Initial capital constraints hinder entrepreneurial venture performance

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MIRJAM VAN PRAAG*

University of Amsterdam, SCHOLAR program, and Tinbergen Institute

GERRIT DE WIT and NIELS BOSMA

EIM Policy Research Institute, Zoetermeer

Abstract

This paper investigates empirically whether and to what extent initial capital constraints hinder entrepreneurial performance once the venture has been started. As discussed in the paper, prior empirical research in this area could investigate this issue only indirectly by lack of data and adequate empirical identification strategies. The key contribution of this paper is that – due to our comprehensive data set - we are able to measure more directly the influence of capital constraints. We find that initial capital constraints during the start-up phase of business have a quite substantial negative influence on performance: the chance of survival of capital constrained entrepreneurs appears to be about 50% less, while those surviving earn on average about 50% less. These results appear quite robust: they do not change very much when specifications are changed.

JEL Codes: G32, J23, L25, M13

***Keywords*:** entrepreneurship, self-employment, small business founder, venture performance, wealth constraint, capital constraint, borrowing constraint, liquidity constraint

*Faculty of Economics, University of Amsterdam, Roetersstraat 11, 1018 WB Amsterdam, Tinbergen Institute, The Netherlands, Tel: +31-20-525 4096, c.m.vanpraag@uva.nl. This version of the paper has benefited from the contribution by the participants in the CESifo conference "Venture Capital, Entrepreneurship, and Public Policy" as well as in the Babson Kaufmann Entrepreneurship Conference, 2003.

1. Introduction

The observation of resource spending by governments for the sake of increasing numbers of higher qualified entrepreneurs is not only explained by the social benefit pertaining to entrepreneurial endeavor and the immense social costs of entrepreneurial failure (Audretsch and Keilbach, 2003), but also by the perceived existence of undesirable impediments to the supply of entrepreneurs (Blanchflower and Oswald, 1998). A lack of capital is one of these factors and is the focus of this paper.

The objective of this paper is to answer the question: To what extent is the performance of a small business founder's entrepreneurial venture, once started, affected by capital constraints at the time of inception? What happens to performance when an entrepreneur has insufficient capital to reach the optimal investment level or timing? Financial capital constraints might prevent entrepreneurs from creating buffers against random shocks, thereby affecting the timing of investments negatively. Moreover, capital constraints might debar entrepreneurs from the pursuit of more capital-intensive strategies. Thus, what we are aiming at is measuring the *causal* effect of initial capital constraints on venture performance. Merely measuring the correlation between capital (constraints) and performance would not be sufficient, since it would (wrongly) include *spurious* factors that affect access to capital as well as performance directly, such as ability and motivation. The distinction between causal and spurious factors is crucial since policy implications diverge. In the first case supplying more capital to entrepreneurs who are hindered to follow the optimal investment scheme would improve performance. In the second case, it will not because the capital constraint itself is not the binding restriction, but the factors underlying it.

Much (empirical) research effort has been put into measuring the effect of capital constraints on the *selection* of individuals into entrepreneurial positions.[1] The conclusion is that capital constraints bind: a significant proportion of individuals willing to enter the entrepreneurial population are hampered by a lack of sufficient capital. Capital markets are not market clearing for the segment of new firms. (Fazzari, 1988). Personal savings and loans from friends and relatives is by far the largest source of capital in newly started firms (e.g. Parker, 2004).

Research effort has also been devoted, though to a lesser extent, to measuring the correlation between access to capital and entrepreneurship *performance* once the stage of startup has been successfully completed.[2] This paper aims to contribute to this category of research.

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[1] For instance Evans and Jovanovic, 1989; Holtz-Eakin et al., 1994b; Van Praag and Van Ophem, 1995; Lindh and Ohlsson, 1996; Blanchflower and Oswald, 1998; Dunn and Holtz-Eakin, 2000; Henley, 2004

[2] Like in Bates 1990; Burke et al., 2002; Cooper et al. 1994; Cowling et al., 2004; Cressy, 1996; Evans and Jovanovic, 1989; Holtz-Eakin et al., 1994a; Hurst and Lusardi, 2004; Lindh and Ohlsson, 1996; Van Praag, 2003

The remainder of this paper is organized as follows. In section 2, we briefly discuss economic theory about the relationship between venture performance and financial capital (constraints). Section 3 reviews the empirical evidence and discusses the state-of-the-art of the underlying empirical strategies used. In section 4, we sketch the main problems attached to the common approaches in a simple economic model. Subsequently, in section 5, we present and discuss the results from a recent study using an improved empirical strategy. Section 6 concludes with a discussion of the remaining shortcomings and potential improvements for empirical research into the effect of capital constraints on venture performance.

2 Theory

A lively theoretical debate has existed about the relationship between access to capital and investment decisions of entrepreneurs. The first stream of thought assumes perfect capital markets. External funds provide a perfect substitute for internal capital in this full information case. An entrepreneur's financial conditions are irrelevant to investment: investment decisions are independent of whether one needs to "pay" the opportunity cost of capital ownership, or the interest rate of borrowing money. Proponents of this view can be traced back to Richard Cantillon (1755) who was the earliest scholar who paid attention to entrepreneurs.

The second stream of research in entrepreneurship assumes less than perfect capital markets due to the existence of imperfect and asymmetric information. The latter makes it costly or impossible for providers of external finance to evaluate the quality of an entrepreneur's investment opportunities. This might debar (some) entrepreneurs from sufficient access to external capital, i.e. type I credit rationing. The common theoretical explanation for credit rationing vis-à-vis newly founded firms is a severe lack of observable and verifiable information about the entrepreneur's type, her plans and the risks associated. The asymmetry of information on the entrepreneur's type and behavior will potentially lead to agency problems: adverse selection and moral hazard. (LeRoy and Singell, 1987; Boadway et al., 1998; De Meza and Webb, 2000). The foresight of these problems might prevent the start of ventures.[3]

The continuation of the debate in entrepreneurship research, starting in the late 1980s, was largely empirical. To prevent adverse selection in actual credit markets, the point of departure is not credit rationing in response to the hidden type problem but "redlining" instead. Redlining, screening, or credit scoring (De Meza and Webb 2000) involves capital suppliers to use selection

[3] This view has a history in economic thought, too. The performance of the entrepreneur in the Classical and Neoclassical theories of Say (1971;1803) and Marshall (1930;1890) is hindered by a lack of own capital since borrowed capital requires a reputation (Say) or a risk premium (Marshall).

procedures based on a set of indicator variables for the expected performance of entrepreneurs and their projects. Those failing to score sufficiently high on the criteria are denied credit. Thus, determinants of entrepreneurship performance such as education and experience might moreover turn out to be indicators of access to capital (Bates, 1990; Scherr et al. 1993). This clarifies part of the discussion below as to whether human (sometimes also social) capital variables have been included into the empirical models.

3 Empirical Evidence: Capital Constraints and Performance

To discriminate between the full information and asymmetric information case, several categories of empirical research have been performed. An overview is given in Table 1. The entries in the table show which studies have used a particular measure of capital constraints (columns) in combination with a particular performance measure (rows). The following subsections discuss each column of the table.

-Insert Table 1-

3.1 Relationship between assets and performance

Many researchers have related the size of family assets to earnings from (or job creation, growth or survival of) entrepreneurial ventures. Both Evans and Jovanovic (EJ, 1989) and Cooper et al. (CGW, 1994) find a positive association between assets and performance for US entrepreneurs. Taylor's (1999) result pertaining to the UK is supportive of EJ and CGW: The effect of a dummy indicating whether the respondent had received interest or dividend payments exceeding £100 is negative on the hazard and thus has a positive effect on survival. Van Praag (VP, 2003) also relates financial variables, i.e. assets and a dummy for home ownership (frequently used as collateral), to survival of young entrepreneurs in the United States. The effect of these variables on the hazard out of entrepreneurship is insignificant. Cressy's (1996) insignificant result on survival for the UK supports Van Praag's finding. Furthermore, Cowling et al. (2004) estimate that assets do not increase job creation by British entrepreneurs. Hence, the evidence varies between a positive impact of assets on performance and a zero impact of assets on performance.

Several general disadvantages are attached to the studies in this category. First of all, the possibility of obtaining external finance remains unconsidered: it is assumed that the "external route to obtain finance" is totally inaccessible. Secondly, a monotone relationship is assumed between assets and performance, while in reality it might well be the case that up to a certain point more access to capital might help in enhancing performance, but "enough is enough". This

possible discontinuity in the relationship is not taken into account in this approach. A third drawback of the method in general is that "family assets" is not an exogenous variable: Without binding capital constraints, a correlation could still exist between assets and performance because of the entrepreneur's ability ("earning power") affecting both quantities. A fourth drawback, finally, is that assets in general are badly reported in individual survey research and therefore unreliable figures, plagued with measurement error.

3.2. Relationship between inheritance receipt and performance

One of the major drawbacks of the approach of merely relating assets, as a measure of access to capital, to new venture performance is the possible endogenous character of assets. An interesting alternative might be the receipt of an inheritance: "The receipt of an inheritance is about as close to a "natural experiment" as one is likely to get in this area, which reduces potential endogeneity problems." (Blanchflower and Oswald, 1998). Holtz-Eakin et al. (HJR, 1994b) were the first to estimate the relationship of this inheritance variable with firm *performance* rather than with start-up. They find a positive effect of receiving an inheritance on firm survival and earnings in the US. Burke et al., 2002 estimate the effect of inheritances on both entry and performance where the latter is measured as survival and employment growth. They find all these relationships to be significantly positive. Cowling et al. find a positive effect of inheritances on job creation by entrepreneurs.

This innovative approach however only solves, if anything, the third of the four drawbacks attached to the first approach: the endogeneity of the assets variable. Even this is questionable though, if not applied adequately: "We find that young men's own financial assets exert a statistically significant but quantitatively modest effect on the transition to self-employment. In contrast, the capital of parents exerts a large influence. Parents' strongest effect runs not through financial means, but rather through human capital, i.e. the intergenerational correlation in self-employment". (Dunn and Holtzeakin, 2000)[4]

3.3 Relationship between windfall gains and performance

Lindh and Ohlsson (1996) estimate the effect of windfall gains on the probability of *being* self-employed on a sample of Swedish individuals. They consider windfall gains as a dummy variable indicating whether people have ever won in lotteries or have ever obtained personal or spousal

[4] However, HJR seem to have dealt with this issue in a neat way: by controlling for (i) whether the inheritance donor is an entrepreneur too and (ii) a measure of firm performance prior to the receipt of the inheritance.

inheritances. They find significant effects on self-employment of both inheritances and lottery prizes. However, upon inclusion of additional control variables (human capital) the significant effect of inheritance receipts vanishes whereas the effect of lottery prizes remains significant. This supports the finding by Dunn and Holtz-Eakin (2000) about the intergenerational correlation of entrepreneurship. The same holds for the findings by Cowlings et al. (2004). They find a positive effect of inheritance receipts on job creation, but they do not find such an effect of alternative indicators of windfall gains. Hence, their conclusion is also consistent with the explanation by Dunn and Holtz-Eakin (2000). The windfall gains approach, as ingenious as it is, does not solve the majority of the drawbacks associated with the first approach, though it somehow solves the problem of endogeneity.[5]

The following model set-up clarifies the first two drawbacks of the existing estimation methods: (i) The possibility of obtaining external finance remains unconsidered and (ii) A monotone relationship is assumed between assets and performance.

4 Model Set-up

Consider the entrepreneurial performance measure gross receipts, as in Holtz-Eakin et al. (1994a) and consistent with Evans and Jovanovic (1989):

(1) $P_i = \theta_i f(k_i) \varepsilon$,

Where θ_i is individual i's entrepreneurial ability or business acumen, $f(.)$ is a production function with one input, capital (k_i), and ε is a random factor to the production process. Individuals know their ability, unlike the analyst or banker who observes an indicator function of ability, $\widetilde{\theta}_i$ only. Ability varies across individuals. It is assumed that ε has mean 1 and finite variance and that $f(0)>0$: the firm can produce output even in the absence of any inputs, other than the entrepreneur's ability, as for example in the professional services industry.

A_i is defined as the value of the individual's personal assets, hence A_i-k_i is generating capital income at rate r. The (risk neutral) entrepreneur maximizes total income:

(2) $y_i = \theta_i f(k_i) \varepsilon + r(A_i - k_i)$

The optimal investment level of capital into the entrepreneur's venture is therefore defined by:

(3) $\theta_i f'(k^*_i) = r$

We assume that A_i is a non-decreasing function of θ_i: entrepreneurial ability is an indicator for general "earning power" from which assets might have resulted. The relationship between

[5] Though both participation in a lottery and selection into entrepreneurship are related to risk attitude and therefore to each other (See Cramer et al., 2002)

entrepreneurial ability and the amount of external capital required, at rate r, k_i^* - A_i, is therefore ambiguous.

Access by individual entrepreneurs to the most desirable amount of external capital, $l_i^* = k_i^* - A_i \geq 0$ at price r is constrained by the factor β_i, where $0 \leq \beta_i \leq 1$. $\beta_i = 1$ represents the fully constrained entrepreneur; $\beta_i = 0$ the unconstrained. The amount of external capital obtained is $l_i = k_i - A_i = (1-\beta_i) * l_i^* = (1-\beta_i) * (k_i^* - A_i)$ for all entrepreneurs. The value of β_i depends on "borrowing power", which is dependent in turn on collateral and $\widetilde{\theta}_i$.

The central question is to what extent β_i creates performance losses, i.e. the effect of β_i on the expected (constrained) performance:

(4) $P_i = \theta_i f(k_i^* - \beta_i(k_i^* - A_i)) = \theta_i f(A_i + (1-\beta_i)(k_i^* - A_i))$

In order to get rid of the intruding effect of ability on the relationship between absolute performance and capital constraints, we consider relative performance:

(5) $\log P_i = \log \theta_i + \log f(k_i^* - \beta_i(k_i^* - A_i))$

Equations 4 and 5 immediately show a drawback of all approaches as discussed in the previous section: Simply looking at how a change in A_i affects performance does not measure the effect of capital constraints on performance.

In the following, we discuss our attempt to measure the effect of capital constraints on performance while limiting as much as possible the biases resulting from the drawbacks that are attached to previous measurements.[6]

5 Estimation Results: Capital Constraints and the Performance of Entrepreneurs

We evaluate the effect of capital constraints on entrepreneurial performance on a panel of 1,000 Dutch entrepreneurs (EIM young business panel) and find that initial capital constraints hinder entrepreneurs in their performance. We use a direct individual indicator variable for initial capital constraints, unlike in previous research, so that policy implications will become more evident.

5.1 Measurement Issues

[6] It is assumed that the positive effects of θ_i on A_i and k^*_i just cancel out: Capital need (k_i^* - A_i) is independent of θ_i and does not affect β_i or P.

The empirical proxy of the centerpiece of our analysis, β_i, is a dummy variable formed by the answer to the question: "Did you experience problems in obtaining sufficient (external) capital at the start of your venture?"

Yes, and I didn't solve the problem	7%
Yes, but I solved the problem	17%
No	76%

We consider the 7% of entrepreneurs who experienced these problems but did not solve them as being capital constrained (β_i=1).[7] The other 93% is characterized by β_i=0: These entrepreneurs operate their businesses at the optimal level, k_i^*.

In this manner, we cope with the first two drawbacks attached to all previously applied approaches: First, our estimate of β's coefficient shows the effect on performance of being capital constrained for the group of entrepreneurs who are capital constrained. Other approaches generate an estimate of the mere effect of an increase in assets on performance. Second, the estimate of β's coefficient embodies the effect of capital constraints that remain after the possibility of obtaining external finance has been exploited. Other approaches assume that external finance is totally inaccessible. Moreover, the fourth drawback, the issue that empirical measures of assets are plagued with measurement error, is also circumvented by not using such a measure. However, circumventing this measurement problem comes at a cost: We rely on self-reported subjective answers about capital constraints. Over- or under-reporting of this variable would lead to biased results.

Another limitation of our approach is that it does not solve the endogeneity issue, i.e. the third drawback, although we try minimizing the bias in our estimates of $\frac{\partial P_i}{\partial \beta_i}$ by controlling as much as possible for ability and motivation in the following manner:

A $\frac{\partial P_i}{\partial \beta_i}$ might be biased upwards, due to redlining by capital suppliers based on $\widetilde{\theta}_i$. This $\widetilde{\theta}_i$ has also direct (positive) impact on performance thereby generating the bias. We control in the performance equations for human capital variables, $\widetilde{\theta}_i^{HC}$ and for social capital variables, $\widetilde{\theta}_i^{SC}$, that are known to affect entrepreneurship performance. The vector of human capital variables has

[7] We considered the 7%+17% of the sample who answered yes as an alternative indicator of capital constraints. This weakened the result considerably. The same holds for the alternative specification where the first answer is translated into β_i=1, the second into β_i=0.5 and the third is equivalent to β_i=0.

the following elements: Age, various sorts of general and specific work experience, and education.[8][9] The vector of social capital variables, $\widetilde{\theta}_i^{SC}$, includes a dummy variable indicating the business owner's activity in an entrepreneurs' network in the first year of operation. A(n emotionally supportive) partner is also considered potentially valuable social capital.[10] The vector includes furthermore proxies for the rate at which respondents used four major strategies of information gathering (revealed from factor analysis)[11], i.e. focus on: (i) the branch; (ii) direct business relations; (iii) commercial relations; (iv) fellow entrepreneurs.[12]

We also include a vector of signals of entrepreneurial ability, θ_i, based on the known result of credit scoring by external capital suppliers: We consider the assignment of a loan by family/friends, banks, and in particular by business partners as informative about unobserved heterogeneity.

B $\dfrac{\partial P_i}{\partial \beta_i}$ might be biased downwards, due to

Time spent People spending much time on other paid activities will probably show weaker venture performance and simultaneously face a lower capital constraint. Without any additional corrective measures, this spurious effect would be included in an estimate of the coefficient of β_i leading to a downward bias. We include a dummy variable that is one for entrepreneurs who spend more than twenty hours per week on other paid activities.

Motivation Financial independence from the venture might be a cause for lower capital constraints and might simultaneously result in a weaker motivation. Without correction, this spurious effect would again lead to a downward bias.[13] Two variables are included into the

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[8] Empirical support for the selection of relevant components of human capital is found in for instance Bates, 1990; Cooper et al., 1994; Cressy, 1996; Van Praag, 2003; Pennings et al 1998.

[9] Education enters the analyses as a dummy variable, differentiating the highly educated business founders (academic/higher vocational formal education) from the lower educated ones.

[10] Empirical evidence on relevant manifestations of social capital can be found in Brüderl and Preisendorfer, 1998, Pennings et al., 1998, and Bosma et al., 2004.

[11] The factors resulting from factor analysis are standard normally distributed.

[12] Using information channels is closely related to social capital, though it is usually not considered as such. It reflects the strategy used to retrieve relevant information from relationships. Since the relationships themselves do not occur naturally and since the information retrieval within each relationship somehow indicates the intensity of the relationship, the resulting factors are labeled as elements of social capital.

[13] A third hypothesis that would cause a downward bias is the over-investment /*overconfidence hypothesis*. Overconfident entrepreneurs might aim at larger than efficient amounts of start-up capital. Without access to the desired amount, they feel constrained and report so. Unfortunately, BVD are unable to test this hypothesis that would again lead to an underestimate of the effect of the capital constraint on performance.

analysis to correct for this bias: (1) A categorized variable "amount of other income available", and (2) A dummy variable indicating financial dependence on the venture income.

5.2 Data

The panel results from annual questionnaires conducted on a sample taken from all newly registered firms in the first quarter of 1994 with the Dutch Chamber of Commerce. 1,323 firm founders answered all subsequent annual questionnaires of 1995-1997.[14] The information from the 1994 questionnaire was used for the construction of potential determinants of performance. Entrepreneurial performance itself, measured by (the logarithm of) profits and survival duration is exclusively measured by means of variables constructed from the subsequent questionnaires.[15] In this manner, problems of serially reversed causality are prevented.

5.3 Estimation Results

The first column of Table 2 shows the result from the Tobit estimation with (log) profit as the dependent variable and the capital constraint and some standard control variables as the only independent variables. The estimation result is consistent with binding capital constraints: entrepreneurs who suffer from a lack of capital for their initial business investments have 63% lower profits. As was expected, column II in Table 2 shows that the effect of capital constraints on profit diminishes (to 59%) when controlling for human capital effects, the capital constraint still being significant. Human capital, as was assumed, appears to simultaneously affect performance positively and the capital constraint itself negatively. The main factors of influence are various sorts of experience and education.

Controlling for social capital factors (column III) has also a diminishing effect on the capital constraint: The coefficient decreases further from 59 to 52% and remains significant. The most important social capital factor is a spouse's emotional support. Other social capital factors of influence are the exploitation of commercial contacts and contacts with fellow entrepreneurs.

Our initial idea that the capital constraint diminishes when correcting for financial screening factors, is not validated in this exercise (column IV). The capital constraint decreases from 52 to 51% only, and remains significant. Moreover, financial screening factors have no additional

[14] The firm size and industry distributions of the 1994 and 1997 are representative of the population of firms considered.

[15] The profit measure has zero as lower bound: Negative profits are not observed. Therefore, the equation is estimated using tobit regressions. For duration, we apply a log-logistic survival model.

significant effect on profits, suggesting that these factors do not reveal any heterogeneity in addition to human and social capital.

-Insert Table 2-

The addition of the next two blocks of variables (columns V and VI in Table 2) serves to correct for the potential downward bias in the estimate for the capital constraint due to time and motivational constraints. It appears that the inclusion of indicators for time and motivational constraints does not, contrary to expectations, increase the absolute value of the coefficient pertaining to the capital constraint. The remaining as "unbiased" as possible effect of the capital constraint on profit is a disadvantageous 51%.

Table 3 shows determinants of duration. The effect of the capital constraint is in the same order of magnitude as in the profit equation: ranging from 63% without corrections to 48% with them. Column II shows that the inclusion of human capital factors diminishes the effect by 10 percent points, whereas column III shows that social capital factors account for a decrease of another six percent points. The other corrections have no significant effect. The remaining as "unbiased" as possible effect of the capital constraint on duration is a disadvantageous 48%.

-Insert Table 3-

When comparing the results tabulated in tables 2 and 3, several patterns pop up. Entrepreneurs who acknowledge unsolvable initial capital constraints experience lower profits, conditional upon survival, whereas their survival rate compares unfavorably to those who are not capital constrained. The size of the effect of capital constraints decreases when correcting for human and social capital factors, but it remains significant and relatively large. Financial screening, time and motivational constraints do not consistently show the expected effects, neither directly on performance, nor indirectly by changing the coefficient of the capital constraint. However, the direction of both the indirect and direct effects is as expected in all cases. Apparently, human and social capital factors generate and explain most of the relevant heterogeneity in the sample. We cautiously conclude that capital constraints apparently generate imperfectness of investment opportunities in terms of size and/or timing.

6 Discussion and conclusion

The theoretical debate about the relationship between financial capital constraints and entrepreneur performance has put forth two opposing views: (i) Capital markets are perfect and do therefore not hinder entrepreneurs in their required investments with regards to the levels and timeliness, vis-à-vis (ii) Capital markets do not supply the right amounts of capital to entrepreneurs due to asymmetric information. Empirical evidence has largely supported the second view: Capital constraints do hinder entrepreneurial performance (see Table 1).

We have pointed out several drawbacks pertaining to the empirical strategies that have produced this evidence. First, since the relationship between assets (obtained in a specific manner) and performance is considered, the possibility of obtaining external finance remains unconsidered. Second, the possible discontinuity in the relationship is not taken into account in this approach. We illustrated these first two drawbacks by a simple model set-up: Most previous studies have not actually measured the effect of capital constraints, but rather the effect of assets or of an (random) increase in assets.. A third drawback of the method in general is that "family assets" is not an exogenous variable. A fourth drawback, finally, is that assets in general are badly reported in individual survey research and therefore unreliable figures. Alternatives like the inheritance or windfall gains approaches have not much alleviated these concerns. Hence, the state-of-the-art of studies into the effect of financial capital constraints on venture performance is somewhat disappointing.

We discussed our application of a different method to evaluate the effect of (perceivably) experiencing capital constraints on entrepreneurial performance that does not suffer from the problems that were encountered in previous studies with the same objective. Nevertheless, our study confirms that initial capital constraints and the implied sub-optimal investment possibilities significantly hinder entrepreneurs in their performance. The conclusion is that capital constraints lead to a sub-optimal use of investment opportunities and thereby to a weaker venture performance. This result emerges no matter what (sub-optimal) estimation strategy is employed.

Our application has been the first that measures the effect of capital constraints, but is not perfect either. First, the extent of capital constraints experienced by entrepreneurs is an endogenous variable in the entrepreneurial performance equation, no matter how many qualified control variables are entered into the performance equation. No study has yet accounted for this by means of Instrumental Variables or any of the other suitable approaches, such as for example the execution of a randomized experiment.

Second, our results are indicative of the effect on performance of whether an entrepreneur has experienced capital constraints. Future research based on a survey that quantifies the *extent* of capital constraints on a continuous scale, where β could be anything in between zero and one, might give further insight in the effects of capital constraints. Data on the individual demand and supply of external capital might be informative to this end.

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Table 1: Effect of Financial Capital on Performance (Empirical Evidence)

Lack of access to capital measure /Performance measure	*Assets*	*Inheritance*	*Windfall gains*
Earnings	EJ: +	HJR: +	
Survival	CGW:+; T:+; vP:0; C:0	HJR: +; BFN:+	LO: +
Growth	CGW: +; CTM: 0	BFN: +; CTM:+	CTM: +

BFN: Burke, FitzRoy, and Nolan (2002); CGW: Coopers, Gimenogascon, and Woo (1994); C: Cressy (1996); EJ: Evans and Jovanovic (1989); HJR: Holtz-Eakin, Joulfaian, and Rosen (1994a); LO: Lindh and Ohlsson (1996); T: Taylor (1999); vP: Van Praag (2003); CTM: Cowling, Taylor, and Mitchell (2004).[16]

[16] Bates (1990) is excluded from the literature overview because he has unfortunately not been able to establish the conditional correlation of interest due to problems of multicollinearity.

Table 2: Estimation results: Capital Constraints and Profits

PROFIT	*I*		*II*		*III*		*IV*		*V*		*VI*	
CAPITAL CONSTRAINT	-0.63	**	-0.59	**	-0.52	**	-0.51	**	-0.49	**	-0.51	**
Human capital												
Experience in business ownership			0.50	**	0.50	**	0.49	**	0.54	**	0.54	**
Experience relevant to business ownership			0.12		0.12		0.12		0.13		0.12	
Experience in industry			0.71	**	0.67	**	0.67	**	0.66	**	0.65	**
Age divided by 10			0.30		0.11		0.14		0.11		0.05	
Age divided by 10, then squared			-0.03		-0.01		-0.01		-0.01		0.00	
High education			0.20	*	0.19	*	0.18		0.20	*	0.22	**
Experience as an employee			0.39	*	0.36	*	0.35	*	0.41	**	0.40	*
Social capital												
Contact with entrepreneurs in networks					-0.08		-0.08		-0.10		-0.10	
Way of information gathering:												
- General channels					0.04		0.04		0.04		0.04	
- Direct business relations					0.05		0.05		0.06		0.06	
- Commercial relations					0.10	**	0.10	**	0.10	**	0.09	*
- Fellow entrepreneurs					0.11	**	0.11	**	0.11	**	0.10	**
Emotional support from spouse					0.51	**	0.52	**	0.49	**	0.49	**
Presence of spouse					-0.21		-0.21		-0.17		-0.11	
Financial screening												
Share own capital in start capital							0.00		0.03		0.04	
Fin. also by loan from family							0.00		-0.02		-0.02	
Fin. also by bank							-0.01		0.00		-0.01	
Fin. also by business partner(s)							0.23		0.24		0.25	
Time constraint												
Spent 20+ hours on other paid activities									-0.35	**	-0.30	**
Motivation												
Other income available											-0.01	
Dependent on profits from business											0.19	
Control variables												
Gender	0.49	**	0.38	**	0.39	**	0.39	**	0.40	**	0.39	**
No affiliations with other businesses	0.58	**	0.49	**	0.58	**	0.61	**	0.62	**	0.61	**
Goal: employment growth	0.37	**	0.34	**	0.29	*	0.28	*	0.25		0.23	
Motive: higher income	0.40	**	0.35	**	0.33	**	0.33	**	0.35	**	0.34	**
Hours worked at the start	0.45	**	0.37	**	0.35	**	0.34	**	0.30	**	0.28	**
Constant	-2.06	**	-3.39	**	-3.07	**	-3.16	**	-2.97	**	-2.81	**
# obs.	1168		1168		1168		1168		1168		1168	
Log Likelihood	-1643.2		-1610.9		-1599.2		-1598.2		-1594.6		-1593.1	

*** sign. at 10% level ; ** sign. at 5% level**

Table 3: Estimation results: Capital Constraints and Duration

Duration	*I*		*II*		*III*		*IV*		*V*		*VI*	
CAPITAL CONSTRAINT	-0.63	**	-0.53	*	-0.47	*	-0.47	*	-0.47	*	-0.48	*
Human capital												
Experience in business ownership			0.17		0.17		0.17		0.19		0.19	
Experience relevant to business ownership			0.38	**	0.29		0.29		0.30		0.30	
Experience in industry			0.58	**	0.53	**	0.54	**	0.53	**	0.52	**
Age divided by 10			0.68		0.77		0.77		0.77		0.75	
Age divided by 10, then squared			-0.05		-0.07		-0.07		-0.07		-0.06	
High education			-0.01		-0.08		-0.09		-0.08		-0.08	
Experience as an employee			0.51	*	0.43		0.44		0.45		0.45	
Social capital												
Contact with entrepreneurs in networks					0.10		0.09		0.09		0.09	
Way of information gathering:												
- General channels					0.29	**	0.29	**	0.29	**	0.29	**
- Direct business relations					-0.08		-0.08		-0.08		-0.08	
- Commercial relations					0.09		0.09		0.09		0.09	
- Fellow entrepreneurs					0.07		0.07		0.07		0.07	
Emotional support from spouse					0.40		0.40		0.40		0.40	
Presence of spouse					-0.47		-0.47		-0.46		-0.43	
Financial screening												
Share own capital in start capital							0.05		0.05		0.07	
Fin. also by loan from family							0.07		0.06		0.07	
Fin. also by bank							-0.01		-0.01		-0.02	
Fin. also by business partner(s)							0.01		0.01		0.02	
Time constraint												
Spent 20+ hours on other paid activities									-0.07		-0.05	
Motivation												
Other income available											-0.01	
Dependent on profits from business											0.07	
Control variables												
Gender	0.38	**	0.27		0.37	**	0.38	**	0.38	**	0.37	**
No affiliations with other businesses	0.77	**	0.77	**	0.92	**	0.91	**	0.91	**	0.91	**
Goal: employment growth	-0.07		-0.05		-0.05		-0.05		-0.06		-0.06	
Motive: higher income	-0.18		-0.24		-0.17		-0.16		-0.16		-0.17	
Hours worked at the start	0.35	**	0.27	**	0.26	**	0.26	**	0.26	**	0.25	**
Constant	3.29	**	0.81		0.75		0.71		0.73		0.80	
# obs.	1073		1073		1073		1073		1073		1073	
Log Likelihood	-1303.3		-1285.1		-1275.0		-1274.9		-1274.8		-1274.7	

*** sign. at 10% level ** sign. at 5% level**