

Job Creation and Firm Dynamics in the U.S.\*

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March 2011

\* Without implication, this paper draws heavily on joint work with Steven Davis, Lucia Foster, Ron Jarmin, C.J. Krizan and Javier Miranda. I thank Lucia Foster, Josh Lerner and Scott Stern for comments on an earlier draft. The Kauffman Foundation provided core funding for the data infrastructure development in longitudinal business databases as well as provided support for many of these papers. I also thank the U.S. Census Bureau for its support of the data infrastructure and research that underlies the papers on which the current paper is based. The papers on which this paper are based have undergone a more limited review than official Census Bureau publications. The views, findings, and opinions expressed in this work are those of the authors and not the U.S. Census Bureau. All results have been reviewed to ensure confidentiality.

“The fundamental impulse that keeps the capital engine in motion comes from the new consumers’ goods, the new methods of production and transportation, the new markets... [The process] incessantly revolutionizes from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact of capitalism.”

– Joseph Schumpeter

## **I. Introduction**

The recent economic downturn and the relatively anemic recovery to date provokes much anxiety and concern among the public, the business sector, and the policy-making community. While there are signs of economic improvement, an open question is “what will be the nature of the recovery and the prospects for sustained growth?”. In this paper, the contribution of business dynamism to U.S. job creation and productivity growth is explored. A key part of this exploration is to uncover the role of business startups, young firms and small firms to job creation and productivity growth. After first providing an overview of these dynamics, I discuss whether the nature of these dynamics has changed over the last few decades, the possible sources of these changes and the potential implications for future U.S. economic performance.

The recent economic downturn has exhibited large increases in job destruction and layoffs; and the recovery has been slow in terms of hiring, job creation and investment. However, it is important to emphasize that some *churning* of firms and jobs are part of a healthy economy. It is inherent in any dynamic capitalist economy that some firms enter, thrive and grow, while others decline and sometimes exit. This paper summarizes recent economic research on the key role that this churning process plays in enhancing economy-wide productivity growth. The sorting of successful business

endeavors from unsuccessful ones is, in fact, a central and necessary part of our market economy, and it is essential that the public and policy makers understand this process.

The connection between the churning of businesses and jobs to productivity growth highlights the complex nature of economic growth. Developing new products and processes as well as adapting existing technologies to changing economic conditions involves substantial experimentation. Business startups and young businesses play an especially important role in these business dynamics. Understanding the nature of these business dynamics in general and the role of business startups in particular is of first order importance in understanding the sources of job creation and productivity growth in the U.S. and in understanding the vulnerabilities to such growth.

## **II. The Role of Entry and Exit in Churning?**

The churning of businesses and jobs is a ubiquitous feature of the U.S. private sector. Each year, millions of jobs are created as a result of growth in existing businesses and the creation of new businesses. At the same time, millions of jobs are destroyed each year as businesses contract or close. Figure 1 illustrates the magnitude of this phenomenon, displaying the average annual job creation and job destruction rates<sup>1</sup> at U.S. establishments between 1980 and 2009. The pace of creative destruction is on average very high. In any given year, about 17 percent of all jobs are from expanding or entering businesses. Moreover, about 15 percent of all jobs present the prior year have

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<sup>1</sup> See the appendix for definitions of terms. The source data for Figure 1 and much of the analysis in this paper is the Business Dynamic Statistics (BDS) available at [http://www.ces.census.gov/index.php/bds/bds\\_home](http://www.ces.census.gov/index.php/bds/bds_home). The figures in this paper take advantage on the latest release of the BDS through 2009. See Haltiwanger, Jarmin and Miranda (2011) for a brief of the nature of this release. This paper draws on the brief by Haltiwanger, Jarmin and Miranda in a number of places as well as earlier work by Haltiwanger, Jarmin and Miranda (2010)..

disappeared through contracting or exiting businesses. The chart also indicates the significant role played by firm and establishment entry and exit.

To understand the role of business entry and exit in this context, it is important to distinguish between firms and establishments. The latter is a single physical location where economic activity takes place. A firm is defined as the economic activity under common operational control. To make the distinction concrete, for a large national chain each store is an *establishment* while all the economic activity from all the stores from that chain (and distribution centers, headquarters, etc) constitutes the *firm*.

With these concepts in mind, Figure 1 shows that 18 percent of gross job creation is accounted for by new firms, 19 percent of gross job creation is accounted for by the opening of new establishments of existing firms and the remainder (63 percent) by the expansion of existing establishments. In terms of gross job destruction, 17 percent is accounted for by firm exit, 14 percent by the closing of establishments of existing firms and the remainder (68 percent) by the contraction of existing establishments.

Figure 1 thus shows that the ongoing restructuring and reallocation in the U.S. involves considerable opening and closing of establishments and firms. Such churning of firms and establishments is costly. The nature of such costs and the obstacles and challenges of opening establishments of existing firms and opening of new firms likely differ substantially – hence the importance of distinguishing between the two type of openings.

So why does the U.S. economy exhibit such a high pace of churning of firms, establishments and jobs? In healthy economic times, the churning of establishments, firms and jobs contributes substantially to productivity growth. That is, churning reflects

moving economic resources away from less productive to more productive establishments and firms. Moreover, as will also come apparent, the entry of new firms and the subsequent up or out dynamics of young firms contributes substantially to productivity growth.

Before turning to the contribution of churning to productivity growth, it is instructive to examine the role of young businesses in these dynamics more closely. This is explored in the next section.

### **III. Young Firms vs. Small Firms as Sources of Job Creation?**

Figure 1 shows that new firms are an important source of job creation. The conventional wisdom is that small businesses are the primary net creators of jobs. Are these two connected? The answer is they are closely connected as explored in depth by Haltiwanger, Jarmin and Miranda (2010) (hereafter HJM). HJM show that much of the conventional wisdom stems from the fact that business startups contribute much to job creation and business startups are small. In this section, I provide an overview of the findings from that earlier work.

Figure 2 shows the share of employment of startups by firm size class. A large fraction of employment by startups are in the very small firm categories. Thirty-eight percent of employment from startups are from firms that startup with less than 10 employees – and more than 70 percent of employment from startups are at firms that startup with less than 50 employees.

Figure 3 shows that there is some truth to the conventional wisdom in that small businesses have higher net growth rates than larger businesses. HJM (2010) show that this finding is sensitive to statistical issues such as regression to the mean. However, for

the current purposes, I focus on their findings about whether it is firm age or firm size that underlies the conventional wisdom. Figure 3 shows that once firm size has been controlled for statistically, there is no longer any systematic relationship between net growth and firm size. The main implication is that it is instructive to focus on startups and young businesses.

Figure 4 shows how job destruction and net employment growth at the firm level vary with age of the parent firm.<sup>2</sup> Among surviving firms, young firms grow very fast in absolute terms and relative to their more mature counterparts. However, the employment-weighted exit rate (equivalent to the job destruction rate from firm exit) is also much higher for young firms. Taken together, the implication is that young firms exhibit an “up or out” dynamic – they either grow fast on average or they exit.

The “up or out” dynamic pattern for young firms is an indicator of the volatility of young firms. A more comprehensive indicator of volatility is to measure the total amount of churning of jobs over and above that due to the net changes. Davis, Haltiwanger and Schuh (1996) developed such a measure of churning they called *excess reallocation*. Excess reallocation is measured as the sum of job creation and destruction less the absolute value of net change.

Figure 5 confirms that young firms play a disproportionate role in the economy’s churning. The excess reallocation rate declines monotonically as firms mature. The magnitudes in Figure 5 are impressive for all firms but especially for young firms. Over 40 percent of the jobs in a firm one-year old are involved in reallocation in that the jobs are either new that year or have disappeared. Even among mature firms reallocation is

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<sup>2</sup> See appendix for definitions on firm age.

large in an absolute sense. Close to 15 percent of all the jobs in mature firms (more than 16 years old) are either new or have disappeared.

#### **IV. Is Reallocation Productivity Enhancing?**

While the churning of jobs is the subject of much debate among policymakers and the cause of much anxiety among workers, research indicates that this churning is important to the economy. A key finding is that there are large differences in productivity across businesses in the same narrowly defined industry. Such differences reflect a variety of factors – the ability of the entrepreneurs and managers, the way the business has been organized, the location of the business, the choice of technology as well as the choice of product mix within an industry. That is, the vast number of choices that are made that make any individual business different than another in the same industry.

Figure 6 illustrates a hypothetical productivity distribution within industries that reflects the patterns that have been observed in the data. As noted, a striking finding is that within narrowly defined industries there are large differences in productivity across businesses. For example, Syverson (2004) finds that the interquartile range within narrow U.S. manufacturing industries is over 30 log points for measures of establishment-level total factor productivity. Foster, Haltiwanger, and Syverson (2008) show that the dispersion of establishment-level total factor productivity within detailed product classes that abstracts from variation in plant-level prices is at least as large. Similarly, there is substantial dispersion in business size. Bartelsman, Haltiwanger and Scarpetta (2009a,b) show, for example, that firms in the top quartile of the U.S. size

distribution are on average 80 times larger than firms in the first quartile of the within industry size distribution.

The large dispersion of productivity and size provide ample scope for there to be differences across countries, time periods within countries and industries within countries in “static” allocative efficiency. By the latter I mean the extent to which in the cross section, resources are allocated to their highest valued use. This implies that the most productive firms should be the largest firms. Bartelsman, Haltiwanger and Scarpetta (2009a,b) show there are large differences in the within industry covariance of size and productivity across countries. For example, the covariance in firm size and firm productivity in the U.S. is high and positive while it is lower in Western Europe and still lower in Eastern Europe. Interestingly, while the covariance between size and productivity is low in Eastern Europe it has been increasing substantially over the last couple of decades. Bartelsman, Haltiwanger and Scarpetta (2009a,b) also show that these differences in the size/productivity covariances are potentially quite important in accounting for differences in output per capita across countries.

While the variation in the within-industry cross-sectional patterns of productivity and size across countries are of critical interest and importance, they offer an incomplete picture. That is, on the basis of the cross-sectional evidence alone one might conclude that there is relatively stable within-industry size and productivity distribution (e.g., that high productivity firms remain high productivity firms; large firms remain large firms). While there is persistence in both firm size and firm productivity, there also is considerable reallocation and movements within the distributions. Estimates of the persistence of idiosyncratic of productivity shocks suggest first order yearly

autocorrelation of about 0.8 (see, e.g., Foster, Haltiwanger and Syverson (2008)). This estimate of persistence (combined with estimates of dispersion) implies that the standard deviation of innovations to productivity shocks is about 0.20 (in terms of log total factor productivity).

Putting these facts about the size and productivity distributions together helps us to understand the potential benefit of the high pace of ongoing reallocation in the U.S. economy. To achieve static allocative efficiency, there must also be dynamic allocative efficiency. That is, the reallocation in a healthy economy should be to move resources away from the less productive to the more productive businesses. The good news is that at least in healthy economic times, the U.S. does well in terms of both static and dynamic allocative efficiency.

To explore the extent of productivity enhancing reallocation (i.e., the extent to which reallocation is contributing to dynamic allocative efficiency), much of the focus of research has been to explore the connection between firm and establishment entry and exit and productivity. In the U.S., research shows that exiting businesses are less productive than continuing ones. Furthermore, the data show that, conditional on survival, young establishments have higher productivity levels and higher productivity gains than more mature establishments. In effect, the churning process replaces lower productivity businesses with new, more productive ones, thereby increasing productivity in the economy as a whole.

Figure 7 illustrates the important role of the entry and exit of establishments in productivity growth. Using the retail industry as an example, this chart shows that entry and exit of establishments makes a greater contribution to industry productivity growth

than continuing establishments. While productivity growth at continuing businesses makes an important contribution to productivity growth in some retail segments (e.g., department stores), virtually all of the productivity growth in the sector as a whole appears to be accounted for by net entry. For comparison purposes, the overall figures for the manufacturing sector are also displayed. Here, the contribution of net entry is more modest (approximately 30 percent), but it remains substantial. It is also worth noting that Baily, Hulten and Campbell (1992) and Foster, Haltiwanger and Krizan (2001, 2006) find a substantial additional contribution of the reallocation of continuing establishments to productivity growth. For example, in the manufacturing sector, these studies suggest about 20 to 30 percent of productivity growth is due to the reallocation among continuing establishments.

Figure 7 provides information about the relevance of establishment entry and exit for productivity growth but not necessarily firm entry and exit. Less is known about firm entry and exit given the challenges of measuring productivity at the firm level. However, much firm exit is for young firms and most startups and young firms are single unit establishment firms. Hence, the findings for establishment entry and exit do shed light on the role of firm entry and exit, albeit imperfectly.

More information about the role of firm entry and exit emerges by focusing on the entry and exit of single unit establishment firms (so that the firm and the establishment are one and the same). Figure 8 shows the relationship between productivity and continuing and exiting for all and single unit establishment firms. Interestingly, the patterns of all establishments are quite similar to those for single unit establishment firms suggesting that, at least for retail trade, the establishment and firm patterns for young

firms are similar. Part of this, of course, is simply that many young establishments are part of single unit firms.

The “up or out” dynamic of young firms discussed earlier is closely connected to productivity differences across firms. Comparing the productivity of exits and new single unit establishment firms to the productivity of mature incumbents, the chart indicates that exits are less productive than (continuing) incumbents, and that young survivors are more productive than incumbents. The figure also shows that young survivors remain more productive five years later. In particular, young survivors are initially 3 percent more productive than mature incumbents, and their productivity advantage over mature incumbents is about 1 percent five years later. The large productivity advantage of young surviving firms relative to exiting young (and mature) single unit establishment firms helps us understand the patterns in Figure 7 showing the large contribution of net entry to productivity growth. Another closely related contributing factor is that not only are the young surviving firms more productive but they are among the fastest growing firms in the economy (Figure 4). The result is that the fast growing highly productive young firms contribute substantially to aggregate productivity.

In short, the results suggest that a large fraction of U.S. productivity gains reflect the displacement of low productivity establishments by new establishments with higher productivity. The volatile role that new firms play in the churning of the economy, it seems, is vital to our productivity growth.

## **V. Is there Misallocation?**

The role that reallocation in general and especially the role of firm entry and the “up or out” dynamics in productivity growth highlights the importance of a flexibility. Such reallocation is obviously costly to both firms and workers so it is important that this reallocation be productivity enhancing and not too disruptive (i.e., so that costs do not outweigh the benefits). Put differently, reallocation has no value in its own right, it is only valuable as a critical feature of sustaining U.S. economic job creation and productivity growth. Given the complexity of such firm dynamics, it is also clear that much can go wrong in these dynamics.

Much of the recent literature concerning differences in productivity across countries and within countries over time discusses the many factors that can go wrong as countries try to achieve both static and dynamic allocative efficiency. A theme in the recent economics literature (see, e.g., Banerjee and Duflo (2003), Restuccia and Rogerson (2009), Hsieh and Klenow (2009) and Bartelsman, Haltiwanger and Scarpetta (2009a,b)) is that there are a host of distortions to static and dynamic allocative efficiency. Such distortions include barriers to entry and exit; regulations that deter job creation *and* job destruction; poorly functioning product, capital and labor markets; weak rule of law; poor public infrastructure for communication and transportation, as well as problems with graft and corruption or otherwise arbitrary and capricious behaviour of governments. The consequences of such distortions can be severe. There are large differences in output-per-capita across countries and a leading explanation (although not the only explanation) accounting for such differences according to the recent literature cited above is misallocation across firms within a country.

As discussed above, in an ideal setting the most productive firms are the largest firms. In a distorted economy with poor institutions, the largest firms may not be the most productive but rather the best connected or perhaps the best at navigating the distortions within a country.<sup>3</sup> In a related fashion, in a distorted economy, entrepreneurs with innovative ideas for new products, processes and ways of doing business may face barriers to entry and growth. Alternatively, unproductive incumbent firms may be able to maintain their size and survive due to lack of competition and distortions.

Achieving static and dynamic allocative efficiency implies that an economy needs to be sufficiently flexible and free from distortions to permit productivity enhancing reallocation. However, given that reallocation is disruptive, it is also important to minimize the disruption costs from such reallocation in manner that does not stifle the reallocation. Few countries achieve the economic environment that is consistent with this broad lesson. One could argue that the U.S. has the market structure and economic institutions that closely approximate this objective in healthy economic times. But the recent Great Recession has reminded us that, even in the U.S., the system is fragile so that disruptions in key markets can distort the economic volatility that is part of the ongoing process of making technological progress. An open question is how do the prospects for the future look for the U.S. in terms of sustainable growth through productivity enhancing reallocation? The next section explores patterns in U.S. business dynamism that raise some concerns.

## **VI. Is the U.S. Becoming Less Dynamic?**

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<sup>3</sup> Bartelsman, Haltiwanger and Scarpetta (2009a,b) provide evidence on differences across countries on a wide range of distortions.

In the last several decades the U.S. has been well-served by being a dynamic, flexible economy. Using this as a starting point, in this section I look at whether there is evidence that the U.S. is becoming less dynamic over time. It turns out there is substantial evidence that the pace of business dynamism has fallen over time in the U.S. Recent studies that have focused on these patterns include Davis et. al. (2007) and Davis et. al (2010). The decline in business level volatility is evident in a pronounced declining trend in the pace of gross job creation and gross job destruction as seen in Figure 9. An important component of the declining trend in gross job creation has been a decline in job creation from business startups. Average annual job creation from business startups has declined from 3.5 percent of employment in the 1980s, to 3 percent in the 1990s to 2.6 percent in the post-2000 period. This represents more than a 25 percent decline in the pace of job creation from business startups.

What is the cause of this decline in U.S. business dynamism? This remains an open question for research although some progress has been made. One structural change that underlies at least part of the decline in firm volatility is the shift towards large, national chains in key sectors like retail trade. In retail trade, establishment-level volatility is inherent since the margin of adjustment is often in terms of adding new retail establishments or closing down existing establishments. In retail trade, there has been a sustained and dramatic shift towards large, national chains and away from small single unit establishment (often referred to as “mom and pop”) retail firms.<sup>4</sup> Much of the firm volatility in retail trade has historically been driven by the volatility of “mom and pop” stores. Now that retail is dominated by large, national chains we see somewhat less establishment-level volatility and substantially less firm volatility (as entry and exit of

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<sup>4</sup> See Foster, Haltiwanger and Krizan (2006) and references therein.

establishments for a large, national chain does not yield firm entry and exit). Does this particular type of structural change imply a less flexible U.S. economy? Not necessarily. One of the reasons that this shift has been observed is that large, national chains in retail have especially taken advantage of improvements in information technology that permit better management of inventories and distribution networks. The evidence shows that a large fraction of productivity growth in the U.S. over the past few decades in retail trade is associated with this shift. An argument could be made that these large, national chains while currently more productive might be less flexible, but this remains to be seen.

Many other factors might underlie the declining trend in firm-level volatility. Davis, Haltiwanger, Jarmin and Miranda (2007) find that a shift in the employment distribution towards older firms plays an important role in all industries. They find for example that from the early 1980s to 2001 the share of employment in businesses more than 6 years old increased from about 75 percent to 83 percent. This shift alone accounts for about 27 percent of the decline in volatility. Does this imply the U.S. economy has become less flexible? Much more research is needed but these patterns raise concerns to the extent that younger businesses are more flexible and engage in more experimentation. Given the findings that young businesses are important drivers of productivity growth through the “up or out” dynamic discussed in earlier sections of the paper, it should be of concern if there is less scope for such dynamism.

The real question is what has driven the increase in the average age of businesses? In retail trade, this is associated with the shift towards large, national chains but what about in other sectors? One possible factor that may be at work is the aging U.S. population. To the extent that there is a connection between fast growing young

businesses and the age of entrepreneurs, this could be a relevant factor.<sup>5</sup> Exploring this and other factors that underlie the rise in business age should be a high priority for future research. But note as well that the age of businesses only accounts for 27 percent of the decline in volatility so other factors (to be determined) are at work.

## **VII. Do the Job Creation Patterns Look Different in the Great Recession?**

The observed decline in U.S. business dynamism is of particular interest given the recent Great Recession and anemic recovery. If the U.S. is less dynamic and less flexible then it will be more difficult for the U.S. to restructure and adapt which will slow down the recovery and have adverse consequences for the prospects for sustained growth.

A related concern is that this recent recession was somehow different than prior recessions in how it has impacted U.S. business dynamism and the role of startups and young and small businesses. To shed light on these issues, Figure 10 shows the annual patterns of job creation and destruction from the Business Dynamic Statistics from 1980 to 2009. It is evident that in recessions there is a spike in job destruction and an accompanying decline of job creation. However, it is evident that the decline in job creation in the Great Recession is especially large relative to prior recessions. It is striking that the gross job creation rate in 2009 is the lowest it has been over the entire 1980-2009 period. This difference in cyclical dynamics is illustrated further in Figure 11 which shows the creation rates, job creation from startups and net growth in the 3 years prior to the trough and in the trough year (as measured by net employment growth) for all of the recessions since the 1982-83 recession. It is evident in Figure 11 that not only is

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<sup>5</sup> There is evidence that many individuals over 50 start businesses but most of these are non-employer businesses that are an important source of self-employment but not job creation and productivity growth.

job creation lower in 2009 than in any time since 1980 but so is job creation from business startups.

The Business Dynamic Statistics (BDS) reflect the changes from March in the prior year to the current year. Thus, the 12.4 job creation rate in 2009 reported in Figure 11 means that between March 2008 and March 2009, expanding and new businesses created jobs at a 12.4 percentage point rate. While this is still many jobs being created in even very difficult times, it represents a substantial decline relative to the 16.5 percentage point rate in 2006 and the lowest rate in at least 30 years.

It is of obvious interest to ask what the patterns of job creation and destruction look like after the first quarter of 2009. The Business Employment Dynamics (BED) provides quarterly job creation and destruction measures from the early 1990s through 2010:2 for the U.S. private sector. Figure 12 shows that since the first quarter of 2009 job destruction rates have largely fallen to levels prior to the recession but job creation rates remain low. The BED does not currently provide job creation rates by firm startups (the BED has establishment openings but we know this is somewhat different than firm startups) but the BED does provide job flows by employer size class.<sup>6</sup> The prior discussion suggests appropriate caution needs to be used in examining patterns by employer size since they likely reflect the patterns of startups and young (small) businesses but with that in mind it is still quite useful to look at these patterns.

Figure 13 shows the job creation and destruction *levels* by size class. It is instructive to look at levels given the very skewed distribution of employer size. Figure 13 shows, consistent with Figure 12, that by 2010:2 job destruction levels had fallen to

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<sup>6</sup> See the appendix for discussions about the relationship between the BDS and BED measures of firm size.

below pre-recession levels. However, Figure 13 shows job creation levels remain low through 2010:2 *especially* for small businesses.

Putting all the pieces together, we find that the Great Recession had an especially large impact on gross job creation. Gross job creation rates in 2009 are the lowest they have been since at least 1980. As part of this low gross job creation, 2009 saw the lowest rate of business startups (on an employment-weighted basis) since 1980. Moreover, job creation for small (young) businesses remains low in the anemic recovery. Combined with the downward trends in churning and job creation from business startups, these patterns raise concerns about how well the U.S. is poised to recover in a robust manner.

### **VIII. Concluding Remarks**

It is important for policymakers, citizens and researchers to understand the complex churning of firms and jobs in the economy. The costs of the churning process are highly visible – and often considerable for the owners and employees of failed or contracting businesses. Business failure and job loss can be traumatic on a personal level and create a sense of insecurity. The benefits that flow from this churning process are less visible but no less real. The reallocation of jobs, workers and capital to their best uses is a major factor behind productivity gains over time, and these gains are the main source of improved living standards. Dynamism and turbulence in the economy have a favorable overall impact on productivity and economic well being. The dynamism in our economy, it appears, is also one of its greatest strengths.

Of potential concern is that the U.S. shows some signs of becoming less dynamic over time – exhibiting a slower pace of reallocation with an accompanying slower pace of job creation from business startups. The recent recession saw the lowest overall rate of

gross job creation and job creation from startups since at least 1980. Job creation for small (young) businesses took an especially large hit in the recession and has been very slow to recover. An open question is whether the observed decline in dynamism exhibited by U.S. businesses will have adverse consequences for U.S. innovation, job and productivity growth in the future.

## Appendix

### *Definition of Terms:*

*Establishment:* A fixed physical location where goods and services are produced (e.g., in retail trade a specific store).

*Firm:* All activity under common operational control.

*Firm age :* When a firm comes into existence, the firm age is based on the age of the oldest establishment at the firm that owns the establishment. Thereafter the firm ages normally adding one year for each year of existence. This means, for example, that new establishments of large, mature firms in Figures 2 and 3 are classified as having a firm age consistent with the parent firm. In Figures 2 and 3, most young firms operate a single establishment so that establishment age and firm age are one and the same. This also has implications for the definitions of firm entry and exit which are discussed below.

*Job Creation Rate:* The gross number of new jobs added to the economy by expanding and new establishments as a percentage of total employment.

*Job Destruction Rate:* The gross number of jobs destroyed by contracting and exiting establishments as a percentage of total employment.

*Net Employment Growth Rate:* The difference between the number of jobs in the current and prior period as a percent of total employment. By construction, it is equal to the difference between the job creation and the job destruction rate.

*Excess Job Reallocation Rate:* The sum of job creation and destruction rate less the absolute value of the net employment growth rate. This measure captures the “excess” reallocation over and above that needed to accommodate net employment growth.

*Firm entry and exit:* Entry is defined as a new firm with all new establishments. Exit is defined as a firm that ceases operations and all establishments shut down. The implication is that job creation from firm entry (startups) is jobs created by true new firms (not from changes in ownership or organizational changes). Likewise, job destruction from firm exit is a true firm shutdown (not from changes in ownership or organizational changes).

*Establishment entry and exit:* Entry is the opening of a new establishment and exit is the shutting down of an existing establishment.

*Productivity:* Two concepts of productivity are used in the discussion. In Figure 6, the interquartile range reported is for total factor productivity. The latter is a measure of output per unit composite input (taking into account capital, labor, materials, energy and purchased services). Another concept of productivity is used in Figures 7 and 8 – labor productivity which is measured by output per worker.

*Data Notes:*

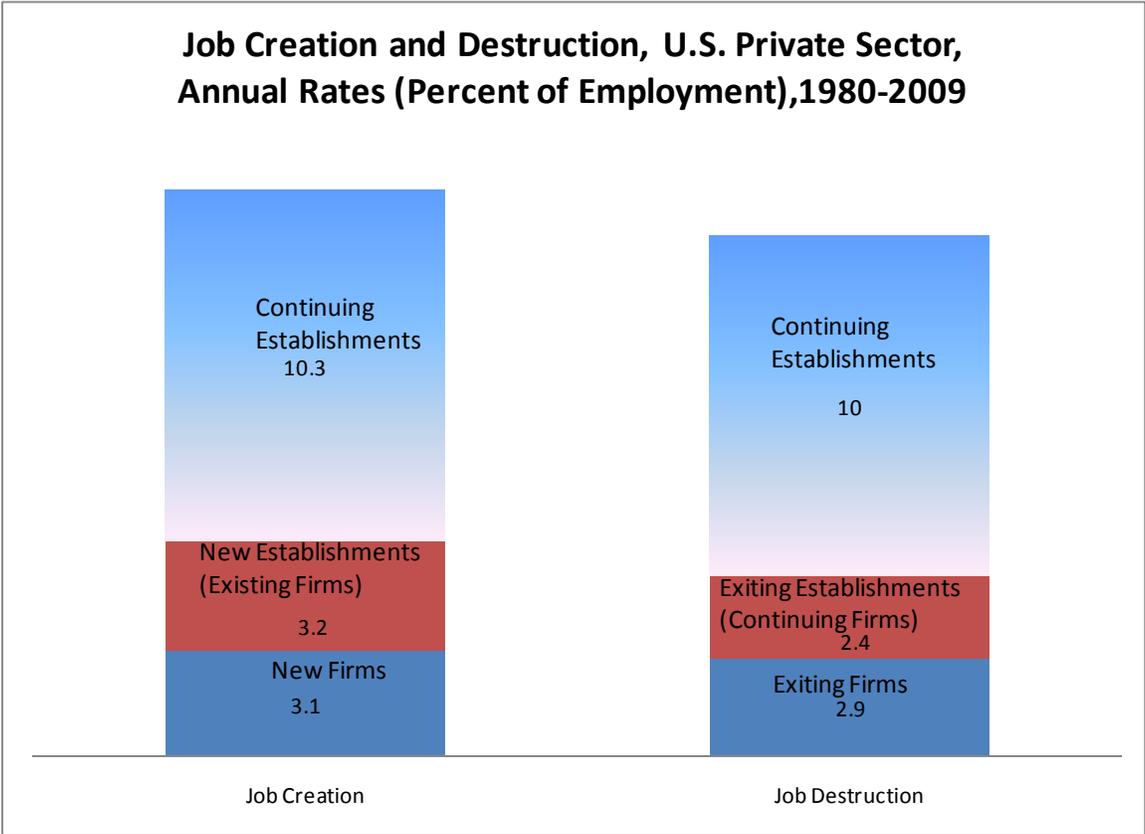
The Business Dynamic Statistics (BDS) data from Census is based on the Census Longitudinal Data Base which in turn is based on the Census Business Register. The core source data for the latter is administrative data from payroll taxes but this is supplemented with much value added from Economic Censuses and business surveys. An advantage of the BDS is that a firm is defined based on operational control. The Business Employment Dynamics data from BLS is based on the BLS /QCEW data. The core source data for the latter is the administrative data from employer filings for unemployment insurance. The BED has the advantage of having quarterly and more timely statistics on job creation and destruction. There are however a few limitations of the BED data by employer size. For one, the series by employer size only begins in 1992. Another limitation is that the employer size measures used by the BED have some limitations. In the BED, firm size is based on defining firms by taxpayer ID (EINs). The taxpayer ID is not an economic concept and many large firms with multiple locations often have multiple EINs. As such, the BED will classify some establishments as belonging to parent firms that are too small relative to the Census Bureau's preferable definition of size. A simple way to see this is that in 2005, the BDS has about 49 percent of employment in the firm size class 500+. The BED has that about 43 percent of employment in the "same" size class. Data sharing legislation that would permit sharing of business data between BLS, Census and BEA would overcome this and many other limitations and discrepancies in the business data across the federal statistical agencies. We also note that BLS has adopted a dynamic sizing method for allocating firms to size classes. See HJM for discussion of this methodology.

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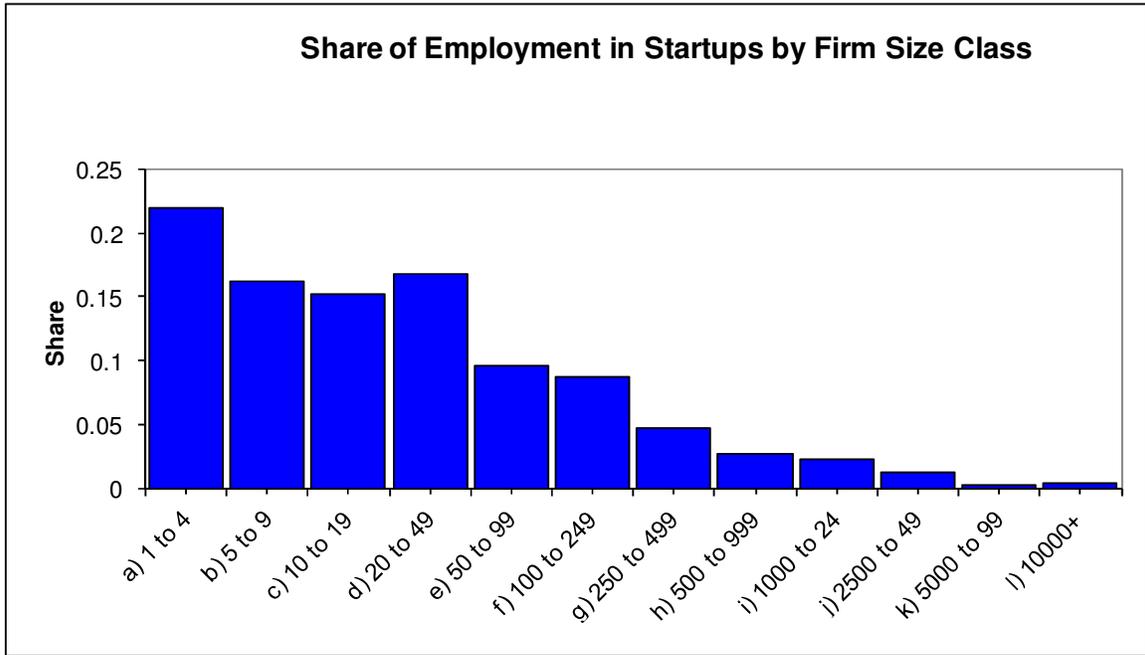
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Figure 1



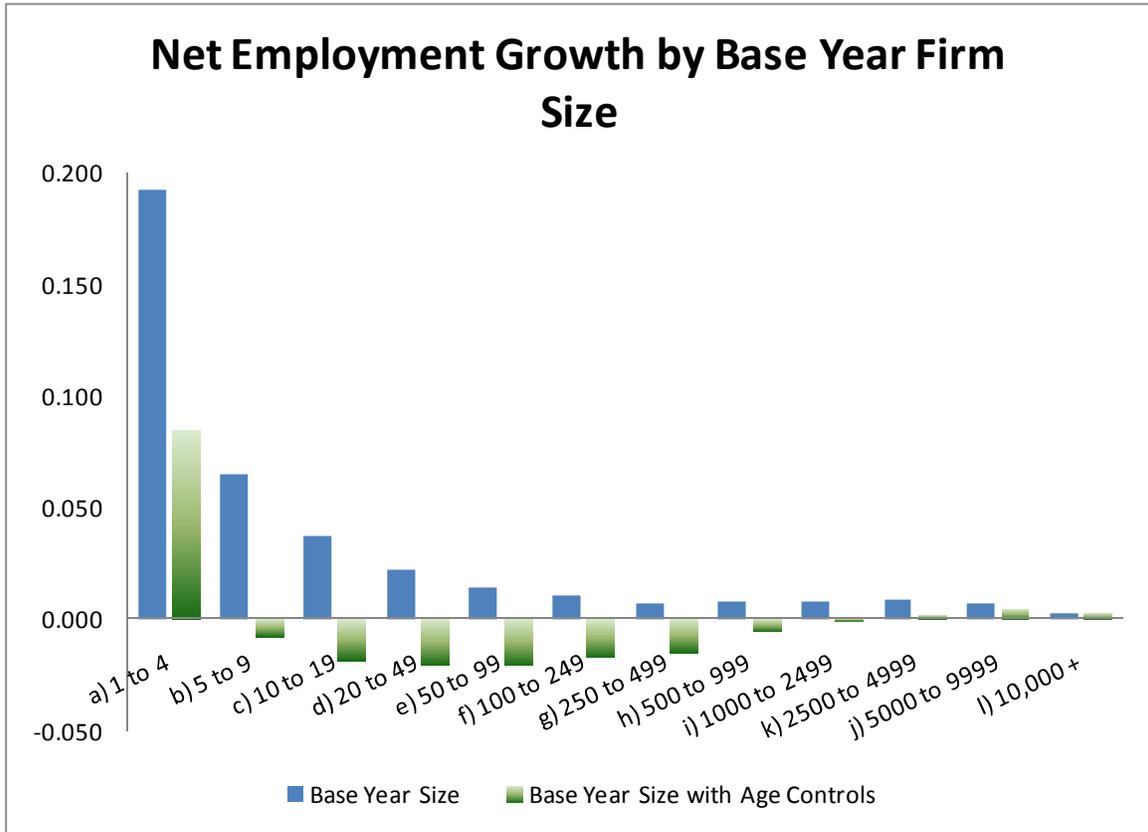
Source: Tabulations from the BDS combined with tabulations from Haltiwanger, Jarmin and Miranda (2010).

**Figure 2**



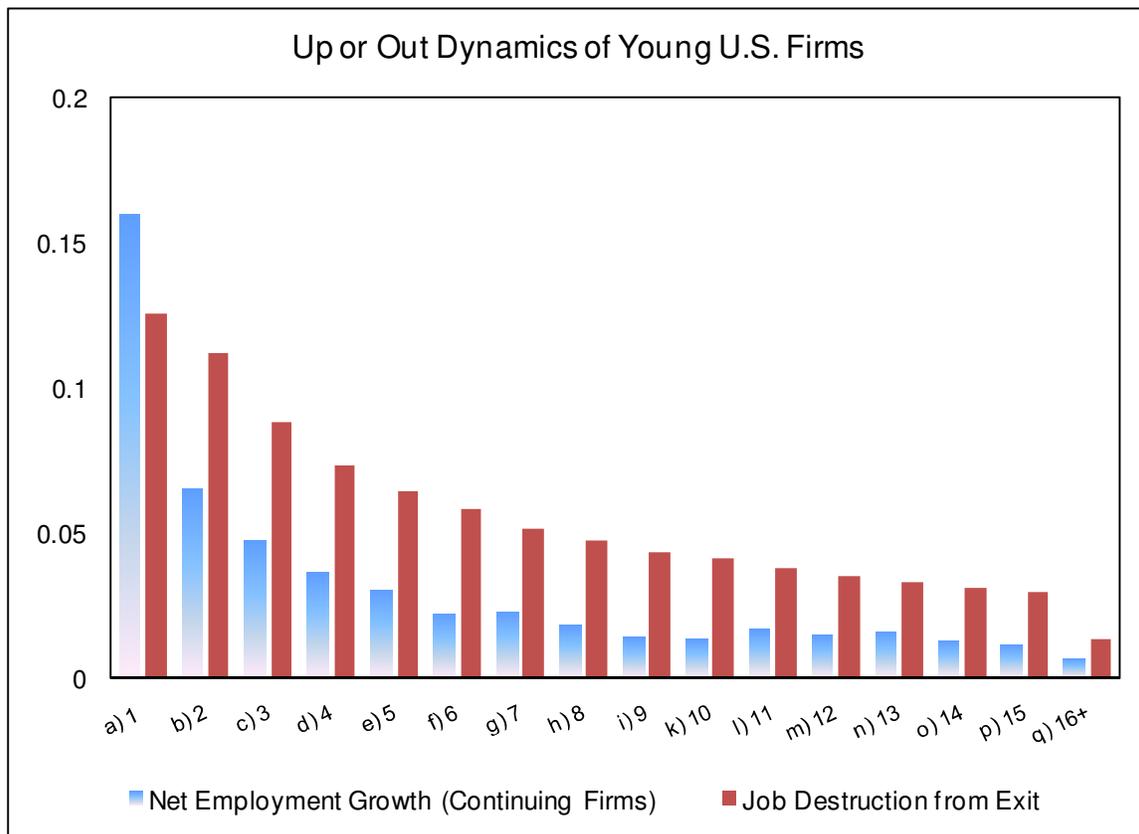
Source: Haltiwanger, Jarmin and Miranda (2010).

**Figure 3**



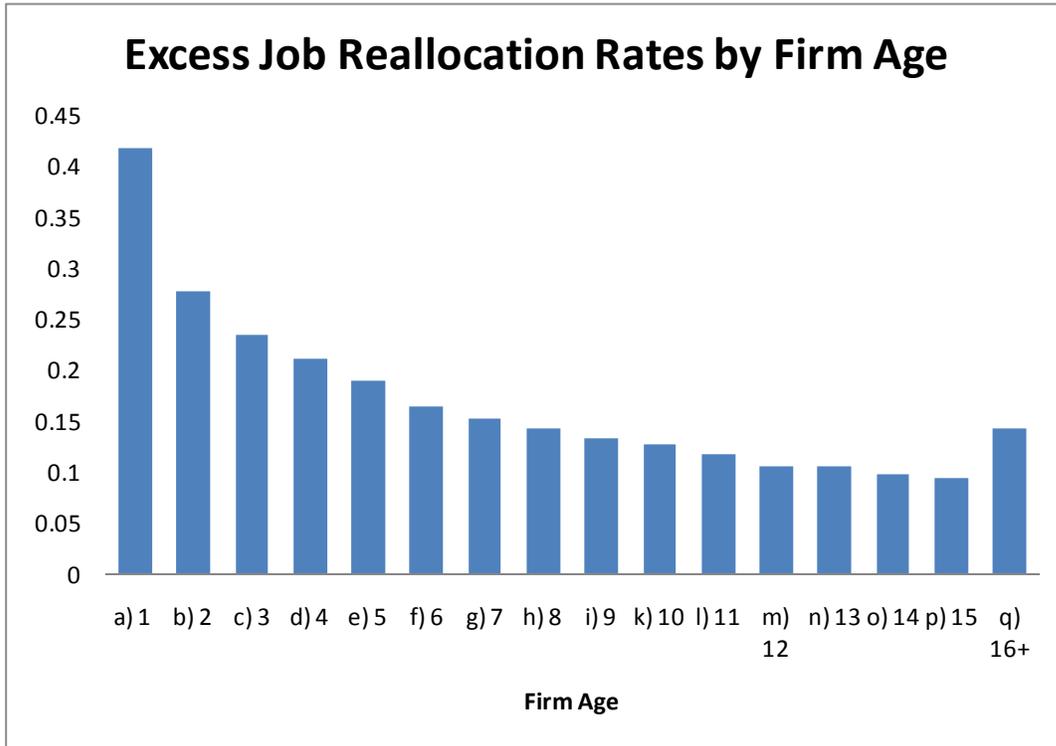
**Source: Haltiwanger, Jarmin and Miranda (2010)**

Figure 4



Source: Haltiwanger, Jarmin and Miranda (2010)

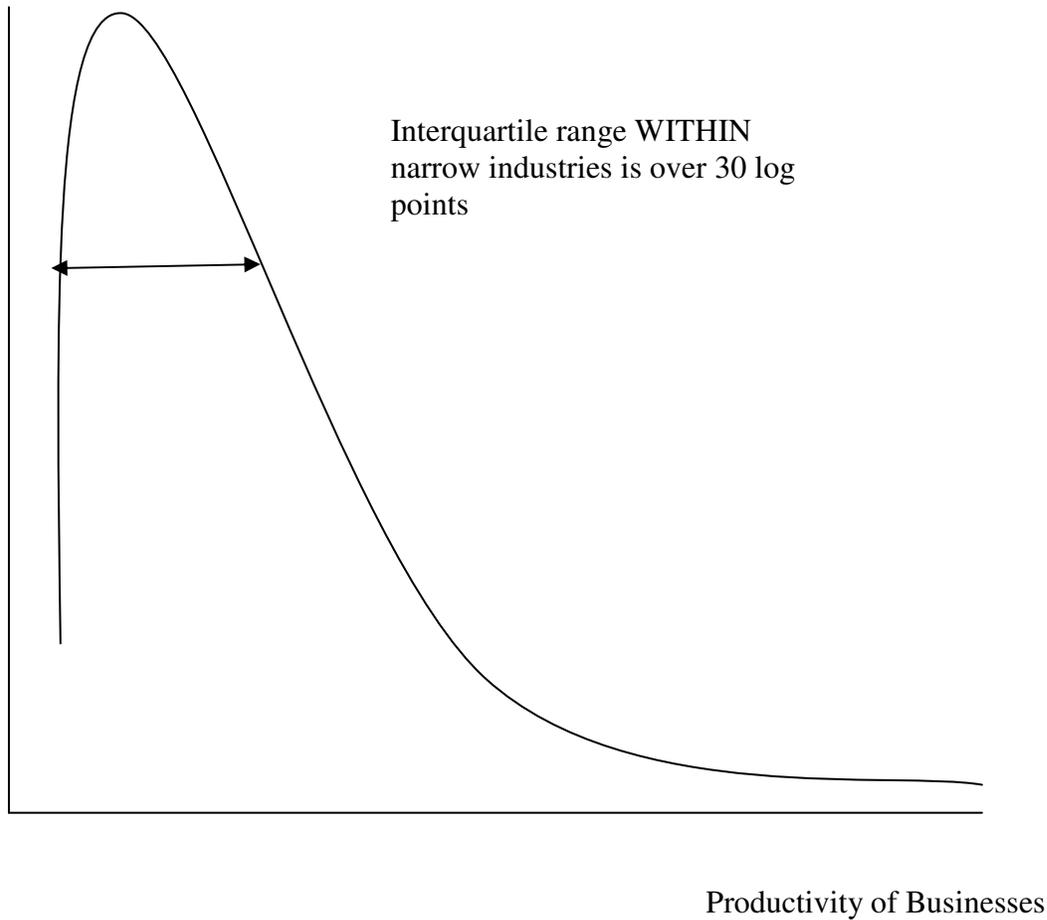
Figure 5



Source: Haltiwanger, Jarmin and Miranda (2010)

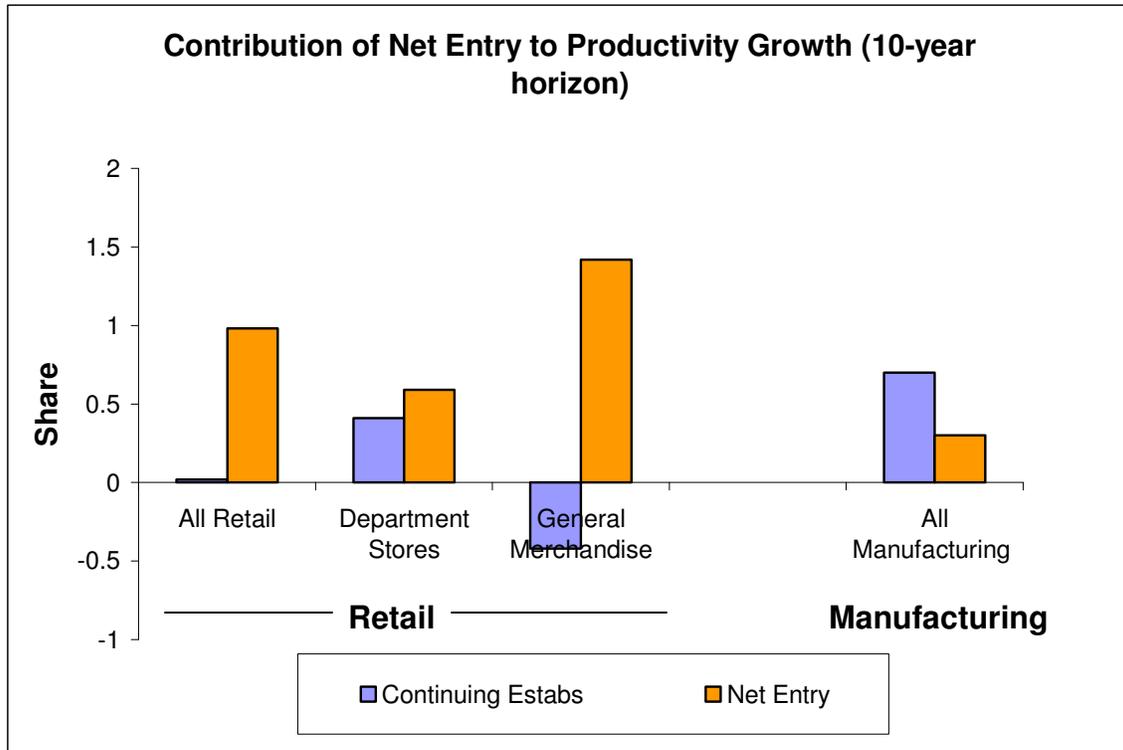
**Figure 6**

**The Distribution of Productivity Across Businesses in the Same Industry**



Notes: The above is a hypothetical depiction of the shape of the productivity distribution reflecting the empirical finding that productivity is approximately log normally distributed. The reported interquartile range is based on the distribution of U.S. manufacturing establishments (see, Syverson (2004)).

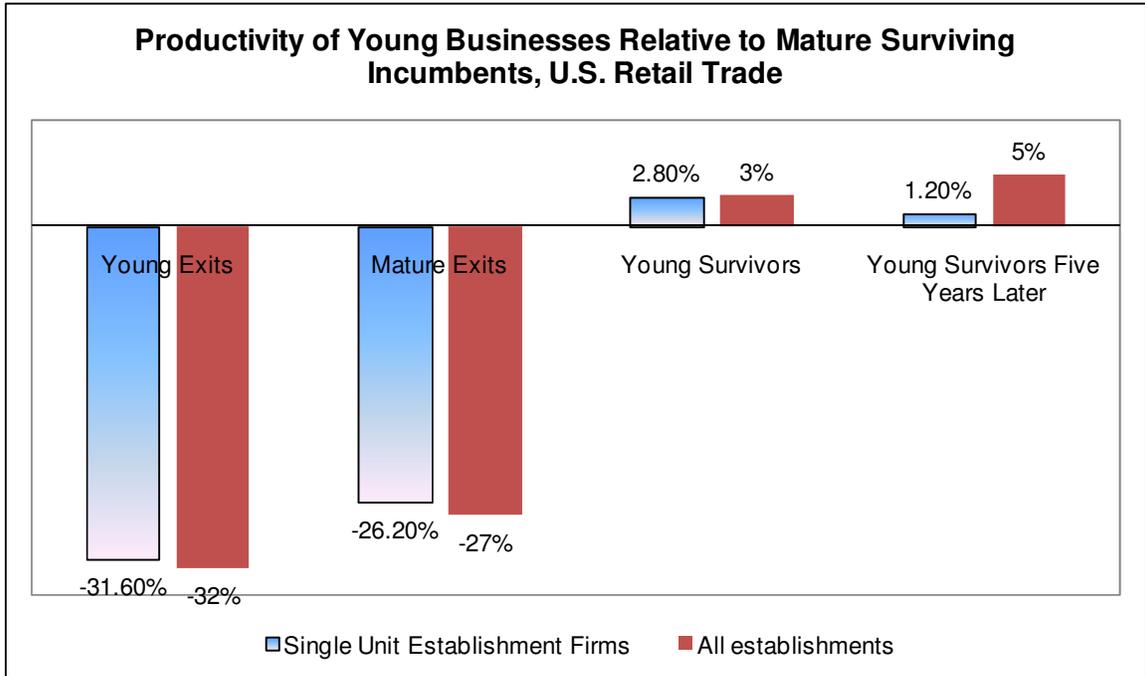
Figure 7



Source: Tabulations from the Census of Retail Trade and the Census of Manufacturers taken from Foster, Haltiwanger, and Krizan 2001 (Manufacturing), 2006 (Retail Trade).

Note: General Merchandise includes warehouse clubs, catalog showrooms, and similar discount houses. See appendix for more information.

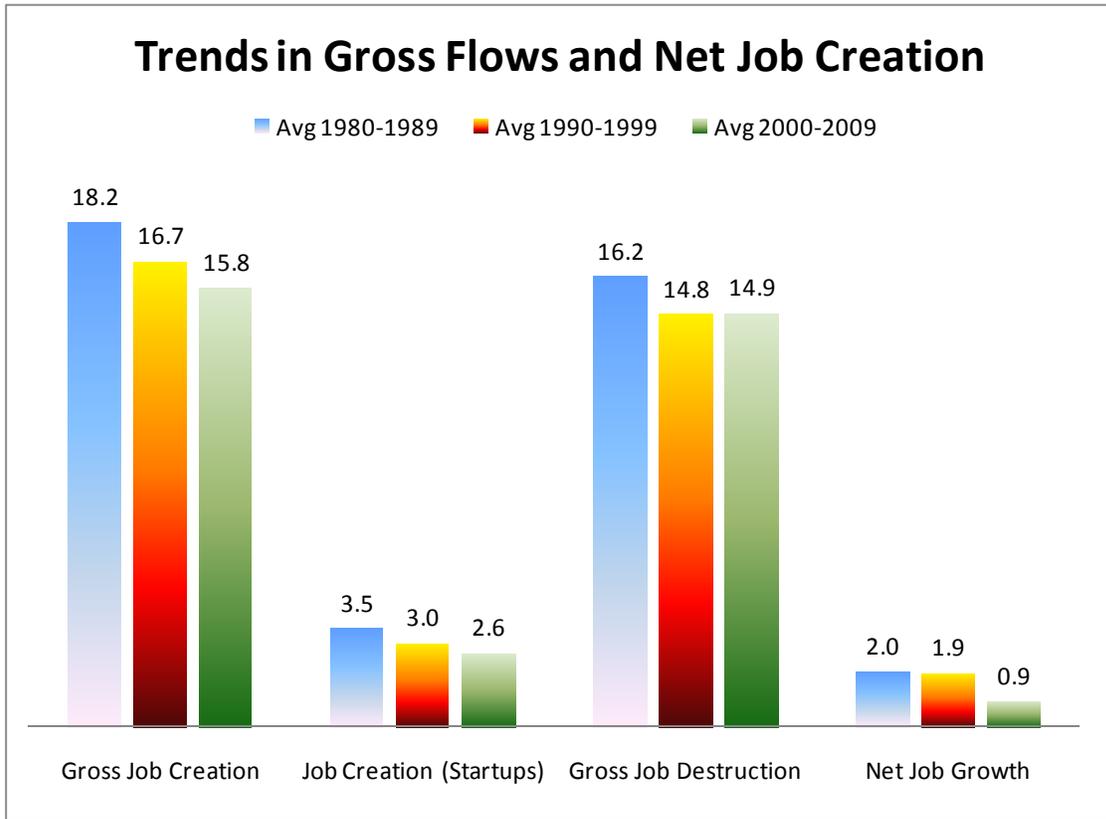
Figure 8



**Source:** Tabulations from Census of Retail Trade taken from Foster, Haltiwanger and Krizan (Table 5, 2006);

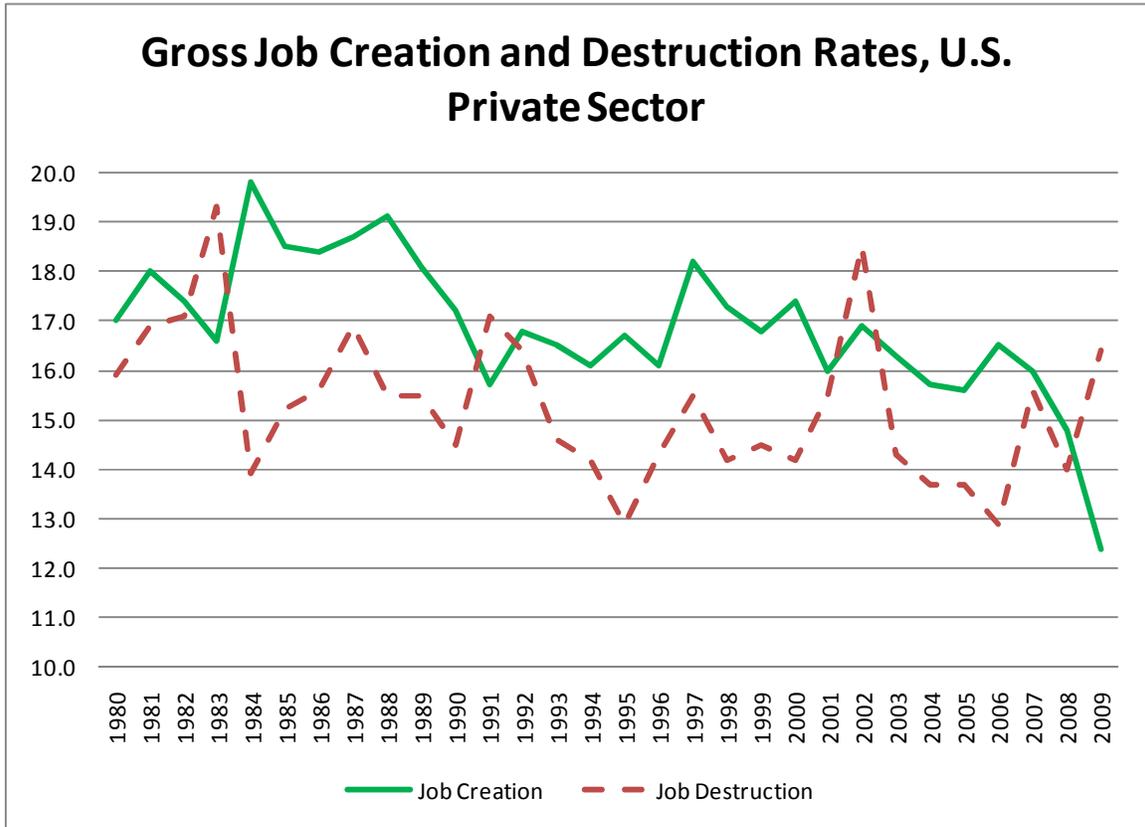
Note: Young establishments are those that are under five years old.

**Figure 9**



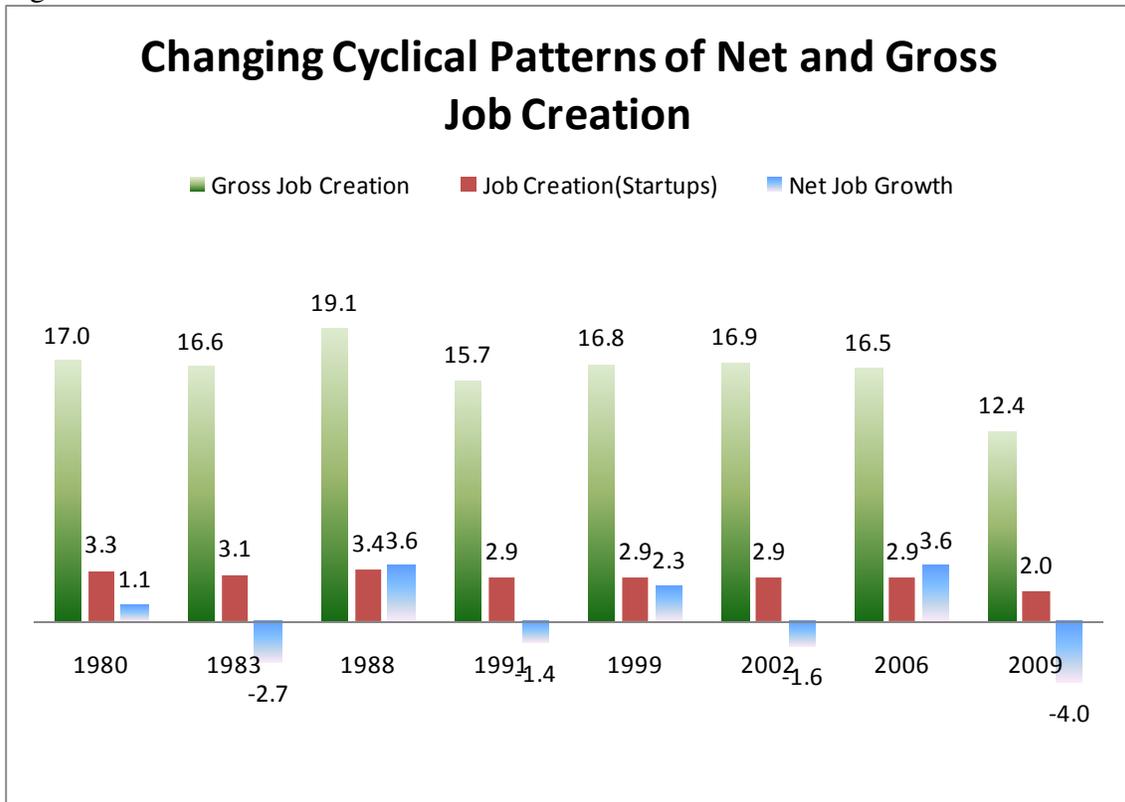
Source: BDS and Haltiwanger, Jarmin and Miranda (2011)

Figure 10



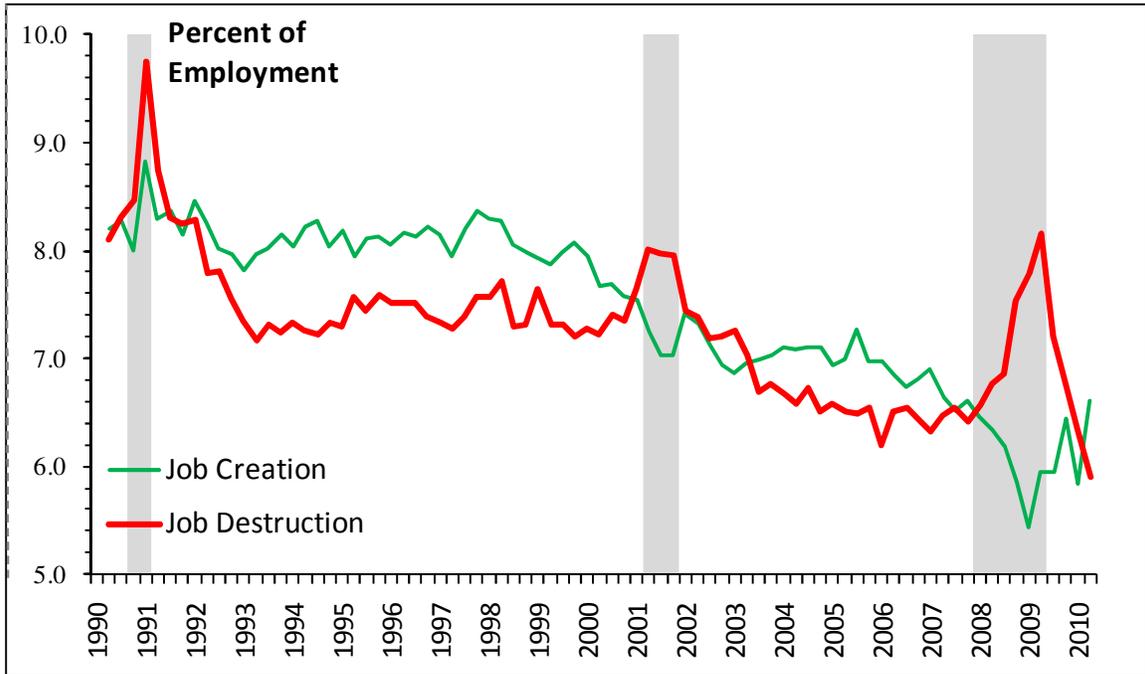
Source: Haltiwanger, Jarmin and Miranda (2011)

Figure 11



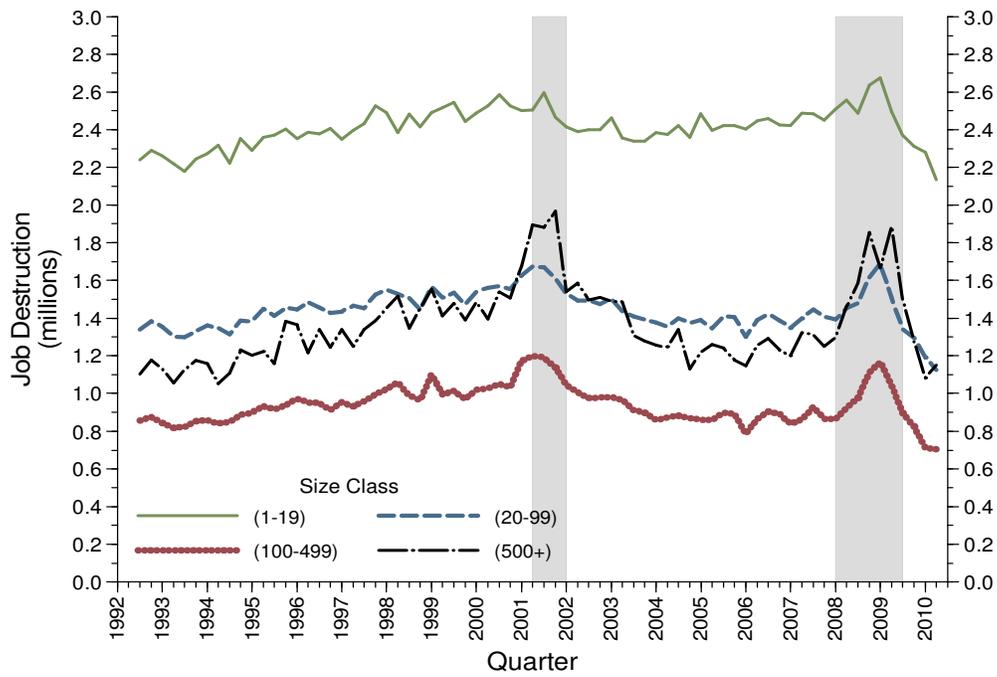
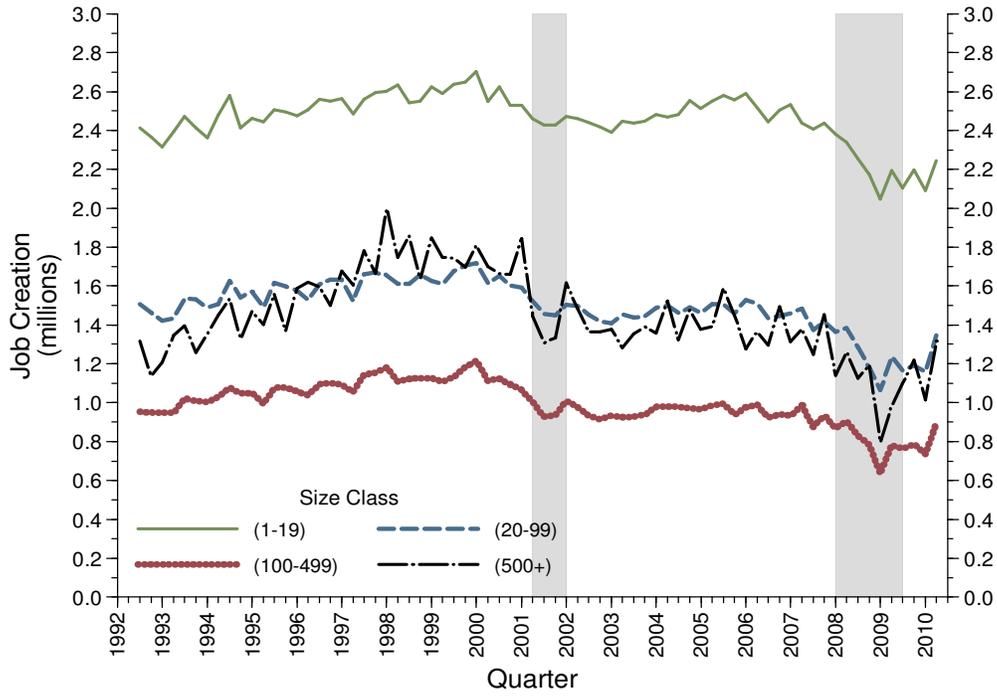
Source: BDS and Haltiwanger, Jarmin and Miranda (2011)

**Figure 12**



Source: Business Employment Dynamics and Davis, Faberman and Haltiwanger (2011)

**Figure 13**



**Source: Business Employment Dynamics**