \$100,000	46

Source: SOI Tax Stats – [Historical Table 24 \(1909-2010\)](#); 2011-2020: Internal Revenue Service, Instructions for Form 1120.

Table A.2: Historical Individual Income Tax Rates in the United States 1981-2018

Tax Year	Lowest bracket		Highest bracket		Tax Year	Lowest bracket		Highest bracket	
	Tax rate	Taxable income under	Tax rate	Taxable income over		Tax rate	Taxable income under	Tax rate	Taxable income over
1981	14.0	3,400	69.1	215,400	2000	15.0	43,850	39.6	288,350
1982	12.0	3,400	50.0	85,600	2001	10.0	6,000	39.1	297,350
1983	11.0	3,400	50.0	109,400	2002	10.0	12,000	38.6	307,050
1984	11.0	3,400	50.0	162,400	2003	10.0	14,000	35.0	311,950
1985	11.0	3,540	50.0	169,020	2004	10.0	14,300	35.0	319,100
1986	11.0	3,670	50.0	175,250	2005	10.0	14,600	35.0	326,450
1987	11.0	3,000	38.5	90,000	2006	10.0	15,100	35.0	336,550
1988	15.0	29,750	28.0	29,750	2007	10.0	15,650	35.0	349,700
1989	15.0	30,950	28.0	30,950	2008	10.0	16,050	35.0	357,700
1990	15.0	32,450	28.0	32,450	2009	10.0	16,700	35.0	372,950
1991	15.0	34,000	31.0	82,150	2010	10.0	16,750	35.0	373,650
1992	15.0	35,800	31.0	86,500	2011	10.0	17,000	35.0	379,150
1993	15.0	36,900	39.6	250,000	2012	10.0	17,400	35.0	388,350
1994	15.0	38,000	39.6	250,000	2013	10.0	17,850	39.6	450,000
1995	15.0	39,000	39.6	256,500	2014	10.0	18,150	39.6	457,600
1996	15.0	40,100	39.6	263,750	2015	10.0	18,450	39.6	464,850
1997	15.0	41,200	39.6	271,050	2016	10.0	18,550	39.6	466,950
1998	15.0	42,350	39.6	278,450	2017	10.0	18,650	39.6	470,700
1999	15.0	43,050	39.6	283,150	2018	10.0	19,050	37.0	600,000

Notes: SOI Tax Stats – [Historical Table 23 U.S. Individual Income Tax](#): Personal Exemptions and Lowest and Highest Bracket Tax Rates, and Tax Base for Regular Tax, Tax Years 1981–2018. The 2017 Tax Cuts and Jobs Act (TCJA) introduced a temporary 20% deduction for certain pass-through income until 2025. The [199A](#) measure (named for the relevant IRS code section) or “qualified business income” deduction effectively lowers the top marginal tax rate on qualifying pass-through income from 37% to 29.6%. For more information, see [Gale and Krupkin \(2018\)](#).

B Data Appendix

B.1 Assigning Establishment-level TLFO

The LBD and BR cover all businesses reporting payroll tax under an EIN. Our unit of observation is an establishment that maps to a single EIN. An employer identification number or EIN is assigned at the business entity level. An entity is a legal organizational boundary that does not necessarily correspond with an establishment or firm. A firm (corresponding to the span of operational control) may comprise multiple entities. Measuring TLFO flows at the establishment level provides the highest quality longitudinal linkages and does not require resolving differing entity and firm boundaries. Since most firms have only one establishment and one EIN, the choice of establishment as the unit of observation for a business makes little difference in practice (see, for example, [Sterk et al. \(2021\)](#)).

While all private and for-profit businesses can be classified as either C corporations or pass-throughs, this is not an exhaustive list. There is a relatively small share of other types, including all forms of nonprofit organizations, estates, trusts, some government organizations, and others. Taxable legal form may also be missing or unknown. To minimize these cases, we create a series of short 4-year panels, i.e., between $t - 2$ and $t + 1$, which we use to fill in years that may be missing a legal form between two years with consistent assignments.

We use LBD data from 1976 to 2016. The 1-year look ahead limits us to cleaned TLFO assignments ending in 2015. While the cleaning procedure could, in principle, assign TLFO as early as 1978, even when cleaned, the quality of the TLFO assignments degraded significantly before 1982. In these years, unknown or missing TLFO categorizations were much more prevalent, which would induce spurious reorganizations away from z in later years when the TLFO measurement improved.

After applying this procedure to reduce missings, we assign each establishment a TLFO as a sole proprietor, partnership, S corporation (all denoted pass-throughs p), C corporation (c), or other (z). The vast majority of the z category are corporate and noncorporate nonprofits, e.g., universities or foundations, with a small share of missing/unknowns and an even smaller share of other unusual tax classifications, e.g., estates and trusts. Panel A of Table [B.1](#) summarizes the establishment share of C corporations (c), pass-throughs (p), and others (z) out of all establishments (panel A.) and entering establishments (panel B.) over the sample. Here, we group all types of pass-throughs, i.e., S corporations, partnerships, and sole proprietors. Appendix [C.1](#) discusses an extension where these more detailed TLFO pass-through types are treated separately.

Table B.1: Distribution of C corporation, pass-through, and other TLFO 1982-2015

	1982-85	1986-89	1990-93	1994-97	1998-01	2002-05	2006-09	2010-13	2014-15
<i>A. Share of All Businesses (Percent)</i>									
C corporations (<i>c</i>)	51.7	46.8	41.3	38.8	35.2	33.4	31.3	30.7	28.3
Pass-through (<i>p</i>)	35.6	37.5	43.3	47.3	50.4	55.2	58.7	59.7	62.8
Other (<i>z</i>)	12.7	15.7	15.3	14.0	14.5	11.5	10.0	9.5	9.0
<i>B. Share of Entering Businesses (Percent)</i>									
C corporations (<i>c</i>)	41.1	36.1	32.5	31.4	28.7	28.3	26.8	27.5	23.4
Pass-through (<i>p</i>)	40.9	43.9	50.6	54.7	55.2	64.3	66.8	67.1	72.7
Other (<i>z</i>)	18.0	19.9	16.9	13.9	16.1	7.4	6.4	5.4	3.8

Note: LBD-TLFO Dataset. Share of New Businesses 1982-85 measured over 1983-85.

B.2 Comparison of SUSB and LBD-TLFO

Statistics of U.S. Businesses (SUSB) is an annual series that provides national and subnational data on the distribution of economic data by establishment industry and enterprise size. Since 2007 it has published tables that include legal forms of business organization (TFLO using our nomenclature). These tables can be found [here](#). Naturally, the published tables are in a cross-sectional data form, where firms are binned into subcategories. Nonetheless, they allow us to verify our measurement procedure in the LBD-TLFO data set. We compare the evolution of pass-through businesses' share and employment shares between these two data sets in the 2007-2015 period. These time series are presented in Figure B.1. The left panel shows the evolution of the pass-through shares across two data sets. The two lines align very closely, with an average difference of around 0.8 percentage points (1.1% difference). Similarly, the employment shares in the right panel follow each other closely, with an average gap of 1.7 percentage points (3.6% difference). In both cases, the LBD-TLFO based time-series is below the one based on the SUSB. However, their overall trends match closely. In particular, our time series also indicates a jump in the pass-through share in 2013, which we associate with enacting The American Taxpayer Relief Act of 2012 (ATRA). We interpret the closeness of the time series across these two data sets as corroboration of our TLFO classification procedure in the LBD-TLFO data set.

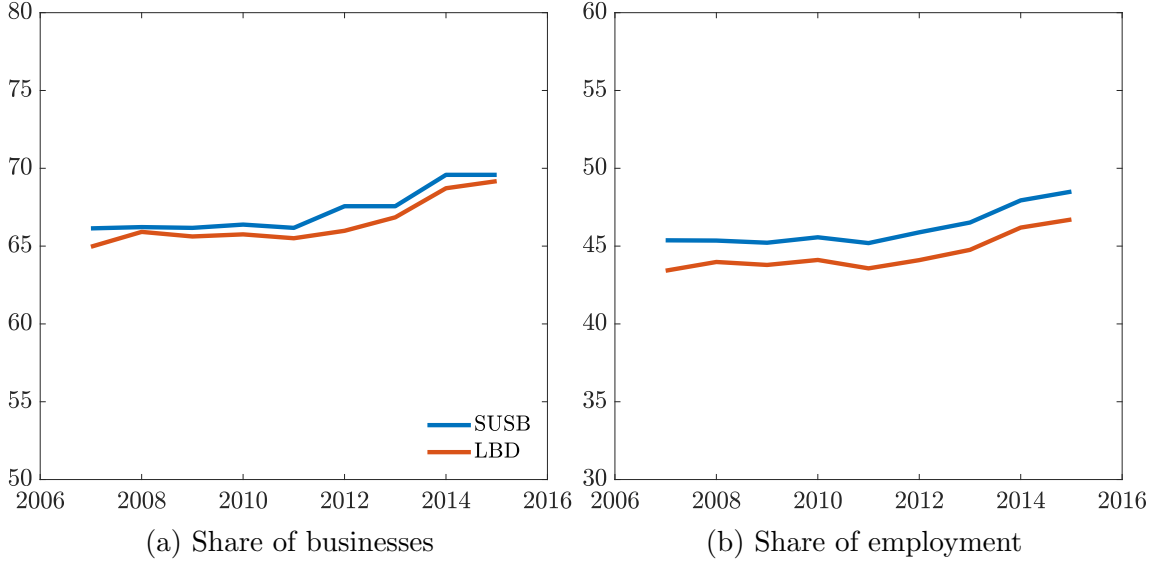


Figure B.1: Pass-throughs in the SUSB and the LBD-TLFO data

Notes: LBD-TLFO Data Set and Statistics of U.S. Businesses (SUSB).

C Dynamic Decomposition Framework and Extensions

In the main text, we present a law of motion for the pass-through share in equation (4.1). For clarity, this scalar expression abstracts from other “z” businesses that are not organized as pass-throughs or C corporations (Section 2). To allow for these types, we present the complete matrix-based dynamic decomposition framework. We apply the complete framework in the main results and then condition out “z” types from the resulting distribution. Alternatively, we could have conditioned out “z” from the initial stocks and annual flows, but this makes little difference overall (Figure C.1).

Let $\Omega_t = [\Omega_{lt}]$ be a column vector stacking the number of businesses organized as C corporations, pass-throughs and others, i.e., with $l \in \{c, p, z\}$. This can easily be extended to more detailed legal forms of organization or other additional states, e.g., letting type further depend on business age or sector. The law of motion for the number of firms can be written as:

$$\Omega_t = \begin{bmatrix} \theta_{ct}^c (1 - x_t^c) & \theta_{ct}^p (1 - x_t^p) & \theta_{ct}^z (1 - x_t^z) \\ \theta_{pt}^c (1 - x_t^c) & \theta_{pt}^p (1 - x_t^p) & \theta_{pt}^z (1 - x_t^z) \\ \theta_{zt}^c (1 - x_t^c) & \theta_{zt}^p (1 - x_t^p) & \theta_{zt}^z (1 - x_t^z) \end{bmatrix} \Omega_{t-1} + \begin{bmatrix} \theta_{ct} \\ \theta_{pt} \\ \theta_{zt} \end{bmatrix} S_t. \quad (\text{C.1})$$

Here, x_t^l is the exit rate of type l businesses that exit between $t - 1$ and t ; $\theta_{l't}^l$ is the share

of surviving type l businesses from $t - 1$ that switch from l to l' in period t ; θ_{lt} is the share of entering businesses choosing to initially organize as type l ; and S_t is the total number of entering businesses. We can write (C.1) more compactly as:

$$\mathbf{\Omega}_t = \mathbf{\Theta}'_t \text{diag}(1 - \mathbf{x}_t) \mathbf{\Omega}_{t-1} + \boldsymbol{\theta}_t S_t. \quad (\text{C.2})$$

We refer to the transition matrix $\mathbf{\Theta}_t = [\theta_{l't}^l]$, which collects the conversion shares of surviving businesses, as the *reorganization* matrix. By convention, row l is the period $t - 1$ type and column l' is period t type, so the matrix is transposed in the law of motion. With vector $\mathbf{x}_t = [x_t^l]$, $\text{diag}(1 - \mathbf{x}_t)$ puts *survival* rates along the main diagonal of a square diagonal matrix. Finally, vector $\boldsymbol{\theta}_t = [\theta_{lt}]$ contains the share of each legal form for entering businesses.

We are now in a position to derive our main object of interest, namely the law of motion for the pass-through share. We transform the law of motion from levels (C.2) to shares, normalizing by the total number of businesses in period t , to express the law of motion in shares:

$$\boldsymbol{\omega}_t = \mathbf{\Theta}'_t \text{diag}\left(\frac{1 - \mathbf{x}_t}{1 - x_t}\right) \boldsymbol{\omega}_{t-1} (1 - s_t) + \boldsymbol{\theta}_t s_t. \quad (\text{C.3})$$

Here, $\boldsymbol{\omega}_t = [\omega_{lt}]$ is the column vector with shares of each type of legal form in year t , $x_t = \boldsymbol{\omega}'_{t-1} \mathbf{x}_t$ is the aggregate exit rate, and s_t is the startup rate or share of entering businesses (number entrants / number total).¹⁰ We can measure the empirical counterparts to the objects in (C.3) directly from the LBD-TLFO dataset (Section 2).

¹⁰The factor $\frac{1-s_t}{1-x_t}$ adjusts for the growth in the number of businesses. The gross growth rate in the number of businesses can equivalently be written as the ratio of the survival rate of incumbents relative to the incumbent share of all businesses, i.e., $1 + g_t^\Omega \equiv l' \Omega_t / l \Omega_{t-1} = \frac{1-x_t}{1-s_t}$.

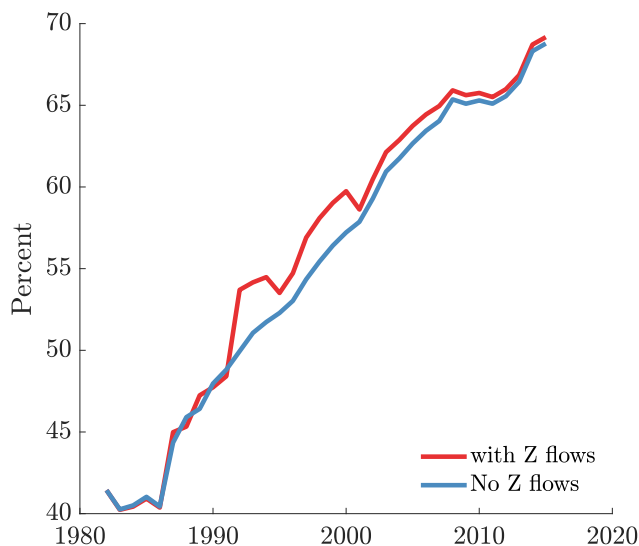


Figure C.1: Pass-throughs with and without z

Note: LBD-TLFO Data Set.

C.1 Decomposition with Detailed Pass-Through Types

The main decomposition groups all type or pass-throughs as a single category p . In the LBD-TLFO we measure 3 distinct types of pass-throughs: S corporations (sc), partnerships (pr), and sole proprietors (sp). When estimating counterfactuals in the RDC, we allow for these additional types in the reorganization matrix and exit vector, i.e., $l \in \{c, sc, pr, sp, z\}$. By construction, when measuring the pass-through share as the sum of all pass-through types $p = \{sc, pr, sp\}$ out of all non z types, the exact decomposition is unchanged. Only the counterfactuals are affected to the extent that the reorganization and exit probabilities are not symmetric across the types of pass-throughs.

Figure C.2 plots as solid lines the main counterfactuals that treat all pass-throughs (p) symmetrically, which match Figure 3a from the main text. The dotted lines plot the main counterfactuals using the more granular decomposition that allows for reorganization probabilities and exit rates to vary by each type of pass-through, i.e., $l \in \{c, sc, pr, sp, z\}$. The results are largely similar to the main text; however, firm dynamics from differences in relative exit rates play a smaller role. And the entry margin plays a slightly larger role. Quantitatively, Table C.1 summarizes the decomposition with more detailed pass-through types by period and is the counterpart to main text Table 3b. Allowing for more detailed types of pass-throughs slightly increases the importance of the entry margin post-1990, accounting for an additional 2.7 percentage points of the post-1990 increase in the pass-through share,

with firm dynamics playing a smaller role.

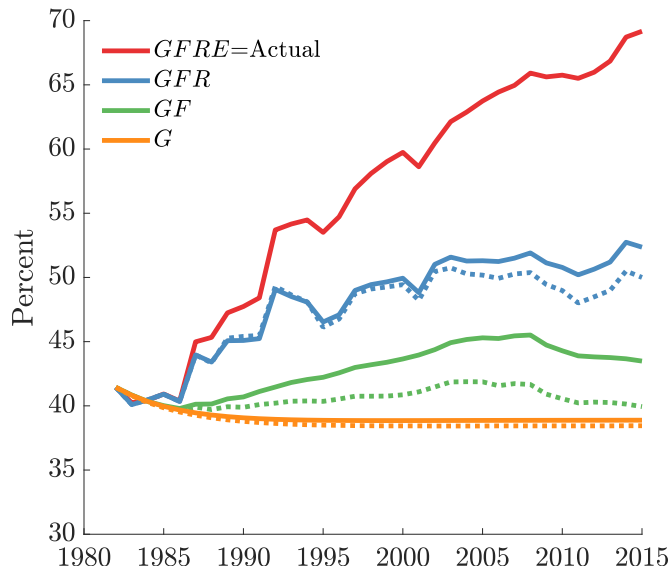


Figure C.2: Actual and counterfactual sequences of the pass-through share 1982–2015 allowing for distinct types of pass-throughs

Note: LBD-TLFO Data Set. Solid lines show results of main decomposition with all pass-throughs grouped as single type p , i.e., $l \in c, p, z$. Dotted lines show results of main decomposition when S corporations (sc), partnerships (pr), and sole proprietors (sp) are treated as separate types, i.e., $l \in \{c, sc, pr, sp, z\}$.

Table C.1: Elements of the Additive Decomposition allowing for distinct types of pass-throughs

	Elements of Decomposition				Total
	Convergence	Δ Firm dynamics	Δ Reorg	Δ Initial org.	
Period 1982-1990	-2.6	1.1	5.5	2.3	6.3
Period 1990-2000	-0.3	1.3	3.1	8.0	12.0
Period 2000-2015	0.0	-0.9	1.5	8.9	9.4
Entire period 1982-2015	-3.0	1.5	10.1	19.2	27.7

Note: LBD-TLFO Data Set. Results of main decomposition when S corporations (sc), partnerships (pr), and sole proprietors (sp) are treated as separate types, i.e., $l \in \{c, sc, pr, sp, z\}$. By construction the actual pass-through share is identical across groupings. Only the counterfactuals are affected. If pass-through firm dynamics and reorganization probabilities were symmetric across types, the counterfactuals would also be identical.

C.2 Decomposition with Business Age-Dependence

The main decomposition treats all ages (except entrants) symmetrically in terms of their reorganization and exit probabilities. Although Section 6.2 shows there is little evidence for a reorganization lifecycle, as is well known, exit rates do vary significantly with business age. To allow for this age dependence in our counterfactuals, we further extend the decomposition in Section C.1 to allow for each $l \in L = \{c, sc, pr, sp, z\}$, the exit and reorganization rates to also depend on business age $a \in A = \{0, 1, 2, 3, 4, 5, 6+\}$.

Thus, let $\boldsymbol{\Omega}_t^A = [\Omega_{lat}]$ be a column vector stacking the number of businesses organized as a legal form l that are of age a . Define now an age-dependent reorganization matrix to be $\boldsymbol{\Theta}_t^a = [\theta_{l'l}^a]$ where following the convention above, the superscript a denotes businesses that are age a in period $t - 1$. As before row l is the period $t - 1$ type and column l' is period t type. Then define a block-diagonal, square matrix $\boldsymbol{\Theta}_t^A$ of dimension $|L| \cdot |A|$ as follows:

$$\boldsymbol{\Theta}_t^A = \begin{bmatrix} \boldsymbol{\Theta}_t^1 & \cdots & \mathbf{0}_{|L|} \\ \vdots & \ddots & \vdots \\ \mathbf{0}_{|L|} & \cdots & \boldsymbol{\Theta}_t^{|A|} \end{bmatrix}$$

where the reorganization matrices $\boldsymbol{\Theta}_t^a$ for consecutive elements of the set A , i.e. $\boldsymbol{\Theta}_t^1, \dots, \boldsymbol{\Theta}_t^{|A|}$ are placed along the diagonal and $\mathbf{0}_{|L|}$ is a square, matrix of zeros of cardinality of the set L .

Further, let x_t^{la} be the exit rate of for period $t - 1$ age a and type l business that exit between $t - 1$ and t . Then, a column vector $\boldsymbol{x}_t^A = [x_t^{la}]$ stacks the exit rates by legal form and age, and $\text{diag}[1 - \boldsymbol{x}_t^A]$ is a square, diagonal matrix with legal form-age survival rates at the diagonal. Let us further define the square, age-evolution matrix \mathbf{A} of dimension $|L| \cdot |A|$ as follows

$$\mathbf{A} = \begin{bmatrix} \mathbf{0}_{|L|} & \mathbf{I}_{|L|} & \cdots & \mathbf{0}_{|L|} \\ \vdots & \vdots & \ddots & \vdots \\ \mathbf{0}_{|L|} & \mathbf{0}_{|L|} & \cdots & \mathbf{I}_{|L|} \\ \mathbf{0}_{|L|} & \mathbf{0}_{|L|} & \cdots & \mathbf{I}_{|L|} \end{bmatrix}$$

where $\mathbf{I}_{|L|}$ is a square, identity matrix of the size of cardinality of the set L . Finally, let $\boldsymbol{\theta}_t^A = [\boldsymbol{\theta}_t, 0, \dots, 0]'$ be a column vector stacking entry rates into different legal forms in the first L elements and zeros elsewhere. Then, we can write a law of motion for the number of firms of different ages and legal forms as follows:

$$\boldsymbol{\Omega}_t^A = (\boldsymbol{\Theta}_t^A \mathbf{A})' \text{diag}(1 - \boldsymbol{x}_t^A) \boldsymbol{\Omega}_{t-1}^A + \boldsymbol{\theta}_t^A S_t \quad (\text{C.4})$$

Again, we can transform the law of motion from levels to shares by normalizing it by the total number of businesses in period t to get

$$\boldsymbol{\omega}_t^A = (\boldsymbol{\Theta}_t^A \mathbf{A})' \text{diag} \left(\frac{1 - \mathbf{x}_t^A}{1 - x_t} \right) \boldsymbol{\omega}_{t-1}^A (1 - s_t) + \boldsymbol{\theta}_t^A s_t \quad (\text{C.5})$$

Figure C.3 plots the main counterfactuals that treat all ages symmetrically, but allow for each type of pass-through as solid lines (these match the dotted lines from Figure C.2). The dotted lines plot the main counterfactuals using the extended decomposition that allows for reorganization probabilities and exit rates to vary by each l and business age. Here too, the results are largely similar above and to the main text. Evidently, firm age composition plays a relatively minor role in explaining the growth in the pass-through share. Table C.2 summarizes the decomposition with more detailed pass-through types and age-dependence by period. Figure C.4 compares the no startup deficit counterfactual from the main text Figure 5b with one using the decomposition in equation C.5 that will adjust for the further effects from the induced changes in the incumbent age establishment-age composition.

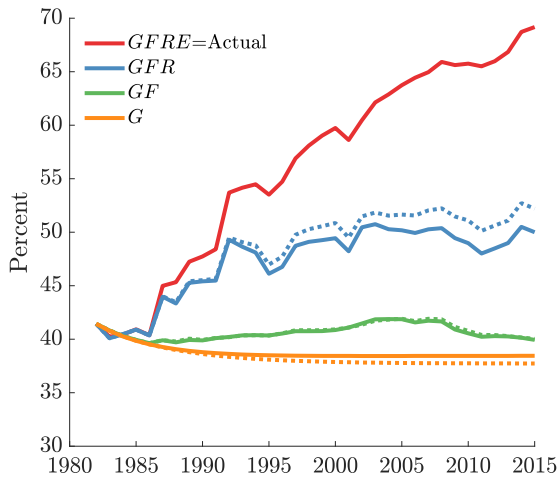


Figure C.3: Actual and counterfactual sequences of the pass-through share 1982–2015 allowing for age-dependent reorganization and exit rates

Note: Note: LBD-TLFO Data Set. Solid lines show results of decomposition with all types $l \in c, sc, pr, sp, z$ but treating all business ages symmetrically. Dotted lines show results of decomposition when further allowing for reorganization and exit rates from $t - 1$ to t for each l to depend on $t - 1$ business age for $a \in \{0, 1, 2, 3, 4, 5, 6+\}$.

Table C.2: Elements of the Additive Decomposition allowing for age-dependent reorganization and exit

	Elements of Decomposition				Total
	Convergence	Δ Firm dynamics	Δ Reorg	Δ Initial org.	
Period 1982-1990	-2.8	1.3	5.6	2.2	6.3
Period 1990-2000	-0.8	1.7	4.4	6.7	12.0
Period 2000-2015	-0.1	-0.8	2.2	8.1	9.4
Entire period 1982-2015	-3.7	2.3	12.2	17.0	27.7

Note: LBD-TLFO Data Set. Results of main decomposition when exit and reorganization probabilities for each $l \in \{c, sc, pr, sp, z\}$ between $t - 1$ and t further depend on $t - 1$ age $a \in \{0, 1, 2, 3, 4, 5, 6+\}$. Only the counterfactuals are affected. If exit and reorganization probabilities were symmetric across ages, the counterfactuals would also be identical to Table C.1.

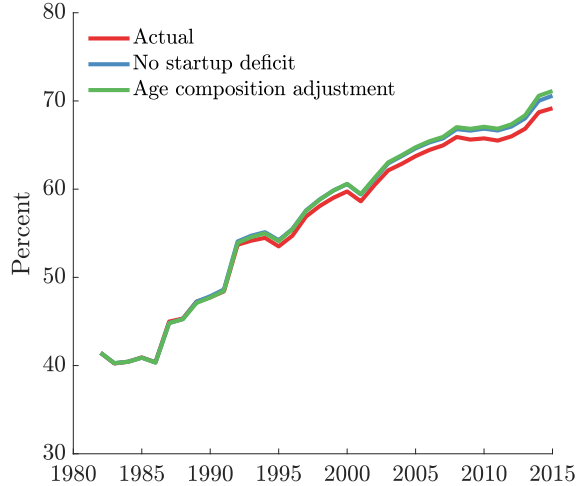


Figure C.4: No startup deficit counterfactual adjusting for shift in incumbent age composition

Note: LBD-TLFO Data Set. No startup deficit counterfactual corresponds to Figure 5b where the startup rate is held constant. The age composition adjustment uses the decomposition in Appendix C.2 that allows for incumbent reorganization and exit probabilities to depend on type $l \in \{c, sc, pr, sp, z\}$ and business age $a \in \{0, 1, 2, 3, 4, 5, 6+\}$. Here, when the startup rate is held constant the counterfactual incorporates the effects that induced changes in business age composition have on reorganization and exit.

C.3 Comparison to Long-run Shares

Even with sudden changes in reorganization or initial organization patterns, adjustment of the overall stock of pass-throughs, ω_{pt} according to the law of motion in equation (4.1) is gradual. The slow convergence can make it difficult to assess the effects of a change in reorganization or initial organization, for example, since they make take many years to be fully incorporated. This gradual adjustment is clear when examining the counterfactual path of ω_{pt}^G which holds constant all firm dynamics, reorganization, and initial organization inputs, in Figure 3a. One way to examine the full effects of any changes to these objects is to measure their effects on the implied long-run distribution of legal forms. To do so we define ω_t^* as the target LFO distribution, which is the one that would prevail in equation (C.3) in the long run if the Θ_t , x_t , θ_t and s_t were to remain constant in all future periods:

$$\omega_t^* = \left(I - \Theta_t' \text{diag} \left(\frac{1 - x_t}{1 - x_t} \right) (1 - s_t) \right)^{-1} \theta_t s_t. \quad (\text{C.6})$$

The target distribution, ω_t^* , is indexed by t because it corresponds to the distribution when all the dynamics are constant at their year t values.¹¹

We plot in the left panel of Figure C.5a the actual share of pass-throughs, ω_{pt} , and the share predicted in the long run, ω_{pt}^* , if the current conversion and entry shares were to remain constant at their year t values. One can observe that the actual share tracks the long-run share; however, for most of the period, the implied long-run series stays above the actual one. This positive gap indicates the scope of convergence at any given time driven by the current level of the flows. It also reflects the slow diffusion of the pass-through form from its law of motion (4.1).

The long-run share is also helpful when applied to the terms of additive decomposition presented in equation (4.5). The right panel (Figure C.5b) plots these counterfactuals using the long-run counterparts of the elements of the additive decomposition. At each point in time, they capture the full effect of any change in the firm dynamics, the reorganization matrix, or the initial shares. Application of the additive decomposition to the long-term shares confirms our main finding documented in the previous section. The reorganization margin drove the pass-through rise for the first decade in our sample. However, post-1990,

¹¹The long-run counterpart to scalar expression (4.1) is

$$\omega_{pt}^* = \frac{(1 - s_t) \theta_{pt}^c \frac{1 - x_t^c}{1 - x_t} + \theta_{pt} s_t}{1 + (1 - s_t) \theta_{pt}^c \frac{1 - x_t^c}{1 - x_t} - (1 - \theta_{ct}^p) \frac{1 - x_t^p}{1 - x_t} (1 - s_t)}.$$

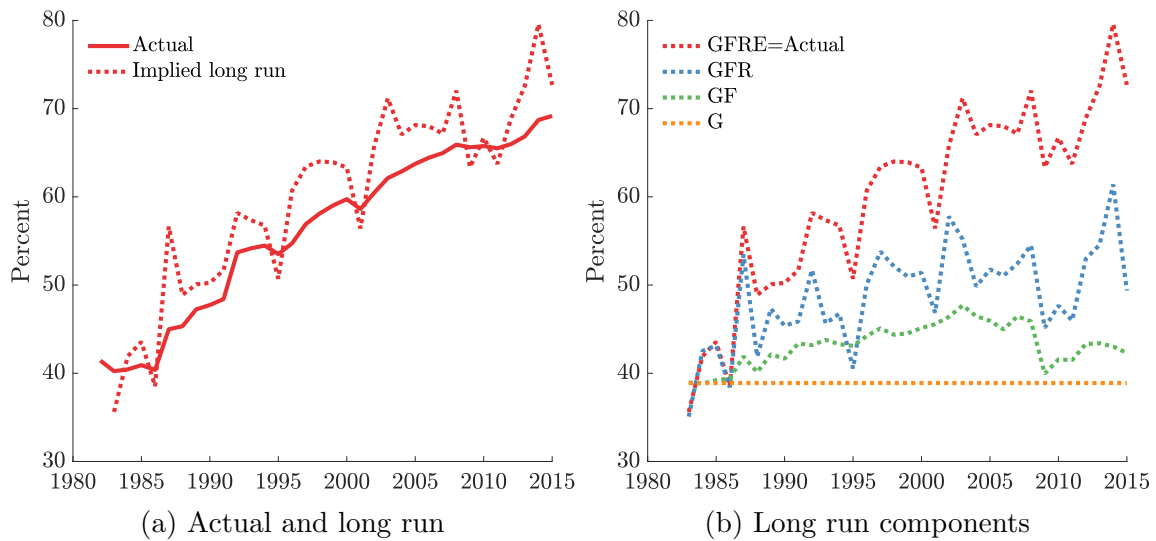


Figure C.5: Long-run pass through share and decomposition implied by year t dynamics

Note: LBD-TLFO Data Set. Left panel compares for each year t the actual pass-through share ω_{pt} with its long-run value if the organizational- and firm-dynamics measured in year t were to remain constant according to equation (C.6). Right panel computes the components of the TLFO decomposition using long-run equation (C.6) in place of equation (C.3).

the entrant organization margin has become dominant. Firm dynamics and convergence have barely contributed to the long-run pass-through share.

D Additional figures and tables

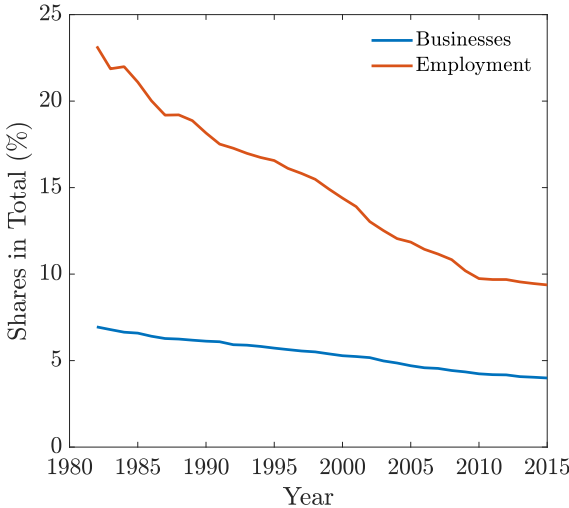
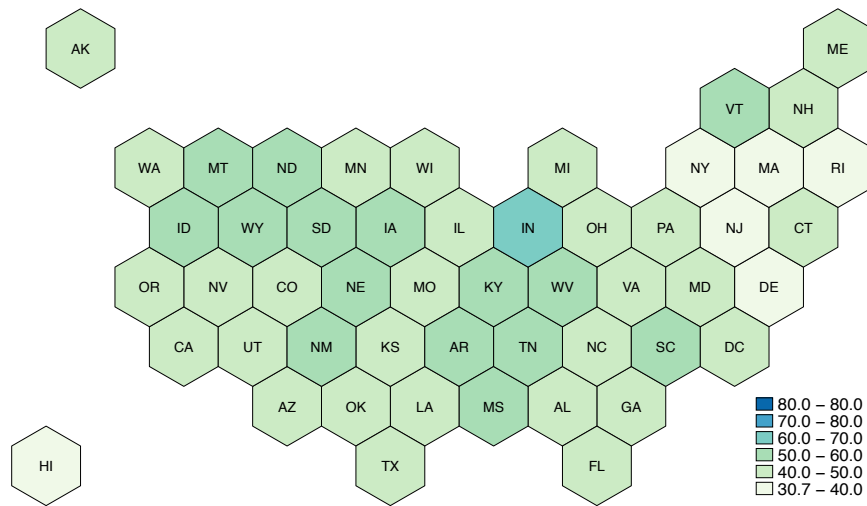
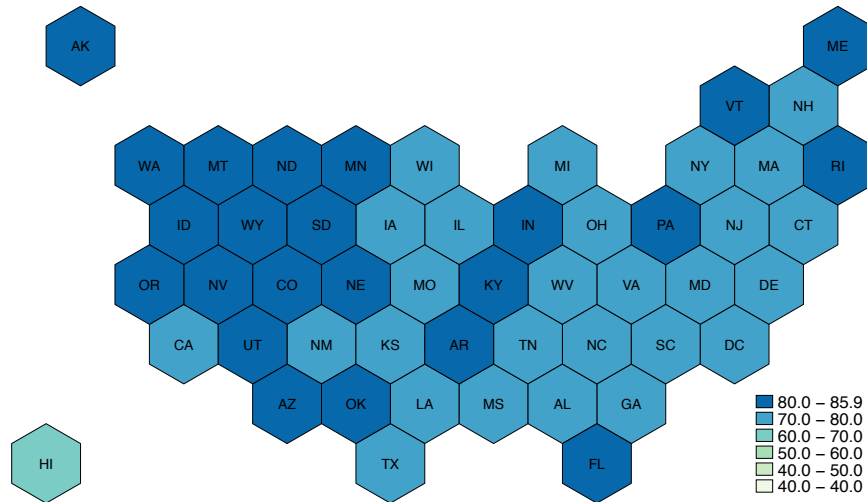


Figure D.1: Share of manufacturing in BDS data

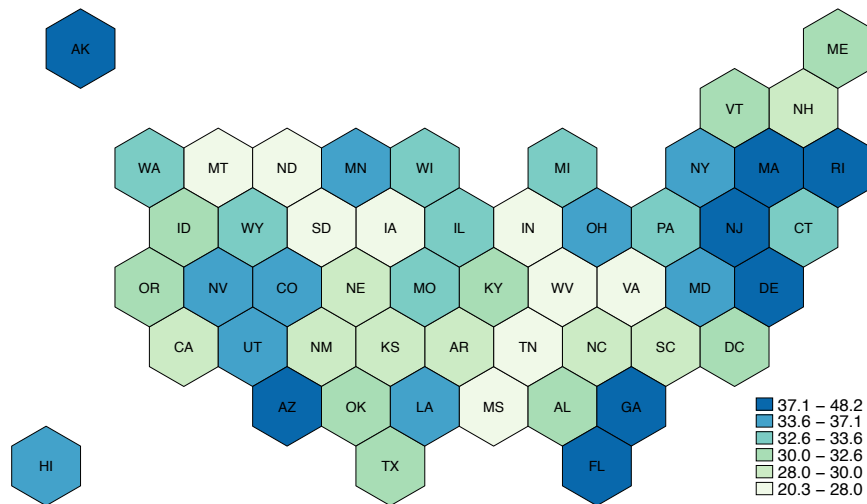
Note: Census BDS.



(a) Share of pass-throughs in 1982

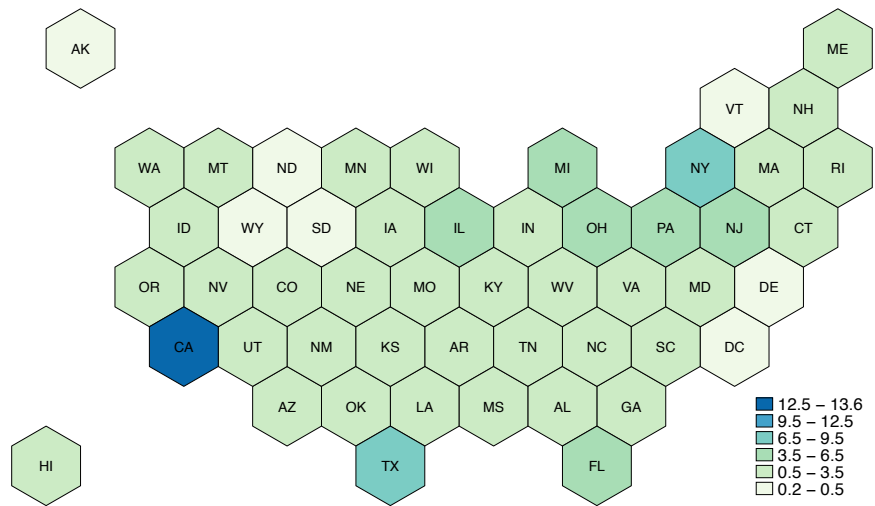


(b) Share of pass-throughs in 2015

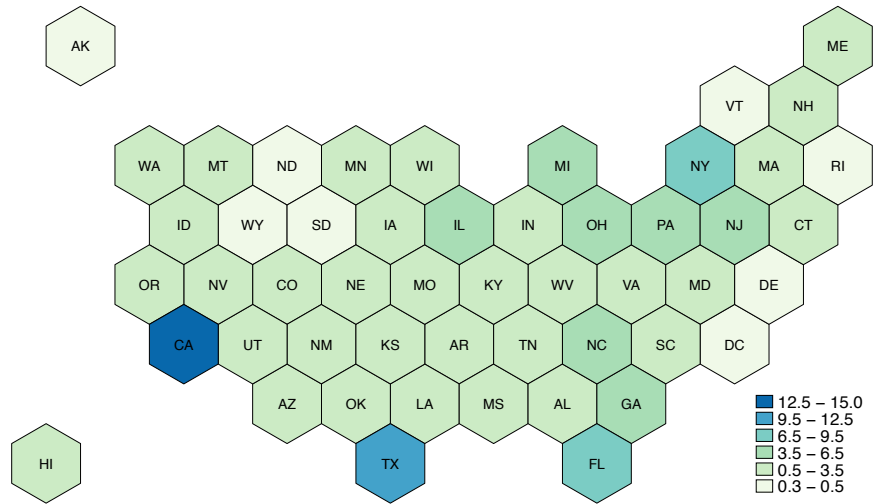


(c) Change in the share of pass-throughs 1982 to 2015

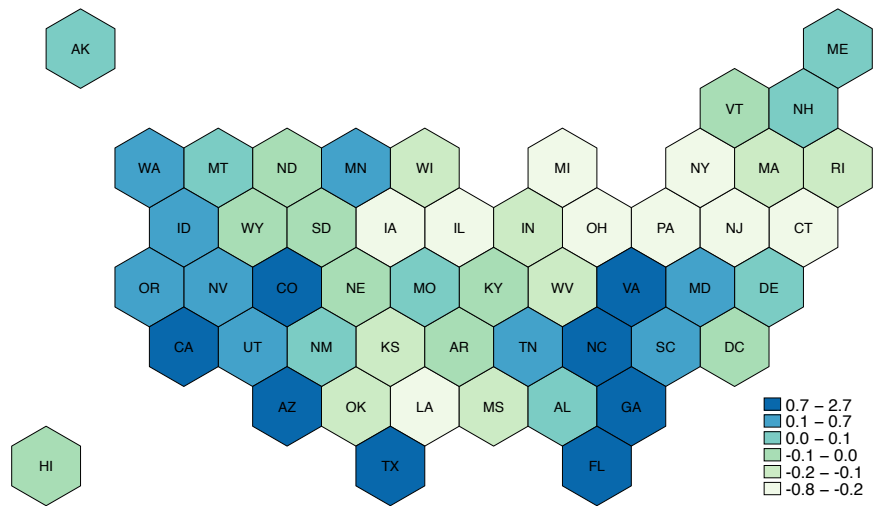
Figure D.2: Fraction of pass-throughs across states and over time.



(a) Share of businesses in 1982

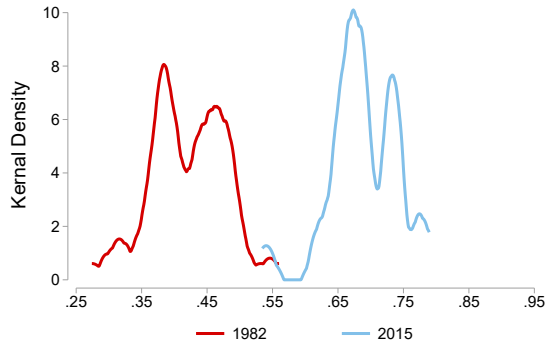


(b) Share of businesses in 2015

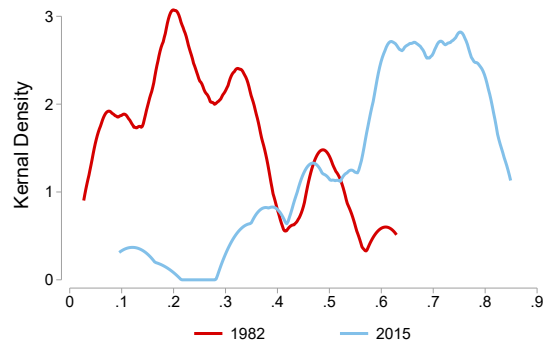


(c) Change in the share of businesses 1982 to 2015

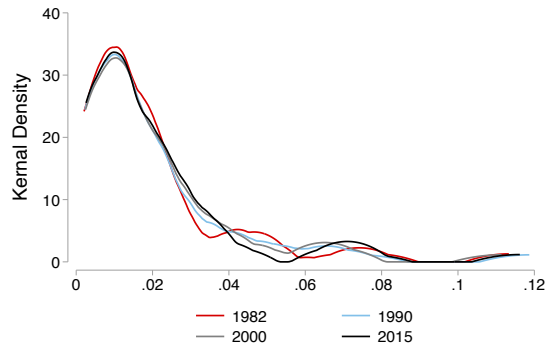
Figure D.3: Shares of businesses across states and over time.



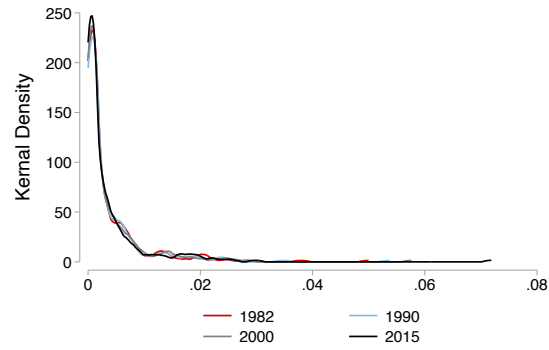
(a) Pass-throughs across states



(b) Pass-throughs across industries



(c) Businesses across states



(d) Businesses across industries

Figure D.4: Kernel densities of shares of pass-throughs and businesses across states and industries over time.

Note: LBD-TLFO Data Set and Business Dynamics Statistics (BDS) data.

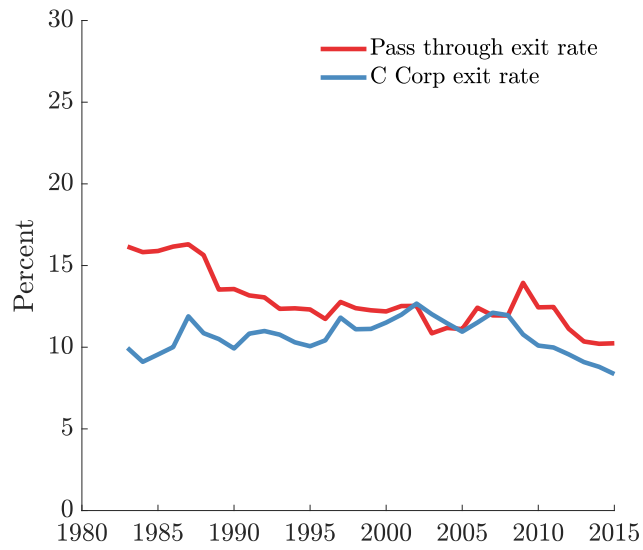


Figure D.5: Exit rates by TLFO

Note: LBD-TLFO Data Set.