Survival Rates of New Firms: An Exploratory Study

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This study examines the survival patterns of new firms that were created during difficult economic times (2009-2011), and how their survival rates might compare to earlier research, given that we used a more inclusive measure of births. Our findings indicate a similar survival pattern compared to previous studies for the first year of a firm's existence but a significantly worse rate for the second year. We discuss the implications of this finding in light of our more inclusive sample and the current macro-economic climate.

In these difficult economic times, the media, researchers, policy makers, and the general public have focused on job creation and venture creation. The overall macro growth rate in the numbers of businesses and jobs in the US is essentially a function of four activities: openings, closings, expansions and contractions of firms (Knaup, 2005). Openings typically consist of new business births and businesses that are reopening, including seasonal openings (Knaup & Piazza, 2007). Taken collectively, these four activities are known as churning (Knaup, 2005); in an economy that is growing, the net effect of churning is that the openings and expansions outweigh the closings and contractions.

One of the first issues that are encountered when doing research on churning is the relative lack of reliable data on small business failure (Watson & Everett, 1996; Wu & Young, 2002). You cannot talk about survival rates without an understanding of failure rates. In their literature review, Watson & Everett (1996) note that failure rates can vary depending on the definition of failure. A bankruptcy with a loss to creditors is the narrowest definition and results in the lowest failure rate (and therefore the highest survival rate) whereas a much broader definition is the discontinuance of the business, which results in a much higher failure rate. Another concern is the ability to collect reliable data on small company failure rates as these are typically private firms, with no reporting requirements (Wu & Young, 2002). In addition, many studies on business failure often focus on what factors influence new firm survival and do not examine the overall survival rate (Acs, Armington, & Zhang, 2007). Other problems stem from the misinterpretations of statistics. For example, Watson and Everett (1996) note that when a certain percentage of failed businesses in a given year are under five years of age, that does not mean that percentage is the failure rate for all small firms. For example, saying that “over 90 percent of the businesses that failed were less than ten years old….does not mean that over 90 percent of all businesses failed within ten years” (Watson & Everett, 1996:57). However, this distinction can be lost in the media, and perception of failure rates can become distorted.

For those studies in the literature that do discuss survival rates, the likelihood of new firms continuing has varied. After allowing for different definitions of failure, van Praag (2003) notes that new firms have only a 50 percent survival rate over the first three years. Monk (2000) offers a similar outlook as he indicated that most new small firms will not make it past their fifth year. Other studies have proven to be more optimistic and fairly consistent, even if the time frames studied are different and the numbers must be adjusted accordingly to be comparable. For example, Knaup and Piazza (2007) found that in year one, 19 percent of the firms in their study went out of business. Geroski, Mata and Portugal (2010) also noted a similar pattern in that 21 percent of firms in their sample failed in the first year. Other
researchers have looked only at longer survival rates, i.e., how many firms are still around after 4 or 5 years (or the reverse- how many firms have exited the market in that time frame). Dunne, Robertson and Samuelson (1988) found a five year exit rate of 52 percent which translated into a similar survival pattern as Knaup’s 2005 study. Survival rates have also been looked at by industry sector, and scholars have reported a remarkable similarity in these rates across different types of businesses (Knaup & Piazza, 2007; Knaup 2005). When using a newer database (see LEEM explanation below), Acs, Armington, and Zhang (2007) found that approximately 63 percent of service sector firms survived for three years. Even in industries that conventional wisdom suggests are exceptionally risky, such as restaurants (part of the leisure and hospitality industry), failure rates do not reflect a difference from the national average (Knaup, 2005). In general, the previous studies suggest a range of about 19 percent to 22 percent of firms exit the market in their first year of existence.

Of course, economic impact is not measured by firm survival only; growth also matters. Some of the industry sectors experience higher growth rates among their survivors, which can lead to a greater overall economic impact, despite that industry losing more firms than other sectors. For example, employment growth was stronger in the information sector than in education, despite the fact that the information sector experienced a lower survival rate (Knaup & Pizza, 2007).

As noted before, our interest was in the survival rates of new businesses in difficult economic times (2009-2011) and how these rates might compare to other studies that were generally conducted when the macro-economic climate was more favorable. An earlier study (van Praag, 2003) noted that regional unemployment rate was not a factor in a firm’s failure rate but that it could influence the decision to enter into a venture. Wu and Young (2002) noted that there was some evidence that the survival of small firms is affected by overall economic conditions upon entry, and that this can vary by region. In general, however, the local small business environment mattered the most (Acs, Armington, & Zhang, 2007; Wu & Young, 2002).

Another area of interest for the current study is whether there exist any differences between studies of previous survival rates and our study as a result of using a more inclusive measure of births than some of these earlier investigations. For example, the Knaup (1995) and the Knaup and Piazza (1997) studies use Business Employment Dynamics (BED) data from the Bureau of Labor Statistics (BLS). These data sets draw "from state employment insurance tax databases and collect information from approximately 98% of nonfarm-payroll business in the US (Knaup, 2005, p50)." Hence, the total number of businesses cited by Knaup and Piazza (2007) in the US in 2007 was 8.9 million. However, the BED data does not capture all of the new business entities created in that time frame. What is missing from the BED data is the solo business entity that does not have employees. Similar to BED, some of the more recent studies have used the Longitudinal Establishment and Enterprise Microdata (LEEM) database, developed by the Bureau of the Census. This database, like BED, tracks all U.S. private sector non-farm businesses with employees (Acs, Armington, & Zhang, 2007).

However, one difference that makes LEEM more accurate than BED is that LEEM can track establishments over time, even if they change hands (Acs, Armington, & Zhang, 2007). Nevertheless, the businesses tracked still must have employees, making them a subset of the total number of firms. In contrast, the United States Small Business Administration (SBA) employs a broader measure of the number of firms that exist; its measure of existence is determined by the filing of a business tax form that shows some business activity. According to the SBA, in 2008, the number of businesses in the US was 29.6 million (Small Business Administration, 2011), which also reflects solo entities. Like the SBA data, our sample includes not only the BED and LEEM firms (ones with employees) but also includes solo enterprises. Our only limitation on firm inclusion was the requirement that these enterprises have a separate business location; we excluded home-based businesses.
HYPOTHESES

We were interested in seeing if the survival rate for the one year old firms was different than the survival rate for two year old firms. Previous studies have indicated that the longer firms survive, the less likely they are to fail in the succeeding year. Or, to look at it another way, the failure rates are the highest in the first year of a firm's existence, and then diminish over time. For example, Knaup and Piazza (2007) found that in year one, 19 percent of the firms in their study went out of business. In year two, another 15 percent went out of business. In year three, an additional 12 percent failed. Geroski, Mata and Portugal (2010) noted a similar pattern in that 21 percent of firms in their sample failed in the first year, followed by 11 percent in the second year. As noted by Knaup (2005), other studies like Dunne, Roberts and Samuelson (1998) had 5 year survival rates of 38 percent, which translated into a similar survival pattern. Accordingly, we expected to find that the survival rate for firms who were one year old and survived to the second year would be higher than firms who were new and survived to their first year, and, therefore, tested the following hypothesis:

H1: Firms that were one month old would have a higher failure rate as they aged to one year old than firms who are one year old and aged to two years old.

We were also interested in learning if the survival/failure rates of the sample would vary for firms based on the number of employees. Previous studies suggested that the firms with a larger number of employees were indicative of a more substantive venture (Geroski, Mata, & Portugal, 2010; Knaup, 2005). In small, privately-held ventures, sales and profitability data is often not available. Hence, number of employees and employee growth has been used as a proxy for business success (Longenecker, Moore, Petty, & Palich, 2010). Consistent with the assertion that a larger number of employees indicates a more substantive venture, we believe that firms with a larger number of employees would be more resilient and would be less likely to fail in the coming year, and, therefore, tested the following hypothesis:

H2: Firms with a larger number of employees would have a lower failure rate than firms with a smaller number of employees

METHODS

Our data came from the New Businesses database that is part of ReferenceUSA, a commercial firm that offers listings of new and existing businesses. When using ReferenceUSA’s New Businesses database, lists of firms can be generated using a number of criteria, including date of creation. We downloaded information on New Jersey firms that were created over a twelve month period from June 2009 to June 2010. We selected a random sample from this list and took every fifth firm in three categories: firms that were 1 month old, 6 months old, and 1 year old.

We chose New Jersey as our geographic focus, as we were interested in examining startups from a highly populated region, and New Jersey is the most densely populated state in the country (Wu, 2011). When accessing this database, we also specified businesses that were started in a commercial space (versus a home-based venture), and were full-time (ReferenceUSA categorizes full-time as meaning that the venture was the primary occupation of the founder). Given the expense and associated financial risk associated with renting a separate business location, we believed that these firms would tend to be more substantial than home-based ventures. Similarly, we believed that the likelihood that employees would be utilized was also greater.
Finally, as only about 70 percent of the firms in this database have phone numbers, we also only took firms with phone numbers as we would be making calls to our sample to check on the accuracy of the information we were using. Since the information in the New Businesses database is gathered from a number of sources but is not vetted by ReferenceUSA prior to its inclusion in the database, (B. Zielinski, personal communication, 7/18/2011), we wanted to ensure that firms in our sample were as represented when we contacted them.

Given the nature of this database, and previous experience with ReferenceUSA, we checked the accuracy of the sample. We made calls to all firms in our sample and experienced a number of different responses which we categorized as follows: the phone number was no longer valid, we reached an answering machine for the business, we talked to an employee (non-owner), or we reached the owner. We found that a number of these phone numbers were not working numbers, even in the newest group (1 month old firms).

As we were making these calls, we also wanted to verify the accuracy of the ReferenceUSA database’s stated number of employees, as employee growth is often used to reflect economic well-being, particularly in circumstances where sales and/or profit data is not available (Longenecker, Moore, Petty, & Palich, 2010). Further, since this data was going to be used for a time series, having accurate starting data was critical. To check the number of employees, we asked two simple data points when we were verifying the firm’s existence: the current number of fulltime employees, and the number of fulltime employees at the time the business opened. We were successful in getting an employee number on 86 of 459 firms (the others either refused to answer the question or we reached an answering machine when we called). As noted before, although we verified this data we did not restrict our sample to those ventures that had employees.

Our total sample size was 730 New Jersey firms that were started between June 2009 and June 2010. It consisted of 244 firms that were one month old, 246 that were six months old, and 240 that were 12 months old. We identified firms as still in business by whether or not they still had a working phone number when they were called. If we spoke to the owner, employee, or reached a business answering machine, we considered them in business. If we reached a bad number, we used the internet to try to locate the firm in case the firm had moved or the database information was inaccurate. If we were unsuccessful in finding the firm, they were considered out of business (labeled “bad numbers”). Phone calls were completed by early August, 2010. The end result was that 271 firms were unable to be contacted and were deemed out of business. Table 1 delineates the results of our efforts to verify the existence of the businesses in our sample.

What we could not determine was the disposition of these 271 firms. Did they try the marketplace and were unsuccessful or was there an accuracy problem in the ReferenceUSA database and we experienced a “garbage in, garbage out” issue? ReferenceUSA’s promotional literature for the New Businesses database states that they identify these businesses from public documents and startup milestones like arranging for utilities (ReferenceUSA, 2004). However, since conversations with a ReferenceUSA representative revealed that these firms are not checked for accuracy when they are entered in the New Businesses database, a fair number of these 271 missing firms may be from data error. What we are sure of is that in August 2010, 459 firms in our dataset were still in business and these firms ranged in age from 1 month to 1 year. Specifically, they consisted of 146 firms that were 1 month old, 161 that were 6 months old, and 152 that were 12 months old. Going forward, our sample had very similar numbers in each group, just like the original 730 firms, leading us to believe that whatever the reasons were for the 271 firms to be missing, the initial data problems were evenly distributed among the remaining 459 firms in our sample.
Table 1- August 2010 Results

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewed owner</td>
<td>26</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>Talked to employee</td>
<td>258</td>
<td>35.3</td>
<td>38.9</td>
</tr>
<tr>
<td>Answering machine</td>
<td>175</td>
<td>24.0</td>
<td>62.9</td>
</tr>
<tr>
<td>Bad number</td>
<td>271</td>
<td>37.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>730</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

These 459 firms were contacted again in July 2011 to measure their survival rate. We used the same methodology as before: if we spoke to the owner, employee, or reached a business answering machine, we considered them in business. If we reached a bad number, we then used the internet to try to locate the firm, in case the firm had moved. If we were unsuccessful in finding the firm, they were considered out of business (labeled “bad numbers”). Of these 459 firms, 103 were out of business, leaving 356 survivors. The results of these phone calls are as follows:

Table 2- July 2011 Results

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewed owner</td>
<td>21</td>
<td>4.6</td>
<td>4.6</td>
</tr>
<tr>
<td>Talked to employee</td>
<td>180</td>
<td>39.2</td>
<td>43.8</td>
</tr>
<tr>
<td>Answering machine</td>
<td>155</td>
<td>33.8</td>
<td>77.6</td>
</tr>
<tr>
<td>Bad number</td>
<td>103</td>
<td>22.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>459</td>
<td>100.0</td>
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When they were contacted the second time during 2011, the surviving firms would be between 13 and 24 months old. Therefore, part of this sample was already approximately 2 years old and would provide a useful comparison on survival rates.

FINDINGS

Hypothesis 1 - Dividing our sample into the age cohorts revealed no differences in survival rates based on whether the firms in the sample were 13 or 24 months old. Of the 459 businesses that were still in business in the summer of 2010, 146 of them would have been 13 months old and 152 of them would have been 24 months old if they all survived when they were contacted again in the summer of 2011 (161 would have been 18 months old). Comparing the survival rates of these one year old firms vs. two year old firms, 76 percent of the one year old firms made it through their first year (24% failed), but what was surprising was that a very similar percentage of firms, 76.3, made it from their first year of existence to their second year, for a 23.7 percent failure rate. Table three summarizes the survival rates. Using a Chi-Square test, there was no difference between these two survival rates (p=.953) and, therefore, hypothesis one was rejected.

Table 3- Survival Rates for Firms that Aged from Birth to One Year Old v s. One Year Old Firms that Aged to Two Years Old

<table>
<thead>
<tr>
<th></th>
<th>New to 1 year old firms</th>
<th>1 year to 2 year old firms</th>
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<tbody>
<tr>
<td>Survived</td>
<td>111- 76%</td>
<td>116- 76.3%</td>
</tr>
<tr>
<td>Failed</td>
<td>35- 24%</td>
<td>36- 23.7%</td>
</tr>
<tr>
<td>Total</td>
<td>146</td>
<td>152</td>
</tr>
</tbody>
</table>

This finding is clearly different than previous research which showed failure rates decreasing as firms’ age. In our study, firms continued to fail at approximately the same frequency as they aged from year one to year two.
Hypothesis 2 - We compared the survival rates of firms that had more employees to firms that had less employees. In the summer 2010, we had confirmed employment data on 86 firms. After the follow up calls in the summer of 2011, we examined the number of employees in firms that survived versus firms that failed. Using a t-test to compare the mean difference of the number of employees between firms that survived and those that failed, the average number of employees in the firms that survived was 8.64 versus 5.42 for the firms that failed. However, this different was not significant (p=.287) and, therefore, the hypothesis was rejected.

Table 4 - Comparison of the Number of Employees in Survived vs. Failed Firms

<table>
<thead>
<tr>
<th></th>
<th>Average Number of Employees</th>
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</thead>
<tbody>
<tr>
<td>Surviving Firms</td>
<td>8.64</td>
</tr>
<tr>
<td>Failed Firms</td>
<td>5.42</td>
</tr>
</tbody>
</table>

DISCUSSION

When looking at the number of employees hypothesis, there was an average difference of 3.21 in the number of employees in firms that survived (8.64) versus failed (5.42), but the difference was not significant, even though previous studies (Geroski, Mata, & Portugal, 2010; Knaup, 2005) noted that employee size is a factor in firm survival. This may be a function of the fact that we were only able to confirm employee size in a sub-sample of our firms, as we did not get that information from any firms if we reached an answering machine or in some cases, if we reached an employee who did not cooperate. As a result, the difference here in employee size - over three- is a variation that cannot be definitively explained. Future research should seek to investigate this further.

However, our most interesting finding relates to hypothesis one and **not** finding a difference in survival rates. Contrary to previous findings, our study revealed that the odds of a firm surviving from year one to year two appear to be no better than the odds of them surviving from inception to year one. This difference seems to manifest itself in a poorer survival rate as the business ages and becomes two years old, and the main difference when compared to the earlier studies is in the year two survival rate. Nationally, from the studies that used BED/LEEM data, the survival rate for firms in their first year of existence was approximately 80 percent (Knaup, 2005; Knaup & Piazza, 2007). Although there were some variations based on industry sectors, previous research does show a remarkable consistency in survival rates (Dunne, Roberts, & Samuelson, 1988; Geroski, Mata, & Portugal, 2010). As noted earlier, in these studies, year two survival rates were better than year one in that about 20 percent of new firms failed in the first year, whereas only about 15 percent of those who survived year one failed in the second year (please note that this 15 percent is a marginal difference and cumulatively, about 35 percent of the firms failed over two years). When we looked at our firms that would have been one year old in 2011, about 24 percent had failed during that first year, which is not much different than the BED/LEEM data. However, when looking at our firms that were 2 years old, the failure rate for firms that aged from one year to two years old was 23.7 percent, or almost the same as the failure rate for firms in their first year of existence. This is the departure from the previous studies, which showed a failure rate of 15 percent for firms that were the same age as our sample.

We think that this finding is related to the uniqueness of our sample. Compared to other studies of new firm survival rates that used BED/LEEM data, our study is more robust as it included a sample of all firms who started a non-home-based business in the time frame indicated, as opposed to studies that only used those firms who had employees. Therefore, our sample would tend to be smaller (as it includes non-payroll businesses) and possibly less fiscally sound than samples consisting only of businesses with employees. However, since we did eliminate home-based businesses, our sample would theoretically have at least some initial capital, enough to rent a business address.
Another possibility for the increased failure rate is the potential risk factor if a firm shuts down. For example, if an owner tries a venture and is able to minimize his/her startup costs and has no employees, running the venture may become a “heads I win, tails I don’t lose much” scenario, and the decision to exit the venture could be easier than in a firm with more at stake. While these ventures would often require more capital than a home-based venture, having no employees does remove one level of consideration when closing.

The macro-economic conditions could also come into play here. The earlier studies cited all looked at data from before the economic crisis in 2008. In the current difficult economic times, firms may continue to experience trouble remaining viable and, therefore, are as much in danger of closing in year two of their life as in year one. However, if this were the case, the macro-economic conditions would also impact the one year old firms in our study and one would expect to see a spike in year one failures when compared to previous studies. This was not the case. Consistent with this, Headd and Kirchoff (2009) found that survival rates were not affected by macro-economic conditions and that the rates remained “stable in a recovery period, in the beginning of a downturn and even during a period of rapid expansion” (p .545). In fact, the year one failure rate of our sample was very similar to previous research and it was only in year two that it diverged. Finally, given the severity of the recession and the current economic conditions that exist once the recession ended (slow growth/sluggish recovery- when compared to previous downturns), perhaps the macro-economic conditions now do have an impact on firm survival rates.

CONCLUSION & IMPLICATIONS

Our exploratory study found that the survival patterns of startups in recent years were different from what has been found in previous research. We believe that this is a result of using a more robust sample of startups (by including non-payroll businesses) than were utilized by previous studies. Other researchers might also consider examining survival rates using this broader measure of business creation to determine if their findings reflect a survival pattern closer to what our sample has experienced so far, rather than the pattern revealed by earlier studies. It may also be useful to separate new firms with employees from new firms without employees, and compare the survival rates of those two groups directly. With additional substantiating research, we might begin to first understand the causes of the difference in the second year of survival rates, and then to make that information widely available.

Another area of interest would be the macro-economic climate. As noted above, perhaps the severity of the recession and the historically weak recovery has changed the “rules of the game” and the macro-economic climate now does play a role in firm survivability. One way this could occur is by lengthening the amount of time a firm may spend in the initial startup stage of its lifecycle. Models of lifecycles vary but there are typically four to five stages: birth/survival, growth, maturity, and decline (Hoy & Sharma, 2010; Churchill & Lewis, 1983, Miller & Friesen, 1984). The issues related to resource scarcity and customer acquisition typically found in stage one (birth/survival) would then continue longer into a firm’s existence, and the growth challenges more commonly found in the next stage may occur later in the firm’s life. Therefore, it is possible that moving past the birth/survival stage is simply taking longer now than before, and the survival patterns will still follow past studies, but with a delay. Conversely, one might expect that regardless of the macro climate, this delay should not occur as small firms are good at adapting, as research has found that small firms are better equipped to deal with difficult economic conditions than larger firms (Bumgardner, Buehlmann, Schuler, & Crissey, 2011). However, the comparison we examined is not the adaptability of small versus large firms. Rather, since there were small firms in both our research and the previous studies, there should not be any difference in the adaptability based on size. This kind of data would be important to policymakers and economic development officials who are tasked with helping small businesses, to researchers and academics who regularly use this data, and to potential business owners who may wish to adjust their business concepts based on better information of survivability.
Finally, along with replication and extension of this study (including examining different areas of the country than New Jersey), another interesting area for further research would be to continue to track this sample of firms as they age to see the pattern of business survival develop over a longer time frame. Will there be further divergence of survival rates from previous studies as these firms age? Additional research can help better answer that question.

REFERENCES


Reference USA. (3/15/2004). *New businesses data card* [Brochure]. Omaha, NE.


