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## **FIRM ENTRY AND EXIT IN THE U.S. RETAIL SECTOR: 1977-1997**

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# Firm Entry and Exit in the U.S. Retail Sector, 1977-1997\*

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## Abstract

The development of longitudinal micro datasets in recent years has helped economists develop a number of stylized facts about producer dynamics. However, most of the widely cited studies use only manufacturing data. This paper uses the newly constructed Longitudinal Business Database (LBD) to examine producer dynamics in the U.S. the retail sector. The LBD is constructed by linking twenty-six years (1975-2000) of the U.S. Census Bureau's Business Register at the establishment level. The result is a dataset on the universe of employer establishments in the U.S. on an annual basis with detailed geographic, industry, firm ownership, and employment information.

We use the LBD to examine patterns of firm entry and exit in the U.S. retail sector. We find that many of the patterns observed by Dunne, Roberts, and Samuelson (1988) are also observed within the retail sector, but interesting and important differences do exist.

**Keywords:** retail sector, entry-exit, longitudinal establishment data

**JEL Classification Numbers:** L11

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# 1 Introduction

Technological advance and changing demand patterns have led to major restructuring in the U.S. economy over the last several decades. Productivity growth and growing demand for services have decreased the share of economic activity accounted for by the once dominant goods producing sectors and increased that of the service and trade sectors. There has been restructuring within industries as well, as more innovative firms have displaced their rivals.

Accurately describing these changes and understanding the processes that influence them, requires disaggregated micro data at the firm or establishment level. Analysis of this sort have been facilitated by a profusion of longitudinal of micro datasets in the U.S. and other industrialized countries over the last decade. An example is the Longitudinal Research Database (LRD), comprised of longitudinally linked establishment level data from the Annual Survey of Manufactures and the Census of Manufactures, developed at the U.S. Census Bureau's Center for Economic Studies. Researchers from the Census Bureau, academia and other institutions have used the LRD to analyze a variety of topics (Bartelsman and Doms, 2000; Caves, 1999) including entry and exit, job creation and destruction and productivity growth.

Researchers using the LRD and other longitudinal micro datasets have learned much about the processes of technological change, productivity growth, and firm and establishment entry, growth and exit. They have demonstrated how these processes interact to generate improved economic performance. However, these insights are limited primarily to the manufacturing sector of the economy where the data have been available to researcher for over two decades.

Creating longitudinal micro datasets is difficult. Initial efforts, such as the LRD, focused where the research payoff was the greatest. That is, of course, the manufacturing sector, where statistical agencies traditionally have collected broad and detailed establishment level data. The growing importance of other sectors, however, has increased the need to extend longitudinal analyses beyond manufacturing.

This paper presents results from a preliminary analysis of the dynamics of the U.S. retail trade sector using a newly constructed micro dataset that links the Census Bureau's business register annually from 1975 to 2000. The Longitudinal Business Database (LBD) contains basic information on employment, payroll, location, industrial activity, and firm affiliation for over 23 million business establishments (see Jarmin and Miranda 2002). The LBD covers all sectors that are in-scope for the Economic Censuses, including the

retail trade sector, as well as some selected out of scope entities. Importantly, the LBD contains longitudinal establishment linkages that did not exist outside of manufacturing (from the LRD) prior to mid 1980's. Considerable effort was made to ensure that the longitudinal linkages on the LBD were as accurate as possible.

The LBD is still under development which somewhat limits how we can examine producer dynamics. One line of research we are keenly interested in pursuing is entry and exit in local retail markets (e.g., 4 digit SIC or 6 digit NAICS at the county or smaller level). We are currently working on improving the industry and geography codes on the LBD to enable us to do this.

However, there is still much can be learned from the data in their current state of development. Our primary focus in this paper is to extend previous results for the manufacturing sector in a comparable fashion for the U.S retail sector. We compute several alternative types of entry and exit statistics, but focus primarily on computing five year firm entry and exit statistics for the 1977 to 1997 period. These statistics are directly comparable to the widely cited manufacturing results obtained by Dunne, Roberts and Samuelson (1988, hereafter referred to as DRS).

Our primary result is the (sometime) significant level differences in our measures. For instance, we find that diversifying firm, new plant entrants and exits are much larger in terms of relative size than their manufacturing counterparts. We also observe higher overall rates of firm entry and exit. We think that these comparisons with the manufacturing sector are useful as a first step to developing a set of stylized facts about the retail sector of the economy.

## 2 Background

Caves (1998) reviews much of the recent work on the turnover and mobility of firms and summarizes some of the findings in the literature. Among them, are that entrants exhibit size heterogeneity at the time of entry, and that entry and exit are concentrated in the smallest size classes. He points out that the majority of the empirical work on turnover has concentrated on the manufacturing sector.

A number of recent studies describe market structure and firm entry and exit in retail trade. Basker (2001) describes the impact on local retail markets after the entry of Wal-Mart stores using a dataset constructed from publicly available data. Bertrand and Kramarz (2001) use data on applications for

store creations or extensions to determine the impact of entry regulation on job creation in France.

Foster, Haltiwanger, and Krizan (2001) examine productivity decompositions within the retail sector using the Census of Retail Trade. They find five-year job and output creation rates over 40%, with about 70% of that accounted for by entry. Similarly, five-year job and output destruction rates are over 25% with about 70% of that accounted for by exit. Overall, they find that most of the activity in the retail sector comes from the reallocation of resources to entering and from exiting establishments.

Doms, Klimek and Jarmin (2001) also use Census of Retail Trade data matched to investment data from the 1992 Asset and Expenditure Survey to examine the role of IT investment in retail productivity growth. They stress the importance of establishment and employment growth at large continuing firms over the 1992 to 1997 period. In particular, between 1992 and 1997 continuing firms with more than 500 employees (in each period) accounted for nearly 71% of the net change in retail employment of over 2.7 million workers. These results give a different interpretation to the role of net entry than do the establishment level results of Foster, Haltiwanger and Krizan (2001). However, differences in the methodologies used in the studies makes direct comparison of the results difficult.

Clearly, more work needs to be done if we are to understand the dynamics of the retail sector. As a first step to developing some facts about the U.S. Retail Sector, we structure this paper to facilitate comparison to results widely cited in the literature. In particular, we structure our analysis to make our results as comparable to those in Dunne, Roberts and Samuelson (1988) (hereafter DRS) for the U.S. manufacturing sector. In our results section we describe in detail where data available for manufacturing differs from that available for the retail sector.

### 3 Data

For this paper, we use the newly available Longitudinal Business Database (LBD). The LBD is being developed by the Center for Economic Studies as part of its mandate to construct, maintain and use longitudinal research datasets based on Census Bureau establishment and firm data. The primary source of the data underlying the LBD is the Census Bureau's business register, the Standard Statistical Establishment List (SSEL).<sup>1</sup>

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<sup>1</sup>The LBD contains confidential establishment level data. Researchers with approved projects can access it at the Census Bureau's Center for Economic Studies (CES)

Several features make the LBD ideal for studies such as this. First, the LBD contains longitudinally linked establishment data for all sectors of the economy, including retail. The LRD, by contrast, contains only manufacturing data. The broad industry coverage of the LBD allows researchers to do cross-sectoral comparisons. Second, the LBD extends back to 1975, whereas other economy-wide longitudinal datasets, such as the joint Census-SBA Business Information Tracking Series (BITS), go back only to the late 80's (see Robb (1999)). Prior to the development of the LBD, longitudinal establishment identifiers were available only back to the mid 1980's for all sectors except for manufacturing. The longer time series of the LBD spans the recessions of the early 1980's and early 1990's, and covers a period of significant technical change and innovation in retail markets.

A detailed description of the LBD is available in Jarmin and Miranda (2002). However, a few points about its construction are useful here. The LBD is created by linking data from annual business register files. The Census Bureau's business register, the SSEL, is a continuously updated database of basic information about all employer business establishments in the U.S. The SSEL program started in 1972 in order to provide a standard sampling frame and mail out list for the economic censuses and establishment surveys conducted by the Census Bureau and other federal statistical agencies. CES maintains annual snapshot SSEL files from 1975 onward.

The SSEL contains name and address information and data on payroll, employment and industrial activity. The SSEL also contains number of numeric establishment and firm identifiers that can be used to link establishments and firms over time. In particular, the Permanent Plant Number (PPN) was introduced in 1981 to facilitate longitudinal analysis of establishment level data. It is the only truly longitudinal identifier on the SSEL and is designed to remain fixed as long as the establishment remains in business at the same location. Other numeric identifiers can change over time with various changes in the status of an establishment (e.g., ownership changes).

The PPN is not available for all sectors over the entire span of the LBD. Also, research using the LRD has shown that there are breaks in PPN linkages leading to spurious establishment births and deaths. For these reasons, name and address matching was used to augment the numeric identifiers to create the longitudinal linkages for the LBD. Successive years of the SSEL were first linked using numeric identifiers. The matches (i.e., numerically identified continuers) were set aside and the residuals were subjected to name

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or Research Data Centers (RDCs). Details on accessing the data are available at [www.ces.census.gov](http://www.ces.census.gov).

and address matching using sophisticated statistical record linkage software. The result of the linking process is a dataset with over 23 million unique establishments and over 140 million establishment-year observations.

### 3.1 Entry and Exit measures

The detailed establishment level data in the LBD allows us to measure a variety of entry and exit statistics. In particular, it's possible to construct both establishment and firm entry and exit rates with the LBD. These statistics can be for the U.S. as a whole, for particular regions and for particular sectors and industries. Differences in definitions and characteristics of the data mean that different measures will yield different results.

An illustration of this is presented in Figure 1 where we compare the simplest of measures establishment and firm entry and exit for all employer businesses in the U.S. Figure 1 shows that the annual birth and death rates for both firms and establishments for all sectors and years covered by the LBD. A result that stands out immediately is that the birth and death rates for firms are higher than those for establishments in the LBD. This result should be interpreted with some caution, however, as differences in the nature of the establishment and firm identifiers currently available on the LBD. In particular, the establishment identifiers on the LBD are longitudinal and are robust to changes in the status of establishments (e.g., ownership, industry classification) as long as the establishment remains in operation at the same physical location. Firm identifiers on the LBD, however, are not designed for longitudinal analysis. Ownership changes through, for example, mergers and acquisitions can lead to changes in firm IDs that show up as firm births and deaths even though there might not be any associated establishment births and deaths.

Figure 1 also shows the sensitivity of birth and death rate computations to the quality of the source data underlying the LBD. The fluctuations in 1978 and 1979 are due to missing SSEL source data and the spike in births in 1990 is due to a change in the way certain agricultural establishments were processed in the SSEL. Steps were taken in the construction of the LBD to mitigate the effects of problems with the source data, but some issues remain (see Jarmin and Miranda 2002).

Finally, even with the noise in the data, Figure 1 reveals an interesting downward trend in both entry and exits over the period covered by the LBD.

For our analysis of the dynamics of the U.S. retail sector, we will compute rates of firm entry into and exit from 4 digit retail SICs following the same basic methodology used by Dunne, Roberts and Samuelson (1988). To

compute these rates and other statistics we use three types of information. First, we construct plant level datasets and identify continuing, exiting, and entering plants. Continuing plants are those that appear in both census year  $t$  and year  $t+5$ . Exiting plants are those that appear in year  $t$ , but not in year  $t+5$ . Entering plants appear in year  $t+5$ , but are not observed in year  $t$ .

Second, we classify all plant entry into two types of firm entry. As an example, suppose that we observe a plant entering in year  $t+5$  in SIC  $j$ . We identify two types of possible firm entry. As entering plants we first observe the plant in year  $t+5$ , but in order to determine the type of firm, we construct datasets that describe the set of firms and firm/four-digit SIC pairs that exist in year  $t$ . If the plant is part of a firm that already existed in SIC  $j$  in year  $t$ , then the plant does not represent a firm entry. If the firm existed in year  $t$ , but not in SIC  $j$ , then the plant observation represents a diversifying firm, new plant entry (DFNP). If the firm did not exist at all in year  $t$ , then the plant represents a new-firm, new-plant entry (NFNP). Since we do not have product level detail in the LBD, we cannot construct the diversifying firm, product mix entry that DRS construct.

We should note that there is one additional type of firm entry that we can observe. This last type would be firm entry, but not plant entry. The firm, either new or diversifying, enters by purchasing an existing plant from another firm. The treatment of single-unit firms and multi-unit firms in the Business Register can generate errors in measuring firm entry and exit. Multi-unit firms are given a six-digit firm identifier called an “alpha”, which begins with a non-zero number and ends with an additional four digits to represent the plant number. Single-unit firms are given ten-digit firm identifier that begins with a zero. Given this structure, when a firms transition from single-unit to multi-unit or vice versa, there is no way to identify if these are true firm entry or exit, or purely changes in the identifiers due to single unit or multi unit status.<sup>2</sup>

### 3.2 The Retail Trade Sector

To facilitate comparisons to DRS, we focus on the analysis of retail firm entry and exit patterns in five-year intervals between 1977 and 1997. We constructed the analytical dataset used in the analysis as follows. First, we track and select establishments in the retail sector over this period of time

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<sup>2</sup>This is not completely true. In the case of a switch from a single unit to a multi unit, if the multi unit firm alpha appeared in the prior year then we know that the plant if simply purchased by an already existing firm.

in the LBD. We then standardize industry definitions across the five census years. Next, we then aggregate plant level data to the firm level within unique four-digit industries. Finally, we identify entering and exiting firms in each industry and for each census year.

Standardizing industry definitions is necessary because of the 1987 revision to SIC industries. When a 1972 SIC industry is split into more than one 1987 SIC industries, we simply aggregate the 1987 industries up to the 1972 definition. When two or more 1972 SIC industries are aggregated into one 1987 SIC industry, we aggregate these industries prior to 1987 according to the 1987 definition. Following this procedure, we end up with 61 four-digit industries corresponding to a mix of 1972 and 1987 SIC classification codes that are consistently assigned for the entire 1977-1997 period<sup>3</sup>

Table 1 provides some summary statistics for the U.S. retail trade sector for the 1977 to 1997 period. As with all the tables we report here, we endeavored to match the design and content of similar tables in DRS to facilitate comparison of our results to theirs. Table 1 highlights some interesting trends in retail. First, while there has been a dramatic increase in retail employment and a steady growth in the number of retail establishments, there has actually been a slight decline in the number of retail firms. This is primarily due to the growth in employment and establishments at large multi unit retail firms.

Comparing our results with DRS, we find that the retail and manufacturing sectors have similar ratios of single to multi unit firms. Multi-unit retailers, however, operate more establishments, on average, than do multi-unit manufacturers (multi unit manufacturers operated, on average 3.6 plants in 1977, whereas multi unit retailers operates an average of 6.8 establishments in the same year). Further, the number of establishments operated by multi unit retailers increases dramatically over the 1977 to 1997 period (from 6.8 in 1977 to 9.0 in 1997), whereas it drops slightly in manufacturing for the period covered by DRS (from 3.7 in 1963 to 3.5 in 1982).

We find that the employment share of multi-unit retailers has gone up substantially since 1977, from 54% to 63%. DRS show that the multi-unit share of manufacturing output goes up from 76% in 1963 to 85% in 1982. On

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<sup>3</sup>There were a nontrivial number of four-digit transitions that were exclusively due to changes in the 1987 SIC classification as well as incomplete four-digit codes. Roughly 19.7% of all four-digit transitions before SIC codes were standardized were due to changes in SIC codes. And roughly 4% of all four-digit transitions were due to incomplete four-digit information. For example some records contained only 2-digit codes or 3-digit codes. We used the longitudinal aspect of the LBD to fix these records whenever the first three digits matched or in its absence then the first two digits matched.

the surface, these two facts appear to reflect a common trend across the two sectors. However, recent work by Baldwin, Jarmin and Tang (2003) shows a large and growing productivity gap between small and large manufacturers has allowed large producers to produce a growing share of manufacturing output with a shrinking share of employment between 1972 and 1997.

## 4 Basic Entry and Exit Statistics

In this section we describe some statistics for firm entry and exit variables and compare our results to those in Dunne, Roberts, and Samuelson (1988). The entry rate (ER) is defined as the number of firm entrants between census year  $t$  and year  $t+5$  divided by the number of firms in year  $t$ . Similarly, the exit rate (XR) is defined to be number of firm exits between year  $t$  and year  $t+5$  by the number of firms in year  $t$ . The entrant market share (ESH) is the employment of the firms that enter between census year  $t$  and year  $t+5$  divided by the employment in year  $t+5$ . The exit market share is defined at the employment of firms that exit between year  $t$  and year  $t+5$  divided by the employment in year  $t$ . The entrant relative size (ERS) is defined as the average employment of an entering firm divided by the average size of an incumbent firm in year  $t+5$ . The exit relative size (XRS) is defined as the average employment of an exiting firm divided by the surviving firm in year  $t$ .

In table 2 we present results for the average four-digit industry in the retail sector. As mentioned in the data section, there are 61 industries in the retail sector. In the LBD; however, we do not always have four-digit detail. In cases where we have limited industry detail, we create a general four-digit industry ending in "00" for each of the eight two-digit SIC industries. We construct each of our six measures for all firms and firms in the 61 four-digit retail SIC industries (i.e. plants not classified into a four-digit SIC are excluded).

We now compare our results to those in DRS, and we will focus on the results where we delete the unclassified retail plants and DRS delete the small firms in manufacturing. In the year where our retail data overlaps with manufacturing data, we find that both the entry rate and the exit rate are substantially higher than those in manufacturing. Using the 1977-1982 period, the entry rate for the average industry in the retail sector is .472 as compared to the average entry rate in the manufacturing sector .307. The exit rate for the average industry in the retail sector is .504 as compared to the average entry rate in the manufacturing sector .308. Although we

find that the rates differ across the two sectors in 1977-1982, we find the rates tend to be consistent over the period we are examining. DRS observe a similar result in manufacturing.

Although we construct the ESH and XSH with employment in retail instead of output in manufacturing, we find the similar result that on a share weighted basis entry and exit are more important than they are in the manufacturing sector.<sup>4</sup> We find that on average 27.7% of employment is due to entrants, as compared to 15.8% of output in manufacturing. Similarly, we find the 29.5% of employment exits the average retail industry, as compared to 16.3% of output in the manufacturing sector. Finally, we find that firm entrants employ on average 44.1% of the average employment of incumbents. This compares with 35.2% of the output in the manufacturing sector. The exit relative size shows a similar pattern.

In table 3 below we divide firm entry into two types: new-firm, new-plant (NFNP) and diversifying firm, new plant (DFNP). We find results similar to those in manufacturing, except that diversifying firm new plant entrants account for an even smaller fraction of firm entrants. In retail, the entrant market share of DFNP turns out to be a larger share of employment than it is the number of firms. Even more dramatic is the relative size of diversifying entrants. On average DFNP entrants employ at least 212% more workers than incumbent firms, as compared to NFNP entrants who employ at most 52.1% of incumbents. DRS find that DFNP entrants compare more favorably to incumbents than NFNP entrants, but in terms of output they are both smaller than incumbents.

In Table 4 we describe in greater detail the exit variables broken up by the method the firm used to originally enter the industry. Our table varies slightly from DRS, in that we specify an additional entry type for adding up purposes. As described in the data section, firms can enter by building a new plant or by purchasing an old plant. We further break these groups into diversifying firms and new firms. The group of firms that enters by purchasing a plant, in terms of the exit rate and employment share, is bigger relative to diversifying firm, new plant entrants, but smaller relative to the new-firm, new-plant entrants. We find the opposite result when comparing the relative size measure, diversifying firm new plant entrants are on average larger at the time of entry and the new-firm new-plant entrants are the smallest at the time of entry. As in DRS, there is a set of firms we observe in

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<sup>4</sup>In the LBD we are limited to administrative data on payroll and employment for establishments. Using data from the Census of Retail Trade, we find that the average correlation between employment and revenue is .688.

the first year of our analysis and are unable to assign an entry type. During our sample period this 1977 cohort behaves exactly as the initial cohort in DRS. We observe declines in the exit rate and exit share, as one would expect as the initial cohort becomes smaller over time. During the period that we examine the relative size of the initial cohort grows compared to the surviving firms, a result also found in DRS.

We find that exiting firms that entered by diversifying-firm, new-plant and new-firm, new-plant behave similar to their counterparts in the manufacturing sector. The diversifying firm, new plant exits are very small in terms of their exit rates and employment share of exit. Their exit size is on average more than twice that of surviving firms, and they dominate the relative size of the other three exit groups as they did in manufacturing. The new-firm, new-plant group is much more important in the retail sector than in manufacturing. They account for the majority of firm exit, where in manufacturing the initial cohort accounts for most firm exit. Like manufacturing, this group is the smallest relative to surviving firms.

## 5 Longitudinal aspects of entry and exit

The LBD gives us the ability to track firms and plants over long periods of time. As a result, it is possible to follow the performance of different cohorts and types of firms. We now turn our attention from the cross sectional patterns of entry and exit to the longitudinal aspects of growth and exit in the retail sector. In doing so, we seek to address the following questions: Do entrants start small and stay small or do successful firms grow overtime in the retail industry? What are the characteristics of exiting firms? Does performance differ for new and diversifying firms? Finally we draw some comparisons between the retail and the manufacturing sector.

Table 5, panels I to IV present employment shares and average sizes of surviving and exiting firms as well as the cumulative failure rate for each entry cohort in each census year and averaged across the 61 four-digit industries, with standard deviations in parentheses.<sup>5</sup> Panel I shows that successive cohorts contribute a significant proportion of all employment in their entry year, ranging from .422 to .298 and averaging .370. When a cohort appears in a second Census the employment share falls to an average of .215, and by the third Census falls to an average of .127. These very high levels of employment churning help explain why each group of entrants is responsible

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<sup>5</sup>This table is similar to DRS, but where they present output weighted shares we present employment weighted shares.

for the largest share of employment in the census year in which it is first observed. Standard deviations indicate that the differences in employment shares across industries decrease over time for each cohort. They also indicate that the employment shares of any cohort become more similar over time.

The decline in employment share of each cohort as the cohort ages and the high churning in employment is the result of high exit rates on average in the sector. Panel IV at the bottom of Table 5 reports the average of the cumulative failure rates for successive cohorts overtime. Failure rates are very high especially during the 87 to 92 periods. On average, of all firms that enter in 82, 87 and 92 roughly .598 will exit in the following 5 years and .819 in the following 10 years. This is not significantly different from exit rates that DRS found for the manufacturing sector between 67 and 77. We find this result somewhat surprising given our a priori assumptions about firm turnover being higher in the retail sector versus manufacturing. Variations in exit rates across cohorts during the first five years after entry appear to be significantly higher in retail than in manufacturing which may be indicative of differences in how these two sectors respond to the business cycle as well as of differences across industries regarding the entry and exit decision (e.g., sunk costs).

While employment shares for each cohort decline on average over time, we find that surviving firms become larger. Panel II in Table 5 summarizes the size of the surviving cohort members relative to the size of all other firms in the industry. This allows for cross-cohort size comparisons. As with manufacturing we see that on average surviving firms grow larger relative to the cross-section average.<sup>6</sup> For example, firms entering in 1982 are typically 41% smaller than the average firm. By 1987, the surviving firms from this cohort are virtually the same size as the average firm. By 1997, the average size of surviving firms from this cohort are 61% larger than the average firm. We observe similar patterns for all of our entry cohorts. Some of this growth will undoubtedly be the result of within cohort exit of small firms. To investigate this notion, Panel III in Table 5 summarizes the size of exiting cohort members relative to the size of all firms in the industry. We see the size of each cohort's exiting firms is significantly smaller relative to the average firm. The share of growth that is due to exits of small firms and that due to plant and firm growth remains an issue for future research.<sup>7</sup>

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<sup>6</sup>Strict comparison is not possible since DRS's measure so size is output weighted.

<sup>7</sup>The LBD not only allows us to track enterprises but it also allows us to distinguish between plants and firms which makes this type of decomposition possible.

Entering firms are on average small relative to the cross-section average. Entering firms are typically 47% smaller than the average over four-digit industries. For each cohort the standard deviation across industries of the relative size of surviving firms increases over time. This pattern is similar to that in the manufacturing sector and indicates that within industry variation in the average size of surviving firms across four-digit industries tend to increase over time as unsuccessful firms are weeded out. Put another way, size differences between new and surviving firms become larger as survivors age.

Table 5 aggregates over all types of entrants. Tables 6 through 9 provide equivalent information disaggregated for four types of entrants: new-firm new-plant (NFNP), new-firm old-plant (NFOP), diversifying-firm new-plant (DFNP) and diversifying-firm old-plant (DFOP). Diversifying firms may bring more resources and market experience than firms that set up for the first time. As a result, we may expect to see different patterns for firms that have no previous experience in the market from those that have previous experience albeit in a different four-digit industry. Similarly, firms that expand or enter the market by buying an already existing entity may face capital or labor related constraints not faced when building a new plant. Again, we may expect to see different patterns for these firms.

The pattern of employment shares for each entry method in Table 6 is similar to the overall cohort pattern found in Table 5. Both the mean and the standard deviation of each cohort's employment share declines as the cohort ages. However, two things are worth pointing out. First, the proportion of employment share that corresponds to NFNPs overwhelm that of all other categories. This is much more the case in retail when looking at employment shares than was found in manufacturing by DRS for output shares. On average, the share of employment of NFNPs when they first enter the market for the 82, 87, 92 and 97 cohorts is .264. The share for all other categories combined is at most .131. Second, diversifying firms that enter through the construction of new plants show a relatively small decline (if any) in the cohort's employment share with age. For example, the share of employment at entry for the 1982 NFNP cohort is .309 while that for DFNPs is .014. However, by 1997, the employment share is roughly one-fifth of what it was in 1982 for NFNPs but remains unchanged for DFNPs. These trends are again consistent with those in manufacturing.

The overall decline in employment shares of each cohort as the cohort ages and the steeper decline for new-firm, new-plant is the result of slightly higher failure rates of new-firm, new-plant as well as the larger growth of diversifying-firm, new plant. Tables 7 and 8 report the average size of enter-

ing and exiting firms disaggregated by entry cohort and type of entry and Table 9 reports cumulative exit rates for each cohort and category of entrants. The size of each cohort's relative entry size is significantly higher for diversifying-firm, new-plant than it is for new-firm, new-plant. This difference increases as the cohort ages. In particular, diversifying-firm, new-plant enter on average at 2.7 times the average size of all other firms in the industry, while the corresponding figure for new-firm, new-plant entrants is 0.43. After a 10-year period, the surviving diversifying-firm, new-plant entrants are approximately 20 times larger than the average firm, while the other entrant types grow to just 10% larger than the average firm. Two factors may contribute to this: (1) firm-size variation as conveyed by standard deviations are on average much larger for diversifying-firm, new-plant than for new-firm, new-plant so that it is possible that the size of surviving firms on average appears to grow relatively more for diversifying-firm, new-plant as the cohort ages and small unsuccessful plants exit, (2) diversifying-firm, new-plant may actually experience more employment growth than new-firm, new-plant. As before the share of growth that is due to exits of small firms and that due to plant and firm growth remains undetermined. Small differences in the exit rates compound this effect. Table 9 reports cumulative exit rates for each cohort and category of entrants. Cumulative failure rates are on average slightly higher for new-firm, new-plant than for diversifying-firm, new-plant.

To summarize, the employment share of each entering cohort generally declines as the cohort ages. This is the result of high exit rates especially during the first few years after entry that is not compensated by the increase in the relative size of surviving cohort members. With each entering cohort new-firm, new-plant generate the overwhelming proportion of all new employment but they also destroy a relatively larger proportion of their initial employment. The largest mean relative size of entrants, the largest mean survival rates and the most stable employment shares occur for diversifying firms that enter an industry through new-plant construction. Overtime, the relative size of diversifying-firm, new-plant grows larger than that for new-firm, new-plant but it is unclear at this point whether this is due to actual firm growth or whether this result is purely statistical. These patterns are generally all in line with those found by DRS (1988) suggesting these patterns are robust to census year, cohort effects and SIC industries.

## 6 Conclusion

We generally find that the patterns of firm entry and exit in retail trade are quite similar to those found in the manufacturing sector. Our primary result is the (sometime) significant level differences in our measures. For instance, we find that diversifying firm, new plant entrants and exits are much larger in terms of relative size than their manufacturing counterparts. We also observe higher overall rates of firm entry and exit. We think that these comparisons with the manufacturing sector are useful as a first step. Our future work will exploit two features of the LBD that we think are more important for the retail trade sector: annual data and geographic detail. Dunne, Roberts, and Samuelson (1988) focus only on the national market in their analysis, but we think that the tremendous amount of firm and plant churning and the regional nature of the retail trade sector make the LBD the perfect dataset to further examine the retail trade sector.

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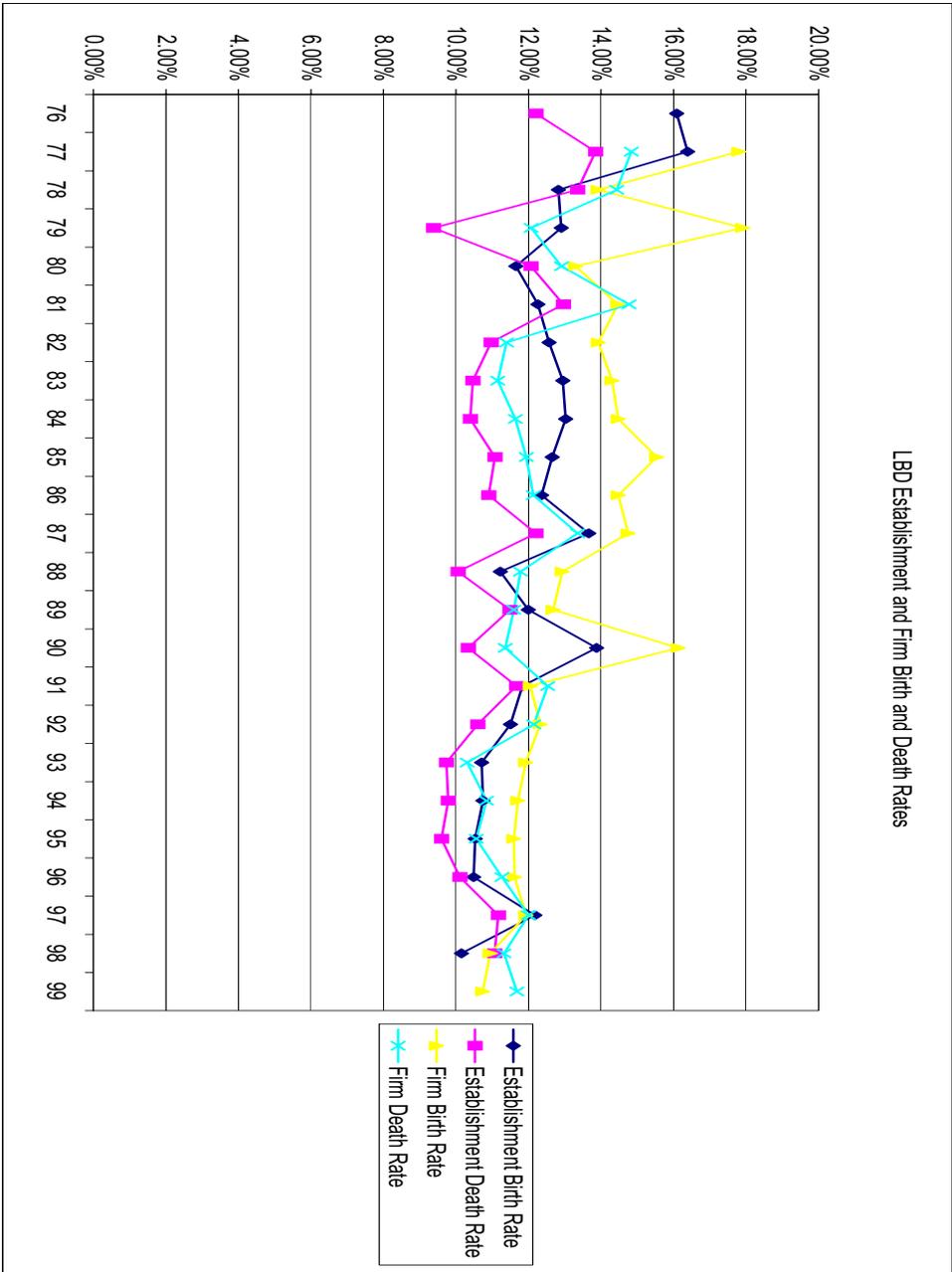


Figure 1

Table 1: Summary Data

Census Year	<u>Total Firms</u>			<u>Single Units</u>		
	Number of Firms	Number of Establishments	Employment	Share of Firms	Share of Employment	Avg. # of 4 Digit SICs
1977	1,128,758	1,476,900	13,791,825	0.946	0.462	1
1982	1,042,091	1,449,816	15,763,188	0.933	0.429	1
1987	1,098,094	1,567,508	19,003,188	0.933	0.408	1
1992	1,077,487	1,558,566	19,655,500	0.935	0.386	1
1997	1,094,881	1,599,589	22,411,413	0.942	0.368	1
<u>Multi-Units</u>						
Census Year	Share of Firms	Share of Employment	Avg. #of 4 Digit SICs	Avg. #of Establishments		
1977	0.054	0.538	1.34	6.76		
1982	0.067	0.571	1.30	6.87		
1987	0.067	0.592	1.32	7.34		
1992	0.065	0.614	1.33	7.89		
1997	0.058	0.632	1.39	9.00		

We restrict our analysis to Economic Census years only 1977,1982,1987,1992,1997, but the LBD provides annual data for retail trade. We examine the extent to which we miss establishments that both enter and exit between census years. On average we observe the entry of about 700,000 establishments from census to census; but we actually miss 24.4%of establishment entry because they don't survive to the following census.

Table 2: Firm Entry and Exit Variables for the U.S. Retail Sector (Averages over Four-Digit SIC Industries)

	1977-1982	1982-1987	1987-1992	1992-1997
<u>Entry Rate (ER)</u>				
All firms	0.519	0.651	0.513	0.828
Unclassified plants deleted	0.565	0.570	0.544	0.512
<u>Entrant Market Share (ESH)</u>				
All firms	0.399	0.367	0.367	0.295
Unclassified plants deleted	0.422	0.376	0.382	0.298
<u>Entrant Relative Size (ERS)</u>				
All firms	0.565	0.477	0.464	0.426
Unclassified plants deleted	0.568	0.510	0.486	0.469
<u>Exit Rate (XR)</u>				
All firms	0.611	0.546	0.621	0.485
Unclassified plants deleted	0.602	0.550	0.605	0.492
<u>Exit Market Share (XSH)</u>				
All firms	0.421	0.414	0.423	0.314
Unclassified plants deleted	0.425	0.426	0.444	0.328
<u>Exit Relative Size (XRS)</u>				
All firms	0.494	0.640	0.523	0.511
Unclassified plants deleted	0.512	0.654	0.574	0.528

Table 3: Entry Variables by Type of Firm Entry (Averages over Four-Digit SIC Industries)

		1977-1982	1982-1987	1987-1992	1992-1997
Entry Rate (ER)	Total	0.565	0.570	0.544	0.512
	DFNP	0.006	0.006	0.005	0.004
	DFOP	0.058	0.041	0.071	0.023
	NFNP	0.467	0.498	0.441	0.453
	NFOP	0.034	0.026	0.026	0.032
Entrant Market Share (ESH)	Total	0.422	0.376	0.382	0.298
	DFNP	0.014	0.014	0.014	0.012
	DFOP	0.059	0.047	0.068	0.019
	NFNP	0.309	0.273	0.252	0.223
	NFOP	0.040	0.042	0.049	0.043
Entrant Relative Size (ERS)	Total	0.568	0.510	0.486	0.469
	DFNP	2.710	2.740	2.047	3.437
	DFOP	1.043	1.387	0.975	0.840
	NFNP	0.521	0.412	0.394	0.392
	NFOP	1.272	2.097	2.265	1.489

Table 4: Exit Variables by Entry Type (Averages over Four-Digit SIC Industries)

Variable	Entry Type	1977-1982	1982-1987	1987-1992	1992-1997
Exit Rate (XR)	1977 Cohort	0.602	0.197	0.118	0.063
	DFNP		0.004	0.006	0.004
	DFOP		0.034	0.039	0.040
	NFNP		0.302	0.427	0.369
	NFOP		0.013	0.016	0.016
Exit Market Share (XSH)	1977 Cohort	0.425	0.190	0.121	0.064
	DFNP		0.012	0.016	0.022
	DFOP		0.028	0.035	0.030
	NFNP		0.186	0.260	0.202
	NFOP		0.009	0.013	0.011
Exit Relative Size (XRS)	1977 Cohort	0.512	0.986	1.094	1.126
	DFNP		3.577	3.131	5.554
	DFOP		0.840	0.929	0.770
	NFNP		0.562	0.483	0.443
	NFOP		0.745	0.880	0.764

Table 5: Employment Shares, Average Firm Sizes, and Exit Rates of Entry Cohorts (Means and Standard Deviations across 61 Industries)

	1977	1982	1987	1992	1997
<i>I. Employment Shares</i>					
1977 Firms	1.000	0.578 (0.148)	0.408 (0.164)	0.301 (0.177)	0.250 (0.181)
1982 Entry Cohort		0.422 (0.148)	0.216 (0.058)	0.125 (0.049)	0.088 (0.057)
1987 Entry Cohort			0.376 (0.128)	0.191 (0.067)	0.128 (0.069)
1992 Entry Cohort				0.382 (0.150)	0.237 (0.080)
1997 Entry Cohort					0.298 (0.133)
<i>II. Average Size of Surviving Firms</i>					
1977 Firms	1.000	3.147 (8.111)	3.232 (3.556)	3.484 (2.830)	5.133 (5.670)
1982 Entry Cohort		0.592 (0.362)	0.982 (0.274)	1.278 (0.601)	1.607 (1.464)
1987 Entry Cohort			0.528 (0.221)	1.016 (0.428)	1.371 (0.958)
1992 Entry Cohort				0.504 (0.219)	0.913 (0.353)
1997 Entry Cohort					0.484 (0.249)
<i>III. Average Size of Exiting Firms</i>					
1977 Firms	0.517 (0.195)	0.998 (0.344)	1.138 (0.492)	1.143 (0.660)	-
1982 Entry Cohort		0.600 (0.345)	0.807 (0.302)	0.918 (0.730)	-
1987 Entry Cohort			0.516 (0.222)	0.73 (0.373)	-
1992 Entry Cohort				0.458 (0.171)	-
1997 Entry Cohort					-
<i>IV. Cumulative Cohort Exit Rates</i>					
1977 Firms		0.599 (0.090)	0.783 (0.076)	0.882 (0.058)	0.927 (0.044)
1982 Entry Cohort			0.602 (0.085)	0.819 (0.071)	0.891 (0.054)
1987 Entry Cohort				0.665 (0.081)	0.819 (0.059)
1992 Entry Cohort					0.527 (0.080)

Table 6: Employment Shares of Entry Cohorts and Entry Categories by Year  
(Means and Standard Deviations across 61 Industries)

	1977	1982	1987	1992	1997
1977 Firms	1.000	0.578 (0.148)	0.408 (0.164)	0.301 (0.177)	0.250 (0.181)
<i><u>1982 Entry Cohort</u></i>					
DF/NP		0.014 (0.017)	0.019 (0.030)	0.017 (0.038)	0.013 (0.046)
DF/OP		0.059 (0.040)	0.023 (0.018)	0.012 (0.014)	0.009 (0.014)
NF/NP		0.309 (0.136)	0.156 (0.050)	0.085 (0.039)	0.060 (0.038)
NF/OP		0.040 (0.029)	0.019 (0.014)	0.012 (0.014)	0.008 (0.012)
<i><u>1987 Entry Cohort</u></i>					
DF/NP			0.014 (0.022)	0.024 (0.049)	0.023 (0.061)
DF/OP			0.047 (0.032)	0.014 (0.008)	0.008 (0.006)
NF/NP			0.273 (0.111)	0.146 (0.048)	0.094 (0.049)
NF/OP			0.042 (0.030)	0.009 (0.006)	0.006 (0.005)
<i><u>1992 Entry Cohort</u></i>					
DF/NP				0.014 (0.019)	0.017 (0.031)
DF/OP				0.068 (0.044)	0.035 (0.023)
NF/NP				0.252 (0.107)	0.170 (0.058)
NF/OP				0.049 (0.048)	0.015 (0.010)
<i><u>1997 Entry Cohort</u></i>					
DF/NP					0.012 (0.031)
DF/OP					0.019 (0.020)
NF/NP					0.223 (0.119)
NF/OP					0.043 (0.029)

Table 7: Average Size of Surviving Firms Relative to All Firms in the Industry for Entry Cohorts and Entry Categories by Year (Means and Standard Deviations across 61 Industries)

	1977	1982	1987	1992	1997
1977 Firms	1.000	3.147 (8.111)	3.232 (3.556)	3.484 (2.830)	5.133 (5.670)
<i><u>1982 Entry Cohort</u></i>					
DF/NP		2.710 (3.401)	8.028 (10.783)	16.256 (32.028)	22.297 (77.361)
DF/OP		1.066 (0.434)	0.901 (0.454)	1.033 (1.114)	1.240 (2.067)
NF/NP		0.521 (0.395)	0.868 (0.279)	1.047 (0.474)	1.278 (0.735)
NF/OP		1.720 (1.958)	1.131 (0.814)	1.270 (1.649)	1.381 (2.470)
<i><u>1987 Entry Cohort</u></i>					
DF/NP			2.740 (4.324)	15.622 (30.670)	24.155 (74.960)
DF/OP			1.420 (0.916)	0.993 (0.590)	1.015 (0.703)
NF/NP			0.412 (0.186)	0.869 (0.289)	1.151 (0.777)
NF/OP			3.050 (4.437)	1.129 (1.368)	1.192 (1.899)
<i><u>1992 Entry Cohort</u></i>					
DF/NP				2.047 (1.987)	6.753 (11.343)
DF/OP				0.993 (0.439)	0.888 (0.425)
NF/NP				0.394 (0.172)	0.813 (0.273)
NF/OP				3.558 (10.482)	1.330 (0.979)
<i><u>1997 Entry Cohort</u></i>					
DF/NP					3.437 (8.575)
DF/OP					0.856 (0.708)
NF/NP					0.392 (0.194)
NF/OP					2.021 (1.875)

Table 8: Average Size of Exiting Firms Relative to All Firms in the Industry for Entry Cohorts and Entry Categories by Year (Means and Standard Deviations across 61 Industries)

	1977	1982	1987	1992
1977 Firms	0.517 (0.195)	0.998 (0.344)	1.138 (0.492)	1.143 (0.660)
<i><u>1982 Entry Cohort</u></i>				
DF/NP		2.659 (5.102)	4.722 (11.489)	13.040 (35.584)
DF/OP		0.991 (0.480)	0.845 (0.647)	0.583 (0.254)
NF/NP		0.531 (0.393)	0.747 (0.276)	0.763 (0.381)
NF/OP		1.676 (3.275)	0.932 (0.539)	0.845 (0.457)
<i><u>1987 Entry Cohort</u></i>				
DF/NP			1.623 (1.720)	17.060 (51.017)
DF/OP			1.351 (1.167)	0.789 (0.510)
NF/NP			0.440 (0.191)	0.678 (0.270)
NF/OP			1.791 (1.115)	0.864 (1.158)
<i><u>1992 Entry Cohort</u></i>				
DF/NP				1.594 (2.235)
DF/OP				0.929 (0.536)
NF/NP				0.385 (0.162)
NF/OP				1.638 (1.531)

Table 9: Cumulative Exit Rates of Entry Cohorts and Entry Categories by Year  
(Means and Standard Deviations across 61 Industries)

	1977	1982	1987	1992
1977 Firms	0.599 (0.090)	0.783 (0.076)	0.882 (0.058)	0.927 (0.044)
<i><u>1982 Entry Cohort</u></i>				
DF/NP		0.595 (0.114)	0.812 (0.095)	0.877 (0.065)
DF/OP		0.545 (0.095)	0.793 (0.074)	0.876 (0.061)
NF/NP		0.621 (0.083)	0.830 (0.068)	0.897 (0.050)
NF/OP		0.397 (0.121)	0.689 (0.107)	0.806 (0.081)
<i><u>1987 Entry Cohort</u></i>				
DF/NP			0.689 (0.101)	0.824 (0.090)
DF/OP			0.604 (0.107)	0.761 (0.086)
NF/NP			0.674 (0.082)	0.827 (0.059)
NF/OP			0.522 (0.118)	0.717 (0.097)
<i><u>1992 Entry Cohort</u></i>				
DF/NP				0.541 (0.103)
DF/OP				0.418 (0.088)
NF/NP				0.548 (0.079)
NF/OP				0.410 (0.104)