The Capital Structure Decisions of New Firms*

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Abstract

This paper investigates the capital structure choices that firms make in their initial year of operation, using restricted-access data from the Kauffman Firm Survey. Contrary to many accounts of startup activity, the firms in our data rely heavily on external debt sources such as bank financing, and less extensively on friends and family-based funding sources. This fact is robust to numerous controls for credit quality, industry, and business owner characteristics. The heavy reliance on external debt underscores the importance of well functioning credit markets for the success of nascent business activity.

1 Introduction

Understanding how capital markets affect the growth and survival of newly created firms is perhaps the defining question of entrepreneurial finance. Yet, much of what we know about entrepreneurial finance comes from firms that are already established, have already received venture capital funding, or are on the verge of going public—the dearth of data on very early stage firms makes it difficult for researchers to look further back in

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firms' life histories.[1] Even data sets that are oriented towards small businesses do not allow us to systematically measure the decisions that firms make at their founding. This paper uses a novel data set, the Kauffman Firm Survey (KFS), to study the behavior and decision-making of newly founded firms. As such, it provides a first-time glimpse into the capital structure decisions of nascent firms.

In this paper we use the confidential, restricted-access version of the KFS, which tracks nearly 5,000 firms from their birth in 2004 through their early years of operation.[2] Because the survey identifies firms at their founding and follows the cohort over time, recording growth, death, and any later funding events, it provides a rich picture of firms' early capital structure decisions.

Our analysis is motivated by the widely held view that frictions in capital markets prevent startups from achieving their optimal size, or indeed, from starting up at all. In credit markets, startup firms face credit constraints, and the inability to access formal credit markets is widely thought to drive many firms to pursue financing from informal channels to finance their startup activity. This motivation is at the heart of an important literature in banking that considers the role of relationships in establishing information flows between banks and firms (see, for example, Peterson and Rajan, 1994, 2000.) The richness of the KFS data allows us to explore the extent to which startups rely on friends and family versus more formal financing arrangements, such as bank loans, credit cards, and venture capital.

Thus, rather than test specific theories of capital structure, our main goal is a more modest, descriptive one: to examine the financing choices that firms make when they

[1]Some noteworthy recent exceptions are Kaplan, Sensoy and Strömberg, 2009, which follows a small sample of firms beginning at business plan stage, and Reynolds (2008) which uses data from individuals who are contemplating starting businesses.

[2]To be eligible for inclusion in the KFS, at least one of the following activities had to have been performed in 2004 and none performed in a prior year: Payment of state unemployment (UI) taxes; Payment of Federal Insurance Contributions Act (FICA) taxes; Presence of a legal status for the business; Use of an Employer Identification Number (EIN); Use of Schedule C to report business income on a personal tax return.

launch, and ask whether any patterns emerge from the data. A null hypothesis is that idiosyncracies in market conditions and access to financial and human capital are reflected in a high degree of variability in the capital structure choices that nascent firms make. Under the null, no pattern would emerge. Rejecting that null in favor a particular capital structure for startup firms then opens the door to questions about which theories provide the best account for the observed capital structure choices that startup firms make.

Our main result is that newly founded firms rely heavily on formal debt financing. Our calculations indicate that external debt financing—primarily through owner-backed bank loans and business credit cards—is the primary source of financing during a firm's first year. Indeed, our data suggest that the reliance on friends and family is an urban myth. The average amount of bank financing is seven times greater than the average amount of insider-financed debt; three times as many firms rely on outside debt as do inside debt. Even if we discard firms that do not use this source of financing, the average amount of external debt is nearly twice that of internal debt.

The reliance on formal credit channels over personal credit cards and informal lending holds true even for the smallest firms at the earliest stages of founding. The average pre-revenue firm in our sample has twice as much capital from bank loans than from insider sources. And when we look at only those firms who access outside equity sources, such as venture capital or angel financing, we still see a preponderance of debt: the average firm that accesses external private equity markets still has around 25% of its capital structure in the form of outside debt.

Of course, these calculations only speak to the equilibrium amount of borrowing from inside and outside sources; they are driven by both the supply of credit as well as the demand for credit. Ultimately, it is challenging to separate supply and demand in the absence of a natural experiment. But to control for the fact that differences in firm quality or creditworthiness may be driving the patterns we see in the data, we make use

of commercial credit scores of the firms. This gives us two avenues to control for demand-side variation. The first is simply to include the credit score directly in our analysis as a proxy for firm quality. Or, by regressing the credit score on industry dummies as well as firm and owner characteristics that affect the demand for capital (such as the legal form of organization of the business and the owner's education), we can purge the credit score of demand-side variation, leaving us with a measure of supply-side variation in credit access. Using these strategies to partition the data into firms with easy access versus constrained access to capital, we can explore how much the capital structure decisions of nascent firms are driven by supply-side factors.

Surprisingly, this partitioning has little effect on the observed capital structure choices firms make. To be sure, firms with high unexplained credit scores have more financial capital. The level of financing of these firms is nearly three times larger on average than constrained-access firms. But the relative amount of outside debt to total capital is about the same for both types of firms.

Apart from the possibility that cross-sectional variation in creditworthiness drives our results, a second possibility is that credit conditions at the time of our survey were unique, and do not necessarily reflect broader patterns from other time periods. While ultimately we are limited to the data that are available, we speak to this possibility by considering the impact of capital structure decisions on outcome variables like firm survival, employment growth, and profitability growth. We find that having a capital structure that is more heavily tilted towards formal credit channels results in a greater likelihood of success. This fact holds even when we include the credit score as a measure of firm quality to guard against the possibility that unobserved factors drive both success and credit access. Our findings indicate that even if credit conditions in 2004 were unique, credit market access had an important impact on firm success.

This paper is related to a number of papers in the banking, capital structure, and entrepreneurship literature. Given the emphasis in the current work on the role of

formal banking channels, our paper is also related to the literature on the role of banks and other sources of financing for small firms (Peterson and Rajan, 1994, 1997, 2000). Finally, we also speak to a literature in entrepreneurship that focuses on the role outside financing alternatives to help firms grow.[3]

The remainder of the paper is as follows. We begin in Section 2 by describing the KFS in greater detail. Section 3 examines initial capital structure choices. We incorporate credit scores and other firm characteristics in Section 4. Section 5 explores multivariate regressions of capital structure on a range of business and owner characteristics to explain capital structure decisions. In Section 6 we examine how initial capital structure affects firm outcomes. Section 7 concludes.

2 The Kauffman Firm Survey

The KFS is a longitudinal survey of new businesses in the United States. This survey collected information on 4,928 firms that started in 2004 and surveys them annually. These data contain detailed information on both the firm and up to ten business owners per firm. In addition to the 2004 baseline year data, there are two years of follow up data (2005 and 2006) now available. Additional years are planned. Detailed information on the firm includes industry, physical location, employment, profits, intellectual property, and financial capital (equity and debt) used at start-up and over time.

Information on up to ten owners includes age, gender, race, ethnicity, education, previous industry experience, and previous startup experience. For more information about the KFS survey design and methodology, please see Ballou et. al (2008). A public-use dataset is available for download from the Kauffman Foundation's website and a more detailed confidential dataset is available to researchers through a secure,

[3]For a noteworthy recent example of the role of outside capital in entrepreneurship decisions, see Cosh, Cumming and Hughes, 2008. Gompers and Lerner, 2001, provide an excellent summary of venture capital. Wong, 2003, is one of the first treatments of angel investing.

remote access data enclave provided by the National Opinion Research Center (NORC). For more details about how to access these data, please see www.kauffman.org/kfs.

A subset of the confidential dataset is used in this research—those firms that either have data for all three survey years or have been verified as going out of business in either 2005 or 2006. This reduces the sample size to 4,163 businesses. The method we used for assigning owner demographics at the firm level was to define a primary owner. For firms with multiple owners (35 percent of the sample), the primary owner was designated by the largest equity share. In cases where two or more owners owned equal shares, hours worked and a series of other variables were used to create a rank ordering of owners in order to define a primary owner. (For more information on this methodology, see Ballou et. al, 2008). For this research, multi-race/ethnic owners are classified into one race/ethnicity category based on the following hierarchy: black, Asian, other, Hispanic, and white. For example, an owner is defined as black, even if he/she is also Hispanic. As a result of the ordering, the white category includes only non-Hispanic white.

Tables 1 and 2 provide details on business characteristics. In Table 1, we report key features of the business—its legal form, location, and other features of operations. Nearly 37% of all businesses in the data are sole proprietorships, while the remaining 63% are structured to provide some form of limited liability to owners. However, only around 30% of businesses are incorporated, and of these, only 10% of the sample are incorporated as C-corporations.

Nearly half of the businesses in the survey operate out of the respondents home or garage; the vast majority (86%) market a service, and only a quarter of the firms in the survey have any form of intellectual property (patents, copyrights, and/or trademarks). Reflecting the fact that they are being measured at their inception, the firms are also tiny by almost any conceivable measure. Nearly 60% of the firms have no employees other than the founder, and less than 8% of firms in the sample have more than five employees in their first year of operations.

Table 2 considers the cash flow characteristics of these nascent businesses. Even though these firms are small, nearly twenty percent of firms (16.8%) have over $100,000 in revenue in their first year. Indeed, 45% of the firms in the sample have more than $10,000 in annual revenue in their first year. Of course, over 57% of firms have more than $10,000 in expenses, and almost one firm in four reports zero profit or loss.

Table 3 examines owner characteristics in more detail. The entrepreneurs in our data are overwhelmingly male and white: less than one-third of respondents are female and over three-quarters are non-Hispanic white. In spite of the fact that most of the businesses in our data begin at home, in people's garages, with fewer than five employees, the overwhelming majority of business owners have at least some industry experience. Less than ten percent of owners have no previous industry experience, while more than half have more than five years of industry experience. Likewise, more than forty percent of business owners have started a business before. More than 80% of respondents are over the age of 35 when they start their business, and roughly half the sample is aged 45 or older.

The entrepreneurs in our sample are relatively well educated. Less than 20% of respondents have less than a high school degree, while well over half of respondents have completed some form of a college degree. Finally, nearly a quarter of all respondents have received some form of advanced, post-graduate education. In broad terms, these demographics match those reported in other data sources. For example, these demographics are similar to those reported in Puri and Robinson (2008), using the Survey of Consumer Finances, and Fairlie and Robb (2007), using the Characteristics of Business Owners Survey.

3 A New Pecking Order?

The standard prescription from pecking order models is that firms first should use internal cash, then rely on debt financing, and then rely on equity financing. Of course, most capital structure models implicitly assume an owner-managed firm but are most often tested using large, well established firms. How well do capital structure theories describe how beginning firms actually make their initial financing decisions? In this section we begin to answer this question by describing the capital structure decisions of startup firms.

To impose some structure on the details of startup fundraising, we group fundraising choices along two dimensions. First, we distinguish owner financing, informal financing and formal financing. We also distinguish debt from equity. Owner financing takes the form of loans or equity positions in the firm that derive specifically from the owner's personal wealth. Informal financing channels include debt or equity from family members and personal affiliates of the firm, while formal financing channels include debt accessed through formal credit markets as well as venture capital and angel financing.

3.1 A detailed look at capital structure

In Table 4, we provide a detailed look at the capital structure choices that nascent firms make. It provides a breakdown of thirty different sources of capital for startup businesses. Over 75% of firms have at least some owner equity; of these, the mean amount is just over $34,500. If we include the quarter of firms with no reported owner's equity, the average owner equity amount drops to $27,365.

Owner debt plays a much smaller role. Only about 1/4 of firms have some form of owner personal debt, and the vast majority of this is mostly in the form of debt carried on an owner's personal credit card. The overall average amount of credit card debt used

to finance startups is a modest $3,400, but this includes the roughly 75% of owners who do not use personal credit cards to start their businesses. Among those who do, the balance is considerably larger—$10,000, or about 1/3 of the size of owner equity. But in general, personal credit card balances make up a relatively small fraction of the startup's overall capital structure at inception—only about 4 to 5% of the firm's total capitalization is in the form personal credit card balances held by firm owners.

While the owner-level capital structure is heavily tilted towards equity, the capital structure of insiders and outsiders is completely reversed. If we include the firms with zero values, firms use about five times as much debt as they do equity. This holds for both inside debt ($7,605) to equity ($1,695), as well as outside debt ($31,255) to equity ($6,979). But seven times as many firms report outside debt as report outside equity. Yet, among those who do receive outside equity, there is no question that it is important. The average amount of outside equity among the 223 firms who access this source of financing is over $150,000, roughly twice as large as the total financial capital for the average firm in the survey.

Turning first to insiders, we see that equity is uncommon. Only about five percent of the sample relies on equity from a spouse or other family members, and the overall average amount (including the 95% with no family equity) is only about two percent of the average funding. Yet, among the group who uses family equity, the source is important: the magnitude of insider equity is roughly the same as that of owner equity, and many times larger than the magnitude of owner debt.

Insider debt is more common, but still a small source of funding relative to outside debt and equity. The mean value of inside debt for all firms is $7,605, and this primarily comes from personal loans received by the respondent from family and other owners. Loans directly to the business from owners or other family members are also important, but the fact that less than ten percent of surveyed firms rely on any one type of inside debt suggests that this funding source is not commonly relied upon by new firms.

When we turn to outsider debt, we see that on average it is the largest single financing category for startups during their first year of operation. While this no doubt reflects the relative supply of outside debt to other funding sources, it is noteworthy that only a relatively small fraction of this comes from credit card balances issued to the business. Of the $31,255 average debt level, less than $2,500 on average comes from business credit cards.

One widely held view about entrepreneurial finance is that startups lack access to formal capital markets, and thus are forced to rely on an informal network of family, friends, and other financing sources like credit cards to bootstrap their initial financing. Table 4 speaks against this idea. First, outside capital is extremely important, even at the earliest stages of a firm's life. The average new firm has approximately $78,000 of financial capital. Of that, roughly half comes from outside sources.

To be clear, however, informal investors do play an important role for those firms who obtain external equity funding. Looking solely at the external equity funding, of the 223 firms who received some form of external equity funding, over half received funding from outside informal investors. The average amount, around $100,000, is roughly one-third the average for the handful of firms that report obtaining venture capital.[4]

Second, the vast majority of this outside capital comes in the form of credit, either through personal loans made directly to the owner or through business credit cards. Moreover, credit cards play a relatively small role for the average startup. If we total the average credit card holdings on all personal and business accounts associated with the business, the amount sums to less than half the average personal bank loan. If we tally the average personal bank loan and the average business bank loan, this amount is roughly four times the size of the average total credit card balances outstanding.

[4]Some firms may indeed misclassify angel investors as venture capital, as the average amounts are quite low.

In some respects, these descriptive statistics suggest that pecking order does a good job of describing the capital structure decisions of new firms. If we treat owner debt and equity as internal funding, and abstract away from its capital structure, then we see that many firms rely on internal funding, fewer firms rely on debt, and fewer firms still rely on equity. This broadly conforms to the basic message of the Myers and Majluf pecking order. At the same time, this characterization misses important details, because it abstracts away from the interaction between capital choice (debt vs. equity) and from whom to raise capital—whether the capital comes from insiders or outsiders.

3.2 Capital Structure and Firm Type

Perhaps the most surprising finding in Table 4 is that formal credit channels—business and personal bank loans—are the most important sources of funding for startups. To push this observation further, we segment the data in Table 5 to report capital structure patterns for different types of startup firms.

The idea behind Table 5 is to isolate those firms that are in their very earliest stages of starting up, to see if the overall capital structure patterns hold there as well. This can be done according to a number of criteria. In the first column of Table 5, we examine the 2,425 firms who have no employees other than the founder. These firms are small relative to the average reported for all firms in Table 4—there total capital is only around $35,000 as compared to the roughly $78,000 in Table 4. But proportionately, outside debt plays a quite similar role: the average non-employer firm has $12,000 in outside debt, or about 36% of its total capital, compared to approximately $31,000, or about 39% of total capital on average for firms overall. Of the outside debt, we again see that business bank loans and personal bank loans make up the bulk of the $12,000. Only about $2,500 comes from other sources on average.

The second column examines the 2,168 businesses which are home-based, meaning that they do not operate any office or warehouse space outside the home. These too are small, presumably including the proverbial "garage business" as well as businesses of a professional nature that operate out of a home office. The capital structure patterns for these businesses are remarkably similar to the non-employer businesses: about forty percent of their total capital is financed through outside debt, and the lion's share of that comes from personal and business bank loans, rather than credit card balances.

Another way to pinpoint firms at their earliest stages is to focus only on pre-revenue or pre-profit firms. We examine these firms in columns (3) and (4), respectively. These firms are considerably larger than the previous two categories, presumably because these include many firms that have secured inventories in advance of sales, or require external building space to operate. Indeed, these columns look quite similar to the averages reported in Table 4 for the whole sample.

Because the first four columns of Table 5 monotonically expand the size and scope of firms under consideration, they offer an alternative way to examine pecking order and access to capital, albeit descriptively. Moving from the first column of data to the fourth column of data more than doubles the firm's size by adding an additional $50,000 of total capital to the firm. By far the bulk of this comes from outside debt and equity, which together make up about half the increase in firm capital. To put it differently, going from non-employer to pre-revenue adds only about $1,000, or doubles, the amount of insider equity, but it nearly triples, or adds over $20,000, to outside debt. Since columns (3) and (4) also contain some non-employer and home-based firms, this comparison understates the magnitude of the shift in capital structure. Thus, the comparisons across the columns of Table 5 indicate that friends and family is probably an earlier source of financing than outside debt, as previous accounts have indicated. It is just not terribly important in terms of total size.

The final two columns of Table 5 split the data according to whether the firm continued to operated throughout the first three waves of the KFS, or whether the firm ceased operations. Firms that survive look very much like the overall average reported in Table 4. On the other hand, firms that ceased operations sometime before 2006 not only began smaller, but also had considerably smaller proportions of outside debt to total capital. Of course, it is impossible to draw any causal connection between these two observations, but in the next section we can examine causation more carefully by considering how credit quality affects these findings.

4 Firm Quality and Capital Structure Decisions

4.1 Credit worthiness, technology and pecking order

Table 6 takes the richness of Tables 4 and 5 and boils it down to six categories: owner debt, owner equity, inside debt, inside equity, outside debt, and outside equity. These classifications are as described in the left-most column of Tables 4 and 5. Reducing the amount of detail not only makes the pecking order that most firms use more apparent, it also facilitates more comparisons across different types of firms.

The rows of Table 6 are arranged from highest to lowest in terms of the overall weighted average level of 2004 funding. If we interpret the magnitudes as an indication of relative importance, then we see a clear pecking order emerge: first outside debt, then owner equity, then debt from insiders. Fourth in the pecking order is outside equity, followed by owner debt; the least used source is inside equity.

An alternative way to characterize the pecking order of nascent firms is to combine owner debt and equity into a single category, internal funding. Looking at capital structure this way, the average firm is roughly equal parts internal funding and outside debt. These two sources of funding are each roughly four times larger than the next

largest source of financing. Regardless of how the financial pieces are assembled, outside debt plays a paramount role in funding newly founded firms.

One reason for this may simply be that outside debt is more plentiful than other sources of funding. To explore this possibility, we obtained commercial credit scores for each firm to identify high credit worthiness and low credit worthiness firms. Table 6 shows that while high credit worthiness firms have access to much more financial capital, they access capital in roughly the same proportions as low credit worthiness firms. Thus, a firm's credit score induces a first-order shift in the level of financing it obtains, but only a second-order shift in capital structure choice it makes.

Outside equity plays a substantially more important role in the capital structure of high tech firms. Across all high tech firms, outside equity is the third largest funding source behind outside debt and owner equity. Among high tech firms with high credit scores, outside equity is the largest form of financing. It is only the low credit score firms in the high tech sector that display a pecking order that resembles the average firm in the data—but even for those firms, owner equity is a more important source of financing than outside debt.

4.2 Separating credit supply from credit demand

To separate credit supply and credit demand, we exploit the availability of credit score information to identify cases in which firms faced unexpectedly easy or difficult access to capital. If the capital structure choices depicted in the previous tables are polluted by differences in the availability of capital, then this should control for that.

To account for this possibility, we regress the firms credit score on variables that proxy for demand-side factors that would influence credit ratings. We consider two

models. First, we run the following regression:

$$score_{ij} = \alpha + \beta_j + \epsilon_i \tag{1}$$

where $score_{ij}$ is the credit score of firm i in industry j, β_j are industry fixed effects. Thus, the first estimation simply includes a set of 60 industry dummies.

For the second specification, we run the following regression:

$$score_{ij} = \alpha + \beta_j + \gamma_1 F_{ij} + \gamma_2 K_{ij} + \epsilon_i \tag{2}$$

where $score_{ij}$ is the credit score of firm i in industry j, β_j are industry fixed effects, and F is a vector of owner characteristics, and K is a vector of firm characteristics, both of which likely vary with demand for credit. For this specification, we include a full set of industry dummies, a set of education dummies corresponding to the breakdown presented in Table 3, and we also include factors such as race, ethnicity, industry experience, intellectual property, legal structure of the enterprise, whether the business is home-based, and whether the business sells a product or provides a service. While these coefficient estimates are interesting in their own right, a full discussion is beyond the scope of this paper. Indeed, in Robb, Fairlie and Robinson (2009) we explore the issue of race and access to credit in greater detail.

The idea behind both specifications is that by purging the credit score of variation that is linked to factors driving the demand for credit, the remaining variation in credit score would reflect supply-side credit restrictions. Firms with high unexplained credit scores should have easier access to capital, while firms with low unexplained credit scores should have relatively more difficult access to capital. Moreover, the differences in their access to capital should reflect suppliers willingness to lend, rather than differences in capital needs.

Recovering the regression errors from these two models gives us a mechanism for classifying firms as credit constrained or unconstrained. Of course, a firm with a low unconditional credit score is constrained, but this low score may arise endogenously because the firm has little need for external capital, low growth prospects, and therefore does not take the steps needed to boost its credit score. By relying on the conditional credit score as opposed to the raw credit score, we circumvent these problems.

Tables 6 and 7 report pecking orders for firms in the lowest and highest quintiles of the unexplained credit score distribution. Firms in the lowest quintile face the most severe unexplained restrictions to credit access, since their credit scores are much lower than would be predicted based on their demand characteristics. In contrast, the top quintile have the easiest access to credit, since they have high unexplained credit scores, given their access to capital.Table 6 presents the detailed classification of funding sources, while Table 7 presents the aggregated data.

In general, the results of Tables 6 and 7 mimic the results from the previous table, in that they show a first order affect on the amount of capital raised, but only a second order effect on capital structure choice. Credit constrained firms have capital structures that look very similar to those of unconstrained firms. The primary difference is that unconstrained firms have much higher levels of capital investment.

5 Explaining Funding Decisions

Having described initial capital structure choices in detail, we now turn to the task of explaining the observed variation in capital structure choice. We do this in Table 9, where we regress capital structure ratios on owner and firm characteristics. In general, Table 9 reports OLS regressions of the following form:

$$\frac{\text{Financing Category}}{\text{Total Capital}} = \alpha + \beta_j + \gamma_1 F_{ij} + \gamma_2 K_{ij} + \epsilon_i \tag{3}$$

where β_j are industry fixed effects, F is a vector of owner characteristics, and K is a vector of firm characteristics. The dependent variable in each column is a financial ratio—either outside debt, outside equity, outside loans, or inside finance—each scaled by the firm's total capital. (The unmeasured category is the ratio of owner financing to total capital.) Outside loans are a subset of outside debt that include only personal bank loans and business loans. The firm characteristics include not only the survey characteristics described in Tables 1-3, but also the firm's credit score, a measure of quality that might well be unobserveable to the econometrician in other circumstances, but would be readily observable to credit market participants.

Do gender and race play a role in determining initial capital structure choices? Table 9 suggests that this is definitely the case. First, gender: women receive significantly less outside capital than other groups. The results for women indicate that the average female-owned business holds about 6-7% less outside debt than the same male-owned business. Although these results may reflect the fact that women face more restricted access to capital in the credit market, the data do not allow us to rule out the possibility that, notwithstanding the industry fixed effects, female-owned businesses simply may demand less outside capital, perhaps because they are more likely to be second-income businesses.

Next, the question of race. Table 9 shows that black-owned businesses hold much less outside debt in their initial capital structure than other businesses. The magnitudes are similar to those found for gender: the ratio of outside debt to total capital is about 7% lower for black-owned businesses than for otherwise equal white-owned businesses. Whether this attributable to supply-side or demand-side considerations, it is important to note that these regressions hold constant the industry of the business, the firm's credit quality, the owner's education, and their prior industry and startup experience. Thus, unobserved heterogeneity in underlying business quality seems unlikely to be a first-order explanation for the difference.

We also observe other racial differences in capital structure choice. Hispanics and Asians, but not Blacks, rely heavily on inside finance.[5] While Hispanic or Asian ethnicity explains little variation in access to external capital, these groups average about 8% more inside capital in their total capital structure. Given that the average firm in Table 4 has an inside-to-total capital ratio of around 12%, this effect is enormous in economic magnitude, representing a 75% increase in the average amount.

Across the board, increasing hours worked in the business is associated with greater outside and inside capital, and consequently, lower owner financing. Similarly, owner age has an increasing but concave relationship with access to external capital, for both debt and equity, while it has the opposite relationship for inside financing.

Prior experience plays an interesting role in determining initial capital structure. Owners with prior startup experience tend to rely on external equity more than others. In contrast, Table 9 indicates that owners with more industry experience rely significantly more on their own financing, since the association between industry experience and capital type is negative across all types reported in the table.

The regressions also include, but do not report, owner education. Different categories of education have similar experiences accessing external debt equity, but there is a pronounced effect associated with inside financing. Namely, those who do not finish high school are significantly more likely to rely on inside financing than other groups. Since the regressions include industry fixed effects, it is not the case that this is driven by sorting of low education respondents into industries with low capital requirements. Rather, this is probably an indication that lower quality businesses are more likely to rely on inside financing instead of accessing external capital markets.

The business characteristics reported in the bottom of the table demonstrate that firms with lower asymmetric information problems enjoy more ready access to external capital sources, and in particular, external credit funding. Home-based businesses rely

[5]This is measured as the sum of inside equity and debt.

more heavily on owner financing, while firms with multiple owners have larger fractions of outside-to-total capital. Comparing the point estimates in Table 9 to the averages in Table 4 suggests that multiple-owner firms receive about a ten percent increase in the baseline amount of outside debt, and about a 25% increase in the baseline level of external equity (from around 8% to around 10%). Firms that have intellectual property are not more likely to access outside debt, but are more likely to access external equity, than those that do not.

6 Does Financial Access Affect Survival?

It is widely noted that startup firms are a key driver of growth in our economy. How then, do capital structure choices affect the growth of startup firms? This question is important for two reasons. First, the question provides normative implications for credit market access. Second, the question provides an important robustness check against the possibility that our main finding of interest—the fact that startups rely extensively on external credit markets to fund their early life—is being driven by peculiarities in the credit market in 2004. If our findings simply reflect the fact that credit was readily available in 2004, then there is no reason to believe that access to external credit should affect firm success.

To take up this question, we report Probit analysis of three key measures of growth from 2004-2006. First, we create a dummy for whether a firm has above median revenues in 2006. Then we repeat this calculation for profits and for employees. Our key explanatory variable is the ratio of outside debt to total capital. The hypothesis that we are testing is that firms with greater levels of external capital had better growth prospects.

Table 10 tests this hypothesis. It includes the same basic set of owner and firm characteristics, plus the ratio of outside debt to total capital and the level of 2004 sales.

The outside debt ratio has a positive and highly significant effect on revenue growth and employee growth, but a statistically insignificant positive effect on profit growth.

To attach a causal interpretation to these findings, it is important to control for unobserved characteristics that might affect access to debt and success. In that regard, including the credit score and other firm characteristics are essential for our findings. Including the credit score allows us to conclude that controlling for firm creditworthiness, firms that accessed more external debt were nearly ten percent more likely to be in the top revenue group, and nearly six percent more likely to have hired employees. Note too that this also controls for the initial revenues the firm experienced in 2004, therefore the effect is not attributable to initial size. Table 10 indicates that, indeed, initial capital structure decisions are important for firm success.

The owner and firm characteristics, which are included as controls in Table 10, are interesting in their own right and raise many questions for future research. First, they show that female-owned businesses are significantly less likely to grow than male-owned businesses. Black-owned businesses are significantly less likely to have grown in terms of profits or sales, but they are more likely to have added employees than white-owned businesses. Asian-owned businesses are also more likely to have added employees, although Asian ownership is unrelated to revenue or profit growth. And finally, the vector of firm characteristics that might describe a firm, a priori, as a lifestyle business or not indeed predicts whether a firm has grown.

7 Conclusions

This paper uses a novel data set to explore the capital structure decisions that firms make in their initial year of operation. In the vast majority of cases, this is when the firms in question are still being incubated in their founders' homes or garages, before outside employees have joined the firm in any significant number, and certainly well

before the firms in question would be attractive to the types of funding sources that are the focus of most discussions of early stage financing.

In spite of the fact that these firms are at their very beginning of life, they rely to a surprising degree on outside capital. The notion that startups rely on the beneficence of a loose coalition of family and friends seems misleading given our findings. While the data suggest that informal investors are important for the handful of firms that rely on outside equity at their startup, the data also indicate that most firms turn elsewhere for their initial capital. Indeed, roughly 80-90% of most firms' startup capital is made up in equal parts of owner equity and bank debt. The fact that the debt is financed through arms length relationships, and not through family and friends networks, is worthy of further research.

To be sure, our findings underscore the importance of liquid credit markets for the formation and success of young firms. If startups hold the key to growth in western economies, then surely economic growth hinges critically on the smooth functioning of credit markets that enable young firms to be formed, to grow, and to succeed. Indeed, if we extrapolate a bit, our findings suggest that the financial crisis that started in the housing market will be especially problematic for financing startups. While an economic crisis may increase the supply of potential entrepreneurs in the short-run, through job losses in other areas, the collateral restrictions implied by the dramatic collapse in housing prices should impair to a major source of capital for startups. Financial constraints facing startups, long thought to be acute, even in boom times, will almost surely be more acute going forward.

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Table 1: Business Characteristics

	Weighted Percentage
Business Legal Status	
Sole Proprietorship	0.360
Partnership	0.057
Corporation	0.277
Limited Liability Corporation	0.306
Business Location	
Home Based	0.500
Leased Space	0.396
Other	0.104
Business Product/Service Offerings	
Service Offered	0.858
Product Offered	0.516
Business Offers Both Service(s)/Product(s)	0.378
Intellectual Property	
Patents	0.022
Copyrights	0.086
Trademarks	0.137
Employment Size	
Zero	59.2
1	14.0
2	9.1
3	4.6
4-5	5.8
6-10	3.9
11+	3.6
Credit Score	
High Credit Score	0.115
Medium Credit Score	0.553
Low Credit Score	0.332

Source: Kauffman Firm Survey, Baseline data. Sample Size: 4,163

Table 2: Cash flow characteristics of startups in the KFS

Panel A: Percent of Businesses by Revenues and Expenses

Revenues	Weighted Percentage	Expenses	Weighted Percentage
Zero	35.3%	Zero	6.7%
$1,000 or less	5.1%	$1,000 or less	8.5%
$1,001- $5,000	7.7%	$1,001- $5,000	16.0%
$5,001- $10,000	6.1%	$5,001- $10,000	11.3%
$10,001- $25,000	10.5%	$10,001- $25,000	16.2%
$25,001- $100,000	18.6%	$25,001- $100,000	25.3%
$100,001 or more	16.8%	$100,001 or more	15.8%

Panel B: Percent of Businesses by Amount of Profits or Losses

Profit (44.5	Weighted		Weighted
Zero	19.4%	Zero	3.4%
$1,000 or less	10.2%	$1,000 or less	13.2%
$1,001- $5,000	16.4%	$1,001- $5,000	27.3%
$5,001- $10,000	12.5%	$5,001- $10,000	17.0%
$10,001- $25,000	17.4%	$10,001- $25,000	17.9%
$25,001- $100,000	20.0%	$25,001- $100,000	16.9%
$100,001 or more	4.1%	$100,001 or more	4.2%

Source: Kauffman Firm Survey, Baseline data. Sample Size: 4,163

Table 3: Business owner demographics

Characteristics	Weighted Percentage	Characteristics:	Weighted Percentage
Male	69.2		
Female	30.8	Industry Exp. (Yrs.)	
		Zero	9.8
White	79.3	1-2	13.9
Black	8.6	3-5	15.6
Asian	4.2	6-9	9.9
Others	2.3	10-14	13.6
		15-19	11.3
Non-Hispanic	94.5	20-24	9.3
Hispanic	5.5	25-29	7.5
		30+	9.3
Owner Age			
24 or younger	1.3		
25-34	16.5	Previous Start-ups	
35-44	33.6	0	57.5
45-54	29.0	1	21.5
55 or older	19.6	2	10.2
		3	5.0
Owner Education		4 or more	5.8
HS Grad or Less	13.9		
Tech/Trade/Voc. Deg.	6.4		
Some Coll., no deg.	21.8	Hours Worked	
Associate's	8.6	Less than 20	18.5
Bachelor's	25.3	20-35	19.5
Some Grad, No Deg.	5.9	36-45	14.3
Master's Degree	13.4	46-55	15.2
Professional/Doctorate	4.7	56 or more	32.5

Source: Kauffman Firm Survey, Baseline data. Sample Size: 4,163

Table 4: Sources of Financing for 2004 Startups

		All firms	All >0 firms	
Category	Funding Source	Mean	Mean	Count
Owner Equity		$28,541	$36,134	3125
Owner Debt		$3,487	$11,322	1194
	Personal CC balance, resp.	$3,175	$10,587	1159
	Personal CC balance, others	$288	$8,995	132
	Personal loan, other owners	$25	$15,853	5
Insider Equity		$1,700	$36,367	177
	Spouse equity	$491	$30,732	62
	Parents equity	$1,209	$35,310	126
Insider Debt		$7,633	$52,048	542
	Family loan	$2,670	$28,398	327
	Family loan to other owners	$286	$34,681	29
	Personal loan to other owners	$1,350	$43,909	115
	Other personal loans	$1,887	$120,000	67
	Business loan by family	$69	$19,349	9
	Business loan by owner	$559	$29,457	73
	Business loan by emp.	$812	$64,514	50
Outsider Equity		$6,901	$150,000	205
	Other informal investors	$2,793	$110,000	110
	Business equity	$1,841	$160,000	56
	Govt. equity	$466	$85,664	27
	VC equity	$1,454	$350,000	26
	other equity	$347	$190,000	9
Outsider Debt		$32,097	$86,374	1439
	Personal bank loan	$10,476	$61,086	641
	Owner bus. CC balance	$1,394	$9,828	543
	Personal bank loan by other owners	$1,498	$65,010	92
	Bus. CC balance	$167	$9,694	62
	Other Bus. CC balance	$859	$7,383	452
	Bus. bank loan	$10,060	$150,000	243
	Credit line balance	$3,798	$71,429	210
	Non-bank bus. loan	$2,040	$120,000	72
	Govt. bus. loan	$725	$84,303	34
	Other bus. loan	$187	$63,305	19
	Other individual loan	$259	$49,512	22
	Other debt	$634	$120,000	22
Total		$80,359	$89,255	3564

Source: Kauffman Firm Survey, Baseline data. The mean for 4,163 firms is reported in the first column. The second column reports the mean for only firms with positive amounts of that source of funding. The sample size for that source of funding is reported in the third column.

Table 5: Sources of Financing for 2004 Startups by Firm Type

Funding Source	Non-Employer	Home-Based	Pre-Revenue	Pre-Profits	Survived thru 2006	Closed by 2006
Owner Equity	$14,730	$18,712	$25,579	$23,316	$27,851	$30,959
Owner Debt	$2,290	$2,647	$2,558	$1,236	$3,332	$4,030
Personal CC balances, resp.	$2,112	$2,370	$2,378	$1,187	$3,065	$3,670
Personal CC balances, other owners	$178	$278	$180	$49	$268	$360
Insider Equity	$761	$898	$2,021	$799	$1,313	$3,053
Spouse Equity	$251	$211	$456	$95	$339	$1,022
Parents Equity	$510	$687	$1,565	$704	$974	$2,031
Insider Debt	$2,751	$3,250	$7,582	$5,713	$7,610	$7,710
Personal family loan, resp.	$1,185	$1,696	$2,422	$1,293	$2,410	$3,577
Personal family loan, other owners	$206	$127	$261	$307	$244	$432
Bus. loan from family	$319	$502	$1,829	$684	$1,278	$1,604
Bus. loan from owner	$247	$269	$1,702	$1,473	$2,215	$737
Other personal loan, resp.	$293	$319	$333	$682	$470	$869
Other personal debt, resp.	$491	$337	$1,028	$1,201	$908	$478
Outsider Equity	$1,440	$2,250	$6,005	$3,072	$7,640	$4,313
Other informal investors	$572	$1,311	$2,010	$1,364	$3,077	$1,800
Businesses	$646	$640	$2,173	$619	$1,959	$1,428
Government	$9	$79	$249	$45	$584	$52
Venture Capitalists	$205	$215	$1,570	$1,045	$1,576	$1,026
Others	$8	$5	$4	$0	$443	$8
Outsider Debt	$12,919	$17,836	$28,972	$26,189	$33,459	$27,326
Personal bank loan, resp.	$6,384	$7,691	$9,012	$11,603	$11,182	$8,008
Bus. CC balance, resp.	$641	$577	$728	$303	$1,538	$891
Personal bank loan, other owners	$334	$993	$1,279	$432	$1,673	$884
Other bus. CC balance	$23	$48	$72	$23	$124	$316
Bus. CC balances, Bus.	$550	$481	$507	$425	$887	$758
Bus. bank loan	$3,702	$5,997	$11,464	$12,017	$10,389	$8,907
Credit line	$382	$694	$2,526	$392	$3,725	$4,057
Non-bank Bus. loan	$336	$460	$2,794	$355	$1,916	$2,475
Government Bus. loan	$56	$245	$423	$622	$795	$480
Other Bus. loan	$142	$280	$10	$0	$240	$3
Other individual loan	$170	$192	$29	$7	$329	$13
Other business debt	$199	$177	$129	$11	$662	$536
Total	$34,890	$45,593	$72,718	$60,325	$81,206	$77,392
Observations	2,425	2,168	1,615	2,144	3,390	773

Source: Kauffman Firm Survey, Baseline data.

Table 6: A New Pecking Order?

	All firms:			Only High Technology firms:		
	All	High credit	Low credit	All High Tech	High credit	Low credit
Owner Equity	$28,541	$45,227	$19,866	$44,493	$64,151	$28,601
Owner Debt	$3,487	$3,344	$3,336	$4,368	$3,321	$6,064
Informal Equity	$1,700	$3,548	$1,100	$2,374	$3,844	$2,819
Informal Debt	$7,633	$17,606	$4,543	$10,871	$22,922	$12,843
Formal Equity	$6,901	$13,998	$3,561	$32,466	$115,099	$17,586
Formal Debt	$32,097	$66,899	$19,209	$42,776	$85,406	$30,292
Total Financial Capital	$80,359	$150,621	$51,615	$137,347	$294,741	$98,205
Zero Financial Capital	10.0%	12.0%	11.0%	9.0%	6.0%	10.0%
N	4163	502	1322	592	89	133

Source: Kauffman Firm Survey, Baseline data. This table reports mean levels of 2004 startup funding by type of funding. The first column matches the category-level data reported in the previous table. The remaining columns report breakdowns for various types of firms. Columns 2 and 3 focus on firms with high and low Dun and Bradstreet credit scores. The final three columns repeat the first three, but only examine high-tech firms.

Table 7: Do Equity-backed Firms Embrace or Eschew Debt?

Each column in this table reports capital structure decisions for firms with different types of outside equity. Thus, the sample size of each column is reported in the third row of Table 4, in the "Outside Equity" section. Amounts are averages over all firms that had the type of funding in the column header in 2004. Some subcategories are suppressed for brevity, but they are included in the totals reported in each category.

Source	Angel	VC	Corporate	Govt-Other
Owner Equity	$104,335	$64,469	$98,738	$47,341
Insider Equity	$11,205	$6,367	$4,904	$5,425
Spouse Equity	$1,046	$0	$2,918	$51
Parent Equity	$10,159	$6,367	$1,986	$5,375
Outsider Equity	$150,594	$488,911	$212,672	$123,189
Other Informal Investors	$107,685	$33,956	$43,801	$7,418
Other Business Equity	$34,834	$102,342	$162,369	$3,686
Government Equity	$3,585	$503	$332	$64,115
Venture Capital Equity	$4,377	$352,111	$6,022	$286
Other Equity	$114	$0	$148	$47,684
Owner Debt	$7,462	$2,697	$9,878	$6,655
Personal Credit Card -Owner	$6,156	$2,681	$9,308	$6,229
Personal Credit Card-Other Owners	$457	$16	$570	$426
Insider Debt	$25,811	$28,731	$12,447	$4,430
Personal Family Loan	$7,754	$1,013	$3,042	$216
Personal Family Loan-other owners	$652	$0	$2,428	$344
Business Loan from family	$1,313	$0	$839	$3,869
Business Loan from Owner	$11,818	$7,343	$4,285	$0
Other Personal Loan	$3,286	$8,111	$842	$0
Other Personal Funding	$958	$12,265	$1,011	$0
Outsider Debt	$106,962	$307,871	$61,727	$58,073
Personal Bank Loan	$17,515	$144,885	$18,358	$6,007
Business Credit Card	$2,474	$2,638	$4,127	$454
Other Bank Loan	$7,228	$140	$5,495	$1,565
Business Credit Cards	$1,418	$3,860	$3,764	$512
Bank Business Loan	$31,438	$136,172	$21,763	$32,681
Credit Line	$14,081	$1,900	$4,799	$3,332
Other Non-Bank Loan	$14,741	$10,112	$1,916	$0
Government Business Loan	$176	$503	$0	$10,286
Other Business Debt	$14,595	$0	$1	$2,952
Total Financial Capital	$406,368	$899,046	$400,366	$245,112

Table 8: Time-series evidence on the importance of formal debt

Each column in this table reports the average for the subset of firms with the characteristics described in the column header. Column classifications are based on 2004. Column 3 is the set of firms that are incorporated, have at least one employee other than the founder, and have assets such as inventories. Home-based businesses are ones that report operating out of the founders' home.

	All Firms	Firm Has Outside Equity	Inc./Employees/ Asset-backed	Home-based Business
Panel A: Initial (2004) Baseline				
Owner Equity	$28,541	$83,785	$64,019	$12,848
Insider Equity	$1,700	$8,292	$5,053	$706
Outsider Equity	$6,901	$153,608	$23,636	$1,401
Owner Debt	$3,487	$7,400	$6,708	$1,985
Insider Debt	$7,633	$18,564	$19,419	$2,313
Outsider Debt	$32,097	$109,483	$82,330	$13,598
Total Initial Capital	$80,359	$381,132	$201,164	$32,851
Panel B: First (2005) Capital Injection				
Owner Equity	$13,015	$29,936	$22,461	$5,661
Insider Equity	$1,433	$1,099	$3,542	$354
Outsider Equity	$6,468	$74,212	$22,390	$901
Owner Debt	$3,346	$6,958	$5,547	$1,854
Insider Debt	$4,717	$11,458	$7,862	$1,906
Outsider Debt	$27,733	$74,898	$63,185	$14,339
Total 2005 Injections	$56,712	$198,560	$124,985	$25,015
Panel C: Second (2006) Capital Injection				
Owner Equity	$10,248	$28,308	$20,623	$4,602
Insider Equity	$647	$956	$2,120	$89
Outsider Equity	$3,949	$22,797	$13,249	$1,622
Owner Debt	$3,243	$5,526	$5,004	$1,838
Insider Debt	$3,910	$13,349	$8,619	$738
Outsider Debt	$27,096	$85,193	$64,169	$12,488
Total 2006 Injections	$49,092	$156,128	$113,785	$21,376
Panel D: Third (2007) Capital Injection				
Owner Equity	$7,933	$16,923	$13,484	$3,988
Insider Equity	$850	$1,960	$2,715	$116
Outsider Equity	$2,984	$33,419	$9,191	$401
Owner Debt	$3,628	$8,257	$6,694	$1,675
Insider Debt	$3,604	$18,215	$9,492	$686
Outsider Debt	$31,701	$87,775	$77,838	$12,910
Total 2007 Injections	$50,700	$166,549	$119,416	$19,776

Table 9: Sources of Financing for 2004 Startups

	Model 1 residual quintiles:		Model 2 residual quintiles:	
Funding Source	Top	Bottom	Top	Bottom
Owner Equity	$41,802	$22,964	$35,395	$29,552
Owner Debt	$3,930	$3,133	$3,610	$4,194
Personal Credit Card -Owner	$3,659	$2,474	$3,362	$3,486
Personal Credit Card-Other Owners	$271	$652	$248	$703
Other Personal Owner Loan	$0	$6	$0	$6
Insider Equity	$3,484	$1,967	$2,566	$2,086
Spouse Equity	$590	$1,011	$266	$961
Parent Equity	$2,894	$956	$2,300	$1,124
Insider Debt	$14,133	$6,772	$12,943	$7,855
Personal Family Loan	$3,874	$3,344	$3,534	$3,500
Personal Family Loan-other owners	$384	$36	$253	$167
Business Loan from family	$4,514	$1,398	$4,117	$1,809
Business Loan from Owner	$3,687	$609	$3,502	$753
Business Loan from Employee(s)	$274	$17	$135	$16
Other Personal Loan	$933	$521	$925	$648
Other Personal Funding	$467	$848	$476	$962
Outsider Equity	$14,018	$5,598	$9,722	$7,394
Other Informal Investors	$4,186	$1,164	$3,601	$1,594
Other Business Equity	$3,436	$1,241	$788	$1,951
Government Equity	$1,056	$250	$735	$568
Venture Capital Equity	$5,219	$1,268	$4,478	$1,569
Other Equity	$121	$1,675	$120	$1,712
Outsider Debt	$53,804	$27,780	$50,216	$32,413
Personal Bank Loan	$15,582	$8,237	$14,717	$8,931
Business Credit Card	$1,634	$791	$1,582	$1,004
Other Bank Loan	$1,941	$1,497	$1,289	$2,178
Business Credit Card-other owners	$93	$293	$93	$362
Business Credit Cards	$1,413	$664	$1,162	$986
Bank Business Loan	$14,262	$11,577	$13,466	$12,953
Credit Line	$11,151	$2,088	$10,795	$3,220
Other Non-Bank Loan	$3,621	$1,276	$3,569	$1,243
Government Business Loan	$1,049	$796	$629	$972
Other Business Loan	$457	$20	$344	$20
Other Individual Loan	$596	$40	$589	$41
Other Business Debt	$2,005	$503	$1,981	$504
Total Financial Capital	$131,171	$68,213	$114,452	$83,493
N	790	820	810	811

Table 10: Explaining Capital Structure Choices of Startup Firms

	Dummy for Raised Financing through:			
	Debt	Equity	Bank Loan	Inside Financing
Female	-0.0333	-0.0174***	-0.0252	0.0124
	(0.0219)	(0.00595)	(0.0178)	(0.0160)
Black	-0.0626*	-0.000578	-0.0478*	0.0705**
	(0.0340)	(0.0119)	(0.0280)	(0.0285)
Asian	-0.0219	-0.00813	-0.0382	0.0694*
	(0.0477)	(0.0111)	(0.0346)	(0.0404)
Other	-0.0411	-0.00965	-0.0564	0.0701
	(0.0588)	(0.0192)	(0.0424)	(0.0550)
Hispanic	-0.00490	-0.0164*	-0.00784	0.0762**
	(0.0436)	(0.00923)	(0.0353)	(0.0357)
Hours worked	0.00247***	0.000228*	0.00135***	0.00231***
	(0.000424)	(0.000126)	(0.000347)	(0.000291)
Owner Age	0.0112*	0.00362*	0.00986*	-0.00841**
	(0.00602)	(0.00207)	(0.00520)	(0.00408)
Age^2	-0.000109*	-0.0000370*	-0.0000862	0.0000638
	(0.0000638)	(0.0000214)	(0.0000554)	(0.0000438)
Work experience	-0.00403***	-0.000221	-0.00312***	-0.00245***
	(0.000987)	(0.000302)	(0.000820)	(0.000747)
Startup experience	0.00143	0.00290	0.0132	0.0105
	(0.0197)	(0.00604)	(0.0165)	(0.0140)
Multiple owners	0.0601***	0.0301***	0.0426**	-0.0158
	(0.0205)	(0.00772)	(0.0174)	(0.0144)
Credit Score	0.00213***	0.000114	0.00158***	0.000121
	(0.000428)	(0.000124)	(0.000353)	(0.000300)
Home-based	-0.0743***	-0.0303***	-0.0634***	-0.0644***
	(0.0207)	(0.00708)	(0.0170)	(0.0150)
Intellectual Property	-0.0135	0.0214**	-0.00234	0.0462**
	(0.0242)	(0.00884)	(0.0199)	(0.0193)
Comparative Adv.	0.0438**	-0.00749	0.00414	0.0124
	(0.0202)	(0.00678)	(0.0170)	(0.0146)
Sells product	0.0449	-0.00516	0.0461*	-0.000827
	(0.0331)	(0.00984)	(0.0265)	(0.0235)
Sells Prod. & Serv.	-0.00231	-0.00590	-0.00416	-0.00286
	(0.0308)	(0.00831)	(0.0243)	(0.0219)
Observations	3751	3744	3751	3744

Robust standard errors in parentheses. 2-digit industry dummies and owner education dummies included. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Explaining Capital Structure Ratios for Startups

	Ratios of Financing Source to Total Capital:			
	Bank debt	Inside Finance	Outside Debt	Outside Equity
Black	-0.0431***	0.00282	-0.0535**	-0.00677
	-0.0165	-0.0144	-0.0212	-0.00502
Asian	-0.0155	0.0668**	-0.0278	0.00785
	-0.0269	-0.0283	-0.0326	-0.0144
Other	0.0000961	0.0203	-0.00352	-0.00947
	-0.0358	-0.0281	-0.0401	-0.00815
Hispanic	-0.0136	0.0317	-0.0291	-0.0161***
	-0.0228	-0.0224	-0.0278	-0.00486
Female	-0.00667	0.00154	-0.0127	-0.0166***
	-0.0119	-0.0095	-0.0147	-0.0041
Hours worked	0.000305	0.000697***	0.000490*	0.0000151
	-0.000224	-0.000176	-0.000271	-0.0000844
Owner Age	0.00642**	-0.00759***	0.00929***	0.00343***
	-0.00302	-0.00277	-0.00355	-0.000951
Age^2	-0.0000647**	0.0000635**	-0.0000965***	-0.0000342***
	-0.0000323	-0.0000279	-0.0000373	-0.00000993
Work experience	-0.00133**	-0.000509	-0.00109*	0.000018
	-0.00053	-0.000399	-0.000655	-0.000231
Startup experience	0.00326	-0.000278	-0.00281	0.00521
	-0.0105	-0.00841	-0.0128	-0.00419
Multiple owners	0.0281**	-0.00453	0.0333**	0.0176***
	-0.0117	-0.00914	-0.0139	-0.00505
Credit score	0.000700***	0.0000142	0.00109***	-0.0000199
	-0.000244	-0.000196	-0.000296	-0.000102
Home-based	-0.0276**	-0.0420***	-0.0418***	-0.0151***
	-0.0107	-0.00928	-0.0134	-0.00462
Intellectual Prop.	-0.0262**	0.0119	-0.0250*	0.0125**
	-0.0117	-0.0111	-0.015	-0.00547
Comp. Adv.	-0.00532	-0.001	-0.006	-0.00261
	-0.0109	-0.00917	-0.0135	-0.0046
Sells product	0.0307	-0.00827	0.0189	-0.00273
	-0.0188	-0.0147	-0.022	-0.00764
Sells Prod. & Serv.	-0.00753	-0.00113	0.00216	-0.00712
	-0.0174	-0.0139	-0.0205	-0.00691
Observations	3385	3385	3385	3385
R-squared	0.055	0.057	0.047	0.038

Robust standard errors in parentheses. 2-digit industry dummies and owner education dummies included. *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Capital Structure Choices and Firm Outcomes

	DV is dummy for above sample median:			
	Revenue	Assets	Profits	Employee
2004 log Revenue	0.0187***	0.00690**	0.00850***	0.00647**
	(0.00274)	(0.00270)	(0.00226)	(0.00265)
Outside debt ratio	0.107***	0.290***	0.0297	0.0654
	(0.0408)	(0.0438)	(0.0330)	(0.0410)
Female	-0.140***	-0.143***	-0.0548**	-0.0634**
	(0.0285)	(0.0303)	(0.0244)	(0.0294)
Black	-0.0870*	-0.0900*	-0.114***	0.125***
	(0.0467)	(0.0481)	(0.0307)	(0.0448)
Hispanic	-0.112**	-0.0920	-0.0120	0.0452
	(0.0519)	(0.0608)	(0.0489)	(0.0637)
Asian	0.0527	-0.0230	0.0485	0.110**
	(0.0662)	(0.0626)	(0.0547)	(0.0559)
Other	-0.224***	-0.0246	-0.142***	0.134*
	(0.0602)	(0.0948)	(0.0504)	(0.0710)
Hours worked	0.00333***	0.00352***	0.00259***	0.00281***
	(0.000586)	(0.000564)	(0.000463)	(0.000582)
Credit score	0.00317***	0.00225***	0.00204***	0.00303***
	(0.000585)	(0.000590)	(0.000474)	(0.000581)
Work experience	0.00422***	0.00322**	0.00352***	0.00426***
	(0.00138)	(0.00133)	(0.00109)	(0.00133)
Startup experience	0.00661	0.0171	-0.0297	0.0342
	(0.0270)	(0.0258)	(0.0217)	(0.0262)
Multiple Owners	0.112***	0.157***	0.0331	0.0570**
	(0.0288)	(0.0259)	(0.0236)	(0.0273)
Home-based	-0.244***	-0.178***	-0.0367	-0.224***
	(0.0270)	(0.0268)	(0.0240)	(0.0268)
Intellectual Property	0.000105	-0.00628	-0.0622**	-0.0127
	(0.0321)	(0.0333)	(0.0248)	(0.0321)
Comparative Adv.	0.0399	0.0180	0.0344	0.0188
	(0.0281)	(0.0278)	(0.0228)	(0.0272)
Sells Product	-0.0817*	0.0553	-0.0134	0.0133
	(0.0474)	(0.0475)	(0.0386)	(0.0463)
Prod. & Serv.	0.0545	-0.0546	-0.0214	0.00997
	(0.0447)	(0.0451)	(0.0361)	(0.0434)
Observations	2403	2411	2396	2402

2-digit industry dummies, owner age, age^2, and education dummies included. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

A Alternative Classification Schemes for Inside/Outside Capital

The following tables change the classification scheme from formal vs. informal to personal vs. business to illustrate the importance of personal access to formal bank channels.

Table 13: Reclassifying Personal and Business Debt: Overall Levels

Equity Source	Average	Debt Source	Average
Total Personal Equity	$28,541		$15,358
		Personal bank loan	$10,476
		Owner bus. CC balance	$1,394
		Personal CC balance, resp.	$3,175
		Personal CC balance, others	$288
		Personal loan, other owners	$25
Total Insider Equity	$4,493	Total Insider Debt	$9,130
Spouse equity	$491	Family loan	$2,670
Parents equity	$1,209	Family loan to other owners	$286
Other informal investors	$2,793	Personal loan to other owners	$1,350
		Other personal loans	$1,887
		Business loan by family	$69
		Business loan by owner	$559
		Business loan by emp.	$812
		Personal bank loan by other owners	$1,498
Total Outsider Equity	$4,108	Total Outsider Debt	$18,728
Business equity	$1,841	Bus. CC balance	$167
Govt. equity	$466	Other Bus. CC balance	$859
VC equity	$1,454	Bus. bank loan	$10,060
other equity	$347	Credit line balance	$3,798
		Non-bank bus. loan	$2,040
		Govt. bus. loan	$725
		Other bus. loan	$187
		Other individual loan	$259
		Other debt	$634
Total Equity	$37,142	Total Debt	$43,216

Table 14: Reclassifying Personal and Business Debt: Credit Scores

	Model 1 residual quintiles:		Model 2 residual quintiles:	
Funding Source	Top	Bottom	Top	Bottom
Owner Equity	$41,802	$22,964	$35,395	$29,552
Owner Debt	$21,508	$12,778	$20,317	$14,776
Personal Credit Card -Owner	$3,659	$2,474	$3,362	$3,486
Personal Credit Card-Other Owners	$271	$652	$248	$703
Other Personal Owner Loan	$0	$6	$0	$6
Other Personal Loan	$933	$521	$925	$648
Other Personal Funding	$467	$848	$476	$962
Personal Bank Loan	$15,582	$8,237	$14,717	$8,931
Other Individual Loan	$596	$40	$589	$41
Insider Equity	$7,670	$3,130	$6,166	$3,680
Spouse Equity	$590	$1,011	$266	$961
Parent Equity	$2,894	$956	$2,300	$1,124
Other Informal Investors	$4,186	$1,164	$3,601	$1,594
Insider Debt	$12,826	$5,697	$11,635	$6,606
Personal Family Loan	$3,874	$3,344	$3,534	$3,500
Personal Family Loan-other owners	$384	$36	$253	$167
Business Loan from family	$4,514	$1,398	$4,117	$1,809
Business Loan from Owner	$3,687	$609	$3,502	$753
Business Loan from Employee(s)	$274	$17	$135	$16
Business Credit Card-other owners	$93	$293	$93	$362
Business Equity	$9,832	$4,434	$6,121	$5,800
Other Business Equity	$3,436	$1,241	$788	$1,951
Government Equity	$1,056	$250	$735	$568
Venture Capital Equity	$5,219	$1,268	$4,478	$1,569
Other Equity	$121	$1,675	$120	$1,712
Business Debt	$37,533	$19,210	$34,816	$23,079
Business Credit Card	$1,634	$791	$1,582	$1,004
Other Bank Loan	$1,941	$1,497	$1,289	$2,178
Business Credit Cards	$1,413	$664	$1,162	$986
Bank Business Loan	$14,262	$11,577	$13,466	$12,953
Credit Line	$11,151	$2,088	$10,795	$3,220
Other Non-Bank Loan	$3,621	$1,276	$3,569	$1,243
Government Business Loan	$1,049	$796	$629	$972
Other Business Loan	$457	$20	$344	$20
Other Business Debt	$2,005	$503	$1,981	$504
Total Financial Capital	$131,171	$68,213	$114,452	$83,493