The Survival Rate of Startups Funded by Angel Investors

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1. Introduction

In developed and developing economies, governments and policy-makers seek to encourage the creation of new firms in order to drive economic development and growth, and to create jobs. In 2013, the Government of Canada spent over $5.4 billion on federal tax and spending programs that support small businesses and entrepreneurship (Carey, Lester, & Luong, 2016).

Since Schumpeter’s early work (Schumpeter, 1934), the importance of entrepreneurship to economies has been well-established, with entrepreneurial innovation and disruption seen as a major contributor to economic growth.

While the importance of new firms to the generation of wealth may seem obvious, it may seem that there is little logic in government encouraging the creation of firms if those firms do not survive. But, it could be argued that even failed firms are an investment in the entrepreneurial capacity of their founders, which could lead to future success and an improvement in Canada’s entrepreneurial culture. Thus, it is clearly in everyone’s best interest – entrepreneurs, employees, investors and society at large – for more new ventures to survive.

This begs many questions: How many startups survive to become successful firms? Why do some startups survive while others do not? What can policy-makers do to improve the survival rate of startups overall?

A startup may not survive for several reasons. For example, the founders may decide to no longer pursue a given opportunity because of changing market conditions, dynamics within the founding team, personal reasons or other factors. Alternatively, and perhaps more relevant to this paper, a startup may cease to operate due to a lack of resources (Global Entrepreneurship Monitor, 2016). Put more plainly, founders generally stop pursuing a given opportunity when they run out of operating capital. This would suggest a link between the survival rate of new ventures and access to capital and other resources (Coad, Frankish, Roberts, & Storey, 2016). Finally, in some cases, the startup may be acquired by another business and cease to exist as an independent entity.

Notwithstanding the various government funding programs aimed at small businesses and entrepreneurship, most startups are funded through private investment made by the entrepreneurs themselves, by friends and family, or by third-party investors (Statistics Canada, 2018). High-potential startups that demonstrate the potential for exponential growth may be suitable for equity investment by angel investors (angels) and venture capital (VC) firms. VCs invest other people’s money and are typically required to report on their activities. Therefore, the role of VCs in the startup investment ecosystem, and the performance of their investments, is generally well understood.
Angels are private individuals who invest their own money and often operate informally (Wong et al., 2009). Relative to VCs, angels are generally believed to invest earlier in the life of a startup and to invest smaller amounts. Yet, the total stock of angel investment in the economy is believed to be many times larger than that of VC investment (Riding, 2008). Based on the angels’ experience and networks, many angels also provide startups with help accessing potential customers or with operational matters. Does the added value provided by angels, or the earlier stage at which they invest, lead to higher survival or growth rates for startups?

Despite the importance of angels in the investment ecosystem, little is known about their activities and the performance of the startups in which they invest – a significant gap in knowledge of this vital investment activity (Mason & Harrison, 2008). This is particularly apparent in Canada, which lacks empirical research in this area.

The goal of this paper is to fill part of that gap by investigating the post-investment survival rates of Canadian startups funded by angel investors and comparing them to the general population of startups in the economy.
2. Survival Rates: Fact vs. Fiction

Much conflicted information has been published on startup survival rates in Canada and around the world. Trade publications, popular news and conventional wisdom within the investment community suggest that the survival rate of new firms is very low. Survival rates of 1 in 10 are often quoted.

For example, a popular Techvibes (2013) article claimed that tech startups post a 90% failure rate, and in support of its claim, it quoted data from a Mashable article. In turn, the Mashable article quoted an obscure infographic that was not referenced and could not be verified. An article in The Independent (2014) suggested that as many as 9 out of 10 new businesses in the United Kingdom do not survive past their second year of operation based on a survey of only 60 startups that were supported by an incubator or accelerator. These examples illustrate the tendency of some publications to draw conclusions on startup survival rates based on limited or anecdotal evidence.

A close examination of data from government agencies and peer-reviewed academic studies tells a very different story, with survival rates in Canada and other countries averaging over 90% after one year, to between 30–50% after 10 years. According to a seminal report commissioned by Industry Canada on the state of entrepreneurship in Canada (Fisher & Reuber, 2010), between 85–87% of new Canadian businesses survive past their first year of operation, while 62% exist after three years, and 51% make it past their fifth anniversary. As shown in Figure 2.1, survival rates appear to be remarkably consistent among many developed nations.

90%
average survival rate in Canada after one year

30–50%
survival rate after 10 years

Figure 2.1: One-year Survival Rate for 2005
Source: Fisher & Reuber (2010)
Survival rates also appear to be relatively stable over time, regardless of economic booms or busts (Bureau of Labor Statistics, 2018). However, as shown in Figure 2.2, more recent evidence suggests that survival rates in Canada have “exhibited a steady and gradual increase from 2002 to 2014” (Industry Canada, 2018). In the period from 2002 to 2011, three-year survival rates improved from 75% to 82%. This same Industry Canada study found higher survival rates among firms that launch on a larger scale. An average of 23% of new firms with 1–4 employees failed within the first three years, compared to an average of 14% of new firms with 20–99 employees.

![Figure 2.2: Average Survival Rate by Goods and Services Sector](source: Industry Canada (2018))

Why the discrepancy between the survival rates reported by entrepreneurs and investors commonly found in trade publications, and those reported by government agencies and academic studies? Two potential reasons are relevant to this paper and worthy of discussion.

First, there are differences in the samples used to derive these statistics. Government departments like Industry Canada publish the survival rates of all incorporated firms in Canada, or of very large representative samples of firms. The vast majority of incorporated firms in Canada are small businesses that would not be appropriate candidates for angel investment or venture capital. Of the 1.2 million small businesses in Canada, only 1.9% receive angel investment or venture capital funding (Statistics Canada, 2019). It is conceivable that the risk profile of this minute proportion of firms would be different from the Canadian average, leading to a lower survival rate.
Second, how survival is defined and other methodological differences could further explain these inconsistencies. For example, Headd et al. (2003) found that approximately one-third of businesses that closed were successful at the time of closure. In such cases, the closures may have resulted from the retirement of the business owner or the acquisition of the firm. Therefore, these firms may be incorrectly included as failures in some databases or studies. Moreover, some studies on startup survival rates only included firms that reported employees (Fisher & Reuber, 2010), while other studies included all firms (Industry Canada, 2018), which could also lead to considerably different results.

In summary, there are several reasons why the survival rates cited by governments, academics and investors may differ. Therefore, it would be reasonable for an investigation of the survival rate of firms funded by angel investors to be consistent with the low survival rates claimed by investors in trade publications rather than the higher survival rates found in government reports and academic literature.
3. Methodology

The question of survival rates was investigated using historical data on Canadian firms that received one or more investments from angel investors over a period of seven years. This data was supplemented with additional data collected from several sources to create a unique dataset.

3.1 Data Source

This paper made use of data provided by the National Angel Capital Organization (NACO). NACO is the only nationwide industry association for angel investors in Canada and has recently extended its membership to include incubators and accelerators. NACO represents over 40 angel investment networks comprised of over 4,000 angel investors across the country. NACO’s data encompassed the performance of 775 startups in Canada that received funding from NACO members from 2010 to 2016. The data on these startups was self-reported to NACO by its members through an extensive annual survey.

The NACO sample includes startups that are operating in several industry sectors. Figure 3.1 shows the distribution of startups by industry.

Information and communications technology (ICT) was the largest sector represented, with 44% of the startups in the sample. This was followed by the life sciences sector at 15%. Several sectors had a relatively small representation in the sample, including clean technologies (6%), manufacturing (5%), the service sector (4%) and diversified consumer products (1%). A considerable number of startups categorized their industry sector as “other” (25%).

Figure 3.1: Startups by Industry Sector
Source: National Angel Capital Organization (NACO)
The startups in the sample received funding from angel investors at different times between 2010 to 2016. Figure 3.2 shows the distribution of the sample by the year in which each startup received their first angel investment by a NACO member. In some cases, they received several investments during that period.

Participation in NACO’s annual survey has increased steadily since 2010. Therefore, the data in the sample is skewed towards more recent years. Almost two-thirds (63%) of the startups in the sample received angel investment from 2014 to 2016.

### Figure 3.2: Startups by Year of Angel Investment

Source: National Angel Capital Organization (NACO)

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#### 3.2 Supplemental Data

The NACO data was then supplemented with secondary data collected from several publicly-available sources to determine whether each of the 775 startups was still in operation. Extensive searches for company websites or other online references were conducted for each startup. Online databases such as Bloomberg\(^1\) and Crunchbase\(^2\) were searched for corporate profile information. Tools such as Waybackmachine\(^3\) were used to access archived online content related to several firms. If no reference to a firm’s operation was found using these sources, it was assumed that the firm was no longer active. Some firms that were no longer active may have been acquired by another firm rather than having failed. Reasonable efforts were made to exclude them by searching publicly available information regarding acquisitions, such as press releases.

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\(^1\)Bloomberg delivers business and market news, company profiles, data and analysis.

\(^2\)Crunchbase is an online platform for finding business information about private and public companies.

\(^3\)Waybackmachine is an online website with 347 billion archived web pages.
3.2.1 Corporate Profiles

Corporate profile databases and other secondary data sources were also used to determine sales revenue and employment for each startup. Corporate profile data was collected primarily from two sources: Mergent Online and Zoom Information Inc.

3.2.2 Survival Rates

Overall survival rates were calculated as the ratio of the total number of active and non-active startups in the NACO dataset. Annual survival rates represent the ratio of the number of active and non-active startups based on the year in which the firm first received angel investment. Survival rates by industry represent the ratio of the number of active and non-active startups in each of the industries reported. Startups may have been in operation for several years before receiving their first investment.

3.2.3 Economic Models

National input-output multipliers, as shown in Table 3.1, were used to estimate the indirect and induced economic impact created by the startups in the NACO dataset. Direct impacts included the startup’s sales revenue and jobs created. Indirect impacts included sales revenue and jobs created in the startups’ value chain, such as suppliers and other companies. Induced impacts were those created when startup employees spent household income in their communities, thus contributing to their local economies. Specifically, this study estimated the contribution of the startups in the NACO dataset to Canada’s gross domestic product (GDP) and job creation.

<table>
<thead>
<tr>
<th>Multiplier</th>
<th>Indirect Impact</th>
<th>Induced Impact</th>
<th>Total Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Revenue</td>
<td>0.54</td>
<td>0.42</td>
<td>1.96</td>
</tr>
<tr>
<td>Jobs Created</td>
<td>0.66</td>
<td>0.47</td>
<td>2.13</td>
</tr>
</tbody>
</table>

Adjusted versions of the input-output multipliers developed by Statistics Canada for 2010 were used, which was the first year represented in this paper’s dataset (Statistics Canada, 2014). Since different multipliers apply to different industry sectors, the multipliers were adjusted to reflect the weighted sector distribution of the startups in the NACO dataset.
4. Results

This paper investigated the survival rates of angel-funded startups measured from the year in which they first received investment from a NACO-affiliated angel investor. The survival rates were then compared to the empirical results from other studies to determine any similarities or differences.

4.1 Survival Rates

A total of 775 startups were included in the study sample that came from NACO. As shown in Figure 4.1, 69% (537 startups) were still in operation in 2017, while 31% (238 startups) were no longer active. Because the sample included firms across various industry sectors and of varying intervals of time elapsed since receiving angel investment, the survival rates were examined from each of these perspectives to provide greater context.
4.1.1 Survival Rates by Age

Based on the results of previous studies, which were discussed in Section 2, it was expected that the survival rate of startups would decrease as the elapsed time since they first received angel investment increased. Figure 4.2 shows the total number of active and not-active firms as of 2016 based on the year in which the startup received angel investment.

![Figure 4.2: Survival Rates by Age Since Angel Investment Source: National Angel Capital Organization (NACO)](image)

Indeed, the results from this paper confirm that the survival rates of startups that received angel investment generally decreased over time. With the exception of 2011 and 2014, the survival rates of startups decreased consistently over the elapsed time since first receiving angel investment in the period from 2010 to 2016.

The startups in this study’s sample had a one-year survival rate of 79%. This result is marginally lower than the one-year survival rate of between 82-85% found by Fisher & Reuber (2010) in their report commissioned by Industry Canada. However, it is significantly lower than Industry Canada’s most recent report that found an average one-year survival rate of 98% from the period between 2002 and 2011 (Industry Canada, 2018). This difference may be attributable to the firm having a founding date that was earlier than when the angel investment was made. Despite the dramatic differences in these one-year results, the three-year survival rate of 78% found in this paper is identical to that found in Industry Canada’s (2018) report. Yet, it is considerably higher than the three-year survival rate of between 62–65% found in Fisher & Reuber (2010).

The five-year survival rate of 54% for the startups in this sample dipped unexpectedly below the trend from other years. The reasons for this difference are unknown. The results are in line with the five-year survival rate of 51% found by Fisher and Reuber (2010) but well below the 63% found by Industry Canada (2018). The differences are even more notable between the seven-year survival rates of 35% found in this paper and 54% found in Industry Canada’s (2018) report.
4.1.2 Survival Rates by Industry

Based on the results of previous research, survival rates were also expected to be different across industry sectors. Figure 4.3 shows the survival rates in each of the sectors represented in this paper’s sample.

The average survival rate of firms in the ICT sector, which represented 44% of the startups in the sample, was 74%. This was exceeded only by the services sector, with an average survival rate of 80%. However, since service sector startups represented less than 4% of the sample, this result should be interpreted with caution. The average survival rate of firms in the life sciences, clean technology and manufacturing sectors were all lower than those in the ICT sector, with average survival rates of 70%, 68% and 64%, respectively.
Figure 4.4 shows the survival rate by age since receiving angel investment for firms in the ICT sector.

The one-year and three-year survival rates of ICT companies are identical at 82%, and slightly higher than those of the total sample (79% and 78%, respectively). Industry Canada (2018) also found three-year survival rates in Information and Cultural Industries of 84%.

The five-year survival rate of ICT companies (62%) is significantly better than that of the total sample (54%), but lower than the Industry Canada (2018) results of 69%. Again, the seven-year survival rate of ICT companies is identical to that of the total sample (35%). Industry Canada’s (2018) seven-year survival rate in Information and Cultural Industries was 58%.
4.2 Economic Impacts

The startups in this study’s sample received a total of CAD $490 million in investment from angel investors from 2010 to 2016. These investments have significantly benefited the startups and their founders, helping them to generate over CAD $1.7 billion in annual revenue and to create 6,856 direct jobs. The economic activities made possible by these investments have also had important spillover benefits to the entire Canadian economy, which are estimated in the following.

4.2.1 Contribution to GDP

The investments made by NACO-affiliated angel investors enabled startups to develop innovative new products and services and to open new markets. The 775 startups in this study’s sample have generated total annual sales revenue of over CAD $1.7 billion. The estimated annual gross value added to the Canadian economy by the NACO-member funded startups – including the indirect and induced economic impacts of their activities – in this study is over CAD $3.3 billion.

$705M
induced

$920M
indirect

$1.7B
direct

$3.3B
in total

Figure 4.5: Estimated Annual Gross Value Added to Canadian Economy
Source: National Angel Capital Organization (NACO)
4.2.2 Job Creation

Between 2010 and 2016, the startups surveyed in the NACO dataset created 6,856 direct jobs in Canada. An estimated 4,522 additional indirect jobs in supplier businesses can also be attributed to the economic activity of these startups, while an estimated 3,250 additional induced jobs were created due to employee household spending in the local economy. Consequently, the NACO-member-supported startups have contributed to creating an estimated total of 14,628 jobs.

Figure 4.6: Estimated Jobs Created
Source: National Angel Capital Organization (NACO)
This study found important differences in the survival rates of angel-funded startups compared to other empirical studies of survival rates in the general population of startups in Canada.

These findings suggest that the one-year survival rate of startups funded by angel investors is lower than that of startups in the overall economy. In fact, according to the most recent report from Industry Canada (2018), the one-year survival rate of angel-funded startups is considerably lower than the Canadian average. However, this paper found that the medium-term survival rates of startups funded by angel investors compared better. Further findings indicate that the longer-term survival rates of angel-funded startups appear to be substantially lower than those of startups in the general economy.

It should be noted that there are important differences in the methodology used to determine survival rates in this paper compared to those used in previously discussed reports. Both Fisher & Reuber (2010) and Industry Canada (2018) determined survival based on the firm’s date of incorporation. This does not necessarily represent the date from which a firm began operating, nor does it factor in the date at which the founders began pursuing a given business opportunity, so while it is a reliable and consistent date, it could be considered somewhat arbitrary. This difference is more likely to have an influence on one-year and two-year comparisons but less so in later years.

This paper investigated survival from the time a firm first received angel investment from a NACO member. Angel investment is often the first capital received by startups (Argerich & Cruz-Cázares, 2017; White & Dumay, 2017). Therefore, it could be argued that the date upon which a firm received angel investment is more relevant because the firm has sufficient resources to begin operating and to pursue a given business opportunity in earnest. These methodological differences should be considered carefully when comparing this paper’s results with those of other reports.

Besides angel investment and assistance, there may be several other reasons for the variance in survival rates. The extant literature suggests that pre-entry knowledge (Dencker, Gruber, & Shah, 2009) and access to ongoing resources and capabilities (Esteve-Pérez & Mañez-Castillejo, 2008) may also play an important role. Indeed, it is reasonable to assume that the risk-return profile of startups that attract angel investment may be different from the general population of startups, leading to a generally lower survival rate. Lower long-term survival rates may also suggest that greater linkages to other stakeholders, such as incubators/accelerators and venture capitalists, are required within the startup ecosystem to appropriately support these startups over time. This study’s findings also suggest that survival rates in various industry sectors may differ, requiring sector-specific investment and startup support mechanisms.

Finally, this paper’s findings, although limited in scope, suggest that the economic activity supported by angel investment has a significant and far-reaching impact on the economy, both in terms of contribution to GDP and job creation.
6. Future Work

Based on these promising early results, additional research is needed to further investigate the differences in the survival rates of angel-funded startups.

This paper measured survival rates from the time a startup first received angel investment, while many other studies measure survival rates from the time of the firm’s incorporation. Additional data on the incorporation date of the startups in the NACO dataset would allow for a more faithful comparison of the survival rates of startups funded by angel investors and those of the general population of startups.

This paper’s findings suggest important differences in the survival rate of angel-funded startups, and further work is required to better understand the reasons for these differences. Future studies using hazard models could investigate which product, market and investment factors are specifically associated with higher or lower survival rates of angel-funded startups.

Understanding the factors associated with higher startup survival rates is important to investors and policy-makers alike. However, angel investors are interested in funding startups that not only survive but also thrive. Future studies using econometric models to investigate the factors associated with high rates of post-investment startup growth would be particularly useful to investors.

Finally, this study’s findings suggest that the longer-term survival rates of angel-funded startups is lower than average, and this may suggest the need, over time, for greater access to follow-on capital and access to other forms of support. Additional work is needed to better understand the existing linkages between key stakeholders in the startup support ecosystem, including incubators/accelerators, angel investors and venture capital, and how these linkages may be improved.
7. Partners

I-INC

Founded in 2014 as a truly national network, the Incubate-Innovate Network of Canada (I-INC) accelerates science and technology-enabled innovation, productivity and job creation through programs, which enable the individual and collective innovation impact of its member Canadian research universities. I-INC members work closely with complementary local, regional and national programs to deliver a spectrum of high quality programming and support required to set national benchmarks and move research from the lab to global markets.

MITACS

This paper was made possible in part through financial support provided by MITACS. MITACS is a national, not-for-profit organization that has designed and delivered research and training programs in Canada for 20 years. Working with 60 universities, 4,000 companies, and both federal and provincial governments, MITACS builds partnerships that support industrial and social innovation in Canada.

NACO

The National Angel Capital Organization supports Angels, incubators, and accelerators as they help entrepreneurs turn good ideas into great businesses. As the only national industry association for Angel investors in Canada, NACO represents over 40 networks comprised of over 3000 Angel investors across Canada. Members assist Canadian startups in every region and industry to execute their vision and compete on the global stage by providing them with patient risk capital, expert advice, and professional networks when traditional financial and other institutions cannot.

Ted Rogers School of Management, Ryerson University

The Ted Rogers School of Management at Ryerson University is Canada’s preeminent entrepreneurial-focused business school that is shaping the country’s next generation of global innovators and leaders. TRSM is home to six schools of management, three innovative graduate degrees – two MBA degrees and one research-focused Master of Science in Management (MScM) – and 15 cutting-edge research centres, institutes and labs.
8. References


