The Secular Decline in Business Dynamism in the U.S.

Ryan Decker, John Haltiwanger, Ron S Jarmin, and Javier Miranda*

The pace of business dynamism in the U.S. has declined over recent decades. The decline in business dynamism is evident in a pronounced declining trend in the pace of both gross job creation and gross job destruction. An important component of these declining trends has been the decline in the firm startup rate. The decline in the startup rate has yielded a significant decline in the share of employment accounted for by young firms – this share has declined by almost 30 percent over the last 30 years. Young firms exhibit enormous volatility – many fail, but amongst those that survive are very fast growing firms that contribute substantially to job creation. We find that the changing firm age distribution accounts for a substantial fraction of the decline in the overall pace of business dynamism, but we find that other compositional changes work in the opposite direction. The well-known shift in economic activity away from manufacturing to service and retail industries is a shift toward sectors that historically exhibited a higher pace of business dynamism. Consideration of different patterns by sector are important not just for compositional reasons but because of large differences in the within-sector trend declines in business dynamics across sectors. The retail and service sectors not only have exhibited the largest increases in employment shares but are also sectors with especially large declines in the pace of business dynamics. These two sectors have also experienced very large declines in the share of activity accounted for by young firms – and as such, the shifting age composition accounts for a very large share of the declining dynamism in these sectors. It has apparently become less advantageous to be a young entrepreneurial firm in retail and services, and this has contributed significantly to the decline in the pace of business dynamism in these sectors.

A hallmark of market economies, such as the United States, is the reallocation of resources from less-valued or productive activities to more-valued or productive ones. Business dynamics – the process of business birth, growth, decline and exit – is a critical component of the reallocative process (Syverson (2011)). An optimal pace of business dynamics balances the benefits of productivity and economic growth against the costs associated with reallocation – which can be high for certain groups of firms and individuals. While it is difficult to prescribe what the optimal pace should be, there is accumulating evidence from multiple datasets and a variety of methodologies that the pace of business dynamism in the U.S. has fallen over recent decades and that this downward trend accelerated after 2000 (see Haltiwanger, Jarmin and Miranda (2011) and Reedy and Litan (2011)).

To get a sense of the pace of business dynamism in the U.S. note that, over the 1980 to 2011 period, annual rates of gross job creation and gross job destruction for private sector businesses averaged 16.7 and 15.2 percent respectively. That is, 16.9 percent of U.S. private jobs are created at new and growing businesses, and 15.2 percent of jobs are lost at shrinking and closing business. Net employment growth is the difference between creation and destruction. Figure 1 shows that these rates exhibit both cyclical and secular patterns. Our interest in this paper is the secular decline of these and related measures. The magnitude of the decline is significant. Between 1985 and 2005, the rate of gross job creation fell by 2.9 percentage points, and the gross job destruction rate fell by 1.5 percentage points. A 1.0 percentage point increase in the rate of gross job creation for the U.S. private non-agricultural sector would represent roughly 1.1 million additional jobs created in recent years.

As we show below, a critical factor in the decreasing pace of business dynamics is lower business start-up rates and a decreasing role of dynamic young businesses in the economy. Haltiwanger, Jarmin and Miranda (2013) show that young businesses exhibit a higher pace of creative destruction than their older counterparts, including a much higher exit rate. However, conditional on survival, young entrepreneurial businesses grow quickly. This up-or-out pattern has been linked to productivity growth (see Foster, Haltiwanger and Krizan (2001, 2006)).

An economy's ability to quickly and efficiently reallocate resources can help it recover quickly from shocks (such as a financial crisis). A striking feature of the Great Recession in the U.S. is that while job destruction rates have since returned to pre-recession levels, job creation rates have not.[1] The slow pace of the recovery with stubbornly low rates of job creation highlights the role business dynamics play in the economy. The tepid response of job creation to stimulative policy interventions that has been observed arguably requires understanding the changing nature of business dynamics, especially the longer-term secular trends on which we focus here.

In this paper, we explore these trends further and discuss potential explanations. For this purpose we use the Bureau of the Census Longitudinal Business Database, a new database that covers all non-farm private sector establishments and firms with paid employees in the U.S. between 1976 and 2011. We analyze the extent to which composition changes in U.S. businesses across detailed industries, states, size classes, age classes and firm structure account for the decline in dynamism. We find that the shift in economic activity from smaller and younger firms toward larger more mature firms over this period helps explain the decreasing pace of business dynamism. Changes in the industry composition toward more dynamic sectors have a muting effect but are not sufficient to reverse the firm age and size effects. Overall, we find that such composition effects explain no more than a quarter of the decline in dynamism even when we consider rich interactions across these firm characteristics. The failure of these effects to account for the aggregate decline partially reflects offsetting composition effects but suggests that the real driving force is to be found in factors working within detailed industry, firm size and age and geographic groupings.

II. Factors Driving the Pace of Business Dynamics

Theories of growth and fluctuations that highlight creative destruction emphasize that market economies are constantly being subjected to changes in the economic environment – new products, new processes, opening up of markets to trade and changes

---

[1] The slow recovery in job creation is especially evident in the Business Employment Dynamics (BED) job creation and destruction series from BLS. See Davis, Faberman and Haltiwanger (2012) for further discussion of the cyclical dynamics in the BED.

in market structure are constantly changing the economic landscape. Firms and workers differ in their capacities to adapt to the ever-changing environment – some firms and workers are sources of the change itself, others adopt and advance with such changes, while still others suffer adverse consequences. According to this view, both the level and growth rate of productivity in an economy depend on how well it accommodates and facilitates the ongoing process of creative destruction. Institutions and policies that impede restructuring and adjustment can yield lower levels and growth rates of productivity (see, *e.g.*, Hopenhayn and Rogerson (1992) and Caballero (2006)).

Empirical evidence supports the importance of creative destruction at least in its broad outlines. Large-scale job reallocation is a pervasive feature of market economies (Davis and Haltiwanger (1999)). The large job flows and high firm-level volatility reflect the restructuring, experimentation and adjustment processes at the heart of theories of creative destruction. Empirically, there is much evidence that in well-functioning economies the high pace of reallocation is productivity enhancing – that is, it largely reflects movement of resources away from less-productive to more-productive businesses (for a recent survey, see Syverson (2011)).

The evidence also supports the view that productivity-enhancing creative destruction involves a high pace of firm entry and exit with the learning and selection dynamics of young firms playing a critical role in productivity and job growth (see, *e.g.*, Dunne, Roberts and Samuelson (1989), Davis and Haltiwanger (1999), Foster, Haltiwanger and Krizan (2001, 2006), and Haltiwanger, Jarmin and Miranda (2013)). Young firms exhibit an up-or-out dynamic in the U.S. – many (most) young firms exit, but conditional on survival they grow faster than their more mature counterparts. The evidence indicates that the rapidly growing surviving young businesses are the more productive businesses. The findings for young firms are consistent with theories that highlight the role of experimentation and adjustment in the face of uncertainty about demand, technologies, costs and managerial ability that are especially pronounced among younger businesses.

Many factors can affect the pace of creative destruction and, in turn, its connection to the level and growth of productivity. As noted above, changes in the structure of markets can affect the ongoing pace of reallocation. Fundamental

transformations in the business model within an industry can drive changes in the pace of reallocation. In the retail trade sector, the expansion of "big box" retailers and, more generally, large national firms has changed the characteristics of the firms and establishments in the industry. These changes, however, have been underway for many decades. Jarmin, Klimek and Miranda (2005) report that the share of U.S. retail activity accounted for by single-establishment ("Mom-and-Pop") firms fell from 70 percent in 1948 to 60 percent in 1967 and further still to 39 percent in 1997.

Empirical studies routinely find a strong, negative relationship between business size and the pace of reallocation. The trend toward larger firms in the retail trade sector has already been shown to account substantially for the observed declines in creation and destruction measures within that sector. Moreover, the evidence supports the view that this transformation has been productivity enhancing in retail trade industries (see Foster, Haltiwanger and Krizan (2006)) and related to patterns in the adoption of new technologies such as information technology (see Doms, Jarmin and Klimek (2004)). As such, for retail trade there is a structural transformation that is both productivity enhancing and reallocation reducing. Note, however, that even in this case there may be a trade-off between economies of scale and flexibility.

This discussion highlights the notion that an observed change in the pace of reallocation may indeed reflect structural changes within and between sectors. An important objective of our empirical analysis is to quantify the extent to which compositional effects from the changing structure account for the decline in the pace of creative destruction. Such quantification does not identify the ultimate source of the change but does identify where to look for such sources. In addition, the discussion highlights that it is important to try to identify structural factors that might impede or distort reallocation and contribute to the secular changes in the creative destruction we describe. If the latter is driving the observed changes, then theory and evidence suggests this will have adverse long-term consequences for productivity and growth.

III. Business Dynamics Data

Most of the findings reported in this paper are based on the Census Bureau's Longitudinal Business Database (LBD) [2] and the public domain statistics on business dynamics that have been generated from the LBD – namely, the Business Dynamics Statistics (BDS).[3] The LBD covers the universe of establishments and firms in the U.S. nonfarm business sector with at least one paid employee. The LBD includes annual observations beginning in 1976 and currently runs through 2011. It provides information on detailed industry, location and employment for every establishment. Employment observations in the LBD are for the payroll period covering the 12th day of March in each calendar year.

A unique advantage of the LBD is its comprehensive coverage of both firms and establishments. Only in the LBD is firm activity captured up to the level of operational control instead of being based on an arbitrary taxpayer ID.[4] The ability to link establishment and firm information allows firm characteristics such as firm size and firm age to be tracked for each establishment. Firm size measures are constructed by aggregating the establishment information to the firm level using the appropriate firm identifiers. The construction of firm age follows the approach adopted for the BDS and based on our prior work (see, *e.g.*, Becker, et al. (2006), Davis, et al. (2007) and Haltiwanger, Jarmin and Miranda (2011)). Namely, when a new firm ID arises for whatever reason, we assign the firm an age based on the age of the oldest establishment that the firm owns in the first year in which the new firm ID is observed. The firm is then allowed to age naturally (by one year for each additional year it is observed in the data)

---

[2] We note that the LBD employment and job creation numbers track closely those of the County Business Patterns and Statistics of U.S. Business programs of the U.S. Census Bureau (see Haltiwanger, Jarmin and Miranda (2009)) as they all share the Census Bureau's Business Register (BR) as their source data. Further details about the LBD and its construction can be found in Jarmin and Miranda (2002).

[3] BDS data are available at http://www.census.gov/ces/dataproducts/bds/. Note also that a synthetic public-use version of the LBD, the SynLBD, is also available for research use. Details can be found in Kinney, et al. (2011), and information about access is at http://www.census.gov/ces/dataproducts/synlbd/.

[4] A closely related database at the BLS tracks quarterly job creation and destruction statistics (Business Employment Dynamics). The BED has advantages in terms of both frequency and timeliness of the data. However, the BED only can capture firm dynamics up to the level of establishments that operate under a common taxpayer ID (EIN). There are many large firms that have multiple EINs – it is not unusual for large firms operating in multiple states to have at least one EIN per state.

regardless of any acquisitions and divestitures as long as the firm as a legal entity continues operations. We utilize the LBD to construct annual establishment-level statistics on job creation, job destruction and net growth rates. Their construction is detailed next.

We compute job flow statistics following Davis, Haltiwanger and Schuh (1996) (hereafter DHS). The job creation rate is based on the sum of employment gains from all expanding establishments (including new establishments) divided by average employment over the period when the changes are measured. We can distinguish between new establishments of new firms and new establishments of existing firms. The job destruction rate is based on the sum of employment losses from all contracting establishments (including exiting establishments). Net employment growth is simply the difference between the job creation and job destruction rates. We also use some summary measures of the overall pace of creative destruction. Job reallocation is the sum of job creation and destruction – it is a summary measure of all the changes in the location of jobs across producers.[5] We quantify patterns of job creation, job destruction and job reallocation by establishment- and firm-level characteristics.

We focus on measures of business dynamics based on establishment-level volatility. We note that others have found that the patterns of firm-level volatility are quite similar to those of establishment-level volatility in terms of the trends (see Davis, et al. (2007)). We discuss the relationship between this earlier work and the findings in this paper below. We also emphasize that all of the measures of volatility that we consider in this paper are employment weighted. Activity weighting measures of business volatility is of critical importance given the highly skewed nature of business activity. Activity-weighted measures are relevant if the focus is on volatility that contributes to aggregate job, output and productivity growth.

---

[5] Another useful summary measure often used in the literature is the excess reallocation rate. That is, job reallocation less the absolute value of net growth. The excess measure captures the reallocation over and above that needed to accommodate net growth. For the sake of brevity we do not show patterns by excess reallocation but note that our patterns of declining trends carry over to excess reallocation. Davis, et al. (2007) show patterns by excess reallocation.

IV. The Decline in Business Dynamism

We now describe the basic secular trends in the pace of job creation, job destruction and reallocation over the last three decades. For this part of the analysis, we use publicly available data from the BDS. Figure 1 shows the patterns of gross job creation and gross job destruction rates for the U.S. private sector using annual data from 1980 through 2011. Included in the figure are trends from a Hodrick-Prescott filter for illustrative purposes.

Figure 1 illustrates the now well-known finding that there is always a large pace of gross job creation and destruction in the U.S. Even in 2009, with a large net employment decline, expanding and new businesses added jobs at a 12.4 percent rate. This translates into more than 14 million new jobs in the private sector created between March 2008 and March 2009. It is also evident from Figure 1 that job creation and job destruction tend to move in opposite directions during expansions and contractions. The impact of the Great Recession is especially large and distinct from previous episodes. All recessions since 1980 were characterized by a large increase in job destruction in one or more years accompanied by a modest decline in job creation. However, the decline in job creation during the 2007-2009 period is especially large.

Figure 1 also highlights the downward secular trend in the rates of job creation and destruction over the last few decades. In particular, the job creation rate averaged 18.9 percent in the late 1980s and decreased in what appears to be a roughly stepwise pattern following recessions to an average of 15.8 percent in the 2004/2006 period just before the Great Recession. This represents a 16 percent decline in the pace of job creation. The job destruction rate experienced similar declines; over the same period it went from an average of 16.1 percent to an average of 13.4 percent. This represents a 17 percent decline in the pace of job destruction. These secular declines are evident in the HP trends. The HP trends also highlight another pattern: the trend decline in the pace of job creation and destruction tends to accelerate in the post-2000 period. The acceleration in the decline post-2000 has been noted by Davis, Faberman and Haltiwanger (2012) and Hyatt and Spletzer (2013) using the BED data in which the trend declines, if anything, are more pronounced.

As noted in the introduction, underlying these trends are structural shifts that lead to changes in the composition of firms in the economy. In the remainder of this section, we discuss three of the most important compositional factors – the changing distribution of firm age, the changing sectoral composition of activity, and the changing geographic distribution of activity.

We begin by examining the role of firm age. We first quantify the patterns in the firm startup rate – the number of new firms divided by the total number of firms. New firms are *de novo* enterprises here – not new organizations resulting from mergers, acquisitions or divestitures. Figure 2 shows that the annual startup rate declined from an average of 12.0 percent in the late 1980s to an average of 10.6 percent just before the Great Recession – a total decline of 12 percent over a 17-year period. It is also apparent that the startup rate plummeted in the Great Recession. Interestingly, Figure 2 also shows that the average size of startups has remained approximately the same over this time period (see Haltiwanger, Jarmin and Miranda (2013) for more discussion of these data).[6]

The decreasing startup rate naturally leads to a reduction in the number of young firms operating in the economy. Figure 3 illustrates the share of young firms (age five or less) in the economy and their share of economic activity as measured by their contribution to gross job creation and employment. The share of employment at young firms in the U.S. economy declined from an average of 18.9 percent in the late 1980s to an average of 13.4 percent at the peak before the Great Recession, a 29 percent decline over a 17-year period. Similarly, their contribution to the share of firms and job creation declined by 17 percent and 14 percent, respectively, from a high in the late 1980s of 46.6 percent and 38.7 percent, respectively.

The decline in the share of young firms has important implications for the pace of business dynamics. Haltiwanger, Jarmin and Miranda (2013) show that young firms are particularly dynamic, with high rates of both job creation and job destruction in their first five years after entry. These patterns are consistent with young firms being engaged in experimentation as well as learning whether they can succeed in the market. Figure 4

---

[6] The evidence from the BED shows a decline in the average size of new establishments (not new firms) over the 1994-2010 period as reported by Reedy and Litan (2011). We note that the BDS does not show a decline in the average size of new establishments over the same period. Both the BED and BDS show a declining share of job creation from new establishments over this period. See Choi and Spletzer (2012) for further analysis of these issues.

shows these patterns in the BDS. Establishments of young firms have very high creation, destruction and reallocation rates relative to more mature firms. Even excluding the contribution of startups, job creation rates of young firms are very high relative to more mature firms (see Haltiwanger, Jarmin and Miranda (2013)). It is evident from Figures 3 and 4 together that one potentially important contributing factor to the decline in the pace of business dynamics is the declining share of young firms. We assess its contribution by itself and relative to other factors in the analysis below.

Turning to changes in the sectoral composition, Figure 5 illustrates well-known shifts away from manufacturing activities and toward the retail and service sectors.[7] These three sectors alone account for about 72 percent of employment in 1980 and about 76 percent of employment in 2011, but the composition among the three has changed dramatically. In 1980, manufacturing accounted for 28 percent and services 24 percent. In 2011, manufacturing accounted for only 11 percent and services 43 percent.[8]

The pace of job reallocation varies systematically by industry. Differences in minimum efficient scale, capital intensity, skill mix, the distribution of technology, demand and cost shocks all vary systematically across industries, and these factors contribute to differences in the pace of job reallocation. Davis and Haltiwanger (1999) find that there is considerable similarity across countries in the differences in the pace of job reallocation by industry. We confirm such differences at a broad sectoral level in Figure 6. For the three largest sectors, the pace of job creation, destruction and

---

[7] Figure 5 and the illustrative analysis use the broad sector definitions in the BDS. The latter are on a consistent SIC basis from 1980 to 2011. We utilized concordances to reassign industries that switched broad sectors (*e.g.*, printing and publishing moved out of manufacturing and food services and eating and drinking places moved out of retail) with the conversion to NAICS back to their original SIC broad sectors. Note that this procedure works reasonably well at broad sectoral levels but is more problematic for reassigning NAICS to SIC classifications at the detailed industry level. In our analysis in the next section, we take advantage of the work of Fort (2013), who has assigned all establishments in the LBD consistent NAICS codes from 1976 to 2011. Therefore, in both this section and the next section we use internally consistent sectoral classifications but use SIC in this section and NAICS in the next section (with some modification as we note below). In the next section we also use detailed industry codes, so the work of Fort (2013) is critical. We also note that when we consider broad NAICS sectors in the next section that we have moved the detailed industries of printing and publishing back to manufacturing and food services and eating and drinking places back to retail trade. This makes the broad sectors we use for illustrative purposes more consistent across the sections. We also note that in unreported results we have examined Figure 5 on a broad sector NAICS basis and the patterns are very similar in terms of changing trends. For example, under NAICS services services grows from 25 percent of employment in 1980 to 41 percent of employment in 2011. Manufacturing under NAICS shrinks from 24 percent to 11 percent of unemployment over this same time period.

[8] Some caution is required here in that the service sector under SIC is a very broad sector covering a wide range of activities. Still there is a clear shift away from goods producing to service providing economic activity.

reallocation is much higher in the service and retail trade sectors on average than in the manufacturing sector. Combining Figures 5 and 6 yields one of the primary challenges to accounting for the overall decline in business dynamics. That is, the patterns in these figures suggest that, based on changes in the sectoral composition of activity, we should have expected an increase in the overall pace of business dynamics rather than a decline.

The changing geographic distribution of activity has the potential to play a role as well. Businesses face different business and regulatory environments in the different states. There are also differences in infrastructures and access to resources. Changing geography will also be connected to the changing firm age structure and sectoral composition of activity. Figure 7 illustrates the shifts in the share of economic activity across some of the larger states between 1977 and 2011. We can see the growth of the south and west in states like Texas, Florida, and California as well as the relative decline in midwest and eastern states like New York, New Jersey, Pennsylvania, Ohio, and Illinois. Figure 8 illustrates average job flows for these states. States in the south and the west tend to have a higher pace of job reallocation than the states in the midwest and the northeast. In this respect, the changing geographic distribution would appear to be a factor pushing for a higher pace of business dynamics rather than the slower pace we actually observe in the data.

In the next section we explore the extent to which compositional shifts explain the declines observed in the data. Before doing so, however, it is important to emphasize that the trends discussed in this section are not confined to the specific measures or data used here. The declining pace of business dynamics has been documented in prior work. In particular, using multiple measures of business dynamics from the LBD, Davis et al. (2007) found that the trend decline is present in both establishment- and firm-level measures of business volatility. They also find the declining trend is evident in within-firm and within-establishment measures of volatility as well as in the cross sectional dispersion measures that we are emphasizing in this paper.

Davis, et al. (2010) show that the declining pace of job flows is evident in the Business Employment Dynamics (BED). They also show that the declining trend in the pace of job destruction is closely linked to the secular decline in the inflow rate to unemployment (both at the national and sectoral level).

Davis, et al. (2012) show that the declining pace of job flows in the BED is matched by a declining pace of worker flows in the Job Openings and Labor Turnover (JOLTS) data. They find that excess worker reallocation (worker reallocation over and above job reallocation (sometimes called churn) has also exhibited a trend decline. Similar findings on the secular decline in churn have been documented and analyzed by Lazear and Spletzer (2012) using the JOLTS data. Hyatt and Spletzer (2013) use the worker and job flows data from the Quarterly Workforce Indicators (QWI) based on linked employer-employee data to examine trends in employment dynamics. They show that the patterns that others have found in the BED and JOLTS are also evident in the LEHD data on hires, separations, job creation and job destruction.

The decline in the pace of overall firm volatility does mask an increase in the pace of firm volatility among publicly traded firms, as documented by Comin and Philippon (2005). Davis, et al. (2007) confirm the Comin and Philippon findings using data that have both privately held and publicly traded firms. They show that the decline in the pace of business volatility among privately held firms overwhelms the rise in firm volatility for publicly traded firms. Their findings suggest that the difference in patterns between publicly and privately held firms primarily reflects a change in the composition of publicly held firms. In particular, more recent cohorts of new publicly traded firms are younger when going public and also grow more rapidly after going public than earlier cohorts.

V. The Changing Structure of the US Economy: The Role of Compositional Shifts

Methodological Approach

Our objective in this section is to quantify the contribution of compositional shifts by firm age, firm size, industry, geographic location and multi-unit status (whether a firm operates at more than one location which we sometimes denote as MU for short in what follows) to the changing patterns of business dynamics. We consider 282 unique 4-digit NAICS (2002) industries, 7 unique firm age groups (0 through 5, and 6+), 8 firm size groups (1-9, 10-19, 20-49, 50-99, 100-249, 250-499, 500-000, and 1000+ employees), 50

states and the District of Columbia, 2 firm status groups (single or multiple location indicator), and 29 different years between 1982 and 2011.[9] There are roughly 280,000 non-empty cells per year defined simultaneously on these dimensions. Note that startups are simply those firms with age zero.

   To quantify the extent to which compositional shifts in the characteristics of firms in the U.S. account for the aggregate secular declines in creation and destruction, we use a standard shift-share decomposition. First we start with employment shares and job flow (job creation rate, job destruction rate and job reallocation rate measures) at a detailed cell level denoted by c. One can decompose job flow statistics for any given level of aggregation i as follows:

$$F_{it} - F_{it_o} = \Delta F_{it} = \sum_{c \in i} s_{ct_0} \Delta F_{ct} + \sum_{c \in i} F_{ct_0} \Delta S_{ct} + \sum_{c \in i} \Delta F_{ct} \Delta S_{ct}$$

where the change in the flow F from time t to the base year can be decomposed into three terms. The first term represents a within-cell component based on the change in flows for a particular cell between the current period t and the base period t_0 weighted by the initial shares of that cell. The second term represents a between-cell component that reflects changing shares, weighted by the flows in the base period. The third term represents a cross term relating changes in shares with changes in flows. We focus our attention on the overall and the within components. The difference between those two reflects the extent to which compositional changes (captured by both the between and covariance terms) account for the difference.

   This shift-share methodology yields counterfactual job flows holding constant alternative classifications of cells at their initial level. Given our focus on the declining trends, we focus our attention on long differences in the actual and counterfactual flows on a peak-to-peak basis. Specifically, we focus on the long difference in the flows from

---

[9] We thank Teresa Fort for the development of a methodology that reclassifies all establishments in the LBD to a consistent NAICS (2002) industry classification system. See Fort (2013) for details. Having a consistent classification system for our entire panel is critical for our analysis. We note that that these consistent NAICS codes have not yet been incorporated into the BDS, so our illustrative analysis of sectoral composition shifts in Figure 5 is on an SIC basis. But as noted in footnote 7, the broad sector patterns are quite similar on a NAICS basis.

the peak in the late 1980s to the peak just before the Great Recession. To mitigate the influence of higher frequency variation, we consider the 3-year averages at each of these peaks. In particular, we use the 3-year average for the 1987-89 period and the 3-year average for the 2004-06 period.

How Much of the Decline is Accounted for by the Changing Composition of Businesses?

Figure 9 illustrates the percent in the decline of job flows explained by changes in composition for selected components and overall. The difference between the actual rate and the within component is the part that is explained by composition shifts. We first examine the impact of controlling for shifts in detailed industry, firm age, and firm size, one at a time by themselves, in order to examine their independent impact. Results for their combined full interaction with state and firm status are also provided. Recall that job creation, job destruction and job reallocation rates declined by 16 percent, 17 percent and 16 percent, respectively, from an average in the 1987-89 period of 18.9 percent, 16.1 percent and 34.9 percent, respectively.

How much of this decline can be explained by compositional shifts across detailed industries? As anticipated by Figures 5 and 6, shifts in detailed industry composition actually work in the wrong direction. If the changing industrial structure were the only influence on the secular trends in job creation, destruction and reallocation rates, we should have seen these rates rise, not fall, over time as employment shifted from manufacturing to retail and services. The job creation rate should have increased by about 20 percent, the job destruction rate by about 4 percent and the reallocation rate by about 13 percent if the only effect operating was the shift in industrial composition.

In contrast, the shifting age composition plays a major role in accounting for the declining pace of business dynamics. The shifting age composition accounts for 32 percent of the observed decline in job creation, 20 percent of the decline in job destruction, and 26 percent of the decline in job reallocation. The change in the firm age composition is by far the most important of any of the individual factors we examine in accounting for the overall declines. The implication is that understanding the sources of

14

the declines in the pace of entrepreneurship is critically important for understanding the decline in business dynamism.

The shift in economic activity toward large firms has similar but more muted effects. The explanatory power for this composition effect alone is about 10 percent for job creation, job destruction and job reallocation. In interpreting the effects of size, it is important to remember that business size and business age are correlated. Young businesses are small, as documented in Haltiwanger, Jarmin and Miranda (2013). However, there are many older, small businesses so it is important to distinguish between those characteristics. Fort, et al. (2012) show that the decline in the share of employment by young businesses (who are also small businesses) shows up in increased shares of older business, both large and older. As such, there is less of a noticeable trend in the share of activity by business size as opposed to business age. In addition, Haltiwanger, Jarmin and Miranda (2013) show the high pace of job creation of small businesses is actually mostly captured by business age. So all in all it is not that surprising that size contributes less than business age.

In unreported results, we have also quantified the independent contribution of geographic shifts and shifts away from single establishment firms. Similar to our findings for industry, the shifting geographic distribution also goes the wrong way but with smaller overall effects. The shift towards multiple establishment firms works in the same direction as age and size but with a substantially smaller contribution. For example, the shift toward multi-unit establishment firms accounts for 5 percent of the decline in job creation, 2 percent of the decline in job destruction and 3 percent of the decline in job reallocation.

It is apparent that there are offsetting composition effects, with shifts towards less volatile older, larger and multi-unit establishment firms working one way and shifts toward the service and retail sectors as well as the shifts towards activity in the south and west working in the opposite direction. The two most important individual factors are firm age and industry – and they are working in opposite directions. In considering all of these effects simultaneously, additional considerations become important as well. As we show in the next sub-section, while there has been a shift towards services and retail these are sectors where the decline in the share employment of young firms has been the

largest. Figure 9 shows that the fully saturated compositional exercise accounts for about 15 percent of the respective decline in job creation, job destruction and job reallocation.

Taking stock, compositional shifts can account for part of the decline in job flows, but most of the decline remains unaccounted for by these factors. Even though only 15 percent of the decline in business volatility is accounted for by all compositional effects taken into account simultaneously, this relatively small combined effect masks substantial individual composition effects working in opposite directions. Shifts toward older firms account for about 26 percent of the decline in business volatility (as measured by the decline in reallocation) by itself, but this is offset by the 13 percent increase in volatility due to the shift towards more volatile industries.

Looking Deeper – Patterns for Specific Sectors and States

Having examined the impact of compositional shifts on economy-wide job flows, it is useful to examine specific sectors in more detail. Figure 10 illustrates the secular decline in the reallocation rate by NAICS sector.[10] As before, the difference between the actual rate and the within component is the component of the decline that is accounted for by changes in composition. There is wide variation in the decline across sectors. As a reference we plot the 5.8 percentage point decline in the economy-wide reallocation rate. Businesses in the construction, mining, retail, wholesale, and services sectors on average have experienced relatively large declines. Recall that Figure 6 showed that most of these were high-flow sectors. By contrast, businesses in the transportation-communication-utilities, manufacturing, finance, and information sectors have experienced relatively small declines. In this respect, we have observed some convergence in flows across sectors, with the high flow sectors experiencing the largest declines. The impact of compositional shifts also differs across sectors. The effects are relatively important in retail, wholesale, and services, where we account for 25.2 percent,

---

[10] For the sake of brevity, we focus on the long difference for job reallocation only in this section. In unreported results, we show the patterns for job creation and destruction are similar to those we discuss in this section.

24.5 percent, and 26.9 percent respectively; but less so in manufacturing, finance, and the information sectors, where we account for hardly anything.[11]

What accounts for these differences? Figures 11 and 12 help answer this question. We focus on the three sectors that account for most of the activity: retail, services and manufacturing. Figure 11 illustrates shifts in the share of employment for young firms for each sector.[12] The share of employment accounted for by young firms differs considerably across sectors. This is consistent with well-known findings that entry rates are much higher in the retail and service sectors, reflecting many factors such as lower minimum efficient scales and entry barriers. In all three sectors, there is a pronounced shift in activity away from young firms over the period. Declines, however, are significantly larger in retail and services, each experiencing a 6.6 and 8.9 percentage point decline respectively relative to a 2.8 percentage point decline in manufacturing. These compositional shifts help explain why we can account for a relatively large share of the decline in retail and services relative to manufacturing. Returning to the counterfactual exercises, we note that age effects account for 40 percent of the decline in job reallocation in services and more than 30 percent of the decline in retail trade. Apparently, it has become less advantageous to be an entrant in these sectors, and this has contributed substantially to the declines in the pace of business dynamics in these sectors.

Figure 12 illustrates shifts in the composition of detailed industries within these broad sectors. Each panel shows the initial reallocation rate plotted against the change in the shares for each 4-digit NAICS industry in each sector. Note that in all cases, even within these sectors there has been a shift in activity away from lower-flow industries to higher-flow industries. For example, in the retail sector there has been considerable growth in the share of Miscellaneous Retail Stores, Limited Service Eating Places, and Electronics and Appliance Stores. These are relatively high-reallocation industries. By contrast, there has been a decline in the share of Grocery Stores and General Department Stores. These are relatively low-reallocation industries. In services, there has been tremendous growth in the Employment Services industry, Computer Systems Design, and

---

[11] Note that in the case of the information sector, compositional shifts should have increased the flows resulting in a higher unexplained within component.

[12] Figure 11 is on a broad sector NAICS basis (see footnote 7 for details). We have also (in unreported results) examined the patterns of Figure 11 on an SIC basis and they are very similar.

Home Health Care Services – all relatively high-reallocation industries, and declines in General Medical and Surgical Hospitals and Psychiatric and Substance Abuse Hospitals – relatively low-reallocation industries. For both retail and services, these shifts toward high-reallocation industries work toward diluting the impact of the aging population of business on job flows. Put differently, were it not for these shifts, the reallocation rates in these sectors would have decreased considerably more.[13] This is especially true in services where the counterfactual decomposition exercise shows that services job reallocation should have risen by 28 percent due to detailed industry composition effects within the services sector, if this was the only composition effect operating (results not shown).

The patterns by broad sector do not provide explanations for the decline in business dynamism *per se*, but they do provide information about where to look. There are especially large reductions in large and growing sectors such as services and retail trade. Those sectors had especially large declines in the share of young firms – although, again, such effects leave much of the within-sector declines unaccounted for. These sectors also had detailed industry shifts within the broad sectors that worked in the opposite direction – especially for the services sector. This implies that not only did services have a very large overall decline in the share of young firms but also important compositional changes within services that increase the contribution of the within "unexplained" factors occurred.

Figures 13 and 14 explore analogous shifts across states. Figure 13 shows the decline in job reallocation rates across states along with the within component of the decline. There are substantial differences across states in the pace of decline. The largest decline is for Alaska, with a 19 percentage point decline in reallocation, and the smallest decline is for Michigan, with a 3 percentage point decline. No obvious pattern emerges although states in the east and the midwest in general experience smaller declines. These are also states with lower average reallocation rates. By contrast, states in the west and south west experience greater declines. These are states with above-average reallocation rates. Figure 14 shows the changing share of young firms for selected large states. In all

---

[13] This can also be seen in the slopes of the simple regression lines in each panel. The within-industry composition effects are especially working toward shifting resources to higher reallocation industries within the service sector.

of these large states, there is substantial decline in the share of employment accounted for by young firms. The declines are the largest in the states with the largest initial shares, so we have observed some convergence in the share of employment accounted for by young firms across states. Like the evidence for industries, Figures 13 and 14 do not provide explanations but do provide information about where to look.

VI. Summary and Conclusions

Business dynamism, as measured by the pace of job creation, job destruction and/or job reallocation, has exhibited a pronounced secular decline in the U.S. The most important factor that we have identified that helps to account for this decline is the decline in the pace of entrepreneurship and the accompanying decline in the share of young firms. Young firms have the highest pace of both job creation and job destruction in the U.S. The large decline in the share of economic activity by young firms accounts for a substantial share of the overall trend decline in the pace of job reallocation. Changes in the age composition of U.S. business activity accounts for about 26 percent of the overall decline in the pace of job reallocation. In some sectors such as services, it accounts for over 40 percent of the decline in the pace of job reallocation. We do not have an explanation for the decline in the pace of entrepreneurship, but it is apparent that this is one of the primary contributing factors in accounting for the decline in the pace of business dynamics.

Shifts in the industrial composition of U.S. economic activity work in the opposite direction of the change in the age composition. As is well known, U.S. economic activity has shifted away from manufacturing (a sector with low reallocation) to sectors such as services and retail trade (which are high reallocation sectors). If these were the only effects operating, our analysis implies that the pace of business dynamics should have risen significantly rather than fallen.

But differences across sectors play more than just a compositional role. The largest declines in the pace of business dynamics have been in sectors like retail trade and services. These are also the sectors with the largest declines in the share of economic

activity accounted for by young firms. Thus, while there have been shifts toward high reallocation sectors, these sectors have also exhibited the largest declines.

The large declines in business dynamics in sectors like services and retail trade that are accompanied by large declines in the share of young firms point towards explanations based on changes in the nature of business activity in those industries. There have been numerous studies of retail trade, in particular, highlighting the importance of the shift to large, national and multi-national firms. Moreover, some evidence has shown that information technology has been especially beneficial to large, national chains in retail and services that depend upon distribution and communication. But we note that even in those sectors, we cannot account for most of the decline by taking into account simultaneously the interaction of firm age, firm size, detailed industry, geographic location and indicators of the firm operating in multiple locations. Ultimately, most of the decline in these sectors is in the "unexplained" within component. There are apparently changes in the conditions facing businesses in these sectors that cannot be accounted for by the joint contribution of firm age, firm size, detailed industry, geography and multiple location status.

Our analysis highlights several places to look for explanations for the trend decline in business dynamics. Primary among them is accounting for the declining pace of entrepreneurship. Another is to account for the especially large declines in key sectors like services and retail as well as in certain geographic areas since the pace of the decline tends to be greater in the southwest and west.

Understanding the sources of the decline is potentially of critical importance for the long-term prospects of U.S. job and productivity growth. The U.S. economy has long been viewed as amongst the most entrepreneurial, dynamic and flexible economies. Analysts and policymakers have often urged the rest of the world to adopt market structure and institutions like the U.S. with the hope that this will encourage entrepreneurship with accompanying dynamism and flexibility. In the U.S., this historically high pace of entrepreneurship and accompanying dynamism has seemingly paid off since the evidence shows that the high pace of reallocation has been productivity enhancing. Moreover, this dynamism and flexibility has in a complementary manner enabled the U.S. to adapt to changing economic circumstances and recover from

recessions in a robust manner in the past. What is driving the decline in the dynamism in the U.S. and, in turn, whether this decline is having or will have adverse consequences are open questions.

References

Becker, Randy A., John Haltiwanger, Ron S. Jarmin, Shawn D. Klimek, and Daniel J. Wilson. 2006. "Micro and Macro Data Integration: The Case of Capital." Chap. 12 in *Studies in Income and Wealth* edited by Dale W. Jorgenson, J. Steven Landefeld, and William D. Nordhaus, vol. 66, *A New Architecture for the U.S. National Accounts,* pp. 541-609. Chicago, IL: National Bureau of Economic Research, University of Chicago Press.

Caballero, Ricardo. 2006. *The Macroeconomics of Specificity and Restructuring.* Cambridge, MA: The MIT Press.

Choi, Eleonor J. and James R. Spletzer. 2012. "The Declining Average Size of Establishments: Evidence and Explanations." *Monthly Labor Review*, March, 50-65.

Comin, Diego A. and Thomas Philippon. 2005. "The Rise in Firm-Level Volatility: Causes and Consequences." Chap. 3 in *NBER Macroeconomics Annual 2005* edited by Mark Gertler and Kenneth Rogoff, vol. 20, pp. 167-228. Cambridge, MA: National Bureau of Economic Research, MIT Press.

Davis, Steven J., R. Jason Faberman, and John Haltiwanger. 2012. "Labor Market Flows in the Cross Section and Over Time." *Journal of Monetary Economics* 59(1): 1-18.

Davis, Steven J., R. Jason Faberman, John Haltiwanger, Ron Jarmin, and Javier Miranda. 2010. "Business Volatility, Job Destruction, and Unemployment." *American Economic Journal: Macroeconomics*, 2(2): 259-87.

Davis, Steven J. and John Haltiwanger. 1999. "Gross Job Flows." Chap. 41 in *Handbook of Labor Economics* edited by Orley C. Ashenfelter and David Card, vol. 3C, pp. 2711-2805. Amsterdam, The Netherlands: Elsevier.

Davis, Steven J., John Haltiwanger, Ron Jarmin, and Javier Miranda. 2007. "Volatility and Dispersion in Business Growth Rates: Publicly Traded versus Privately Held Firms." Chap. 2 in *NBER Macroeconomics Annual 2006* edited by Daron Acemoglu, Kenneth Rogoff, and Michael Woodford, vol. 21, pp. 107-80. Cambridge, MA: MIT Press.

Davis, Steven J., John C. Haltiwanger, and Scott Schuh. 1996. *Job Creation and Destruction.* Cambridge, MA: MIT Press.

Doms, Mark, Ron S. Jarmin, and Shawn Klimek. 2004. "Information Technology Investment and Firm Performance in US Retail Trade." *Economics of Innovation and New Technology* 13(7) 595-613.

Dunne, Timothy, Mark Roberts, and Larry Samuelson. 1989. "Plant Turnover and Gross Employment Flows in the U.S. Manufacturing Sector." *Journal of Labor Economics* 7(1): 48-71.

Foster, Lucia, John Haltiwanger, and C.J. Krizan. 2001. "Aggregate Productivity Growth: Lessons from Microeconomic Evidence." Chap. 8 in *Studies in Income and Wealth* edited by Charles R. Hulten, Edwin R. Dean, and Michael J. Harper, vol. 63, *New Developments in Productivity Analysis*, pp. 303-372. Chicago, IL: National Bureau of Economic Research, University of Chicago Press.

Foster, Lucia, John Haltiwanger, and C.J. Krizan. 2006. "Market Selection, Reallocation and Restructuring in the U.S. Retail Trade Sector in the 1990s." *The Review of Economics and Statistics* 88(4): 748-58.

Fort, Teresa. 2013. "NAICS 2002 Code Assignments to the Longitudinal Business Database." Mimeo, Center for Economic Studies.

Fort, Teresa, John Haltiwanger, Ron S. Jarmin, and Javier Miranda. 2013. "How Firms Respond to Business Cycles: The Role of the Firm Age and Firm Size." Paper presented at the 13th Jaques Polak Annual Research Conference, International Monetary Fund, Washington, D.C.

Haltiwanger, John, Jarmin, Ron, and Javier Miranda. 2009. "Business Dynamics Statistics: An Overview." Kauffman Foundation: Other Research. At http://www.kauffman.org/uploadedFiles/BDS_handout_011209.pdf.

Haltiwanger, John, Ron Jarmin, and Javier Miranda. 2011. "Historically Large Decline in Job Creation from Startups and Existing Firms in the 2008-09 Recession." Business Dynamics Statistics Briefing No. 5, The Kauffman Foundation.

Haltiwanger, John, Ron Jarmin, and Javier Miranda. 2012. "Where Have All the Young Firms Gone?" Business Dynamics Statistics Briefing No. 6, The Kauffman Foundation.

Haltiwanger, John, Ron S. Jarmin, and Javier Miranda. 2013. Forthcoming. "Who Creates Jobs? Small vs. Large vs. Young." *Review of Economics and Statistics*.

Hopenhayn, Hugo and Richard Rogerson. 1993. "Job Turnover and Policy Evaluation: A General Equilibrium Analysis." *Journal of Political Economy* 101(5): 915-38.

Hyatt, Henry R. and James Spletzer. 2013. "The Recent Decline in Employment

        Dynamics." CES Working Paper no. 13-03. Washington, D.C.: Center for

        Economic Studies, U.S. Census Bureau.

Jarmin, Ron S., Shawn Klimek, and Javier Miranda. 2005. "The Role of Retail Chains:

        National, Regional and Industry Results." CES Working Paper no. 05-30.

        Washington, D.C.: Center for Economic Studies, U.S. Census Bureau.

Jarmin, Ron S., and Javier Miranda. 2002. "The Longitudinal Business Database." CES

        Working Paper no. 02-17. Washington, D.C.: Center for Economic Studies, U.S.

        Census Bureau.

Kinney, Saki, Jerry Reiter, Arnold Reznek, Javier Miranda, Ron Jarmin, and John

        Abowd. 2011. "Towards Unrestricted Public Use Business Microdata: The

        Synthetic Longitudinal Business Database." *International Statistical Review*

        79(3): 362-84.

Lazear, Edward and James Spletzer. 2012. "Hiring, Churn and the Business Cycle."

        American Economic Review: Papers and Proceedings 102(3): 575-79.

Reedy, E.J. and Robert E. Litan. 2011. "Starting Smaller; Staying Smaller: America's

        Slow Leak in Job Creation." Kauffman Foundation Research Series: Firm

        Foundation and Economic Growth. At http://www.kauffman.org/research-and-

        policy/starting-smaller-staying-smaller-americas-slow-leak-in-job-creation.aspx.

Syverson, Chad. 2011. "What Determines Productivity?" *Journal of Economic Literature*

        49(2): 326-65.

Figure 1: Annual job creation and destruction rates, 1980-2011
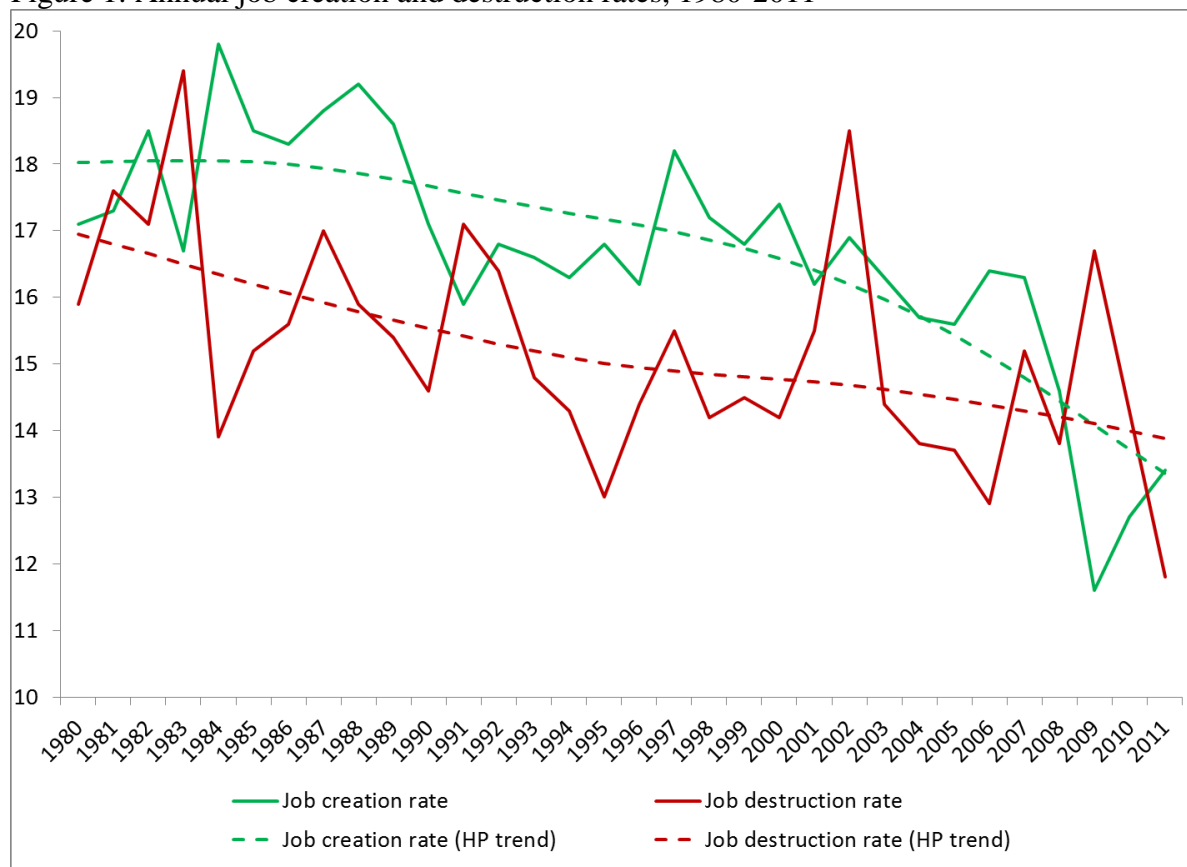
Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Filter is Hodrick-Prescott with multiplier 400. Vertical axis does not begin at zero.

Figure 2: Annual startup rate and average startup size, 1980-2011
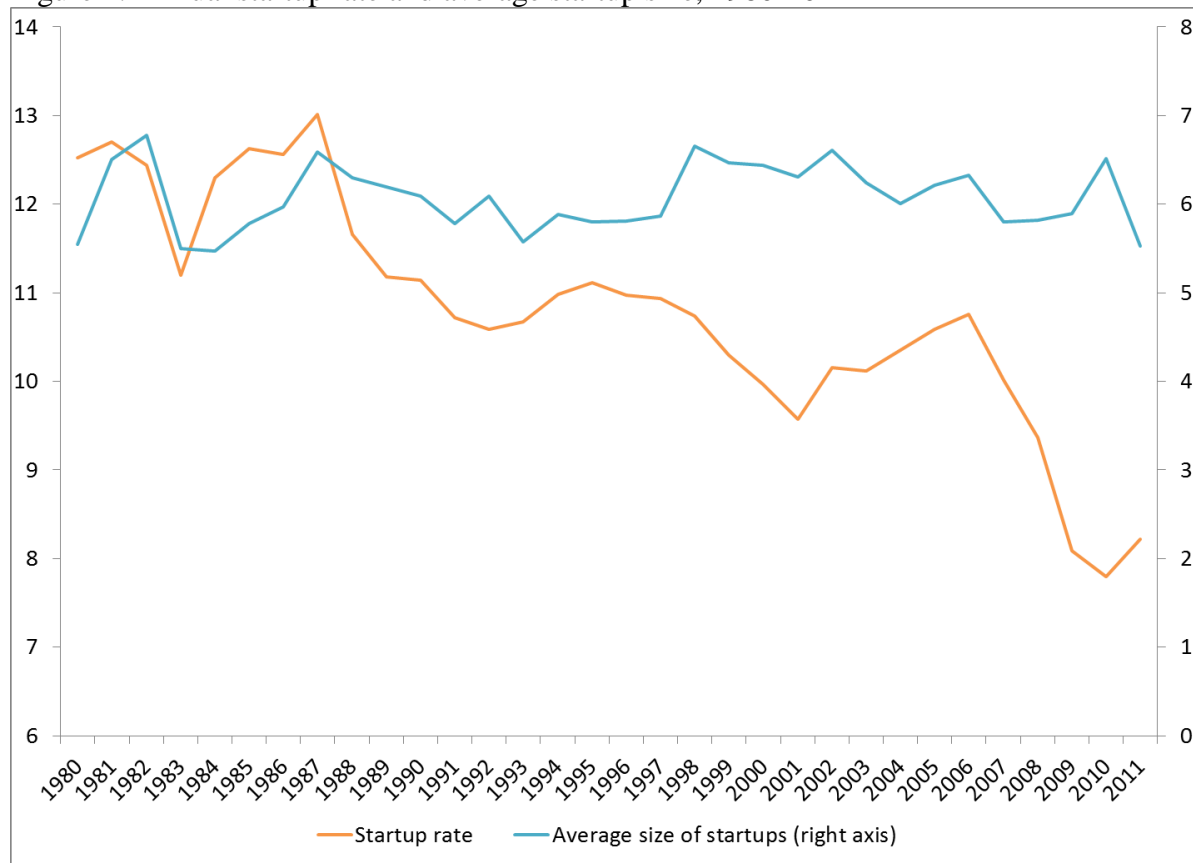
Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Left vertical axis does not begin at zero.

Figure 3: Declining share of activity from young firms (firm age five or less)
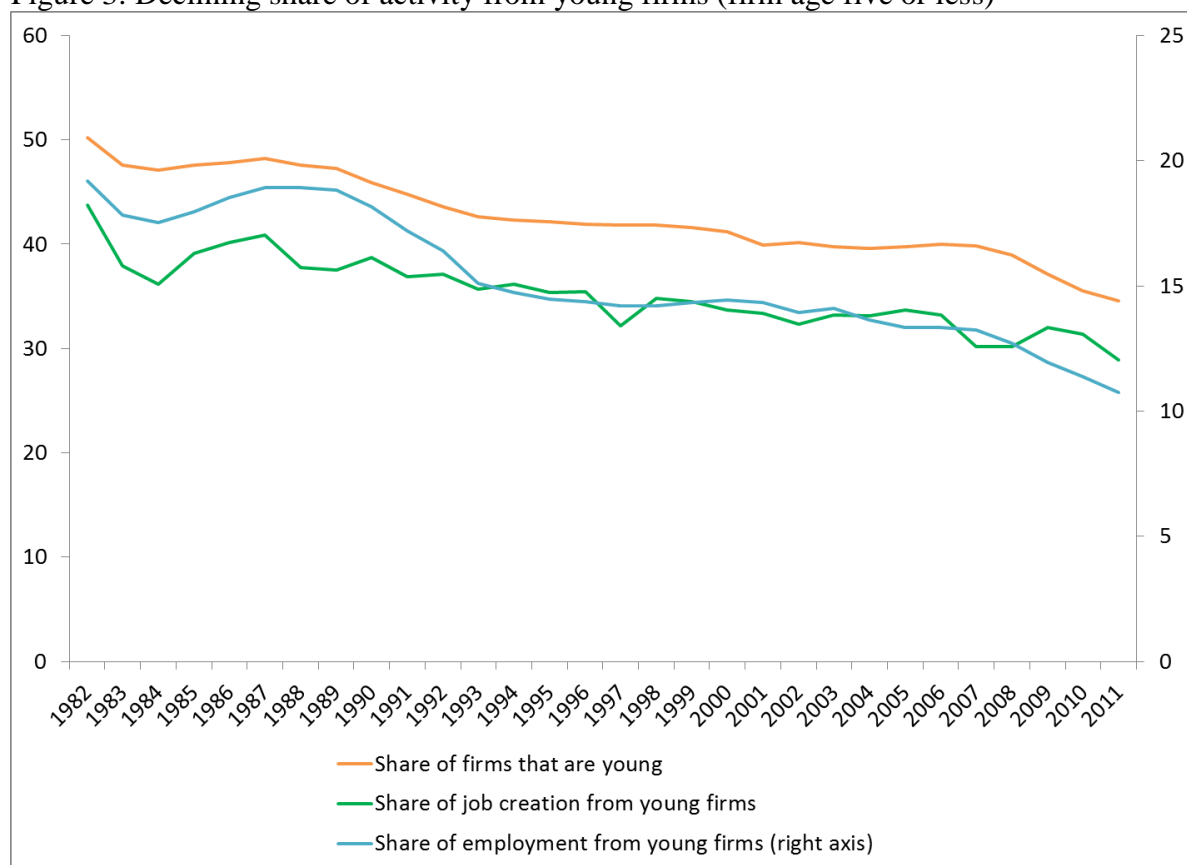
Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Employment shares in each period based on the average of employment in period t-1 and t (the denominator of the DHS growth rate).

Figure 4: Average flows by firm age, 1982-2011
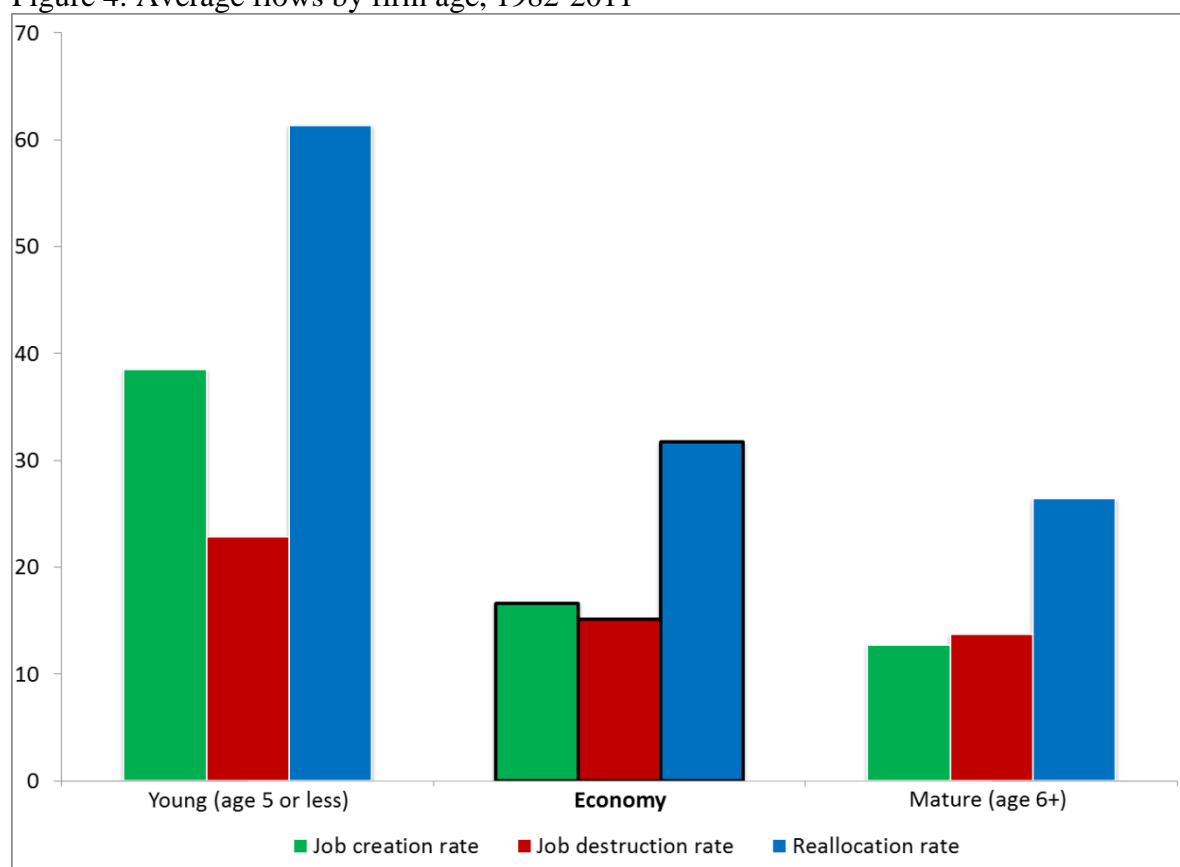
Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics.

Figure 5: Sector share of employment, 1980-2011
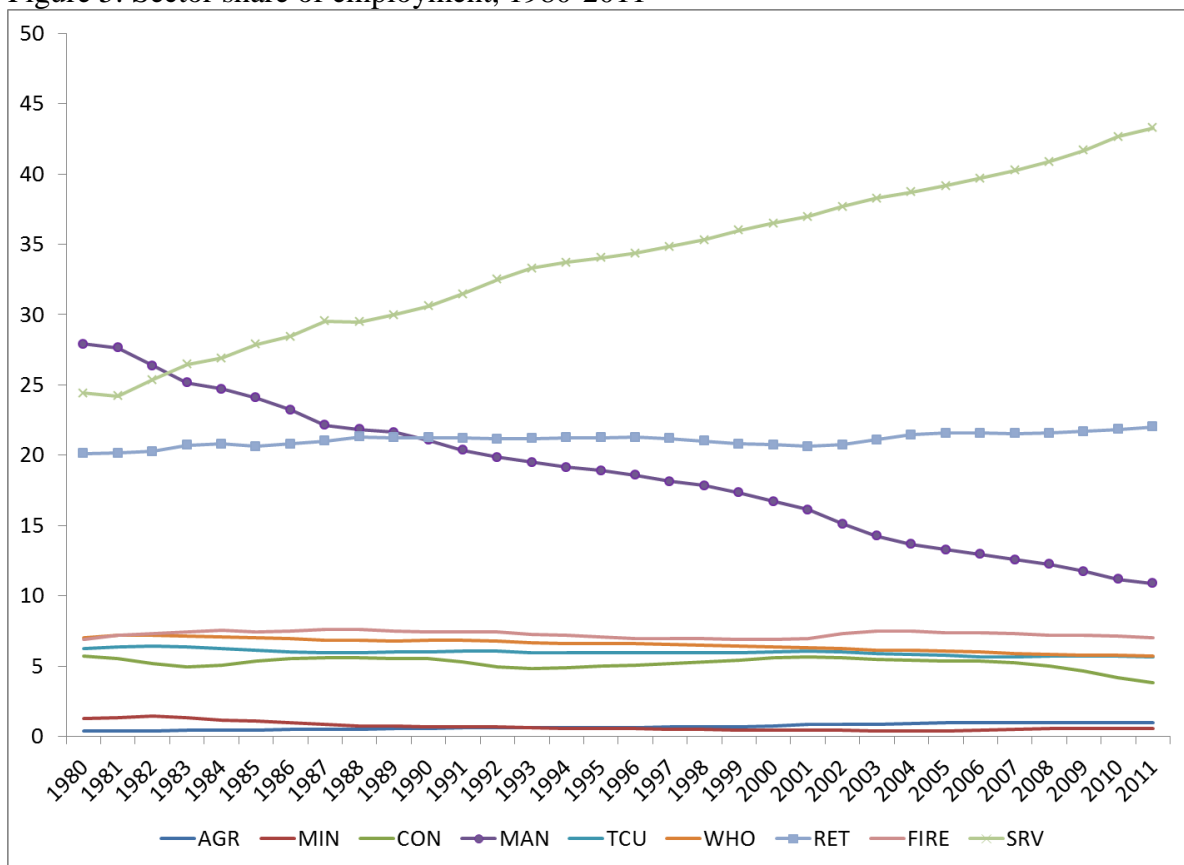
Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Broad sectors are on SIC basis. AGR= Agricultural Services, MIN=Mining, CON=Construction, MAN=Manufacturing, TCU=Transportation, Communication and Utilities, WHO=Wholesale Trade, RET=Retail Trade, FIRE = Finance, Insurance and Real Estate, and SRV=Services.

Figure 6: Average job flows by sector, 1980-2011
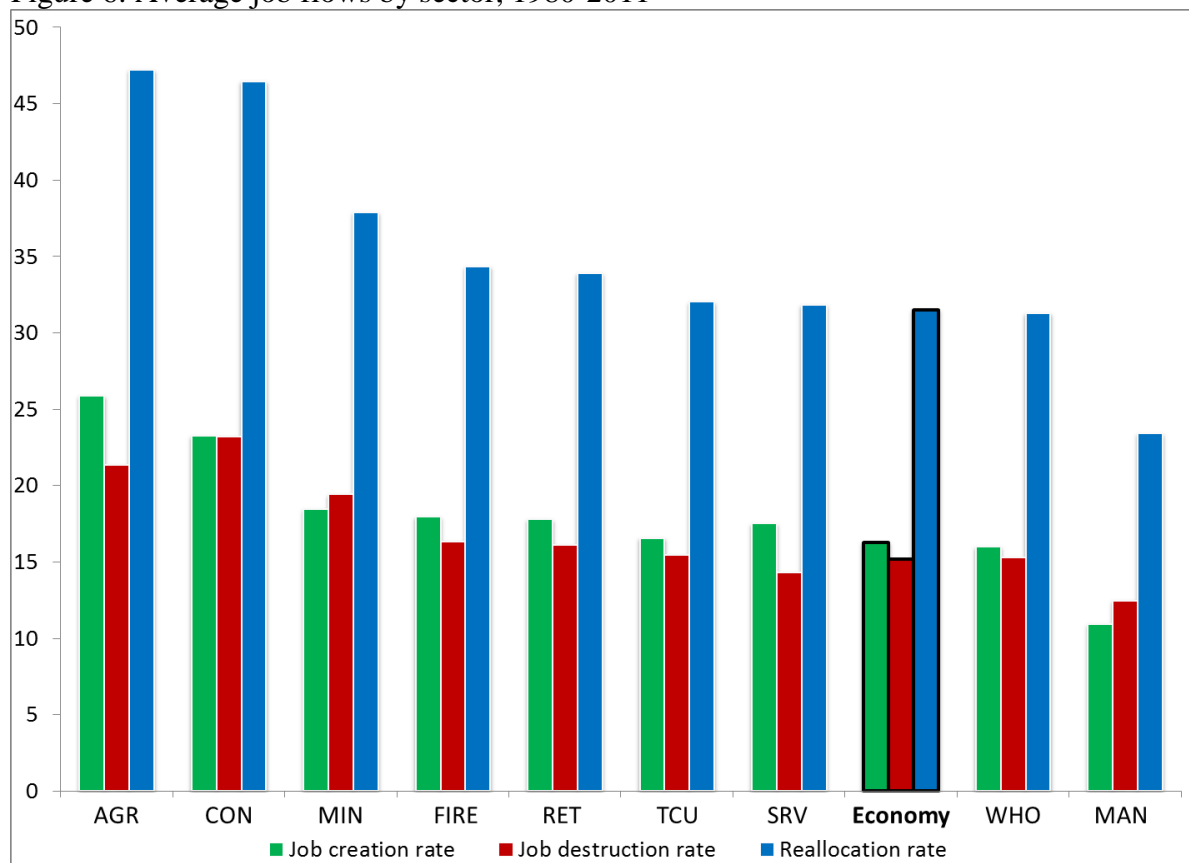
Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Sector definitions from SIC. See notes from Figure 5 for details on sectoral abbreviations.

Figure 7: State share of total employment, selected states, 1980-2011
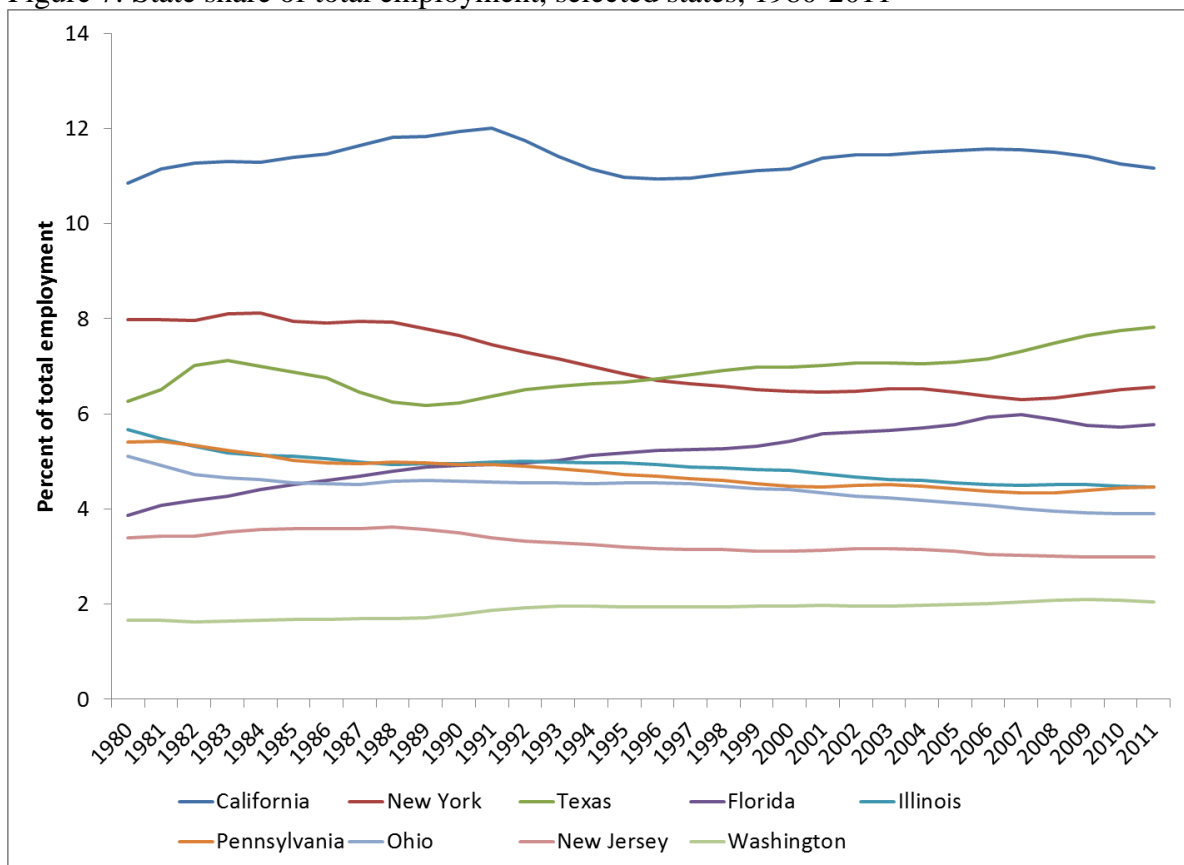
Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Employment shares in each period based on the average of employment in period t-1 and t (the denominator of the DHS growth rate).

Figure 8: Average job flows by state, 1980-2011
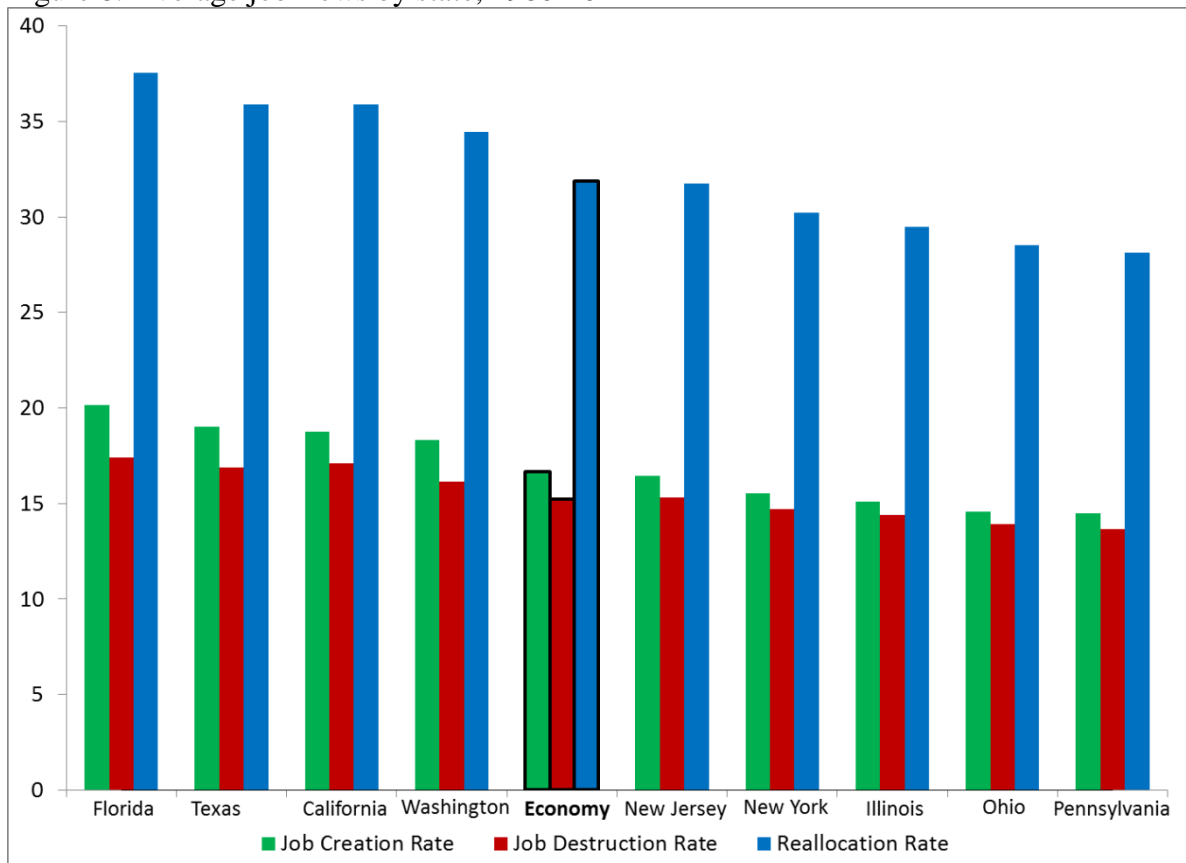
Note: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics.

Figure 9: Percent of decline in job flows from 1987/89 to 2004/06 (averages) accounted for by composition effects
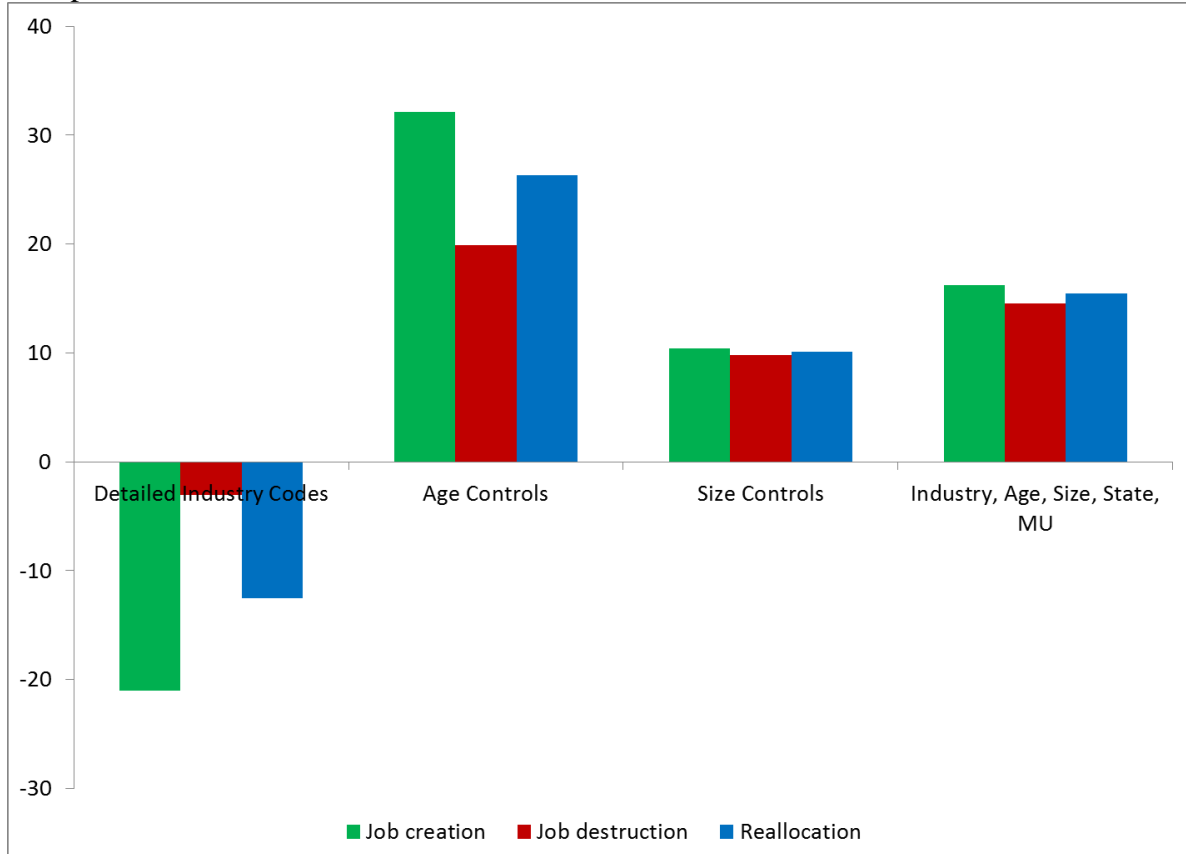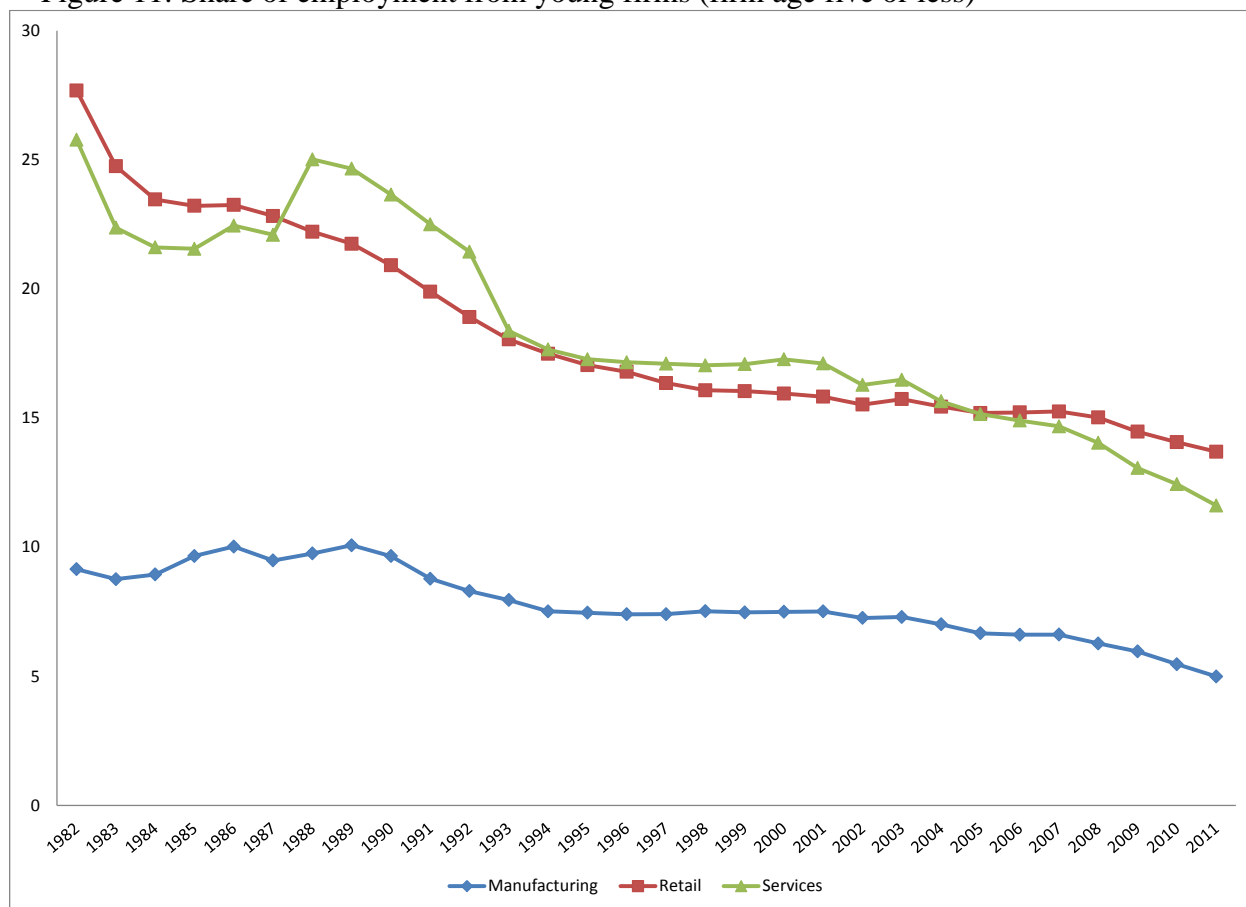

Notes: Author calculations from the U.S. Census Bureau's Longitudinal Business Database. See text for details of the decomposition used to generate these calculations.

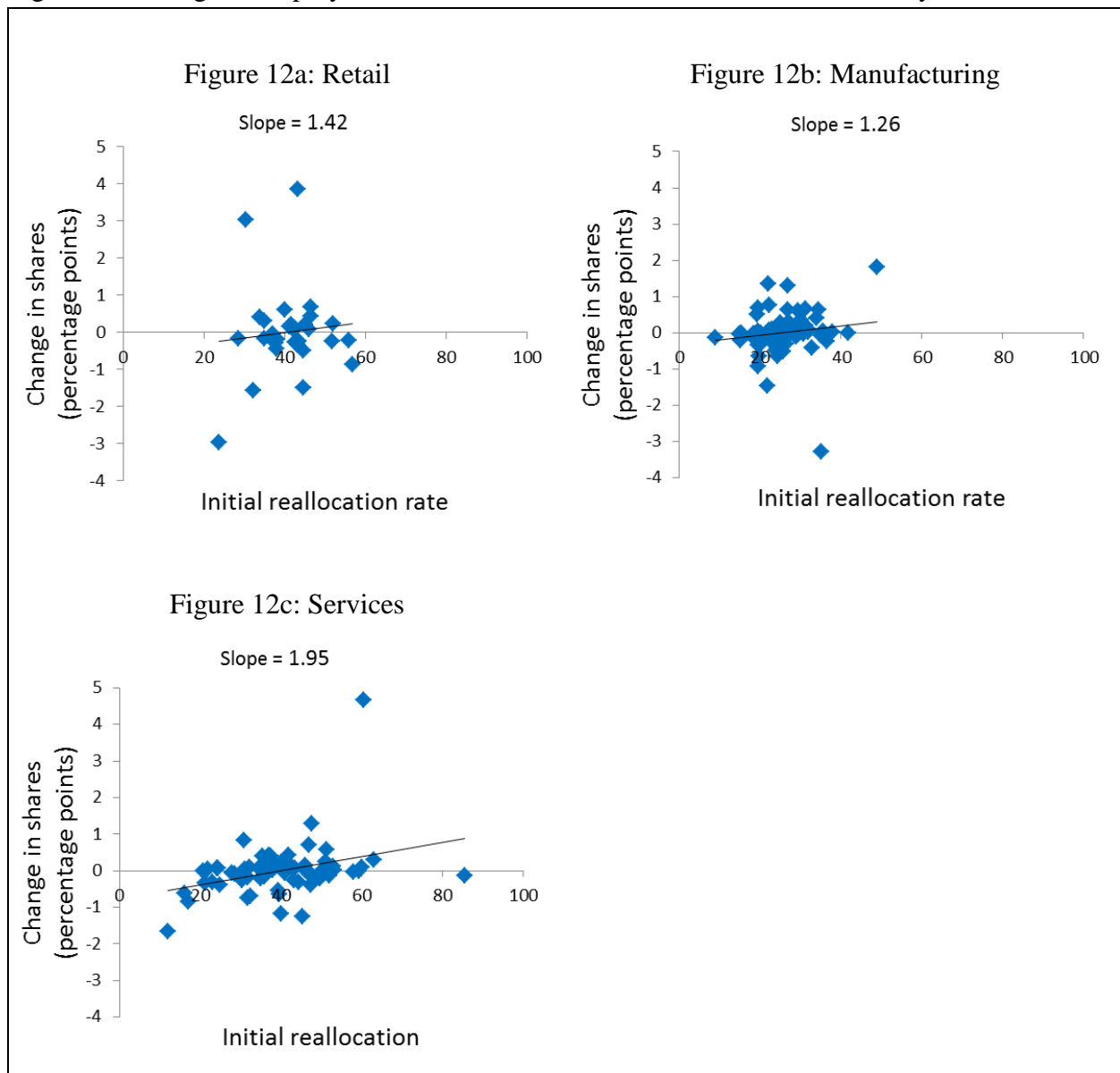Figure 10: Change in reallocation rate and within reallocation rate, 1987/09-2004/06
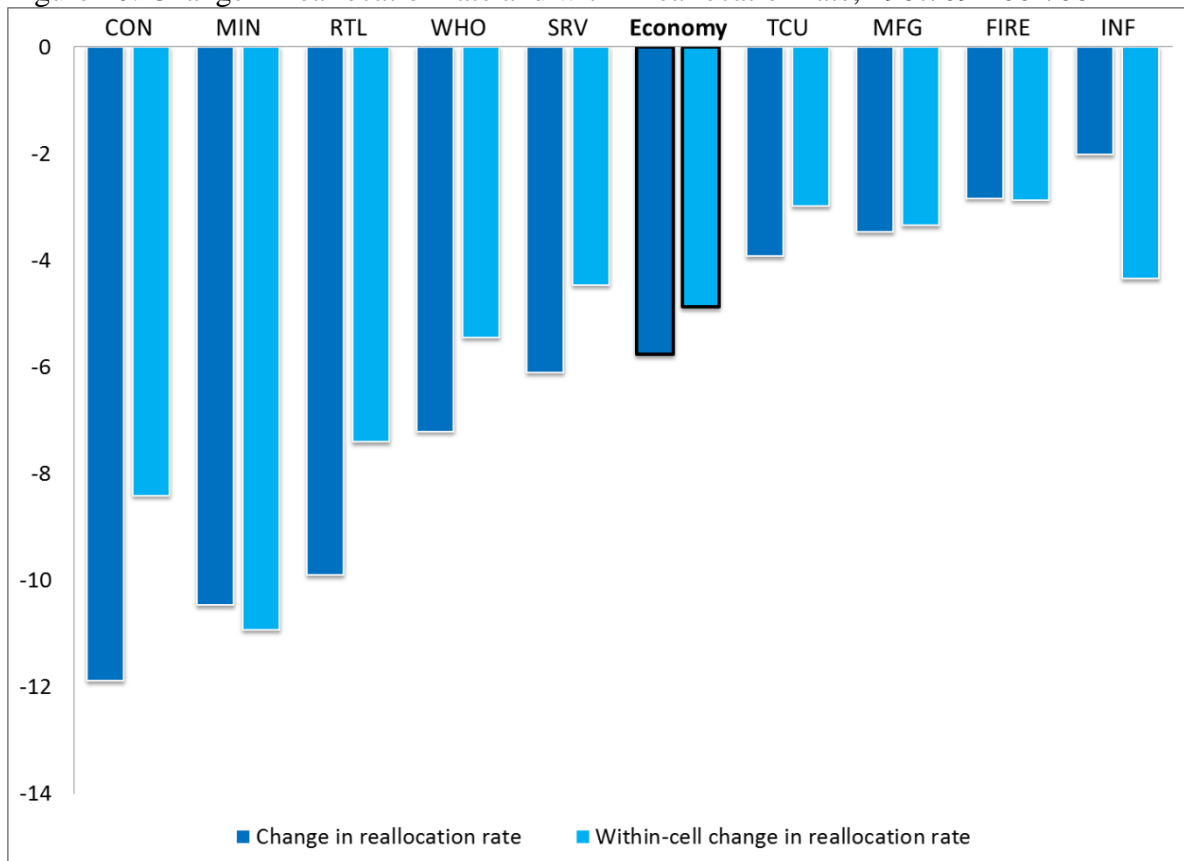
Notes: Author calculations from the U.S. Census Bureau's Longitudinal Business Database. Sector definitions use consistent NAICS definitions. See text for details of the decomposition used to generate the within cell change. The within cell change is based on controlling for 4-digit NAICS, firm age, firm size, state and multi-unit status in a fully interacted manner.

Figure 11: Share of employment from young firms (firm age five or less)
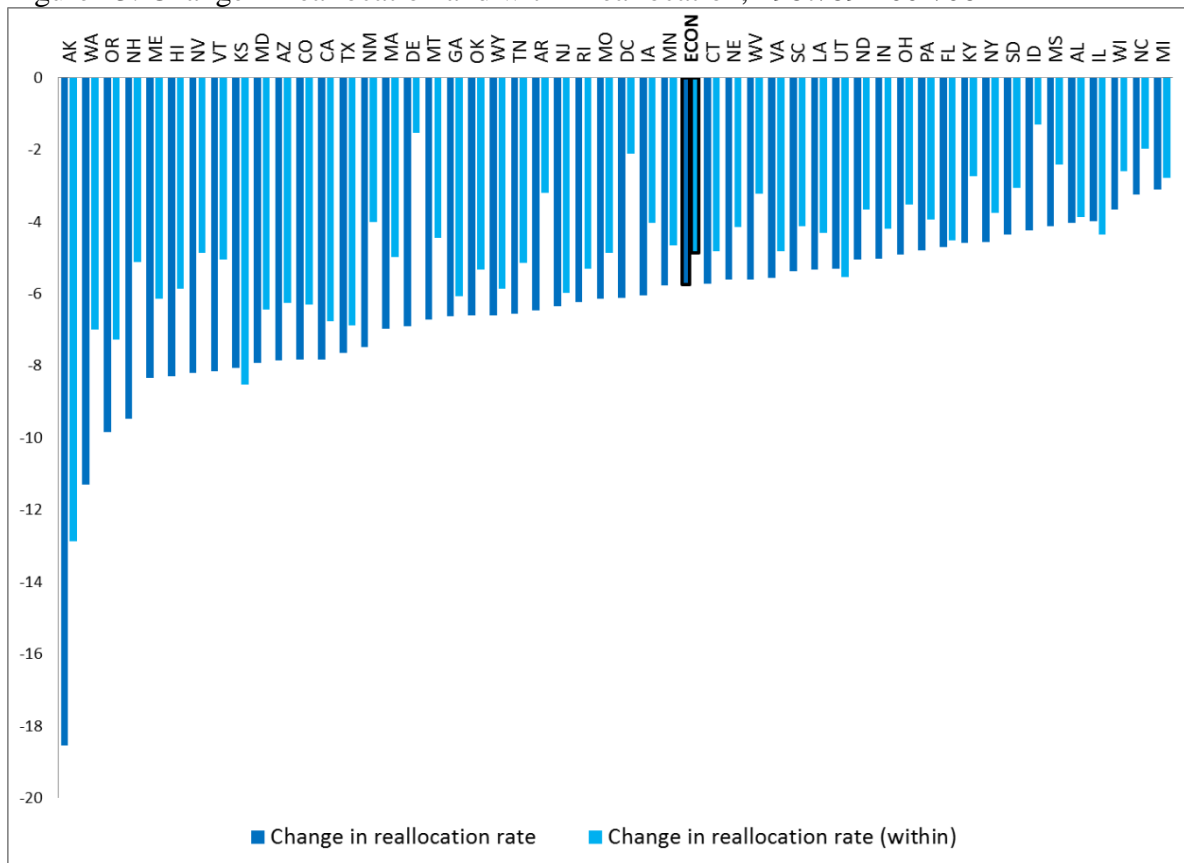

Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Sector definitions are on a NAICS. Employment shares in each period based on the average of employment in period t-1 and t (the denominator of the DHS growth rate).

Figure 12: Change in employment shares vs. initial reallocation, 87/89-04/06, by sector

Figure 12a: Retail

Slope = 1.42

Figure 12b: Manufacturing

Slope = 1.26

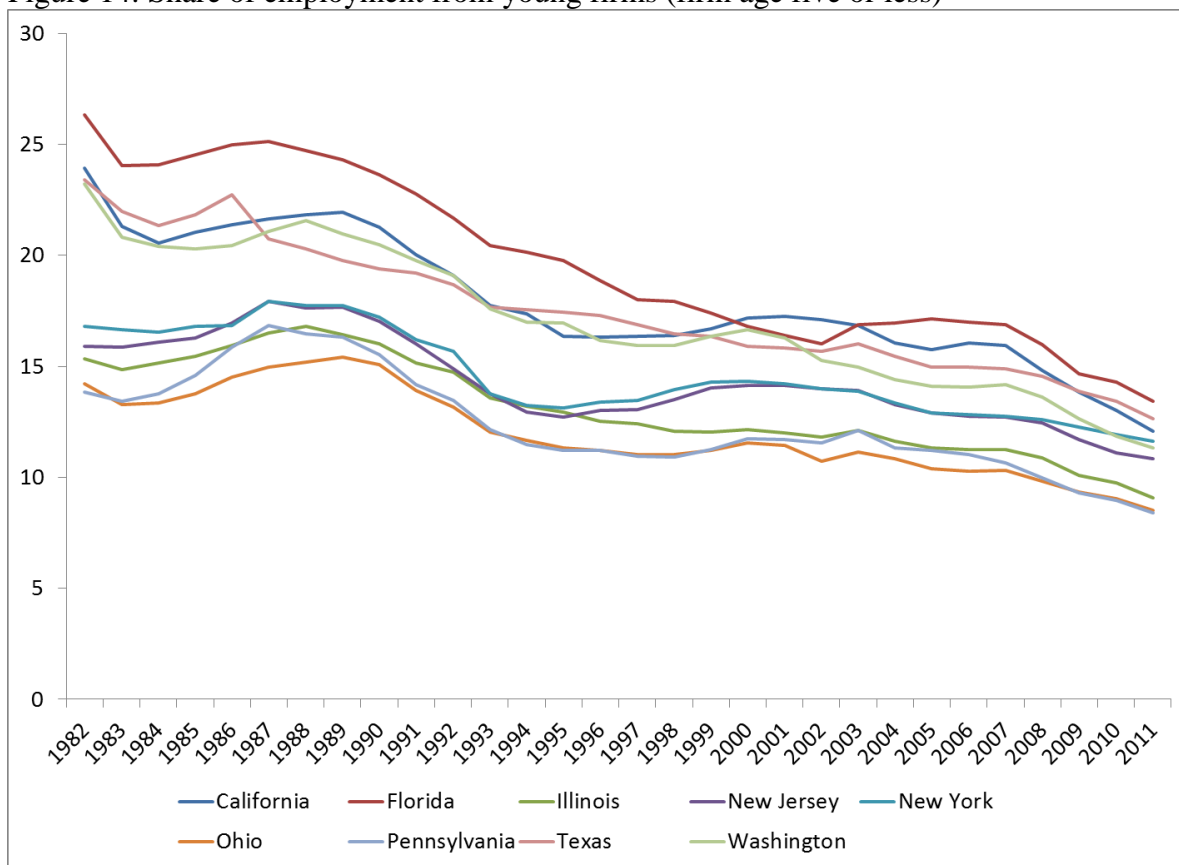Figure 12c: Services

Slope = 1.95

Notes: Author calculations from the U.S. Census Bureau's Longitudinal Business Database. 4-digit industry definitions on a consistent NAICS basis. Sector definitions also on a NAICS broad sector basis. Employment shares in each period based on the average of employment in period t-1 and t (the denominator of the DHS growth rate).

Figure 13: Change in reallocation and within reallocation, 1987/89-2004/06

Notes: Author calculations from the U.S. Census Bureau's Longitudinal Business Database. See text for details of the decomposition used to generate the calculations of within. The within cell change is based on controlling for 4-digit NAICS, firm age, firm size, and multi-unit status in a fully interacted manner.

Figure 14: Share of employment from young firms (firm age five or less)

Notes: Author calculations from the U.S. Census Bureau's Business Dynamics Statistics. Employment shares in each period based on the average of employment in period t-1 and t (the denominator of the DHS growth rate).