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Measuring the Dynamics of Young and Small Businesses: Integrating the Employer and Nonemployer Universes

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I. Introduction

The measurement of economic activity by federal statistical agencies focuses greater attention on larger, more mature business units. This data gathering strategy has two clear advantages. First, it yields greater accuracy in estimating the level of economic activity, whether “greater attention” takes the form of higher sampling probabilities or more careful auditing and editing. Second, it is easier to identify and promptly capture the activity of large, long-established business units. On both counts, the desire for a cost-effective approach to measuring the level of economic activity leads naturally to a focus on larger, more mature units.

There are, however, drawbacks to this data gathering strategy. When responses to shocks and new developments vary systematically with business size or age, a focus on larger and more mature units can yield less accurate, potentially misleading, measures of changes in economic activity. A simple example occurs when young and small business units are relatively sensitive to aggregate shocks. In this case, a cost-effective approach to estimating short-term growth rates can require over sampling younger and smaller business units, and there is tension between a sample design optimized for the level of activity and one optimized for the growth rate. Perhaps more important, the traditional focus on larger and more mature units limits our ability to measure and analyze the early life cycle dynamics of businesses and to evaluate theories of business formation, selection and growth.

In this paper, we report our initial efforts to remedy these drawbacks. We develop a preliminary version of an Integrated Longitudinal Business Database (ILBD) that combines administrative records and survey-based data for virtually all employer and non-employer business units in the United States.² In the process, we confront conceptual and practical issues that arise in measuring the importance and dynamic behavior of younger and smaller businesses. We also document some basic facts about younger and smaller businesses. In doing so, we exploit the ability of the ILBD to follow business transitions between employer and non-employer status, and vice-versa. This feature of the ILBD opens a new arena for the study of business formation, early life-cycle dynamics, and business selection over time.

After briefly characterizing the dimensions of the distinct employer and nonemployer universes in the ILBD, we focus our analysis on roughly two dozen industries with relatively big roles for young and small businesses. Even for these industries, most employer activity is accounted for by large and mature businesses. In contrast, young and small businesses account for a much greater fraction of both firms and revenue for nonemployers. The higher revenue shares of younger and smaller businesses holds for the nonemployer universe as a whole and for our selected industries. Much of our analysis considers dynamic linkages between employer and nonemployer businesses. We find that half of all economic activity in our selected industries occurs at employers that link to nonemployer businesses in the previous seven years. However, among employer

² Prior to 2002, the Bureau of the Census maintained the employer and nonemployer portions of its business universes separately. Since 2002, the Census Bureau has been engaged in creating an integrated business universe for its internal processing and data collection and production activities. The ILBD as conceived in this paper is closely related to this effort but has a key added enhancement longitudinal linkages within the integrated universe.

businesses with such backward-looking links, the employer's oldest establishment is typically older than the nonemployers to which it links. In other words, the prevailing linkage pattern appears to involve continuing employers that absorb or become affiliated with nonemployers, rather than nonemployer businesses that evolve to become new employers.

A small but important segment of nonemployers make successful transitions to employer status. Here, "successful" means that the business transits from positive receipts in the nonemployer universe to positive payroll in the employer universe and zero receipts in the nonemployer universe. This form of transition is important since it suggests that "entering" employer businesses may not be truly entrants but rather businesses that have operated for a period of time without employees. Interestingly, we find that prior to becoming an employer, these "successful" transitions have higher growth rates and lower volatility than other nonemployer businesses.

The opposite route, by which employers with positive payroll transit to zero payroll and positive revenue in the nonemployer universe, is relatively rare in the sense that only a small fraction of employer businesses transit in this manner. We do find that for any given cohort of existing employer businesses that a substantial fraction of them will be linked to a nonemployer business in the future. However, typically this takes the form of the employer business continuing and having some type of link to a nonemployer. For example, consistent with the earlier finding, one possible link is that the employer absorbs a nonemployer.

As another step toward an integrated perspective on the dynamics of young and small businesses, we compare the growth and volatility patterns of employer and nonemployer businesses. For this purpose, we focus on revenue as an activity measure because it is available for all business units, employers and nonemployers alike. As in previous research, we find that net growth rates are highest for the youngest employers, and that the volatility of revenue growth rates declines with employer age. These two patterns also hold for nonemployers, but net growth declines less sharply with age while volatility falls off much more rapidly at early ages among nonemployers. The dispersion of growth rates among business units is higher for nonemployers than for employers, holding age constant.

Mean revenue growth rates rise with size among employers, but they are U-shaped in size among nonemployers. The dispersion of revenue growth rates declines with size for both types of businesses. These simple comparisons of growth dynamics between the employer and nonemployer universes are interesting, but they neglect business transitions between the two universes, as do almost all previous studies of business dynamics. The complex pattern of linkages between the two universes that this paper begins to explore raises a variety of issues regarding the measurement and analysis of business formation, growth and volatility, especially for younger and smaller businesses. Our initial foray into this territory suggests that the Integrated Longitudinal Business Database will prove extremely useful in developing a clearer, more comprehensive picture of business dynamics.

The paper proceeds as follows. Section II discusses the construction of the ILBD presents some basic facts about the employer and nonemployer businesses. Section III offers a first look at the linkages between the two business universes by considering the 2000 cross section of employer businesses, and looking backwards for links to the

nonemployer universe. Section IV presents simple transition dynamics for particular cross sections of nonemployer and employer businesses respectively from a forward-looking perspective. Section V documents net revenue growth and volatility patterns by business size and age for employers and nonemployers. Section VI concludes with a summary of our findings and a discussion of next steps.

II. Constructing an Integrated Business Universe

The Census Bureau maintains separate universes for employer and nonemployer business units. This administrative approach to data collection and processing reflects basic differences between employer and nonemployer business units in their tax treatment and reporting requirements. In terms of data development, our objective is a fully integrated longitudinal business-level dataset that includes all employers and nonemployers in the private non-farm economy. We anticipate that this type of integrated dataset will be especially useful in the study of young and small businesses.

From an analytical perspective, the presence or absence of employees is simply another business characteristic to be measured. From a database development perspective, the creation of an Integrated Longitudinal Business Database (ILBD) is a major undertaking. Fortunately, we can build on previous work that led to the Longitudinal Business Database (LBD), which covers nonfarm private employers in the period from 1975 to 2001. Our database development efforts in this paper concentrate on the construction of longitudinal identifiers for nonemployers and the creation of contemporaneous and dynamic linkages between employer and nonemployer business units.

Inputs to Census Bureau administrative records include Internal Revenue Service (IRS) data derived from applications for an Employer Identification Number (EIN), payroll tax records, corporate and individual income tax returns, and Census data collections in its annual surveys (e.g., Company Organization Survey) and quinquennial economic censuses. The Census Bureau receives different information for different types of business. For large corporations, routine data inputs include payroll records and corporate income tax returns augmented by direct Census Bureau collections for multiple location companies. For smaller employer firms (whether sole proprietors, partnerships or corporations), routine data inputs include payroll records, tax returns and periodic direct Census Bureau data collections (e.g., the Economic Census). For small nonemployer businesses, Census Bureau obtains administrative records mainly from individual income tax returns. These are supplemented with surveys of such small businesses (e.g., CBO). More generally, the data available to the Census Bureau depends on the legal and tax status of a business.

For our purposes, this means that the set of measured business characteristics differs depending on the original sources of the administrative and survey data. It also means that our ability to link records from different sources requires common business identifiers. Employer businesses have unique Employer Identification Numbers and other Census Bureau identifiers. Most nonemployer businesses do not have an EIN and instead are tracked using the Social Security Number (SSN) of the business owner (hereafter referred to as the person ID). To fully understand how businesses form and evolve, we must longitudinally integrate the employer and nonemployer universes. This type of integration is essential for the study of transitions between the two universes and other linkages between employer and nonemployer businesses.

Table 2.1 summarizes the number and activity levels of the major business categories in the Census Bureau's administrative record system. There are approximately 16 million nonemployer businesses in 2000, roughly 14 million person ID units (sole proprietorships without employees) and another 2 million EIN units (corporations, partnerships and other nonemployer business entities with EINs).³ In addition, there are approximately 5.4 million employer businesses, of which 182 thousand are multi-unit (MU) enterprises with multiple locations, while the rest are single-unit (SU) businesses. While comparatively small in number, these 182 thousand MU enterprises account for 56% of aggregate U.S. business revenue in 2000. Nonemployer business units account for about 12% of aggregate revenue.

Table 2.1 gives a snap shot of the two universes but no indication of how they are related. Work to develop the current LBD uncovered a number of still unresolved issues. These included "new" establishments with administrative flags suggesting the unit had been in business for some time and spells of inactivity (exceeding one year) for continuing establishments. One hypothesis is that these phenomena are related to transitions to and from the nonemployer business universe. We also show below that a sizable percentage (roughly how big) of large EIN nonemployer businesses link to businesses in the employer universe. This finding is additional evidence that the two universes are closely related. At this point, it is unclear whether the Census Bureau double counts certain activities of large firms, or whether it incorrectly assigns some employer activity to the nonemployer universe. The Integrated Longitudinal Business Database will help to resolve these and other issues and to improve the measurement of business activity.

To construct the ILBD, we must first ensure that the administrative data from each universe is cleaned and ready for integration. On the employer side, this has been accomplished in creating the LBD, a longitudinal dataset of employer establishments (see Jarmin and Miranda, 2002).⁴ The LBD is an excellent source of establishment and firm age information for the employer business universe. High quality longitudinal establishment linkages make computation of establishment age easy and accurate. Longitudinal establishment linkages are relatively straightforward to construct, because they are one to one, and because establishments typically have a clear physical location. Firms are more difficult to track over time as firm-level links can be many to many. Work is progressing on developing a rich set of longitudinal firm linkages. In the mean time, we define the age of a firm in the LBD as the age of its oldest establishment.

We have done similar work with the nonemployer business register (see Nucci and Boden, 2003 and Boden and Nucci, 2004 for early attempts to longitudinally link data from the Census Bureau's nonemployer business register). However, longitudinal linkages are more difficult in the nonemployer universe for the same reason that longitudinal firm linkages are difficult in the employer universe. That is, businesses can

³ This distinction between the person ID and the business ID (or EIN) portion of the nonemployer universe has some complexities. For example, a nonemployer business that is a sole proprietorship that has applied for an EIN, has positive receipts but zero payroll will typically be on the person ID portion of the universe and may also appear on the employer universe. The point here is that having an EIN is not sufficient to be on the EIN portion of the nonemployer universe.

⁴ The main outstanding issue with respect to the establishment based LBD concerns spikes in the births of establishments owned by multi-unit companies during the quinquennial Economic Censuses. We are developing an algorithm to impute the actual year of birth for these establishments using both administrative and survey data.

change legal or tax status, and business identifiers such as person IDs or EINs can change as well. (person IDs do not change for individuals, but ownership changes can yield a change in the person ID associated with a business.) In the event of ownership changes for nonemployer businesses, it is not possible to maintain longitudinal business links absent additional information of a sort that is not typically available in the Census Bureau's administrative record system. On the employer side, direct Census Bureau collections provide this additional information, but there is no equivalent on the nonemployer side.

Integrating records from the employer and nonemployer business universes is further complicated by differences in the underlying administrative data and differences in the unit of analysis. The Census Bureau's Employer Business Register, which underlies the LBD, is a list of establishments (i.e., physical locations) maintained to serve as a mailing list for the Economic Census and as a frame for a variety of surveys. It relies heavily on administrative data, but is augmented by direct Census Bureau collections⁵. Since the unit of analysis is the establishment, longitudinal linking is relatively straightforward. Such linking is facilitated by having numeric establishment IDs (LBDNUMs and PPNs), administrative IDs (EINs) and enterprise IDs (Alphas) and business name and address information⁶.

The Census Bureau's nonemployer Business Register is made up entirely of administrative data. The unit of analysis is a business tax return and longitudinal linking can only be done with taxpayer IDs (person IDs and EINs) or Business Name information. Linking is further complicated by the fact that taxpayers may report income for multiple nonemployer businesses and these businesses do not have fixed locations. In order to facilitate creation of a longitudinal nonemployer business dataset, we first aggregate individual records up to the taxpayer ID. An individual may have more than one nonemployer business (e.g., file more than one Schedule C). For now, we aggregate records to one person, one ID since the name and ID are much more reliable data elements for linking over time (as opposed to self-reported industry on schedule C). We then link annual files longitudinally using the person ID or EIN in various combinations along with Business Name.⁷ In addition to the longitudinal linkages within each file, for this paper we have created preliminary linkages between the employer and nonemployer universes for our set of selected industries. These linkages make use of EINs, person IDs and business names found on records in both files. For this purpose, we take advantage of several key items of administrative information. For example, when an individual applies for an EIN they must fill out an SS-4 form for the IRS. This form includes Business Name information, person ID and the EIN and this information is stored in the administrative records system in the Census Business Register.

Given the sheer size of these data and the complexities of addressing a host of measurement issues, in this paper we focus on a selected number of industries. We deliberately select industries with large numbers and relatively high revenue shares for young and small businesses, because the relationship between the employer and

⁵ In order to maintain the establishment structure of Multi Unit enterprises, the Census Bureau annually conducts the Company Organization Survey. This is sent to all large multi unit companies and a sample of smaller ones. During an economic census, all establishments of multi unit companies are sent forms.

⁶ We plan to fully document establishment and firm IDs in a data appendix which will accompany future drafts of this paper.

⁷ The data appendix describes the linking in some detail.

nonemployer universes is likely to be most important for these industries. We steer away from industries with complex measurement issues related to financial holding companies and tax shelters. It turns out that for legal and tax reasons, many large complex employer businesses are also affiliated in some manner with nonemployer businesses (special purpose financial entities). While such corporate organizational structures are of interest in their own right, they are not the focus of our data integration and analysis efforts.

The selected industries are listed in Table 2.2 along with some basic statistics.⁸ Table 2.1 provides summary information for the selected industries as a group. We focus much of our analysis in this paper on these employers and nonemployers in these industries over the period 1992-2000. For the employer universe, via the LBD, we can examine business dynamics over a much longer period (1975-2001). For the nonemployer universe, we have reliable administrative data at the micro level from 1992-2001 (although we are missing the data for 1993). We do not use the 2001 data in the current version of the analysis since some of our processing for any given year requires taking advantage of prior year information available in subsequent years. Given this sample period and our interest in exploring the role of young and small businesses, much of the analysis in the paper uses 2000 as a reference year and looks backward or uses 1994 as a reference year and looks forward (we don't use 1992 as the reference year in our forward looking exercises since we are missing the 1993 nonemployer micro data).

Table 2.3 and Figures 2.1 and 2.2 provide information about the age and size distribution of these selected industries relative to the entire economy. Business age here is defined as the first time the entity is seen in its respective universe (for employer firms this is the age of the oldest establishment as noted above). We define the following age classes in a consistent manner in both universes: 1, 2, 3, 4, 5, 6-7, 8+. We combine age classes 6 and 7 since the nonemployer data are missing for 1993.

When comparing the size distributions across the two universes we use revenue size classes as this is the comparable activity measure across the two universes. The revenue cutoffs we use (in thousands of year 2000 dollars) for revenue size classes are: less than 3, 3-6, 6-9, 9-12, 12-30, 30-90, 90-180, 180-360, 360-600, 600-1200, 1200-3000, 3000+. The lowest size classes are, as will soon become clear, somewhat less relevant for the employer universe but we include them here since they are quite relevant for the nonemployer universe. Likewise, the largest size class is somewhat less relevant for the nonemployer universe but we include since it is so important for the employer universe.

⁸ The listed industries are 3-digit SIC industries. Since our sample period overlaps with the transition from SIC to NAICS we have to deal with this issue. Prior to 1997, the only industry codes available on the data files are 3-digit SIC. After 1997, for the employer universe we have both SIC and NAICS codes through 2000. For the nonemployer universe, we only have NAICS codes after 1998. As such, we had to convert the NAICS codes to SIC codes for the nonemployer universe. This is complicated in general given that NAICS to SIC is a many-to-many concordance but is made more complicated by the fact that the industry coding on the nonemployer universe is less reliable and less detailed in general since the detailed product line information collected via economic censuses is not available for such businesses. While in principle the nonemployer files have 6-digit NAICS codes, in practice many have only 4-digit NAICS codes. For 3-digit SIC detail this is not critical for all industries as there is often a one-to-one concordance for our selected 3-digit SICs but for others the concordance is less exact. As such, appropriate caution needs to be used in analyzing the results by detailed industry reported in this section. In many ways, our selection on specific industries is primarily designed to reduce the magnitude of the data we are exploring and to avoid specific industries (e.g., some financial services industries) where the nature of the nonemployer entities is more complex.

In terms of age, even for our selected industries, almost 80 percent of revenue and more than 40 percent of employer firms is accounted for by firms that 8 or more years old. For nonemployer firms, the share accounted for by firms 8 or more years older is much smaller. For nonemployers in particular, the firm share and revenue share distributions are u-shaped with very young firms accounting for a larger share than say 5 year old businesses. In terms of the size distribution, most nonemployer businesses are very small earning less than \$3K in annual revenue but not surprisingly such firms account for a very small fraction of revenue for nonemployer firms. For employer firms, almost seventy percent of revenue is account for my firms with more than 3 million dollars in annual revenue but such firms account for less five percent of the share of employer firms. Most employer firms are in the middle size classes depicted in Figure 2.2. Indeed it is striking the number of employer firms that have between 90K and 360K of annual revenue.

The tremendous variation in size across nonemployer and employer businesses exhibited in Figure 2.2 suggests appropriate caution in drawing inferences about the behavior of “small and young” businesses per se. The size distribution variation alone reminds us that many nonemployer businesses are extremely small reflecting some secondary or supplemental means of generating income. Analyzing the dynamics of such businesses alongside much large employer and nonemployer businesses is a challenge for this effort to construct and analyze the ILBD. In what follows, we often report results on both a firm and revenue weighted basis. The former by construction provides more insights about the behavior of the very small (and more prevalent) businesses while the latter provides more insights into the contribution of the larger businesses.

In terms of specific industries, Tables 2.2 and 2.3 show that a few of our selected industries constitute a large fraction of the total nonemployer business population – e.g., Miscellaneous personal services, Miscellaneous Business Services, Landscape and Horticultural Services and Management and Public Relations are all industries with more than 1 million nonemployer entities. In those industries (and in general for nonemployer businesses), a very large fraction of the firms are small (in terms of revenue) and young, and the young and small firms in these industries account for a large fraction of revenue. For employers, those same industries have substantially fewer entities. Instead, the employer industries with the biggest number of firms in our selected industries are Eating and Drinking Places, Automotive Repair Shops, and Legal Services. In these (and the other selected industries for employers), the young and small businesses account for a substantial fraction of firms but a much smaller fraction of revenue. For example, for accounting, auditing and bookkeeping shops, employer businesses with less than \$90K of annual revenue account for 32.8 percent of the businesses but only 1.6 percent of revenue.

Table 2.4 presents a look at the age and size distribution for a combined version (but not fully integrated) employer and nonemployer data. This combined version is generated by simply stacking the two datasets on top of each other. Not surprisingly, the revenue and firm shares by size and age for the integrated data lie between those for the separate universes where the firm shares are closer to those for the nonemployer universe and the revenue shares are closer to those for the employer. It is striking that there are some sectors where revenue is so dominated by employers that the revenue shares in the integrated data are essentially the same (e.g., life insurance and computer processing services) as in the employer universe. Alternatively, it is interesting there are some

sectors where the revenue share for young and small businesses is very large in the combined data (e.g., beauty shops, landscape and horticultural services and miscellaneous personal services). Overall, it is apparent that most firms in the combined data are very small and young but these firms account for a relatively small share of activity. The skewed nature of the distribution is especially apparent with respect to size where more than 70 percent of businesses had less than \$90K of revenue but these businesses accounted for less than 2 percent of aggregate revenue. Young businesses (less than 3 years old) account for a 38 percent of businesses and about 8 percent of total revenue.

Table 2.4 is a very preliminary look at combining the employer and nonemployer data but does not reflect true data integration. A truly integrated database would take into account the links between the employer and the nonemployer database, define business age appropriately taking such links into account, and permit analysis of the dynamics of young and small businesses as such businesses potentially cross over the nonemployer and employer boundaries. In the subsequent sections, we begin the process of exploring the links between the two universes that will permit such integration.

III. Backward-Looking Links from Employers to Nonemployers

A key objective is to understand the linkages between the employer and the nonemployer universe. As a first step, we start with the 2000 LBD and limit the analysis to our selected group of industries. We want to understand the longitudinal characteristics of businesses in the LBD in 2000. For instance we want know things like how old the business is or whether it originated as a nonemployer business. Thus, we match the 2000 LBD for our selected industries to the Nonemployer Business Register for all available years between 1992 and 2000. Since the LBD is an establishment file and the Nonemployer Business Register is a tax return based file, we need to role the observations in each dataset up to the level of the matching fields in common across them. These are EIN, person ID and Business Name. The LBD records, aggregated to the appropriate level, are linked to each year of available nonemployer data. Once links are obtained, LBD records are then aggregated to the enterprise level since it is not possible, at this point, to tell which specific establishments, if any, are associated with a linkage to the nonemployer data.

The result is an LBD based dataset with linkages to the nonemployer data and additional variables that describe the nature of the nonemployer records to which the enterprise is linked. Note that the unit of observation here is an enterprise operating within one of our selected 3-digit SIC industries. That is, firms operating in more than one of these industries will have multiple observations in these data.

Tables 3.1 and 3.2 summarize the age and size distributions of employer businesses from the LBD in 2000. The tables exhibit the familiar pattern of business age and size distributions. That is, for any cross section, the number of active businesses declines with both age and size, but the bulk of activity – measured here by payroll and employment – is concentrated in old and large businesses.

Our main focus in these tables, however, is to see how a cross section of employer businesses is linked to nonemployer businesses. When we think of business formation and growth the typical pattern of nonemployer to employer linkages we would expect to

see is where a business starts as a nonemployer, grows and eventually transitions to the employer universe where it grows further still. In our work to date, however, we take a more agnostic view and simply search for any and all linkages between our cross sections of employer businesses and the nonemployer universe.⁹

The second column in tables 3.1 and 3.2 gives the number of employer businesses that link to one or more nonemployer businesses between the years 1992 to 2000 (excluding 1993). We break these preliminary linkages out by the size and age of the employer business in the 2000 LBD. Two things stand out immediately. First, the majority (50.4%) of all 2000 employers firms with links to the nonemployer data are aged eight years or older. Second, an even bigger majority (63.6%) of firms with links are small (fewer than 5 employees). We also want a sense of the amount of nonemployer business activity links to the 2000 employer businesses in our selected industries. Since an employer business active in 2000 can link to nonemployer units over several year, we compute the average annual nonemployer receipts over all years to which an employer business has links to the nonemployer universe. Again, we find that most of the nonemployer activity with linkages to the 2000 LBD is concentrated among older (50.97% of linked NE receipts link to employers age 8 and higher) and smaller (49.96% of linked NE receipts link to employers with fewer than 5 employees) employer businesses. However, it is interesting to note that very young business account for a much higher portion of the linked nonemployer receipts than they do for either payroll or employment (7.68% of receipts versus 2.3 and 1.7% of payroll and employment respectively for age 0 businesses).

The high portion of linkages to the nonemployer universe accounted for by older employer businesses suggests that transitions of young growing businesses is not the predominant way in which nonemployer enter the employer universe. We examine the timing of these linkages in more detail in Table 3.3 and Figure 3.1. We know the age of employer businesses from the LBD. We construct an age measure for a nonemployer business based on the first year we observe it in the Nonemployer Business Register. We can observe employer businesses in the LBD all the way back to 1975, but our nonemployer data go back only to 1992. Thus, many nonemployer businesses observed in 1992 will actually be much older (just as many employer businesses observed in 1975 will be much older). In results not reported here, we dropped all cases where the nonemployer business was observed in 1992 and found no qualitative differences in the results.

The exercise in Table 3.3 simply shows which record is older when we are able to link an employer business active in 2000 to a nonemployer business sometime over the 1992-2000 period. We would expect to see the nonemployer record be older if the phenomenon by which nonemployers end up in the employer universe is business growth. Figure 3.1 provides a more complete comparison of the age distributions of linked employer and nonemployer businesses. Only linked cases are used in the figure which shows the frequency of the computed difference in the age of employer and nonemployer records that link. The modal outcome is zero difference. That is, both records appear in their respective universe for the first time in the same year. However,

⁹ The at risk group for this analysis are all employer businesses in 2000 with positive payroll in our selected industries. In looking backwards for links we do not require that the link to the nonemployer business be in the same industry. The link is via ID and/or business name.

the interesting thing to take away from the figure appears when one examines the asymmetry in the age differences around zero. A positive difference implies the employer record is older and a negative difference implies the nonemployer record is older. The figure clearly shows that cases where the employer record is older outnumber cases where the nonemployer record is older (for example, there are approximately 35,000 cases where the difference is 1 and only about 27,000 cases where the difference is -1).

Looking at things from the point of view of a nonemployer business, the most likely transition into the employer universe is to be absorbed by an already existing, indeed older, employer business. This is quite a different path than when an entrepreneur starts up a small nonemployer business that grows and eventually transitions into the employer universe. That is not to say, however, that being absorbed by an existing employer business is a bad thing. There have been many media reports over the years of small start ups being purchased for big money by large corporations. While this does happen, the results in Table 3.2, that show most employer businesses with links to nonemployers are quite small, suggest that most nonemployer businesses meet a more mundane fate upon transition to the employer universe.

IV. Transitions between Nonemployer and Employer Status

In the prior section, we undertook a preliminary examination of the linkages between the employer and nonemployer business universe. The primary results are that there are extensive and complex linkages between the two business universes. The extent of the linkages suggests that integrating the employer and non-employer business universes is critical for understanding business dynamics and especially the dynamics of young and small businesses. However, the nature of the linkages are complex suggesting that businesses move across the employer and non-employer boundary frequently and that many non-employer businesses transit to employer status by becoming absorbed by older employer businesses. Thus, the simple view that some non-employer businesses become sufficiently profitable that they transit to employer status is overly simplistic.

In this section, we continue this exploration into the linkages and transitions between the two business universes by conducting a forward-looking analysis of transitions for both business universes. In particular, we examine the 1994 non-employer business universe and explore the status of all such 1994 businesses three years later.¹⁰ In turn, we conduct a parallel analysis for the 1994 employer business population.

Figure 4.1 depicts the three year transition dynamics for the 1994 population of non-employer businesses.¹¹ The specific population we use are the non-employer businesses with positive receipts in 1994 in our selected industries. Linkages over time are based upon person ID and EIN matches over time as well as name matches.¹² For the

¹⁰ We have also computed these transition shares over a six year horizon and the basic patterns are very similar, although the magnitudes change in expected directions (e.g., the share of activity accounted for by exits on both a firm and revenue basis increases substantially).

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¹² As in the prior section, we don't require the forward link to be in the same industry. The categories we examine in terms of continuers and exits as well as links are not dependent on being in the same industry. In the subsequent analysis of employer to nonemployer transitions, we follow a similar

transitions between the non-employer and employer universe as we noted in section 2, name matches are an important source of the linkages.

We classify the possible outcomes into six categories. Three of the categories are “Exit” categories which in this setting reflects businesses with positive receipts in the non-employer universe in 1994 and zero receipts three years later (in 1997). Amongst these exit categories are three types: businesses who have no record in the employer universe in 1997, businesses who do have a record in the employer universe in 1997 but have zero payroll in 1997 and businesses who have a record in the employer universe in 1997 and have positive payroll. The first category are plausible candidates for “true exits” – they have zero activity on both universes in 1997. The third category are businesses that are plausible candidates for “successful transitions” from the nonemployer to the employer universe where “successful” here means that the business successfully moved from positive activity in the nonemployer universe to positive activity in the employer universe. The middle or second category are more difficult to classify – they may be businesses that attempted a transition to the employer universe but failed or they may be businesses that are in the process of transiting to the employer universe.

Three of the categories are for continuing non-employer businesses. Continuing in this context means the business also had positive non-employer receipts in 1997. Here again the businesses are classified into three groups. The first group are the businesses that have no record in the employer universe in 1997. As such, they are simply continuing non-employer businesses. The second group are the businesses that have a link to the employer universe in 1997 but have zero payroll. The last group are the businesses that have a link to the 1997 employer universe and also have positive payroll. These continuing businesses with links to the employer universe may reflect many different events. For example, the third category might easily include persons who own both an employer and a non-employer business on a continuing basis. Alternatively, the second group (those with a link but zero payroll) might be businesses in the process of transiting to the employer universe. For example, they may have applied for an EIN with the intention of hiring workers but have not yet hired any workers.

About half of the nonemployer businesses and about 40 percent of the revenue in 1994 are continuing businesses without any links to employer businesses in 1997. About thirty percent of the businesses and about twenty percent of the revenue are associated with true exits. About five percent of businesses but about ten percent of revenue in 1994 are successful transitions to the employer universe. While five percent is not a large share per se, since there are over five million nonemployer businesses in our selected industries, this reflects more than 250,000 businesses in this “successful transition” category. To provide some perspective on this magnitude, in our selected industries there are about 500,000 employer businesses that are less than three years old in 1997. In principle, then, the “successful transitions” may be accounting for up to half of these 1994-97 true employer entrants. However, our analysis in section 3 already indicates that many of the transitions from non-employer to employer businesses reflect businesses that have transited more than once and/or reflect non-employer businesses that have been absorbed by employer businesses (and thus would potentially be absorbed by an employer business older than three years old).

protocol. That is, the at risk group are employer businesses in 1994 with positive payroll in our selected industries. Forward links are not dependent upon being in the same industry.

The continuing non-employer businesses that have some link to the employer universe in 1997 constitute about 15 percent of firms and 30 percent of revenue in 1994.

Interestingly, more than half of the latter is accounted for by businesses that have a link to an employer business in 1997 but the employer business has zero payroll. It will require further analysis to decipher the nature of such linkages – in particular, it could be these are businesses that have already attempted a transition or are about to undertake a transition or are simply contemplating a transition (i.e., applied for an EIN).

Figure 4.2 reports the analogous transitions with person ID firms and EIN firms broken out separately. We find that true exits and continuers without any link to employer universe are more prevalent amongst person ID firms. Accordingly, it is the EIN nonemployer firms that in general have more links to the employer universe. One interesting exception to this is the share of firms that are continuing nonemployer firms and have positive payroll in the employer universe. For this category, the share of EIN firms is virtually zero. This suggests that this category may be primarily populated by individuals who have both a nonemployer and an employer business.

These basic transition patterns raise more questions than they answer. Basic questions include: what are the factors that determine the patterns that we observe? and/or even more generally what are the characteristics of the businesses in each of the transition categories? While it is beyond the current paper to answer these questions fully, Figure 4.3 takes a basic step in answering this question by providing insight into the growth dynamics of the businesses in each of the categories prior to any transition that may have occurred. Specifically, for any business that exits the nonemployer category, we compute the average annual growth rate of real revenue for the years prior to exit (e.g., if a business is present in 1994, 1995 and 1996 but exits in 1997 this would be the average of the 1994-95 and 1995-96 growth rates). In addition, for continuers, we compute the simple average annual growth rate of real revenue for the 1994-97 for each of the categories under consideration.

In addition to the net growth rate measure, a measure of the volatility of growth rates is computed as well. For the latter, we use the excess reallocation rate which follows the concepts developed by Davis, Haltiwanger and Schuh (1996) (hereafter DHS). In this context, the measure of activity is not employment but rather revenue but the basic idea is the same. For each business, the growth rate is measured as the change in revenue from time $t-1$ to t divided by the average revenue for the business in $t-1$ and t .¹³ A gross revenue expansion rate is calculated as the weighted average of the growth rates for all expanding businesses (including startups) where the weights are the average revenue of the business in periods $t-1$ and t .¹⁴ A gross revenue contraction rate is calculated as the weighted average of the growth rate for all contracting businesses (including those shutting down). The sum of the expansion rate and the contraction rate is the total reallocation rate. The latter is a useful summary measure of volatility (and indeed is an absolute deviation measure of dispersion centered around zero) but this measure of volatility will by construction be positively related with the magnitude of the absolute

¹³ This growth rate concept is discussed in detail in DHS but has desirable properties like the log first difference growth rate measure in that it is symmetric for positive and negative changes but has the advantage relative to the log first difference in that it can accommodate startups and shutdowns.

Moreover, this measure is a second order approximation of the log first difference growth measure.

¹⁴ The weighting implies that the net growth rate for a given category is the aggregate net growth rate for the category. Moreover, the measure of volatility (excess reallocation) is activity weighted as well.

value of the net growth rate. To overcome this limitation, we use an “excess” reallocation rate which is the total reallocation rate less the absolute value of the net growth rate (see DHS for more discussion of these concepts).

Figure 4.3 shows that “successful transitions” have the highest net growth rate and, interestingly, the lowest excess reallocation rate for the years prior to the transition.. The next highest net growth rate and also lowest excess rate is for continuers without any links. The next highest growth rate is for businesses that have exited the nonemployer universe but have a link to employer universe in 1997 without payroll. However, this category also has a very high excess reallocation rate. The category with the lowest net growth rate and the highest excess rate are the true exits.

These patterns make intuitive sense and, in turn, help us understand more about the nature of these transition dynamics. The high net growth rate for the successful transitions suggests that businesses prior to making the transition tend to have disproportionately high growth, and, interestingly relatively low volatility. In contrast, the businesses that exit tend to contract prior to exit on average but also exhibit very high volatility. It is also interesting that the businesses that exit the nonemployer universe but have a link to employer universe without payroll have relatively high average growth and also high volatility. Presumably this category includes businesses that are in the process of a transition which would help explain the higher average net growth but they also include businesses that tried to make the transition and failed – which would help account for the high volatility. Without substantial further analysis, these inferences are very preliminary but the systematic and intuitive nature of these patterns provides hope that we can make sense of the observed transition dynamics.

To conclude this section, we examine transitions going the other way – i.e., we examine the universe of 1994 employer businesses and examine outcomes at a three year horizon. Figure 4.4 reports the results for these transition dynamics that are defined in an analogous manner. The primary difference here is that for the employer universe, positive activity is defined in terms of positive payroll so the universe at risk is employer businesses with positive payroll in 1994. Exits are businesses with zero payroll in 1997 while continuers have positive payroll in 1997. In each of these cases, we distinguish between those businesses with and without a link to the nonemployer universe in 1997. A link exists if the ID or name of business is found in the 1997 nonemployer universe. For the latter we distinguish between businesses we find that have zero receipts and those that have positive receipts. Finally, although the exit/continuer status is defined in terms of payroll, we report shares of activity in terms of shares of firms and shares of revenue. We use the latter activity concepts to make the results as comparable as possible to results reported above. Note that we have examined the shares of payroll as well by these categories and the results are very similar for payroll and revenue.

In examining these transitions, by far the most important category are continuing employers without links to the nonemployer universe. The second most important category are the true exits from the employer universe without any link to nonemployer universe. While this qualitative pattern matches the analogous transitions for nonemployers reported in Figure 4.1, it is notable that “true exits” for employer businesses are less likely than “true exits” for nonemployers.

In terms of employer businesses with links to the nonemployer universe, most are continuing employers with either positive receipts or zero receipts in 1997 in the

nonemployer universe. The continuers with links with positive receipts in part reflect individuals who own both an employer and a nonemployer firm. The continuers with links with zero receipts presumably reflect in part employer businesses that are in the process of absorbing a nonemployer business.

The share of businesses (on a firm basis or revenue) basis that exit the employer universe in terms of having zero payroll and have a link to the nonemployer universe is quite small. For example, the exits that have positive receipts in the nonemployer universe in 1997 account for about 5 percent of firms and 2 percent of revenue in the employer universe in 1994. Comparing the analogous category in Figure 4.1 (what we denoted as successful transitions), this category of transitions from employer to nonemployer is much smaller. Putting this finding together with the findings for continuers suggests that while there are many employer businesses that subsequently have a link to a nonemployer business, most of those links are not transitions from employer to nonemployer status but rather are some other type of link.

We also classify these same transitions by whether the firm has only one establishment (SU for single unit) or the firm has multiple establishments (MU for multi-unit). The results of this exercise are reported in Figure 4.5. The same basic patterns reported in Figure 4.4 hold for each type of firm but the magnitudes differ in substantial and interesting ways. In terms of share of revenue especially, MU firms are much less likely to exit than SU firms. Also in terms of shares of revenue, MU firms are much more likely to be continuing employer firms with a link to a nonemployer firm (with and without positive receipts). The zero receipt continuer category makes sense in terms of MU firms absorbing nonemployer firms. The continuers with links and positive receipts category is somewhat more puzzling to the extent that this category reflects individuals who own both employer and nonemployer businesses. If this interpretation is correct, the employer businesses in such relationships are more likely to be MU firms.

V. Business Revenue Growth and Volatility by Age and Size

The prior sections make clear there are a rich set of linkages between the employer and the nonemployer universes. The nature of the linkages is complex. Some reflect transitions such as a nonemployer business becoming sufficiently successful that it transits to employer status (i.e., the business hires workers). Others reflect existing employer businesses absorbing nonemployer businesses. Still others apparently reflect individuals or entities that operate simultaneously (or at least frequently) in both the employer and the nonemployer universe. Given our focus on the dynamics of young and small businesses, these rich connections imply that the study of only employer businesses and/or only nonemployer businesses separately may yield some misleading characterizations of dynamics – particularly dynamics with respect to entry and exit and more generally the role of business age. Our long run objective is to integrate the employer and nonemployer business universes to provide a comprehensive data infrastructure that will enable us to look at the core issues of young and small business growth taking the linkages between the employer and nonemployer universes into account. However, as should also now be clear from the analysis above, the linkages are sufficiently complex that constructing an integrated, longitudinal business database incorporating employer and nonemployer businesses is a major data infrastructure undertaking. Our goal in this paper is to explore the connections and relationships between the two universes to help us to this long run objective. With this in mind, in this

section we undertake a comparison of the growth rate dynamics we observe in each of the universes independently. Our limited objective here is to compare and contrast the dynamics observed in each universe, knowing that a full understanding of these dynamics awaits the integrated data infrastructure.

Specifically, in this section, we examine the patterns of net growth and growth rate volatility (using the excess reallocation concept) for both the employer and nonemployer universes by measures of business age and business size. As before, when looking backwards and using age and size as the business characteristics, we focus on the reference year 2000 (really the growth between 1999-2000 as this is the most recent year we can measure growth and volatility in a consistent manner in both business universes).

Figure 5.1 depicts the pattern of net revenue growth rates by age class and Figure 5.2 depicts the pattern of volatility (excess revenue reallocation rates) by age class for both the employer and nonemployer universes. Since we have more years we can construct these statistics for the employer universe, we include the 2000 statistics but also the time series average of the same statistics for the years 1994-2000 for the employer universe. Note that all of the statistics reported in this section are based on activity-weighted growth rates as described in section 4. This implies that at least within a category (age or size class) businesses that are larger are given a larger weight.

For both employer and nonemployer businesses, net growth and volatility decline with business age. However, the pace of the decline of net growth with age is much sharper with employer businesses suggesting that the first few years of an employer business are especially critical in terms of adjusting to the size it operates in while still young. In contrast, volatility of nonemployer businesses declines more sharply with business age and volatility of nonemployer businesses is substantially higher for all age groups.

Figures 5.3 and 5.4 show the analogous patterns for revenue size classes. The net growth relationship with size is quite different across employers and nonemployers. For nonemployers, net growth is u-shaped with respect to size. In contrast, for employers, net growth increases with size. For the very smallest size classes this may not be especially interesting since the share of employer businesses in the smallest size classes is very small but this pattern also holds for the middle size classes where there are an important fraction of employer businesses. Moreover, net revenue growth increases with size amongst the top three size classes for employer businesses. For nonemployers, revenue growth actually declines slightly with size for the top three size classes.

In terms of volatility, Figure 5.4 shows that the volatility declines with business size for both employers and nonemployers. For the very small businesses, volatility is actually greater for employers but once businesses have at least \$180K in annual revenue, this relationship is reversed (i.e., nonemployers are more volatile). Interesting volatility for employer and nonemployer businesses is about the same for the largest businesses.

Finally, as a robustness check, Figure 5.5 reports analogous net and volatility measures for payroll for the employer universe only and by business age. These rates are reported along with the revenue based rates reported in Figures 5.1 and 5.2. We find that the patterns for payroll based measures are very similar to those for revenue.

VI. Concluding Remarks

Our main findings are:

- For employer businesses, it is well known that most businesses are small (and in turn many of these small businesses are young) but most activity is accounted for by large and mature businesses. For nonemployer businesses, it is also the case that most businesses are young and small but in this universe the young and small businesses account for a much larger share of activity. However, the overall share of activity (e.g., measured in terms of revenue) is accounted for by large, mature employer businesses.
- The linkages between employer and nonemployer businesses are rich and complex. Looking backwards and forwards a large fraction of employer firms have some prior year or subsequent year connection to a nonemployer firm. These connections take many forms: an employer business absorbing a nonemployer, a continuing nonemployer and a continuing employer firm having an ongoing connection, and a nonemployer firm transiting to becoming an employer firm.
- The latter category (nonemployer firms transiting to employer firms) are especially important for the measurement and analysis of the dynamics of young and small firms. We find a small but important segment of nonemployer businesses make this transition suggesting that a non-trivial number of entering employer businesses are actually not true new entrants but rather are businesses that have had a prior history as an employer business. Interestingly, among nonemployers, we find that the businesses that make this transition have higher than average net growth and lower than average volatility compared to other nonemployer businesses in the years prior to the transition. While our analysis of dynamics is at a very primitive stage, these findings suggest that understanding the entrants of employer businesses requires understanding the potential prior history and dynamics as nonemployer businesses.
- In exploring the separate dynamics within the employer and nonemployer businesses in terms of revenue growth and volatility, we find that the qualitative relationships between growth, volatility and age are similar but differ substantially quantitatively. For example, for both employer and nonemployer businesses, net growth is a declining function of size but the rate of decline is much steeper for employer businesses. However, while both employer and nonemployer businesses exhibit declining volatility with age, the rate of the decline is much greater in this case for nonemployer businesses.
- The relationships between growth and volatility with size (measured in terms of revenue) differs across the two business universes to a greater extent. For nonemployers, net growth is u-shaped with respect to size while for employers net growth is increasing in size. For both employer and nonemployer universes, volatility declines with business size.

Our ultimate goal is to construct and analyze an Integrated Longitudinal Business Database based upon an integration both cross sectionally and longitudinally of the employer and nonemployer business universes. This paper represents small but important steps in this direction. The findings to date quantify the importance and the measurement difficulties that must be confronted in constructing the integrated business database. The complex nature of the linkages between the employer and the nonemployer universes are

the biggest challenge we face in working towards this objective.

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Table 2.1 Summary Statistics for the Employer and Nonemployer Business Universes, 2000

Nonemployer Business Universe				Employer Business Universe				
	All Industries	26 Selected Industries			All Industries	26 Selected Industries		
	Number	Number	Percent		Number	Number	Percent	
EIN Units	2.13	0.45	21%	Single-Unit	5.26	1.64	31%	
SSN Units	13.94	5.10	37%	Multi-Unit	0.18	0.06	33%	
All	16.06	5.55	35%	All	5.44	1.70	31%	
	Revenue	Revenues	Percent		Revenue	Revenue	Percent	
EIN Units	248.9	44.8	18%	Single-Unit	2,020.1	358.3	18%	
SSN Units	520.3	160.3	31%	Multi-Unit	3,551.9	379.4	11%	
All	769.2	205.1	27%	All	5,572.0	737.6	13%	
Shares of Aggregate Business Revenue					Payroll	Payroll	Percent	
<i>Nonemployer Businesses</i>		<i>Employer Businesses</i>		Single-Unit	413.7	112.4	27%	
EIN Units	SSN Units	Single-Unit	Multi-Unit	Multi-Unit	677.3	135.4	20%	
3.9%	8.2%	31.9%	56.0%	All	1,090.9	247.8	23%	
Shares of Business Revenue, 26 Selected Industries					Employment	Employment	Percent	
<i>Nonemployer Businesses</i>		<i>Employer Businesses</i>		Single-Unit	42.47	12.59	30%	
EIN Units	SSN Units	Single-Unit	Multi-Unit	Multi-Unit	56.23	11.95	21%	
4.7%	17.0%	38.0%	40.2%	All	98.70	24.53	25%	

Number of Units and Employment in Millions; Revenue and Payroll in Billions.

Table 2.2 Selected Industries in the Integrated Business Universe, 2000

Industry	Employer Firms	Nonemployer Entities*	Employer Firms		NonEmployer *	
			Payroll	Employment	Revenue	Revenue
Farm labor and management services	1.0	41.5	71.01	8.8	563.31	1,520.52
Landscape and horticultural services	65.3	1,101.4	3,394.57	428.3	9,916.98	36,680.20
Logging	11.3	11.0	662.68	74.9	3,649.08	503.24
Commercial printing	27.5	35.3	6,743.87	569.4	20,902.60	1,658.61
Industrial machinery, n.e.c.	22.7	15.7	4,408.47	356.1	14,210.48	913.92
Electronic components and accessories	5.0	9.9	9,663.26	551.6	44,274.64	313.16
Ship and boat building and repairing	3.2	256.9	1,631.55	145.0	7,835.66	6,366.54
Trucking and courier services, except air	97.1	379.0	18,420.36	1,774.8	63,811.71	27,248.59
Eating and Drinking Places	308.4	182.0	28,038.91	7,284.0	83,570.94	10,630.25
Security brokers and dealers	9.1	173.2	15,608.85	400.4	51,824.95	13,957.35
Life insurance	0.5	9.7	6,515.87	366.8	17,862.75	271.00
Insurance agents, brokers, and service	105.4	316.9	8,968.78	657.5	36,765.91	15,021.60
Real estate operators and lessors	73.3	752.4	4,330.40	456.3	25,402.23	88,352.21
Real estate agents and managers	100.9	854.1	10,060.61	830.5	32,109.25	42,045.89
Laundry, cleaning, and garment services	42.6	828.3	2,432.00	420.2	6,857.46	19,262.64
Beauty shops	63.3	561.0	2,070.27	400.1	4,513.57	11,948.08
Miscellaneous personal services	28.2	2,223.9	972.57	299.0	2,673.64	42,647.00
Computer and data processing services	101.4	414.7	40,871.50	1,883.9	91,428.73	16,956.86
Miscellaneous business services	88.7	3,075.2	12,645.84	1,773.7	34,306.87	97,262.38
Automotive repair shops	121.1	260.0	5,505.06	617.5	20,487.70	11,768.91
Producers, orchestras, entertainers	15.3	635.5	2,116.41	177.6	5,750.88	18,766.35
Misc. amusement, recreation services	52.6	283.3	6,024.42	1,087.2	19,592.21	10,392.00
Legal services	145.5	214.9	19,030.72	985.9	50,004.84	11,798.40
Individual and family services	31.3	77.2	5,382.90	831.5	12,106.23	1,328.73
Accounting, auditing, and bookkeeping	74.4	303.1	10,307.43	747.2	21,108.56	6,231.75
Management and public relations	101.3	1,282.8	21,915.42	1,406.3	56,103.61	73,764.38
Total Economy	5,443.4	16,064.9	1,090,946.23	98,696.2	5,571,950.81	769,189.71

* duplicate entities across industries (NAICS-SIC3 conversion problem)

* Units and employment in thousands. Payroll and Revenue in millions.

Table 2.3 Revenue Shares for Young and Small Businesses, Selected Industries, 2000

Label	NONEMPLOYERS		EMPLOYERS		NONEMPLOYERS		EMPLOYERS	
	Revenue Shares		Revenue Shares		Firm Shares		Firm Shares	
	Age 0 to 3	<\$90,000	Age 0 to 3	<\$90,000	Age 0 to 3	<\$90,000	Age 0 to 3	<\$90,000
Farm labor and management services	35.5%	37.0%	20.7%	0.5%	42.9%	91.2%	38.5%	30.4%
Landscape and horticultural services	46.0%	47.3%	17.5%	2.9%	52.6%	92.0%	33.7%	29.2%
Logging	29.0%	25.6%	13.3%	0.7%	39.4%	87.5%	23.8%	17.7%
Commercial printing	35.6%	35.0%	4.8%	0.2%	43.6%	86.9%	16.4%	14.5%
Industrial machinery, n.e.c.	50.9%	24.4%	6.6%	0.3%	52.3%	84.9%	21.7%	15.7%
Electronic components and accessories	43.3%	35.4%	2.3%	0.0%	52.3%	92.7%	20.9%	14.9%
Ship and boat building and repairing	32.4%	65.7%	3.3%	0.1%	35.8%	95.2%	29.7%	21.1%
Trucking and courier services, except air	27.1%	36.0%	9.2%	0.5%	32.3%	71.7%	37.6%	22.1%
Eating and Drinking Places	34.8%	32.5%	16.2%	1.0%	44.6%	87.0%	34.2%	21.5%
Security brokers and dealers	33.8%	20.1%	6.0%	0.0%	40.3%	81.6%	30.1%	23.0%
Life insurance	34.8%	40.0%	0.2%	0.0%	45.5%	93.7%	27.4%	27.0%
Insurance agents, brokers, and service	46.1%	40.3%	10.2%	0.9%	52.1%	86.6%	23.0%	23.8%
Real estate operators and lessors	33.5%	16.1%	22.3%	0.8%	43.1%	65.7%	27.0%	24.5%
Real estate agents and managers	33.6%	39.2%	19.2%	1.1%	38.2%	85.6%	33.6%	28.4%
Laundry, cleaning, and garment services	37.0%	64.0%	11.8%	2.8%	41.2%	95.7%	28.7%	30.9%
Beauty shops	40.2%	83.4%	21.8%	10.7%	53.7%	98.0%	30.6%	50.8%
Miscellaneous personal services	33.9%	72.2%	37.7%	6.8%	42.0%	97.4%	48.6%	46.4%
Computer and data processing services	29.6%	37.2%	13.1%	0.4%	43.3%	89.3%	53.5%	28.1%
Miscellaneous business services	33.2%	47.7%	17.6%	0.9%	37.3%	92.7%	45.0%	28.6%
Automotive repair shops	53.9%	44.3%	15.9%	1.3%	55.1%	87.5%	25.0%	16.6%
Producers, orchestras, entertainers	48.0%	44.1%	16.7%	0.8%	53.4%	94.0%	31.0%	27.9%
Misc. amusement, recreation services	34.0%	35.3%	12.6%	0.9%	35.7%	92.0%	29.4%	27.9%
Legal services	21.0%	37.0%	9.4%	0.8%	29.4%	82.7%	22.1%	19.5%
Individual and family services	23.6%	71.3%	5.0%	0.9%	28.6%	97.5%	17.6%	29.8%
Accounting, auditing, and bookkeeping	28.7%	64.7%	8.6%	1.6%	34.8%	96.0%	22.8%	32.8%
Management and public relations	29.2%	29.7%	20.8%	0.7%	33.0%	85.2%	47.5%	30.8%
Total Economy	30.8%	36.0%	7.0%	0.2%	39.1%	88.3%	29.5%	21.8%

Table 2.4 Revenue Shares for Young and Small Businesses in ILBD, Selected Industries, 2000

Label	<u>Revenue Shares</u>		<u>Firm Shares</u>	
	Age 0 to 3	<\$90,000	Age 0 to 3	<\$90,000
Farm labor and management services	24.87%	17.74%	43.22%	89.87%
Landscape and horticultural services	27.40%	27.34%	42.41%	88.51%
Logging	14.69%	1.75%	38.00%	52.04%
Commercial printing	5.53%	1.08%	28.13%	55.26%
Industrial machinery, n.e.c.	7.59%	0.78%	35.27%	44.05%
Electronic components and accessories	2.41%	0.09%	42.38%	66.64%
Ship and boat building and repairing	8.72%	13.99%	39.28%	94.31%
Trucking and courier services, except air	12.49%	4.85%	42.32%	61.61%
Eating and Drinking Places	16.21%	1.00%	34.16%	21.47%
Security brokers and dealers	8.32%	1.68%	35.41%	78.71%
Life insurance	0.41%	0.21%	50.98%	90.09%
Insurance agents, brokers, and service	11.46%	5.59%	27.80%	70.93%
Real estate operators and lessors	27.71%	8.97%	34.97%	62.06%
Real estate agents and managers	21.57%	12.60%	32.39%	79.59%
Laundry, cleaning, and garment services	22.89%	32.31%	43.79%	92.53%
Beauty shops	27.38%	44.64%	39.29%	93.17%
Miscellaneous personal services	35.25%	61.73%	45.51%	96.72%
Computer and data processing services	14.99%	2.48%	52.28%	77.24%
Miscellaneous business services	25.33%	23.55%	43.15%	90.86%
Automotive repair shops	18.76%	8.14%	33.94%	64.99%
Producers, orchestras, entertainers	24.44%	23.30%	37.08%	92.42%
Misc. amusement, recreation services	16.24%	6.05%	39.37%	81.97%
Legal services	10.82%	3.43%	29.65%	57.23%
Individual and family services	6.21%	3.33%	43.16%	77.99%
Accounting, auditing, and bookkeeping	10.48%	7.21%	30.97%	83.55%
Management and public relations	24.75%	9.49%	42.42%	81.23%
Total Economy	8.02%	1.60%	37.99%	71.71%

Table 3.1 2000 LBD by Age for Selected Industries with Backwards Linkages to the Nonemployer Business Register

Firm Age	Number of Firm-SIC Obs	Number of obs with links to NE data	2000 Payroll (*\$1000)	2000 Employees	Avg, Annual NE Receipts ¹⁵	% of all Firm-SIC obs	% of obs with links	% of total 2000 LBD Payroll	% of 2000 LBD emp.	% of Linked 92-00 NE Receipts	avg pay	avg emp	avg NE receipts
0	190557	37420	21929143	463654	4677166	10.13%	19.64%	2.34%	1.74%	7.68%	115.1	2.4	125.0
1	170841	39737	29585312	1135316	4706546	9.08%	23.26%	3.16%	4.27%	7.73%	173.2	6.6	118.4
2	152818	38762	28945150	1084923	3952287	8.12%	25.36%	3.09%	4.08%	6.49%	189.4	7.1	102.0
3	133757	39208	27541387	1033389	4435974	7.11%	29.31%	2.94%	3.89%	7.28%	205.9	7.7	113.1
4	116420	36199	26665226	963311	3548311	6.19%	31.09%	2.85%	3.62%	5.83%	229.0	8.3	98.0
5	100483	33599	23664132	859183	3371086	5.34%	33.44%	2.53%	3.23%	5.54%	235.5	8.6	100.3
6-7	164542	55842	42309612	1520623	5165039	8.74%	33.94%	4.51%	5.72%	8.48%	257.1	9.2	92.5
8+	852455	285826	736551902	19536299	31036368	45.30%	33.53%	78.59%	73.45%	50.97%	864.0	22.9	108.6
Total	1881873	566593	937191864	26596698	60892679								

¹⁵ To compute this we summed deflated (base year is 2000) annual NE receipts for all years between 1992 and 2000 (excluding 1993) for each 2000 LBD firm that linked to the NE data within each age category. To annualize we divide by 8.

Table 3.2 2000 LBD by Employment Size for Selected Industries with Backwards Linkages to the Nonemployer Business Register

Firm Age	Number of Firm-SIC Obs	Number of obs with links to NE data	2000 Payroll (*\$1000)	2000 Employees	Avg, Annual NE Receipts ¹⁶	% of all Firm-SIC obs	% of obs with links	% of total 2000 LBD Payroll	% of 2000 LBD emp.	% of Linked 92-00 NE Receipts	avg pay	avg emp	avg NE receipts
1-4	1203980	360425	64733466	1935798	30424096	63.98%	29.94%	6.92%	7.29%	49.97%	53.8	1.6	84.4
5-9	306324	91358	50351163	2006613	9768158	16.28%	29.82%	5.38%	7.56%	16.04%	164.4	6.6	106.9
10-19	185392	54720	63710214	2495859	6928679	9.85%	29.52%	6.81%	9.40%	11.38%	343.7	13.5	126.6
20-49	123348	37182	95340805	3708820	6118350	6.55%	30.14%	10.20%	13.96%	10.05%	772.9	30.1	164.6
50-99	37098	11865	71338457	2521953	2805822	1.97%	31.98%	7.63%	9.50%	4.61%	1923.0	68.0	235.5
100-249	17128	6589	79537446	2549965	2481276	0.91%	38.47%	8.51%	9.60%	4.08%	4643.7	148.9	376.6
250-499	4770	2179	69301829	1634811	1004022	0.25%	45.68%	7.39%	6.15%	1.65%	12312.0	345.4	460.8
500+	3808	2243	440717096	9704327	1358787	0.20%	58.90%	47.03%	36.49%	2.23%	130293.7	3206.1	605.8
Total	1881873	566593	937191864	26596698	60889189								

¹⁶ To compute this we summed deflated (base year is 2000) annual NE receipts for all years between 1992 and 2000 (excluding 1993) for each 2000 LBD firm that linked to the NE data within each size category. To annualize we divide by 8.

Table 3.3 Timing of Backward Linkages from Employer Businesses in 2000

Linkage Timing	# of Employer Businesses	Payroll	Emp	NE Receipts (92-00)	% of Businesses	% of linked businesses	% of total 2000 LBD Payroll	% of 2000 LBD employment	% of Total NE Receipts
No Link	1315287	416010608	13736660	0	69.89%	0.00%	44.39%	51.65%	0.00%
LBD Older	397823	487047130	11700208	253478080	21.14%	70.21%	51.97%	43.99%	60.36%
NE Older	127864	23842749	850027	143462816	6.79%	22.57%	2.54%	3.20%	34.16%
Same	40899	10291377	309803	23008614	2.17%	7.22%	1.10%	1.16%	5.48%
Total	1881873	937191864	26596698	419949510					

Figure 2.1

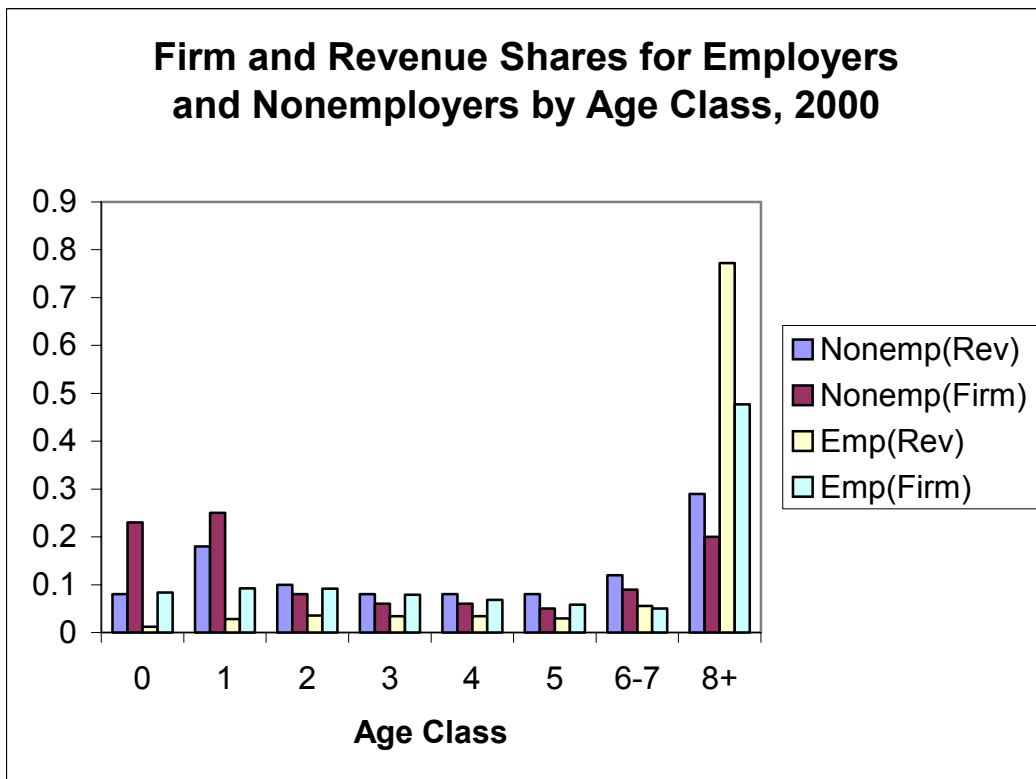


Figure 2.2

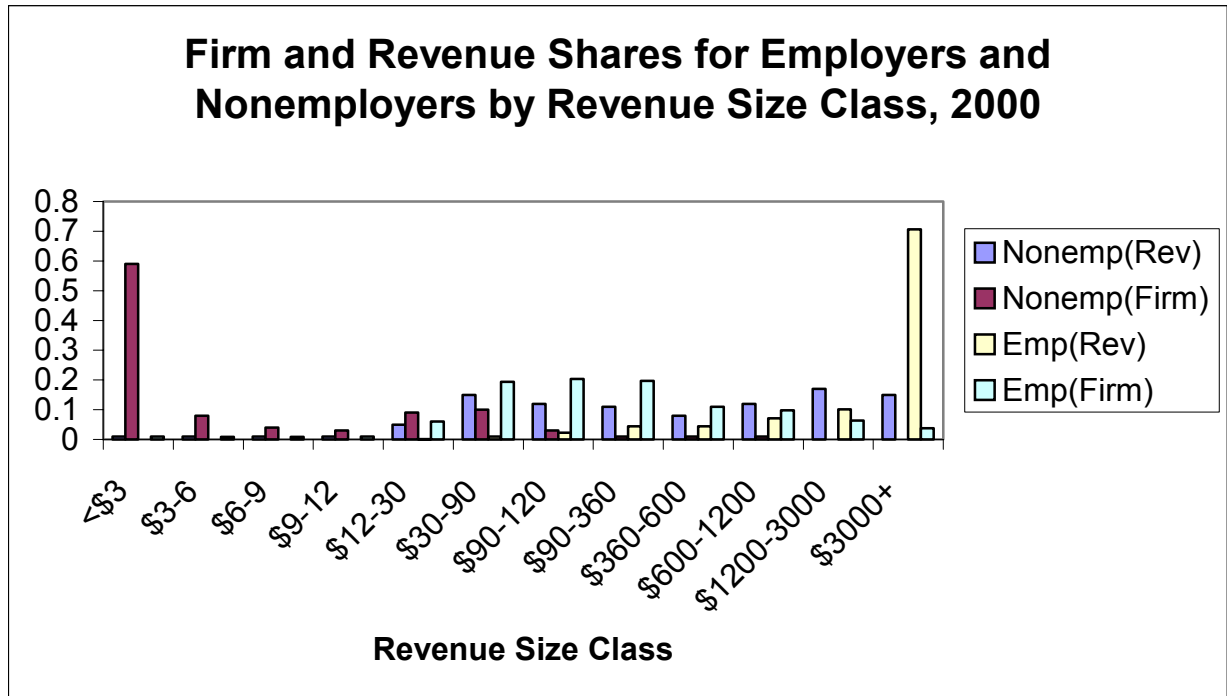


Figure 3.1

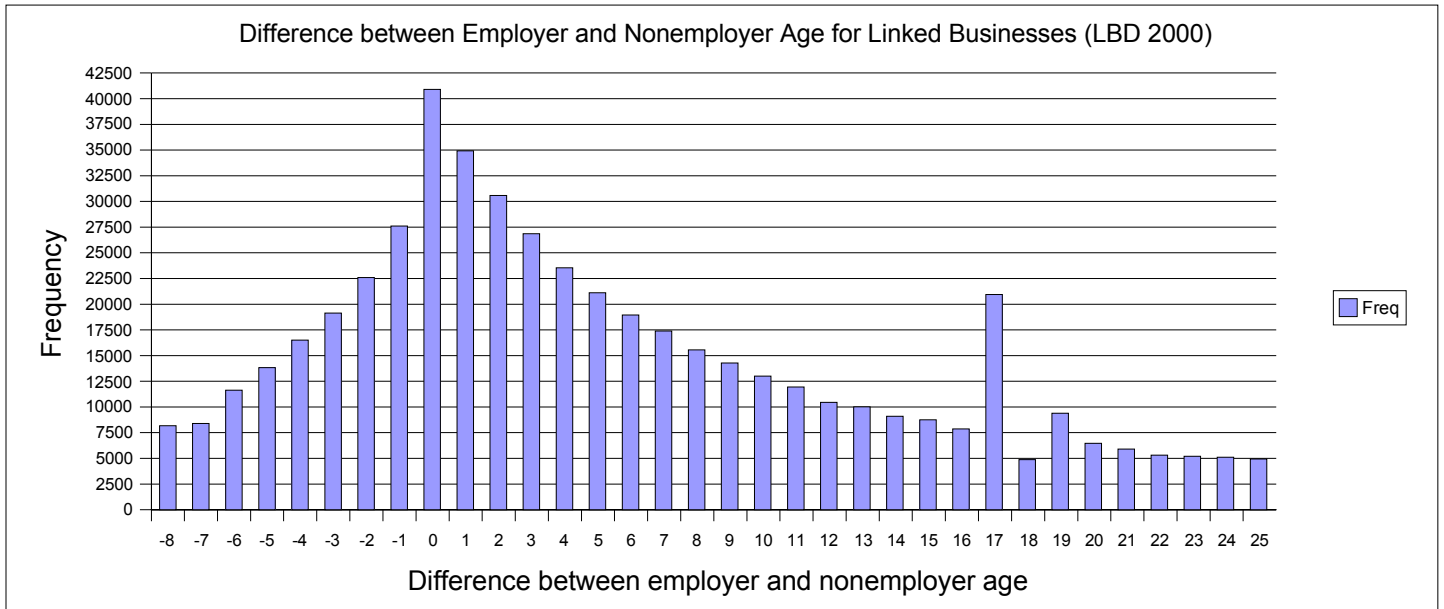


Figure 4.1

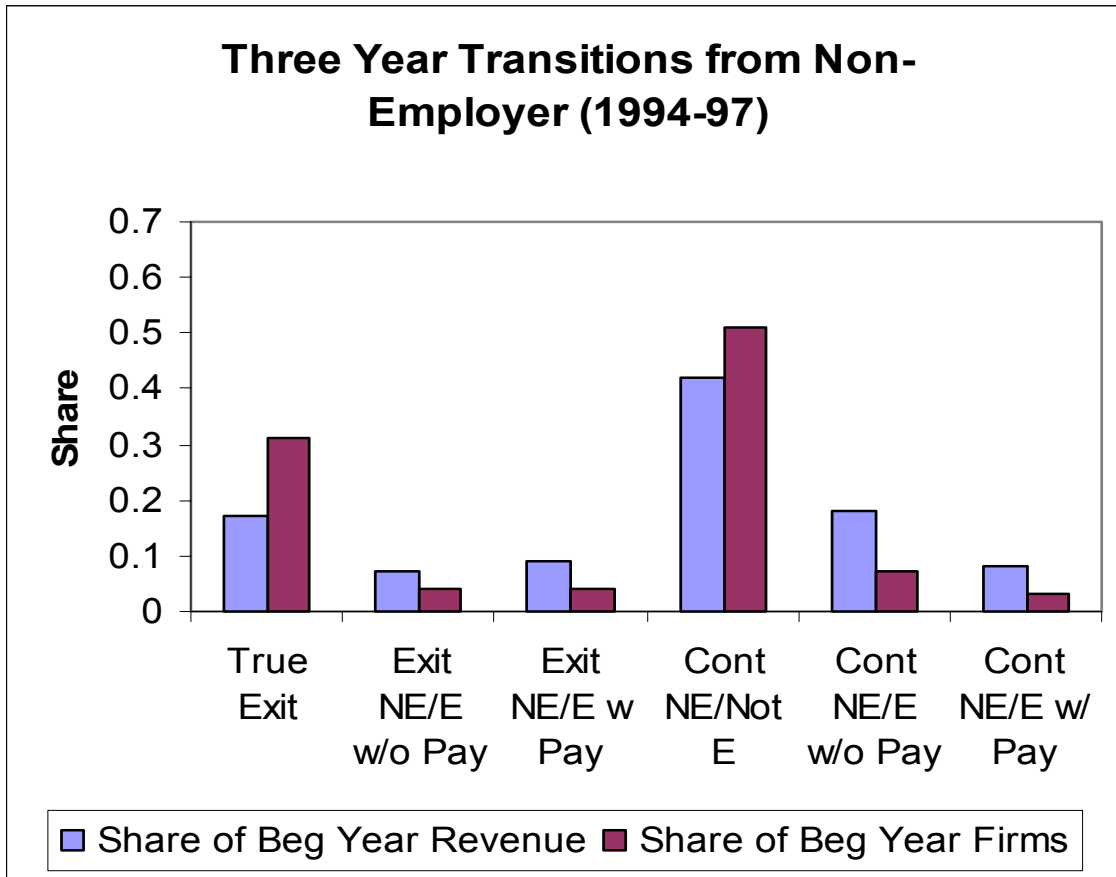


Figure 4.2

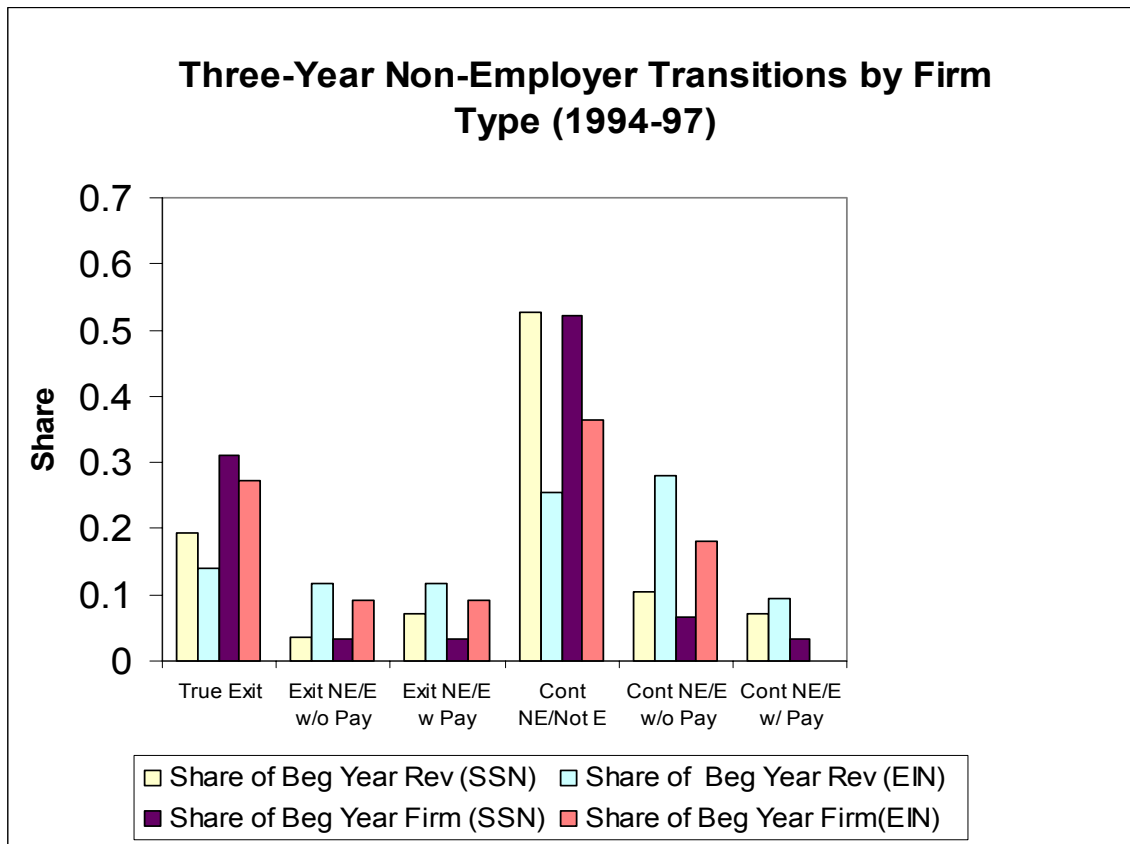


Figure 4.3

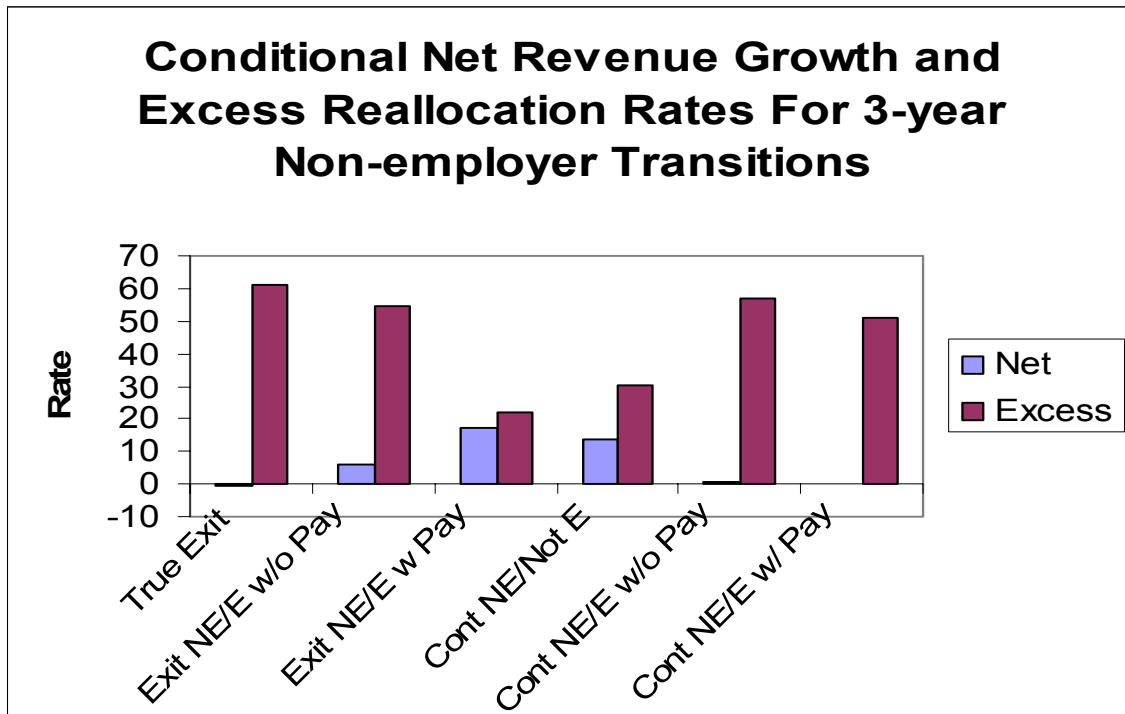


Figure 4.4

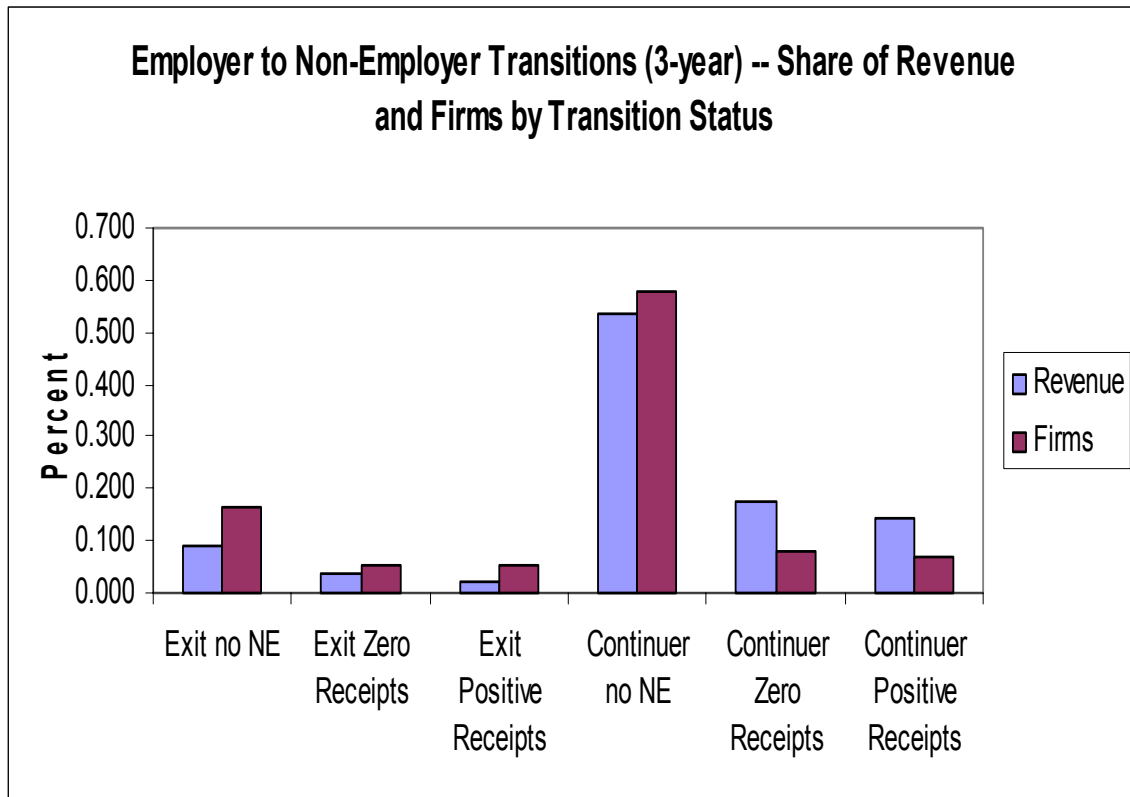


Figure 4.5

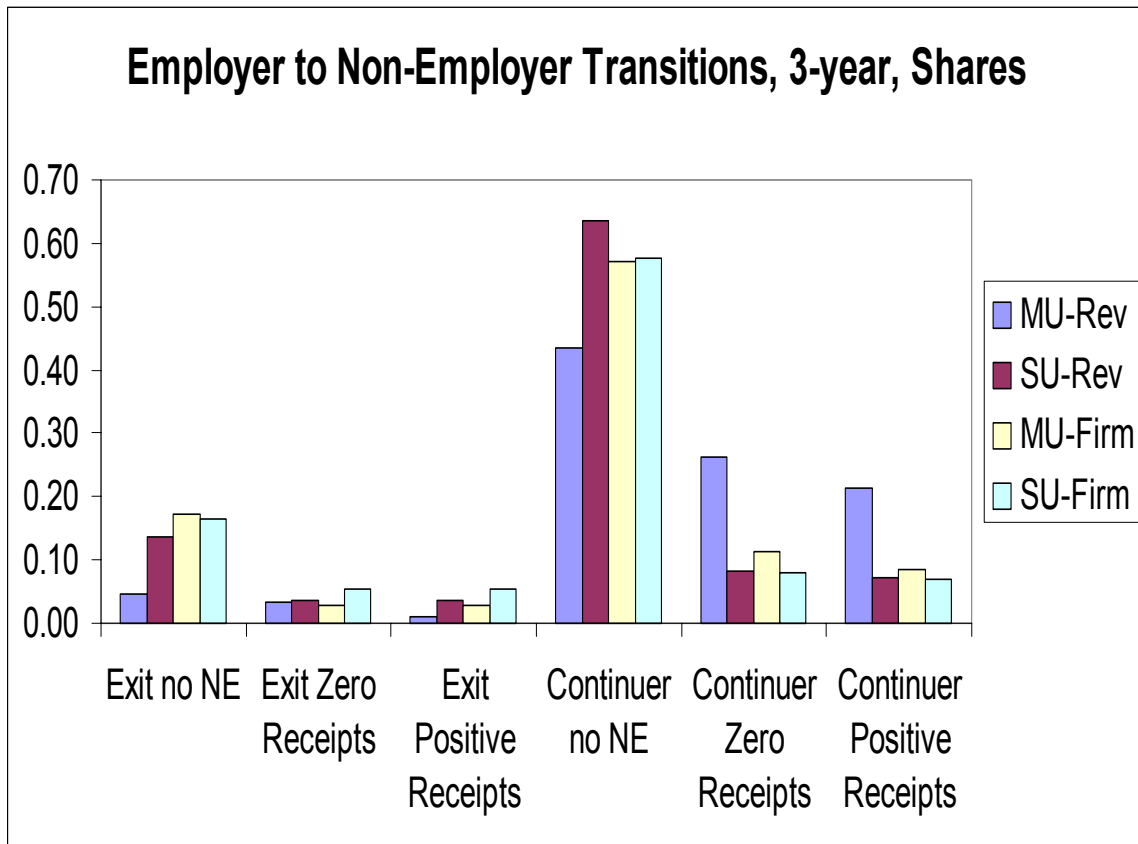


Figure 5.1

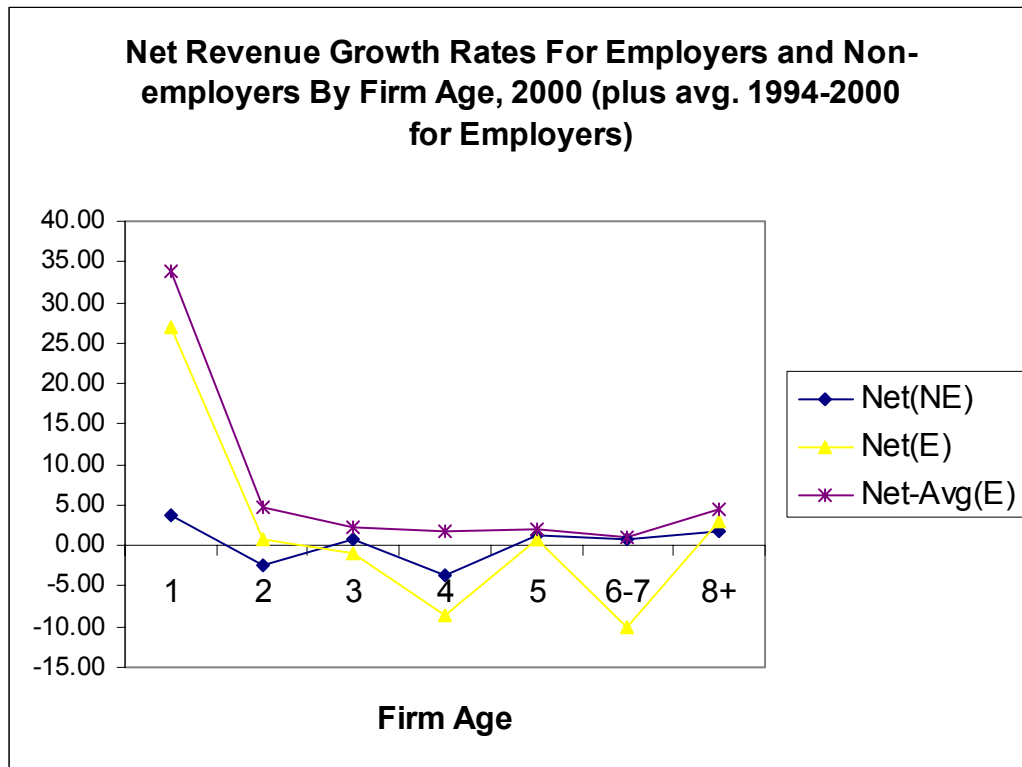


Figure 5.2



Figure 5.3

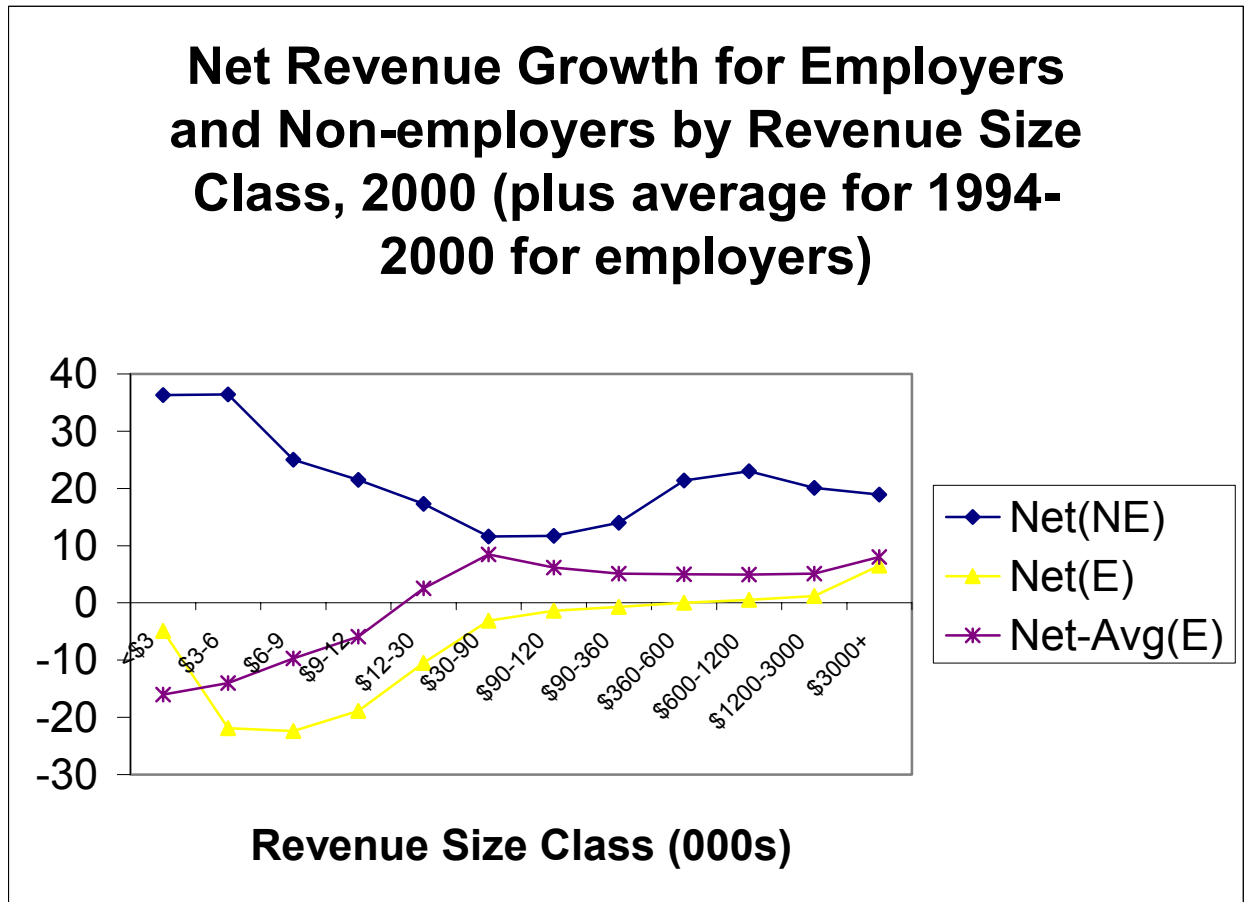


Figure 5.4

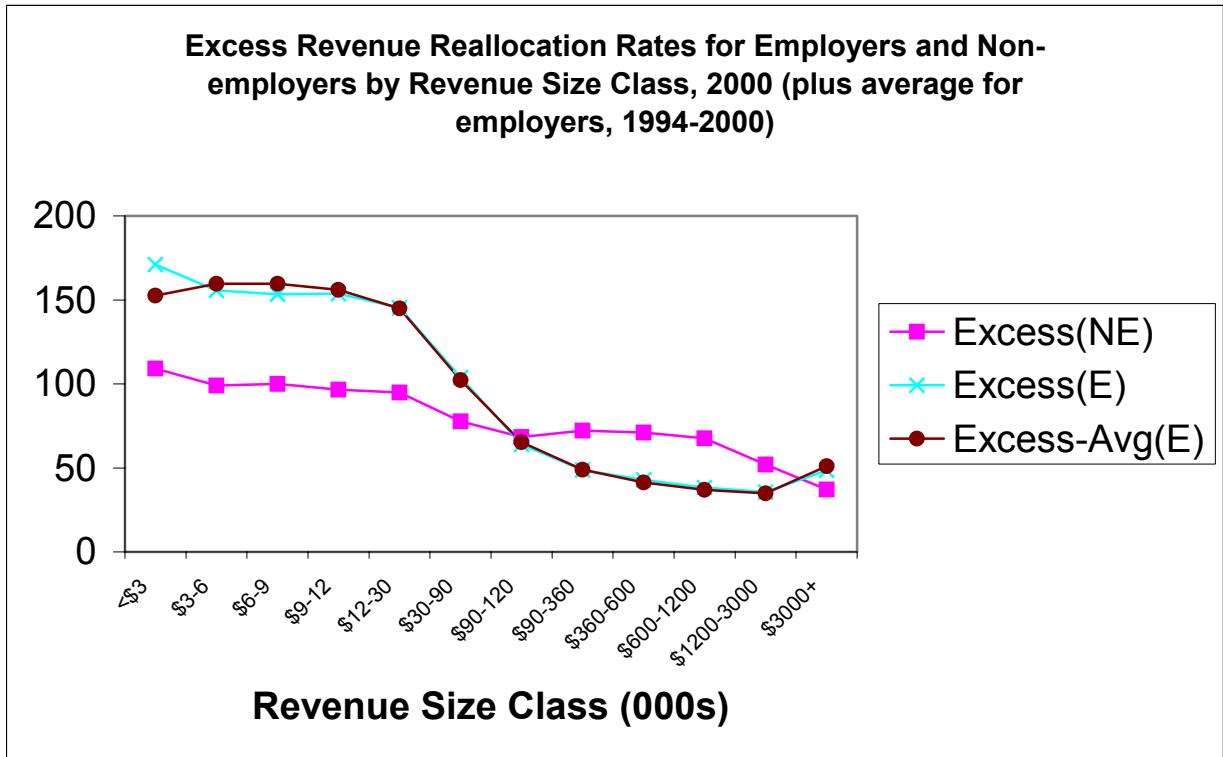


Figure 5.5

