Abstract

In this paper, I investigate the interplay between entrepreneurial biases such as optimism/overconfidence and the stigmatization of failure. I first establish the optimality of debt contracts even with biased entrepreneurs and then show that when contracting with overconfident entrepreneurs, investors provide them more funds compared to rational entrepreneurs. Indeed, when entrepreneurs are overconfident, agency rents are reduced, and they suffer less from credit rationing. Even after a failure, entrepreneurs who remain overconfident benefit from an easier access to financing. However, this should not be confounded with the stigmatization of failure which exists regardless of the level of confidence, as long as investors are pessimistic.
“Success is not final, failure is not fatal: it is the courage to continue that counts.” W. Churchill

1. Introduction

As stated by Churchill, it is essential after a failure to have “the courage to continue”. In an entrepreneurial context business failure is often out of the expected social norm to such an extent that entrepreneurs confront stigma. This “social devaluation” that appears when deviating from a social norm (Goffman, 1963) makes it even more difficult to continue. Therefore, business failure induces not only financial costs but also social and emotional costs like grief, humiliation and guilt (Shepherd et al, 2009). The cumulation of all these costs, then, may influence significantly entrepreneurs’ decisions and behaviors. In particular, it may prevent them from reinterring the entrepreneurial market (Simmons, Wiklund and Levie, 2014) as well as it may prevent potential entrepreneurs simply from starting a venture. Nevertheless, in some countries, failure is seen as a “stepping-stone for future success” and is not stigmatized. Hence, incentives to start a business or to enter an experimentation process by abandoning projects, depend on the country’s perception of failure.

At the same time, the decision to involve in an entrepreneurial activity as well as all other entrepreneurial decisions are also influenced by behavioral biases. Indeed, expected profits include both benefits and costs from future success and failure. Overestimating or underestimating any of these components will affect decisions. As supported by many studies, entrepreneurs are more likely to be subject to overconfidence and optimism biases (Busenitz and Barney, 1997; Cooper et al, 1998; De Meza and Southey, 1996; Camerer and Lovallo, 1999; Cassar, 2010; Townsend et al; 2010). Knowing that, investors’ attitudes toward failure might be affected and driven by other factors. Consistently, I show that when entrepreneurs are subject to overconfidence, investors offer them a lower part of the gains relatively to less confident entrepreneurs. If this does not appear as good news for those entrepreneurs at first glance, there may exist a trade-off between receiving less and getting access to financing.

Thus, the aim of this paper is to investigate the interplay between entrepreneurial biases such as optimism and overconfidence and the stigmatization of entrepreneurial failure. Does being biased lead to easier access to financing? May it constitute another source of stigmatization for failed but unbiased entrepreneurs? While studies related to overconfidence and optimism in finance and entrepreneurship are numerous, to the best of my knowledge, there is no established relation between overconfidence/optimism and the stigmatization of business failure. Based on contract theory, this paper identifies optimal financing contracts when entrepreneurs have biased beliefs and shed light on the link between biases and stigma. I find that, even with biased entrepreneurs, debt-like contracts are

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1 In Japan, top managers of failed firms committed suicide (Tezuka, 1997) because they felt ashamed.
optimal. Also, overconfident entrepreneurs suffer less from credit rationing due to a reduction in agency rents. However, this should not be confounded with the stigmatization of failure which exists independently of the level of confidence, as long as investors are pessimistic. Therefore, this paper contributes to both behavioral and entrepreneurial finance literature.

The remainder proceeds as follows. I briefly review the literature in section 2 before presenting the theoretical framework in section 3. I then present my preliminary results in section 4. I finally discuss the results and conclude on implications and limits in the last section.

2. Literature review

Although the preeminence of overconfidence and optimism among entrepreneurs is well documented (Busenitz and Barney, 1997; Cooper et al, 1998; De Meza and Southey, 1996; Camerer and Lovallo, 1999; Cassar, 2010; Townsend et al; 2010), the distinction between these two biases is not always clear. While overconfidence is defined in three different ways (Moore and Healy, 2008), there is a unique definition of optimism. Indeed, overconfidence could be considered as the overestimation of one’s actual ability or performance. It could also refer to the overplacement of one’s performance relative to others as well as to the overprecision of one’s beliefs in an analysis. Optimism means overestimation of the likelihood of positive events and underestimation of the likelihood of negative events regardless of E’s involvement. Hence, while overconfidence is a form of optimism, the latter does not systematically mean overconfidence.

De Meza and Southey (1996) state that only optimists become entrepreneurs and show in a theoretical model that due to optimism, the equilibrium is characterized by an excess demand of debt over equity. Cooper et al. (1988) show that business owners are likely to be overoptimistic about the outcome of their business. They report that existing entrepreneurs perceive the odds of success of their business to be significantly higher than historically observed ones. Consistently, Camerer and Lovallo (1999) suggest through an experimental approach that overconfident subjects are entering excessively businesses. In addition, Cassar (2010) supports that nascent entrepreneurs overestimate not only the probability that their venture will be an operating one but also the expected future sales and employment. Regarding contractual aspects, Landier and Thesmar (2009) argue that entrepreneurial optimism leads to a preference for short-term debt over long-term debt.

On the other side, studies in entrepreneurship focusing on the stigma of failure consider it mainly through the perspective of financial costs and bankruptcy laws. In Landier (2005), stigma is associated with a conservative equilibrium in which, after a failure, reinterring the market means supporting higher financial costs. These costs prevent mediocre entrepreneurs from abandoning potentially bad projects and starting again like in the experimental equilibrium. Bankruptcy laws are also known to influence significantly incentives to develop entrepreneurial activities (Peng et al, 2010; Rodano et al, 2016).
Also, stigma is closely related to the optimal length of memory (Elul and Gottardi, 2015; Kovbasyuk and Spagnolo, 2016). For instance, cancelling public reporting of managers involved in corporate liquidations is shown to positively influence the entrepreneur’s ability to borrow (Cahn, Girotti and Landier, 2017). In particular, the probability for failed entrepreneurs to re-enter or to borrow from a surviving venture increases.

3. Theoretical Framework

3.1 Model set-up

To investigate the relation between overconfidence/optimism and the stigmatization of failure, I consider a two-period moral hazard problem. In each period $j$, an entrepreneur (E) endowed with an initial wealth $A_j$, asks $I - a_j$, with $a_j \leq A_j$, to an external investor to start a project requiring an investment $I$. The investor then makes a take it or leave it contract offer to E.

Once the project is funded, E may either behave (here by behaving I especially refer to making an effort) or misbehave (shirk). While misbehaving reduces the success probability $p_H$ to $p_L$, it allows E to get some private benefits $B$. The project’s outcome realized at $t = 1$, is $X_H$ in the case of success and $X_L < X_H$ in the case of failure. I assume that the project’s NPV is positive in the first case and negative in the second one. The timeline and project characteristics are the same for each period.

The probabilities mentioned above are the objective ones that correspond, in a sense, to the true probabilities associated with the project’s success. In this paper, I consider that both investors and entrepreneurs may deviate from these true probabilities and rely on their own subjective probabilities. I refer to subjective probabilities for E with $\tilde{p}_i = p_i + \theta_i ; i = H, L$ where $\theta_i$ corresponds to the difference with the true probability. For $\theta_i = 0$, E is defined as realistic; for $\theta_i > 0 (\theta_i < 0 )$, E overestimates (underestimates) $p$. As far as the investor is concerned, I only focus on his assessment of $p_H^2$, denoted by $p_I = p_H + \theta_I$. Also, I assume that even when biased, E is always aware of the fact that providing an effort increases the probability of success relatively to shirking ($\Delta p + \Delta \theta > 0$).

As a rational benchmark, I consider the situation where both parties are endowed with objective probabilities.

3.2 Definitions

Such a setting allows me to provide a clear distinction between overconfidence and optimism. I refer to overconfidence (underconfidence) when E overestimates (underestimates) only $p_H$, the probability of success when he provides an effort. By contrast, when E overestimates (underestimates) $\tilde{p}_L^2$

\footnote{His perception of $p_L$ does not influence the contract design.
both $p_H$ and $p_L$ by $\theta_H = \theta_L$, he is said to be optimistic (pessimistic) only. Otherwise, if $\theta_H \neq \theta_L$, I consider that E is both overconfident (underconfident) and optimistic (pessimistic). Thus, the distinction between over(under)confidence and optimism relies on the perception of $p_L$. Also, it is worth noting that as the investor does not provide any effort, he may only be optimistic or pessimistic.

3.3 Belief-updating

Before starting the second project, both parties may update their beliefs, especially if they do not have objective priors. Considering that $\tilde{q}_{H/F}$ corresponds to the probability of success conditional on a failure, derived from Bayes’ rule, I denote by $\tilde{q}_{H/F} = (1 - \lambda) \tilde{p}_{H/F} + \lambda \tilde{p}_H$ the subjective conditional probability of E, that may deviate from Bayesian updating (when $0 < \lambda \leq 1$). Similarly $q_{H/F}$ refers to the investor’s belief. The objective probability is $p_{H/F} \geq p_H$. It means that after a failure, E is as skilled as before in the worst case and more competent than before in the better case (learning from experimentation).

4. Results

I first analyse the first period as in a single-period model, to derive results on contractual design.

The investor’s problem is:

$$\max p_i(X_i - S_i) + (1 - p_i)(X_i - S_i) - (I - a)$$

s.t.

$$\Delta S \geq \frac{B}{\Delta p + \Delta \theta} \quad (IC)_E$$

$$\tilde{p}_H S_H + (1 - \tilde{p}_H) S_L \geq a \quad (PC)_E$$

$$X_i \geq S_i \geq 0, i = H, L \quad (LL)$$

Here, the benchmark case corresponds to $p_l = p_H$ and $\theta_H = \theta_L = 0$ meaning that $\tilde{p}_H = p_H$.

**Lemma 1:** When $a < \frac{B (p_H + \theta_H)}{\Delta p + \Delta \theta}$, the optimal contract is such that $(IC)_E$ binds and $(PC)_E$ is slack:

$$\Delta S^* = \frac{B}{\Delta p + \Delta \theta} \text{ and } S_i^* \geq a \frac{B (p_H + \theta_H)}{\Delta p + \Delta \theta}.$$  

When $a \geq \frac{B (p_H + \theta_H)}{\Delta p + \Delta \theta}$, the optimal contract is such that $(PC)_E$ binds and $S_i^* \leq A - \frac{B (p_H + \theta_H)}{\Delta p + \Delta \theta}$.

The level of $a$ E is willing to provide is determined by proceeding through backward induction.
Lemma 2: To maximize his profit, $E$ is better off providing $a^* = \bar{A} \leq A$. Under the assumption that both parties agree to disagree: $a^* = \bar{A} = \max \{ \frac{B p_1}{\Delta p + \Delta \theta} - [p_H X_H + (1 - p_L) X_L - I]; 0 \}$.

Proposition 1: No matter $E$’s level of confidence, the optimal contract is a debt contract such that: $S_H^* = \frac{B}{\Delta p + \Delta \theta}$ and $S_L^* = 0$.

Proposition 2: When $E$ is subject to an overconfidence bias, the agency rent is reduced by $B \frac{\Delta \theta}{(\Delta p + \Delta \theta) \Delta p}$ relatively to the benchmark and $E$ suffers less from credit rationing.

Proposition 3: When $E$ is only optimistic, the optimal contract is the same as in the benchmark case meaning that entrepreneurial optimism does not have any impact on credit rationing. On the contrary, the investor’s optimism (pessimism) contributes to lower (raise) the degree of credit rationing relatively to a rational benchmark.

I focus now on the second period of the two-period model, to derive results on the stigmatization of failure. Knowing that overconfident $E$ suffer less from credit rationing, I investigate here if they still have an easier access to finance after a failure. I consider stigma in the following sense: when entering the market is more costly, or even impossible, for a second-time $E$ after a failure compared to a new $E$ with same characteristics (amount of wealth, ability…); then the second-time $E$ is stigmatized for his previous failure.

To get access to financing, the participation constraint of the investor ($PC$)$_I$ must be satisfied. In particular, ($PC$)$_I$ specifies the minimum contribution ($\bar{A}$) required from $E$ to be funded. After a failure, stigma exists if the contract is such that $\bar{A}_{2/F} \geq \bar{A}_{1/N}$, where $\bar{A}_{1/N}$ is the minimum required from a comparable first-time $E$. This stigma is even more pronounced when $\bar{A}_{2/F} \geq A - a_1 \geq \bar{A}_{1/N}$ since it means that a new $E$ will enter the market while a previously failed one will not.

Lemma 3: Under a rational benchmark, where both the investor and $E$ are endowed with objective probabilities, there is no stigmatization of failure. On the contrary, knowledge acquisition implies an easier access to financing even after a failure.

Proposition 4: No matter the level of confidence of $E$, under subjective probabilities, stigma exists whenever $q_{H/F} < p_{H/F}^*$, that is when investors are pessimistic.

Proposition 5: When investors are endowed with objective probabilities or acquire them through learning, $E$ are not stigmatized for their failure but the minimum required contribution $\bar{A}_{2/F}$ is lower for those who remain overconfident.
5. Discussion

My findings suggest that no matter the level of confidence of E, the optimal contract remains a debt contract. However, the more E’s level of overconfidence is, the less he will suffer from credit rationing. Indeed, overconfident E do not require as much as realistic E to behave well. Hence, the agency rent may be reduced, allowing the investor to benefit from an increase in profits compared to the benchmark case. As agency conflicts decrease with overconfident agents, this in turn impacts the level of the minimum required capital, reducing credit rationing.

Regarding optimism, I find that being optimistic brings closer to the case of the realistic E. In particular, if E is only optimistic and not overconfident, there is no changes in the contract and access to finance relatively to the rational case.

Introducing the notion of subjective probabilities (Epstein and Zhang, 2001) and non-Bayesian updating (Epstein, 2006) allows me to consider situations where neither E nor investors are endowed with realistic beliefs. Hence, both parties may be subject to behavioral biases or may deviate from Bayes’ rule when updating their beliefs. Thus, I establish that similarly to E’s overconfidence, investors’ optimism contributes to lower the degree of credit rationing compared to a rational benchmark or compared to the case where only investors are realistic.

Considering the stigmatization of failure, lemma 3 suggests that as long as objective probabilities reflect entirely E’s ability, \( p_{HF}^* \geq p_H \) and stigma is never optimal. An important assumption I make here is that experimentation does not reduce skills and E does not lose a knowledge once it is acquired. Thus, in the best case, through experimentation, E may acquire knowledge while in the worst case he will be as skilled as before. This even implies that E should have an easier access to finance after a failure. With subjective probabilities, actual probabilities are acquired through learning. In this case, failure may be imperfectly informative about the skills of E due to the existence of bad luck. Then, a second kind of benchmark may be considered with Bayesian updating. As long as investors are pessimistic, regardless of the level of entrepreneurial confidence, stigma exists. There is a clear distinction to make here between an optimal decision induced by learning and stigma. Indeed, investors who overestimate \( p_H \) in the first period and properly update their beliefs after a failure will take the optimal decision by increasing the cost of entry or not financing E. This is due to learning and not due to stigma. Similarly, if E have an easier access to financing when they are overconfident, this is due to their bias and does not mean that they are less stigmatized for a failure than a rational E with similar characteristics.
6. Limitations and implications

My findings support that overconfident entrepreneurs benefit from an easier access to funding. In particular, if $E$ provides the minimum required capital to be funded, a negative correlation between the degree of confidence of an entrepreneur and his initial provision of capital should exist. Therefore, if the entrepreneurial population is known to be overconfident, this could be due to the easier access to financing that overconfident $E$ have thanks to their bias. Even after a failure, as long as they remain overconfident, they will be funded more than less confident entrepreneurs. However, this should not be considered as a stigmatization of failure for the latter ones. Indeed, even overconfident entrepreneurs may suffer from stigma after a failure, as long as investors are pessimistic. What I mean by stigma, here, is the requirement of a higher contribution from an $E$ after a failure\(^3\) relatively to a first-time $E$ with same characteristics. As overconfident $E$ get funded more even without a failure, compared to an equally skilled rational $E$, this latter does not suffer from more stigmatization when overconfident $E$ have easier access to financing after a failure. The reduction in credit rationing implied by the overconfidence bias only decreases the impact of the stigmatization of failure for an overconfident entrepreneur, but considering same level of confidence, it does not prevent them from being stigmatized.

Nevertheless, when establishing these results, I supposed that subjective beliefs are common knowledge. If investors may be considered as experts able to properly assess $E$’s beliefs (or if $E$ naturally reveal their beliefs when meeting investors), it is not necessarily the case for $E$. Therefore, as a further step, I have to analyse what happens when investors’ beliefs are not common knowledge and $E$ make assessment errors.

Also, as I consider two distinct contracts for each period, I am not able to point out what happens when the second period’s decisions depend on the first period ones, that is, when $E$ have not updated their beliefs yet. In the same spirit as Epstein (2006), it could be relevant to consider entrepreneurs who are aware of the intensity of their reaction toward a success or a failure and make choices at $t = 0$ to avoid any suboptimal situation in the second period.

Finally, coming back to the stigma, this paper has some limitations. As stigma is often related to cultural dimensions and bankruptcy laws, part of it is exogeneous. Regarding bankruptcy laws, I assumed limited liabilities, but in countries where stigma prevails, $E$ are not so protected and may be personally liable. Hence, to establish a cross-country comparison, relaxing limited liability constraints would be interesting. This would strengthen stigma and allow me to capture the exogeneous aspect of stigma. In addition, entrepreneurship is essentially based on human relations.

\(^3\) This increase could be interpreted as a higher cost of re-entry after a failure and it reduces the likelihood of reentering the market after a failure.
References


Goffman, Erving, (1963), Stigma: notes on the management of spoiled identity


