

Overoptimism among Founders: The Role of Information and Motivation

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OVEROPTIMISM AMONG FOUNDERS: THE ROLE OF INFORMATION AND MOTIVATION

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Keywords: overoptimism, nascent entrepreneurs, information, motivation

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1. INTRODUCTION

The majority of entrepreneurs prefer to manage a venture that is successful and that provides them with sufficient financial means to live a comfortable life. For many aspiring entrepreneurs the reality does not meet their initial expectations. In fact, failure rates among start-ups and new ventures can amount up to sixty percent within the first five years (Cooper et al., 1988; Phillips and Kirchhoff, 1989) and the average income of the self-employed is often well below that of comparable employed individuals (Hamilton, 2000). The high failure rate and the relatively low returns of new ventures suggest that many firms are started by entrepreneurs who are overly optimistic (De Meza and Southey, 1996).

Overoptimism occurs when the expectations of an individual regarding an outcome exceed the realized outcome (Pulford and Colman, 1996). In general, cognitive biases such as overoptimism arise when individuals are confronted with too much or overly complex information, preventing them from making rational decisions. Bounded rational individuals then tend to resort to simplifying strategies or decision rules (Tversky and Kahneman, 1974).

Overoptimism or overconfidence¹ has been found to play a role in different decision-making situations and professions (Lowe and Ziedonis, 2006; Barber and Odean, 2001). Various scholars have linked overoptimism to entrepreneurship (Kahneman and Lovallo, 1993; Camerer and Lovallo, 1999; Busenitz and Barney, 1997; Sarasvathy et al., 1998; Palich and Bagby, 1995; De Meza and Southey, 1996; Arabsheibani et al., 2000). Entrepreneurs can be overly optimistic in the areas of, for example, the attractiveness of their product, consumer demand, degree of competition, their own managerial abilities and their ability to control future events (Wickham, 2006).

Several explanations have been proposed for the overoptimistic nature of entrepreneurs. The heuristic of overoptimism may help entrepreneurs to cope with the information (over)load, time pressure and uncertainty of entrepreneurship and to take

¹ In the present paper we use the notion of 'overoptimism' also to include what other researchers have termed 'overconfidence'. Overoptimism and overconfidence can be seen as two distinct concepts. Overoptimism involves the overestimation of the probability and/or magnitude of positive outcomes and underestimating the probability and/or magnitude of negative outcomes. Overconfidence refers to overestimating one's abilities to deal with future outcomes.

timely actions, e.g., developing the new venture before all relevant information is available and known (Busenitz and Barney, 1997)². In addition there is the possibility of self-selection with entrepreneurship attracting a certain type of (overoptimistic) people (Forbes, 2005; Åstebro et al., 2007).

Although overoptimism has been linked with excessive entry, high failure rates and below-average earnings (Camerer and Lovallo, 1999; Koellinger et al., 2007), many entrants manage to survive and prosper³. This is an indicator of variation in the degree of overoptimism among entrepreneurs, which may be driven by individual and environmental characteristics (Forbes, 2005; Bhandari and Deaves, 2006). Recently, Hayward et al. (2006) introduced a ‘hubris theory of entrepreneurship’ to explain the consistently high failure rates of new ventures from a combination of entrepreneurial, firm and environmental characteristics. It is hypothesized, for example, that dissimilar founding experience and business planning in complex and dynamic environments may aggravate rather than reduce overoptimism.

The present study contributes to the relatively scarce but growing stream of literature linking overoptimism to entrepreneurship and empirically tests the hypotheses proposed by Hayward et al. (2006). The emphasis is on the effects of information and start-up motivation on the reported degree of overoptimism by entrepreneurs. In contrast with earlier studies we do not examine students who participate in experiments, but make use of a large data sample including observations of 1,147 entrepreneurs who manage new ventures of less than one year old. These ‘nascent’ entrepreneurs are often assumed to display relatively high levels of overconfidence (Dosi and Lovallo, 1997). We take a broad perspective on overoptimism and investigate not only the financial consequences of overoptimism, but also overoptimism with respect to psychological stress and leisure time. These three aspects generally play an important role in determining the utility derived from an occupation. Psychological well-being has previously been studied as an important career outcome for the self-employed (Feldman and Bolino, 2000; Jamal, 1997).

The remainder of this paper is organized as follows. In Section 2 we discuss the determinants of overoptimism. The focus is on factors related to information and

² Busenitz and Barney (1997, p.15) argue that entrepreneurship can be seen as an *enactment* process where acting precedes thinking.

³ Puri and Robinson (2007) find that overoptimism also has positive effects: optimistic people work harder, they invest and save more.

motivation. On the basis of relevant literature we formulate eight hypotheses to be tested in the empirical study. Section 3 presents the sample and variables. Sections 4 and 5 present and discuss the results.

2. DETERMINANTS OF OVEROPTIMISM

There are various reasons why some entrepreneurs display more overoptimism at the start of their ventures than others. We distinguish between two main determinants. The first is *information*. We expect that entrepreneurs who possess more specific business information at the time of start-up are less overoptimistic with respect to financial performance or non-monetary (dis)utility derived from the business (e.g., psychological well-being, leisure time). The second determinant is *motivation*. We expect that entrepreneurs who are motivated by and aim to achieve specific pecuniary or non-pecuniary benefits by starting up a business, will devote ample attention to realizing these benefits, thereby limiting overoptimism regarding these outcomes.

2.1 Information and Knowledge

Nascent entrepreneurs differ in terms of the amount of relevant knowledge they require and possess. They may start in very different business environments, requiring different types and levels of knowledge and information. Individuals who are well-informed about the possible consequences of their choices are unlikely to display overoptimism. A distinction is usually made between general and specific or relevant knowledge, for example, discriminating between education level and experience (Becker, 1993; Castanias and Helfat, 2001). Individuals with higher levels of education tend to be more self-confident (Davidsson and Honig, 2003), and as a result may have relatively high expectations of the results of their work efforts. Bhandari and Deaves (2006, p. 10) argue that: “those with formal education do not know more about investments, but they think they do: thus they are overconfident”. Hence, well-educated nascent entrepreneurs may be more likely to overestimate their abilities to run a venture than entrepreneurs with lower levels of education.

It is important to distinguish between formal education and relevant (or pertinent) knowledge (Bhandari and Deaves, 2006), the latter which can be acquired through previous experience with for example managerial tasks and working in the industry. Nascent entrepreneurs with past exposure to the challenges of entrepreneurship or

who performed related activities in their past career may be expected to be more realistic and less susceptible to the overoptimism bias (Fraser and Greene, 2006).

Experience does not necessarily enhance learning. Wright et al. (1997) indicate that serial entrepreneurs are less able to recognize their own limitations than first-time entrepreneurs. Hayward et al. (2006, p.165) claim that experienced founders may be overconfident in particular when the nature of their venture differs from that of previous endeavors. Cooper et al. (1988) find that serving similar markets or working with similar technology in the past lowers overoptimism and enhances venture success. We assume that general knowledge in terms of high education or general entrepreneurial experience enhances overoptimism and that more specific knowledge about running a business in a particular industry makes nascent entrepreneurs more realistic regarding (future) venture performance. The following hypotheses are formulated:

H1: Nascent entrepreneurs with high levels of *general* knowledge will be more overoptimistic than entrepreneurs with lower levels of such knowledge.

H2: Nascent entrepreneurs with high levels of *specific relevant* knowledge will be less overoptimistic than entrepreneurs with lower levels of such knowledge.

The knowledge required to run a successful business varies across activities and industries. Dynamic, complex and uncertain markets usually require more specific knowledge than activities undertaken in stable, simple and certain environments. Situations in which entrepreneurs are confronted with high levels of environmental uncertainty often demand high levels of knowledge, forcing entrepreneurs to rely on heuristics to make decisions (Busenitz and Barney, 1997, p. 10). The cognitive bias of overoptimism is found to be greatest for complex tasks and forecasts with high levels of uncertainty (Griffin and Tversky, 1992; Madsen, 1994) and in ambiguous environments (Camerer and Lovallo, 1999).

Because high-tech entrepreneurial activity requires relatively high levels of detailed knowledge, entrepreneurs engaging in such activity may be subject to the overoptimism bias. Simon and Houghton (2003) find that managers who introduce pioneering products are more overconfident as compared to managers who pursued incremental innovations. Hayward et al. (2006, p. 164) hypothesize that greater environmental complexity and dynamism will lead to greater founder overconfidence.

Hypothesis 3 captures that the effect of required knowledge in complex and dynamic environments on overoptimism.

H3: Nascent entrepreneurs who embark on activities in complex and uncertain environments, characterized by high levels of required knowledge, will be more overoptimistic than entrepreneurs who do not engage in such activities.

Realistic entrepreneurs will have an adequate perception of the limitations of their own skills and knowledge. To counteract unrealistic optimism Parker (2006) argues that entrepreneurs should form relationships with outsiders or professional advisors because they are knowledgeable, objective and detached. Similarly, Bhandari and Deaves (2006) advocate third-party advice to entrepreneurs who do not have relevant experience and are reluctant to engage in relevant training or education. Mobilizing experts does not guarantee success because entrepreneurs may be stubborn and ignore the advice of experts, in particular when recommendations conflict with their own ideas (Åstebro et al., 2007; Åstebro, 2003). Therefore outside advice may do little to temper entrepreneurial overoptimism (Lowe and Ziedonis, 2006, p. 176). Sometimes advisors find it hard to communicate specialized information to entrepreneurs and resort to giving a general and neutral summary (Suen, 2004). The heuristics of entrepreneurs, used to process such information, could then easily be employed in a self-serving way. Furthermore, advisors may have biased perceptions of reality or follow their own agenda, irrespective of the goals of the entrepreneur (Parker, 2006). Next to hiring in advice, entrepreneurs can also outsource activities with which they have no experience or that do not belong to the core business. We expect that outside help makes nascent entrepreneurs more realistic, provided the support is adequate and the entrepreneur is open to it. Hypothesis 4 is formulated as follows:

H4: Nascent entrepreneurs who fill in the gaps in their skills and knowledge by asking for outside help will be less overoptimistic than entrepreneurs who do not reach out for support.

Nascent entrepreneurs can prepare themselves for business start-up, for example, through writing a detailed business plan. According to Delmar and Shane (2003) business plans provide helpful guidelines for managing a (new) venture. Cooper et al. (1988, p. 105), on the other hand, find that well-prepared entrepreneurs are just as optimistic as those who are poorly prepared. Hayward et al. (2006) propose that

business planning may even enhance overoptimism as the extensive scenario and contingency plans increase the entrepreneur's confidence that (s)he is able to meet the proposed deadlines and create a successful business. Consistent with this projection, Cassar (2007) finds that entrepreneurs who use plans and financial forecasting show greater ex-ante bias in their expectations. Hypothesis 5 reflects the assumption that business plans can create false hope for entrepreneurs:

H5: Nascent entrepreneurs who write a business plan will be more overoptimistic than entrepreneurs who refrain from writing a plan.

2.2 Motivation

Individual motivation will shape the way in which information is interpreted and used. There are various motives for new venture creation (Gilad and Levine, 1986). In addition to the financial benefits of starting up a business, there are several non-pecuniary rewards including the wish to be independent, the entrepreneurial challenge and the possibility of combining work and household responsibilities (Amit et al., 2001). Hamilton (2000) claims that these non-pecuniary benefits of self-employment must be substantial as the pecuniary rewards are often disappointing. Start-up motives of entrepreneurs can have important consequences for overoptimism as entrepreneurs are expected to evaluate performance by linking firm outcomes to their initial goals and expectations. Feldman and Bolino (2000, p. 65) conclude that career anchors influence individuals' satisfaction with self-employment and their intentions to stay self-employed.

In this study we link start-up motivation to three types of overoptimism. We discriminate between overoptimism with respect to income; psychological burden (stress); and leisure time. We expect that entrepreneurs who start a venture mainly for pecuniary reasons prepare themselves by paying due attention to the various financial aspects of the new venture and are, therefore, less likely to be disappointed in this respect. Similarly, entrepreneurs who are motivated by psychological well-being and more flexible working hours will emphasize and monitor these issues during start-up, enhancing realism in these areas. Below we develop hypotheses for each of the three types of overoptimism.

Opportunity perception can be considered a central feature of entrepreneurship (Kirzner, 1979). Entrepreneurs may set up a business by acting upon a perceived

profitable market opportunity. In this way opportunity perception or recognition can be seen as a key pecuniary start-up motive. Although entrepreneurs who are 'blinded' by their ideas run the risk of inadequately assessing competition and underestimating potential problems, they are also expected to anticipate on financial problems, devoting much attention to acquiring information on these issues before and during start-up, thereby increasing their financial realism. Hypothesis 6 is formulated as follows:

H6: Nascent entrepreneurs who start a business to profit from a perceived market opportunity will be less overoptimistic regarding income than entrepreneurs who are not motivated by such opportunities.

Two important intrinsic start-up motives include that of being your own boss and the challenge of entrepreneurship (Feldman and Bolino, 2000). Individuals who start a business often want to be in control over what they do and feel the need to be inspired by their work. Individuals who are motivated by these non-pecuniary benefits are expected to be better able to cope with the psychological burden of entrepreneurship than those who are not driven by such psychological benefits. Entrepreneurs seeking independence and challenge often want to avoid or escape an unwanted predictable nine-to-five subordinate occupation. Hypothesis 7 is formulated as follows:

H7: Nascent entrepreneurs who are driven by intrinsic start-up motives are less overoptimistic with respect to psychological burden than entrepreneurs who are not (or less) driven by such motives.

The combination of work and household responsibilities appears an important consideration at firm start-up, in particular for women. According to Wellington (2006, p. 359): "Self-employment can allow women to work at home, work part-time, choose what hours during the day they work, and control how much effort to exert on work activities". Whereas the motive of combining responsibilities is not expected to have important consequences for the degree of overoptimism regarding income, it may lead to more realistic expectations of leisure time and flexible working hours. Williams (2004) finds that caring for children reduces the duration of self-employment ventures, suggesting that self-employment may not be particularly attractive for people who want to combine career and family responsibilities. Nevertheless, individuals who start a business from the perspective of combining

responsibilities may be better aware of and prepared for the relatively high time investments that characterize entrepreneurship. Hypothesis 8 is formulated as follows:

H8: Nascent entrepreneurs who start a business to combine work and household responsibilities will be less overoptimistic regarding leisure time than entrepreneurs who do not see this as an important issue at start-up.

3. RESEARCH METHODOLOGY

3.1 Sample

To test the hypotheses we use data of a detailed panel survey of the research institute EIM Business and Policy Research that was commissioned by the Dutch Ministry of Economic Affairs. A representative sample was drawn of independent new ventures registered at the Chamber(s) of Commerce in the first half year of 1994. The distribution of firms was representative across sector and size class. Only main establishments were selected. The following firms were excluded: agricultural firms and companies extracting minerals, businesses that changed legal form or activity, and relocated firms. Main themes in the survey include firm and owner characteristics; finance and investment; bottlenecks; strategy and goals; market and environment; realization and expectations. About 12,000 firms were approached by telephone of which approximately 3,000 participated in the survey. These firms received a questionnaire by mail. Of these questionnaires 1,938 were returned, mainly by firms that were in existence between six months and one year. The present study uses a sub-sample of 1,147 Dutch entrepreneurs who are either owners or owner-managers and include all observations for which information is available for the variables included in the present study.

3.2 Measuring the Dependent Variable: Overoptimism

Various measures of overoptimism have been proposed. First, there is the *indirect* approach of asking survey questions or performing experiments on various general issues where participants are provided with detailed instructions. A well-known example is the calibration procedure conducted by Fischhoff et al. (1977) and Lichtenstein and Fischhoff (1977), investigating the quality of people's probability assessments by matching them with the corresponding relative frequency of occurrence. Applying the indirect approach, Puri and Robinson (2007) take the

difference between self-reported life expectancy and that derived from ‘life tables’ as a proxy for overoptimism. The calibration procedure has been widely cited and has been applied in the area of entrepreneurship by for example Busenitz and Barney (1997) and Forbes (2005). However, the outcomes of the calibration studies have been questioned (Brenner et al., 1996). An important disadvantage is that the experiments are artificial and relate only indirectly to entrepreneurial optimism.

A second approach is to compare *predicted versus realized* outcomes. For example, Arabsheibani et al. (2000) compare predicted and actual income of British wage- and self-employed individuals. Yang et al. (2007) compare predicted with actual credit card usage among US credit card holders. It is difficult to apply the prediction-realization approach in the context of nascent entrepreneurs because entrepreneurial goals are not realized directly after start-up and expectations may be difficult to quantify before start-up. Nascent entrepreneurs are often confronted with unexplored markets, goal ambiguity and lack of a predictable future (Sarasvathy, 2003).

A third approach is to use *actual behavior* as a proxy for overoptimism. Barber and Odean (2001) look at the trading volume of investors as an indication of their overoptimism. Malmendier and Tate (2005) focus on the stocks CEOs hold in their own firms as a proxy for overoptimism. A problem with this approach is that a certain behavior is assumed to be related to overoptimism, whereas in reality this may not be the case.

Finally, people may answer questions related to their overoptimism *directly*. Although this approach circumvents many of the problems mentioned earlier, it may be complicated by hindsight bias (“I knew it all along”). Nevertheless, it has the advantage of dealing with the relevant population and capturing the variables of interest. Similar measures of self-reported satisfaction have been applied in the areas of customer satisfaction (Peterson and Wilson, 1992) and job satisfaction (Wanous et al., 1997).

In this study overoptimism is measured asking nascent entrepreneurs directly whether the outcomes of their new venture are in line with their initial expectations. Answer categories range from (1) “far better than expected” to (5) “much worse than

expected”⁴. The outcomes of the new venture after one year of operation can take the form of income, psychological burden or leisure time. Correlations between the three different variables of overoptimism indicate that these are related, yet separate constructs. The Pearson coefficient is highest for the relationship between overoptimism regarding leisure time and that with respect to psychological burden, and amounts to 0.356 ($p < 0.01$). Overoptimism with respect to income is relatively different from that regarding psychological burden and leisure time, i.e., Pearson coefficients amount to 0.215 ($p < 0.01$) and 0.088 ($p < 0.01$), respectively. We expect that hindsight bias is limited due to the fact that questions are asked within a year after start-up and because the information requested (disappointment regarding income, leisure time and stress) is not so difficult to bring to mind (Sanna and Schwarz, 2006).

3.3 Independent Variables

The proposed hypotheses are tested using a set of variables. An overview of these variables, grouped into the categories of information, motivation and controls (personal and firm characteristics), can be found in Table 1. Hypothesis 1 reflects the effect of general knowledge on overoptimism and is tested through the variables *Education* and *EntExperience*. Although the latter may also reflect relevant entrepreneurial experience, this is controlled for by including the job similarity variable. The effect of specific knowledge on overoptimism in Hypothesis 2 is tested on the basis of the variables *JobSimilarity* and *FinManExperience*. The complex environment of Hypothesis 3 is measured in terms of the two variables *Hightech* and *KeepUp*, the latter which measures the ability of entrepreneurs to keep up with relevant developments in the industry. Hypothesis 4 presents the effects of external support. We include three support variables: *Networking*, *Advice* and *Outsourcing*. Entrepreneurs who participate in relevant networks will have access to the experience and knowledge of colleagues in the same line of business. The variable of business advice measures whether or not an entrepreneur used external advisors for market orientation. The fact that entrepreneurs decide to engage in outsourcing signals that these individuals are aware of their limited knowledge and skills. Hypothesis 5 is tested using the dichotomous variable *BusinessPlan*.

⁴ Note that our measure of overoptimism allows respondents to be rated in the range from overly optimistic to overly pessimistic.

The three hypotheses about motivation are tested as follows. Hypotheses 6 and 8 are tested using the variables *Opportunity* and *WorkCare*, which capture the extent to which the perception of a market opportunity and the combination of responsibilities and play a role in the start-up decision, respectively⁵. Hypothesis 7 is tested combining the two motivations of ‘the wish to be independent’ and ‘the challenge of starting and running a business’ into one variable: *Intrinsic*. This variable represents the extent to which these two main intrinsic motives play a role in the start-up decision⁶.

3.4 Control Variables

This study controls for personal and firm characteristics when explaining overoptimism. We include gender, age, having a life partner, access to other income and time spent on other activities to capture variation in the personal profile of individual entrepreneurs. In terms of firm characteristics we incorporate amount of start-up capital and industry as well as dummy variables for newly started business and home-based firm.

1. *Gender*. On average women are expected to be less overoptimistic than men. Several studies point at a tendency of more realism among women. Barber and Odean (2001) find that women trade less than men do, suggesting a link between gender and overoptimism⁷. Arabsheibani et al. (2000) find that unrealistic financial optimism is lower for women than for men. Lin and Raghuram (2005) find that Taiwanese women are less overoptimistic than men in the areas of marriage and divorce. Gender differences in overconfidence appear to be highly task-dependent (Lundeberg et al., 1994) and greatest for tasks that are perceived to be masculine, such as entrepreneurship (Beyer and Bowden, 1997).

2. *Age*. Nascent entrepreneurs with more life experience may display less overoptimism because they are more likely to have encountered setbacks and disappointments in life. Taylor (1975) found that older managers search for more

⁵ Note that the respondents could indicate more than one start-up motive in the questionnaire. Other motives include (threat of) unemployment, dissatisfaction with the current wage job, self-employment due to an occupation (e.g. dentist), and taking over the family business.

⁶ The two motives of ‘challenge of starting and running a business’ and ‘the wish to be independent’ score clearly as most often mentioned important start-up motives in our survey data. Their average scores are close to 2.5 (on a scale from 1 to 3). The two motive variables are highly correlated and, hence, they were combined into one variable.

⁷ Gender differences appear even more pronounced when comparing single men and single women.

information prior to making a decision and that they were less confident about their decisions ex-post. Forbes (2005) provides evidence that overconfidence is more prevalent among younger than older entrepreneurs.

3. *LifePartner*. A life partner may temper or enhance overoptimism. On the one hand, a partner can point at the need to be cautious when financial risk is involved. On the other hand, (s)he can increase the confidence level of an individual and reduce stress related to the business by sharing problems.⁸ Arabsheibani et al. (2000) do not find an effect of marital status on overoptimism.

4. *Subsistence*. Entrepreneurs who are dependent on the financial revenues from the business may be more careful when spending money and may try to avoid situations characterized by high risk. Thus, reliance on the revenues of the firm for subsistence may reduce the tendency for overoptimism.

5. *OtherHours*. An entrepreneur with demanding side-activities (e.g., family care, hobbies, schooling) is more likely to be confronted with time pressure and stress than individuals who do not engage in such activities. Entrepreneurs may concentrate on the business and underestimate the sizeable time they already invested, enhancing overoptimism regarding the perceived psychological burden and leisure time.

6. *FirmStatus*. This variable measures whether the firm is newly started or a takeover of an existing business. This variable is included because takeovers often come with relevant information about consumers, costs and financial and legal requirements, which may reduce overoptimism.

7. *StartCapital*. Several studies find that start-up size and optimism are positively related (Frank, 1988; Fraser and Greene, 2006; Hayward et al., 2006). We control for size differences across the young firms in our sample by taking into account the amount of start-up capital. This is a categorical variable with seven size classes, ranging from relatively small (<4,500 Euro) to substantial start-ups (>225,000 Euro). Large start-ups usually require more preparation and have to deal with outside supervision, e.g., by capital suppliers, possibly reducing the chance of overoptimism. A large amount of start-up capital may also indicate that entrepreneurs strongly believe in their venture or that they foresee problems (Cooper et al., 1988).

⁸ The partner may also earn an income that provides the entrepreneur with financial security.

8. *HomeBase* measures whether a business is run from the home or business premises. Starting and running a business from the home may be an indicator of prudence on the part of the entrepreneur. Running a business from the home may also have consequences for the perceived psychological stress and leisure time.

9. *ManuCons* and *WholeRetail* capture industry effects. We distinguish between three type of industries: ‘manufacturing and construction’ (*ManuCons*); ‘wholesale and retailing’ (*WholeRetail*) and the base category of ‘other industries’ (mainly personal services).

4. ANALYSIS AND RESULTS

The results of the OLS regression explaining overoptimism are presented in Table 2. The majority of the hypotheses receive (partial) support. The general knowledge variables of education and entrepreneurial experience have the expected positive effect on overoptimism with respect to income. Entrepreneurial experience also seems to affect overoptimism regarding psychological burden, albeit at the 10 percent level. Hypothesis 1 is supported. The specific knowledge variables of job similarity and experience with financial management significantly reduce overoptimism regarding income and leisure time, respectively. There is some support for Hypothesis 2.

The complexity of the venture enhances overoptimism: entrepreneurs who run high-tech firms and who have difficulty keeping up with relevant developments are more likely to be subject to overoptimism. Hypothesis 3 receives considerable support, in particular for overoptimism relating to income. To some extent networking and outsourcing reduce overoptimism with respect to income, suggesting that outside support helps to reduce overoptimism and that an individualistic approach is not always rewarded. Nevertheless, external advice does not appear to have an effect on overoptimism, which may imply that entrepreneurs are stubborn and interpret advice in a self-serving way, or perhaps that advisors fail to adequately assess and communicate their views and expertise. Hypothesis 4 is only partially supported. Business planning has a positive effect on financial overoptimism. Although the effect

is significant only at the 10 percent level, planning apparently does not help in reducing overoptimism.⁹ There is some support for Hypothesis 5.

Starting a business to profit from a perceived opportunity appears to reduce financial overoptimism, supporting Hypothesis 6. Entrepreneurs who perceive a lucrative opportunity seem to be aware of the conditions for successful exploitation of this opportunity. They report, on average, not to be disappointed. We find that intrinsic motives reduce overoptimism regarding psychological burden. Thus, nascent entrepreneurs appear better able to cope with stress when intrinsically motivated. We do not find a significant relationship between intrinsic motivation and overoptimism with respect to both income and leisure time. There is support for Hypothesis 7. Entrepreneurs motivated by combining work and family care appear to be more realistic regarding both the psychological burden of running a business and the amount of leisure time at their disposal. The latter is in line with Hypothesis 8. Apparently, nascent entrepreneurs who balance work and family care are well aware of the demands of self-employment and benefit from having more flexible working hours. The support for the last two hypotheses indicates that entrepreneurs enjoy the non-pecuniary benefits of self-employment as proposed by Hamilton (2000).

⁹ Inspired by Proposition 3 in Hayward et al. (2006), stating that greater business planning leads to overoptimism in particular in complex and dynamic environments, we also tested a model including the cross-effect of the complexity of the venture (*HighTech* and *KeepUp*) and business planning. We did not find evidence for the existence of such a cross-effect for the three types of overoptimism.

Table 1: Variable description

Variable name	Variable description	mean	std.	min	max
Overoptimism with respect to <i>income</i>	Thus far, is the income you retrieved from your business in line with your expectations? [1=far better than expected; 2=better than expected; 3=similar to expectations; 4=a bit disappointing; 5=much worse than expected]	2.84	0.87	1	5
Overoptimism with respect to <i>psych. burden</i>	Thus far, is the psychological burden of starting up a business in line with your expectations? [1=far better than expected; 2=better than expected; 3=similar to expectations; 4=a bit disappointing; 5=much worse than expected]	2.75	0.88	1	5
Overoptimism with respect to <i>leisure time</i>	Thus far, is your (remaining) leisure time in line with your expectations? [1=far better than expected; 2=better than expected; 3=similar to expectations; 4=a bit disappointing; 5=much worse than expected]	2.96	0.91	1	5
Education	What is your highest level of education? [1=average second. education; 2=higher second. education; 3=low-level vocat. training; 4=Leerlingstelsel*; 5=mid-level vocat. training; 6=high-level vocat. training; 7=university]	4.37	1.85	1	7
EntExperience	Did you run a business prior to the start-up of this firm? [0=no; 1=yes]	0.08	0.28	0	1
JobSimilarity	To what extent are your current activities related to past work? [1=not at all; 2=somewhat similar; 3=identical]	2.01	0.76	1	3
FinManExperience	Did you have experience with financial management prior to the start-up of this firm? [1=no experience; 2=little experience; 3= quite some experience 4= a lot of experience]	2.03	0.97	1	4
Hightech	Is the sector you operate in characterized by rapid technological developments? [1=no; 2=somewhat; 3=yes]	1.48	0.74	1	3
KeepUp	Are you able to keep up with all relevant developments in your line of business? [1=not really...4=to a large extent]	3.16	0.71	1	4
Networking	Do you feel that you are able to participate in the relevant networks? [1=very weak...5=very strong]	2.85	0.96	1	5
Advice	Did you make use of external advisors for your market orientation? [0=no; 1=yes]	0.13	0.34	0	1
Outsourcing	Are certain activities within the firm contracted out? [0=no; 1=yes]	0.45	0.50	0	1
BusinessPlan	Did you write a business plan prior to the start-up of this firm? [0=no; 1=yes]	0.33	0.47	0	1
Intrinsic	Did intrinsic motives play a role in the start-up decision? An average score is calculated on the basis of answers to the importance of two intrinsic motives: (1) the wish to be your own boss and (2) challenge. [1=no; 2=to some extent; 3= very important]	2.47	0.58	1	3
WorkCare	Did the combination of work and household responsibilities play a role in the start-up decision [1=no; 2=to some extent; 3=very much]	1.63	0.80	1	3
Opportunity	Did a discovery of a market opportunity play a role in the start-up decision? [1=no; 2=to some extent; 3= very important]	1.57	0.74	1	3
Gender	Are you male or female? [0=male; 1=female]	0.28	0.45	0	1
Age	Age in categories [1=<20; 2=20-24;3=25-29; 4=30-34; 5=35-39; 6=40-44; 7=45-49; 8=50-54; 9=55-59; 10=>60]	4.58	1.71	1	10
LifePartner	Do you have a life partner? [0=no; 1=yes]	0.82	0.38	0	1
Subsistence	To what extent are you dependent on the profits from your business for subsistence? [1=not at all...4=completely]	2.24	1.19	1	4
OtherHours	At the start of your firm, how much time did you spend on other activities? [0=0; 1=1-9; 2=10-19; 3=20-39; 4=>40 hours]	1.58	1.66	0	4
FirmStatus	What is the status of your firm? [1=newly started firm; 2=restart existing firm; 3=take-over]	1.24	0.62	1	3
StartCapital	What is the total amount of start-up capital? [1=<fl.10,000; 2=fl.10,000-fl.25,000; 3=fl.25,000-fl.50,000; 4=fl.50,000-fl.100,000; 5=fl.100,000-fl. 250,000; 6=fl.250,000-fl.500,000; 7= >fl.500,000]**	2.12	1.45	1	7
HomeBase	Do you run your business from the home? [0=no; 1=yes]	0.69	0.46	0	1
ManuCons	Do you run a business in manufacturing or construction? [0=no; 1=yes]***	0.13	0.33	0	1
WholeRetail	Do you run a business in wholesale or retailing? [0=no; 1=yes]***	0.30	0.46	0	1

*Here students combine school with a minimum of 20 hours work; **StartCapital is measured in Dutch guilders. One guilder is equivalent to 0.45 Euro. *** The category 'personal and business services' is the base category.

The personal and venture control variables appear to have limited effect on overoptimism. Women are found not to be more realistic than men with respect to financial rewards and are even more overoptimistic regarding the psychological demands of entrepreneurship. Age reduces overoptimism regarding psychological burden, which may be due to the fact that individuals with more life experience tend to be more realistic. A life partner seems to reduce overoptimism with respect to income, although the effect is significant at the 10 percent level only. A life partner does not appear to reduce the stress involved in running a new venture. Overoptimism is lower for entrepreneurs who heavily rely on the firm as source of income than for those who have additional income. The variable *OtherHours* has the expected positive effect on overoptimism with respect to leisure time, which means that entrepreneurs who engage in other activities (next to running the business) will experience more time pressure.

A takeover enhances rather than reduces overoptimism with respect to leisure time. Entrepreneurs seem to underestimate the challenges of running a business perhaps driven by the conviction that an existing business requires less time and effort than creating a new venture because of the existing infrastructure. Start-up capital has little effect on overoptimism, only causing some additional psychological stress perhaps due to the higher financial commitment. However, there may be reversed causality: confident entrepreneurs may feel able to deal with the challenges of starting a business and may decide to start at a larger scale. Home-based ventures seem attractive in preventing disappointments with regard to leisure time, possibly related to the gradual development of the business. Finally, entrepreneurs who start wholesale and retail firms appear more overly optimistic regarding income than in other sectors. This might be related to the specific year (1994) following a lowering of institutional entry requirements in the Netherlands which led to more entry in several industries (Carree and Nijkamp, 2001).

The model fit is relatively low. The explanatory power for overoptimism regarding income amounts to only 10 percent and is even lower for the other two types of overoptimism. This low explanatory power appears quite common in studies explaining overoptimism, however (Bhandari and Deaves, 2006; Cooper et al., 1988; Pallier et al., 2002).

Table 2: Linear regression explaining three types of overoptimism

	Overoptimism with respect to ...					
	income		psychological burden		leisure time	
Constant	4.139***	(17.2)	3.386***	(13.5)	2.978***	(11.5)
INFORMATION						
Education	0.040***	(2.8)	0.009	(0.6)	0.008	(0.5)
EntExperience	0.181**	(2.0)	0.172*	(1.8)	0.077	(0.8)
JobSimilarity	-0.135***	(-3.7)	0.017	(0.4)	0.002	(0.1)
FinManExperience	-0.036	(-1.3)	-0.031	(-1.1)	-0.059**	(-2.0)
HighTech	0.082**	(2.3)	0.022	(0.6)	0.068*	(1.8)
KeepUp	-0.161***	(-4.5)	-0.100***	(-2.7)	0.008	(0.2)
Networking	-0.053*	(-1.9)	-0.043	(-1.5)	-0.068**	(-2.3)
Advice	0.101	(1.3)	0.031	(0.4)	0.051	(0.6)
Outsourcing	-0.100*	(-1.9)	-0.011	(-0.2)	0.076	(1.4)
BusinessPlan	0.105*	(1.7)	0.022	(0.3)	0.018	(0.3)
MOTIVATION						
Intrinsic	-0.064	(-1.4)	-0.102**	(-2.1)	0.004	(0.1)
WorkCare	-0.046	(-1.4)	-0.075**	(-2.1)	-0.115***	(-3.2)
Opportunity	-0.085**	(-2.4)	0.024	(0.6)	0.002	(0.0)
CONTROLS						
Gender	-0.018	(-0.3)	0.163**	(2.5)	0.067	(1.0)
Age	0.018	(1.2)	-0.040**	(-2.4)	0.014	(0.8)
LifePartner	-0.128*	(-1.8)	-0.039	(-0.5)	-0.071	(-1.0)
Subsistence	-0.089***	(-3.5)	0.043	(1.6)	0.003	(0.1)
OtherHours	0.005	(0.3)	0.020	(1.1)	0.042**	(2.2)
FirmStatus	-0.033	(-0.7)	0.001	(0.0)	0.203***	(4.1)
StartCapital	-0.011	(-0.5)	0.043*	(1.9)	-0.014	(-0.6)
HomeBase	-0.041	(-0.6)	-0.008	(-0.1)	-0.128*	(-1.8)
ManuCons	0.042	(0.5)	0.054	(0.6)	0.065	(0.7)
WholeRetail	0.200***	(3.4)	0.063	(1.0)	0.044	(0.7)
N	1147		1147		1147	
R ²	0.104		0.040		0.058	

(*), (**), (***) refer to significance levels of 0.10, 0.05 and 0.01, respectively (two-sided test). *t*-values are presented between brackets.

5. DISCUSSION AND CONCLUSIONS

Optimistic entrepreneurs often remain in business too long, earning less and bearing greater risk than they would do in a regular wage job (de Meza and Southey, 1996). This study investigates how overoptimism of recently established entrepreneurs

emerges. We examine factors that influence the degree of overoptimism displayed by entrepreneurs who have been operating a business for less than a year. Consistent with Forbes (2005) our study shows that entrepreneurs are not a homogeneous group when it comes to overoptimism. We find that founders differ in terms of the degree of overoptimism due to informational and motivational reasons. Most findings on the role of information are in line with the 'hubris theory of entrepreneurship' as proposed by Hayward et al. (2006). Realism appears high for entrepreneurs previously engaged in similar activities; who have relatively low level of education; who have experience with financial management but not with entrepreneurship; who participate in networks and contract out activities; and for those who run a firm in a simple, stable and low-tech environment. These results suggest that entrepreneurial overoptimism can be reduced by making entrepreneurs aware of the importance of relevant information and experience for starting a successful business and stimulating them to acquire such knowledge prior to business start-up.

We also find evidence for a link between start-up motivation and overoptimism. Individuals appear to be realistic about the pecuniary or non-pecuniary benefits of self-employment when these benefits are closely related to the initial start-up motivation. This is an interesting finding, supporting Hamilton's (2000) notion that many self-employed are motivated by non-pecuniary benefits. The 'disillusioning' effect of having a clear motivation must be interpreted with some care. It may be explained by the fact that entrepreneurs aim to realize and therefore do not lose track of their initial goals and expectations during the first year. But there may also be a form of cognitive dissonance at play, where respondents compare business outcomes to their labor market situation prior to start-up instead of taking into account their initial expectations. This may be the case when outcomes are worse than expected at the time of start-up but still better as compared to the circumstances of the previous (wage) job. Realism may set in only at the end of the first year.

This type of hindsight bias is a disadvantage of directly asking respondents whether the outcomes meet their initial expectations. Although overoptimism of the entrepreneurs in our study is measured within the relatively short time span of one year after start-up, hindsight bias may still play a role. Future research may uncover whether the relationship between motivation and overoptimism is robust across different measures.

Small business advisors may benefit from learning about which entrepreneurs are more likely to be overoptimistic. In particular higher educated individuals who start firms in complex environments without relevant experience should be informed about, for example, potential pitfalls, underestimation of competition, project duration and the difficulty of finding customers. Given the findings in this study, it is certainly warranted to do further research into the ‘demographics’ of overoptimism (Bhandari and Deaves, 2006). Obviously, there is a debate on whether advisors can influence (would-be) entrepreneurs. Some have argued that biases and heuristics are often applied in an unconscious manner (Tversky and Kahneman, 1981) and are therefore resistant to change or modification. Others have reasoned that decision biases can be corrected through training (Fong and Nisbett, 1991; Busenitz and Barney, 1997, p. 24). Our contribution shows that overoptimism appears to be sensitive, at least to some extent, to factors related to information and motivation.

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