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A Multidisciplinary and Quantitative Study

Nielsen, Kristian

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Bringing the
Person and Environment
together in
Explaining Successful Entrepreneurship

A Multidisciplinary and Quantitative Study

Kristian Nielsen
Aalborg University, DRUID

Dissertation for the degree of Doctor of Philosophy

Preface

The dissertation you are about to read is the result of extended work on the research project "Jagten på Fremtidens Nye Vækstvirksomheder" ("The Hunt for the Future Growth Ventures") co-financed by the Danish Rockwool Foundation. This project resulted in two publications in 2009 (only in Danish) together with Pernille Gjerløv Jensen and Michael Dahl as the main coordinator. The funding of this project allowed for the completion of a larger questionnaire survey administered by Statistics Denmark which, furthermore, allowed for the respondents to be connected to longitudinal register data from IDA (Integrated Database for Labour Market Research). This data is also the basis for the dissertation.

Starting with the Danish Rockwool Foundation, a lot of people have helped shape the dissertation or created possibilities for me in one way or another. The DREAM (Doctoral Retreat on Entrepreneurship As Making) workshop in 2008 organised by Saras Sarasvathy (Darden School of Business) and Poul Rind Christensen (Designskolen Kolding) was a great inspiration for critically reviewing the methodology and the (important) research questions in entrepreneurship research. In the summer of 2009, I received the Tuborg Foundation Business Economics Award which allowed me to continue these great discussions with Sarasvathy at Darden in the spring of 2010 and later in the fall.

I am grateful for the guidance of my supervisor Michael Dahl, always taking time to answer questions, and for being a great inspiration when being new in academia. Also a grateful thanks to my second supervisor, Poul Rind Christensen, for keeping my focus on the theoretical and methodological issues in the beginning. For great co-authorship, a special thanks to Saras Sarasvathy and Carlos Freire-Gibb, who extended my knowledge of entrepreneurial learning and economic geography. The chapter co-authored with Saras Sarasvathy, "Passive and

Active Learning from Entrepreneurship” further benefited from comments by Per Davidsson, Toke Reichstein, Guido Bünstorf, and Lars Frederiksen while the chapter co-authored with Carlos Freire-Gibb, ”Entrepreneurship within Urban and Rural Areas” benefited from comments by Saras Sarasvathy, Rolf Sternberg, Philip Cooke, and Søren Kerndrup. Furthermore, the DRUID community (Danish Research Unit on Industrial Dynamics) and the IKE group (Innovation, Knowledge, and Economic Dynamics) at Aalborg University have been very helpful with constructive critique and comments through conferences and seminars as well as informal beer sessions. Finally, many thanks to Dorte Baymler and Jeanette Hvarregaard for patiently helping my with travel reimbursement and other non-academic work as well as creating a nice atmosphere to work in.

Through the development and implementation of the questionnaire survey, and for taking care of questions and problems with the register data, a lot of people at Statistics Denmark have been very helpful: Helle Månsson, Søren Leth-Sørensen, Jørn Hansen Schmidt, Peter Linde, Ellen Nielsen and Anne Merete Nielsen. Also thanks to Olav Sorenson for commenting on the very first draft of the questionnaire and for taking the time to give a very inspirational workshop on how to apply econometric methods at Aalborg University.

Finally, I would like to thank Mette and Asta for being so understanding and supportive during the up’s and down’s in work pressure and work satisfaction which is inevitable when writing a dissertation; moral support is not just important in entrepreneurship. And, furthermore, for sharing a wonderful time with me in Charlottesville when I was a visiting scholar at Darden School of Business (University of Virginia).

It goes without saying, that I alone am responsible for the final content and mistakes in this dissertation. It is my hope that the emphasis on multidisciplinary research as well as including both the inner and outer environment in the research design is evident during the read. This is something that I, retrospectively, missed when taking my Master’s degree in Economics.

Kristian Nielsen

Aalborg, October 1st, 2011

*To my daughter,
Asta*

Summary

Entrepreneurship is studied in a broad range of disciplines including psychology, sociology, and economics. However, the main research questions of interest are: why they act? (the causes of entrepreneurship), how they act? (the entrepreneurial behaviour), and what happens when they act? (the effects of entrepreneurship). This dissertation pursues the broad research questions "*Who becomes an entrepreneur?*" and "*Who makes the right decision to become an entrepreneur?*" from a multidisciplinary approach bringing together both the inner and outer environment. Through the four chapters making up this dissertation, the inner environment is an individual's three categories of means: who they are (their identity), what they know (their knowledge base), and whom they know (their networks). The outer environment is in the first part of the dissertation the entrepreneurship environment where the two research questions are studied for (potential) novice and habitual entrepreneurs. For the second part, the outer environment is defined by industry and geography for (potential) novice entrepreneurs.

Identity indicators include some of the most common entrepreneurial personality traits from the psychology literature and intrinsic and extrinsic work values as well as work involvement (i.e. value-orientation towards work and possible work-family conflict) studied in the sociology literature. Indicators for knowledge are based on the human capital literature within economics; i.e. the importance of skills and abilities often measured by different types of education and work experiences. Finally, the ego-centric social network literature within sociology dominates the indicators for networks: contact frequency and willingness to different weak ties and the presence and encouragement of entrepreneurial role models among strong and weak ties.

Looking at the novice entrepreneurs, both who they are – traits and values – and who they know – network use and entrepreneurial role models – are found to be important for new venture founding. Turning to the habitual entrepreneurs, no direct measures of identity are included but optimism seems to be prevalent among entrepreneurs since failure experience do not prevent entrepreneurs from starting again. Hence, the passive learning argument – entrepreneurs learn about their own entrepreneurial abilities only through entrepreneurship – is not supported. Interestingly, however, active learning from previous venture failure is possible but only for certain individuals. Especially, years of education and marriage (moral support) seem to affect the adaptive capacity needed for learning from failure. However, these individuals are not more likely become habitual entrepreneurs which indicates a Type I error, i.e. they do not start-up a second time even though they should, but this conclusion is based on survival as the criteria for success. Future research should challenge this conclusion by investigating the alternative options for failed entrepreneurs. For instance, by looking at earnings and work satisfaction of previously failed entrepreneurs in different occupations.

Earnings and work satisfaction are used in the study of novice entrepreneurs to assess the opportunity cost of entrepreneurship for individuals with different means. An entrepreneurial identity is found to lead to greater work satisfaction in both entrepreneurship and employment but, contrary to the expected, only to higher earnings in employment. Hence, encouraging individuals with an "entrepreneurial mindset" to enter entrepreneurship might not be the best policy but more research in this area is needed. In general, the social network is found not to influence earnings in both entrepreneurship and employment but when it comes to survival and work satisfaction among entrepreneurs, the social network is found to be crucial. Finally, even though years of education has no effect on the likelihood of entering entrepreneurship for the first time, these individuals should enter to a lesser extent when assessing opportunity cost both in terms of earnings and work satisfaction. Given the political focus on encouraging academic entrepreneurship, both chapters provide important findings to spur future research.

The findings related to industry and geography emphasise the importance of bringing the person and environment together in explaining entrepreneurship. Starting with the industry environment, the study supports expected hypotheses related to the role of personal abilities and start-up strategies but it also reveals novel findings that call for further research. Initially, industry profitability and uncertainty are found to have the expected positive and negative effect,

respectively, on new venture performance. As is the case with the first part of the dissertation, the years of education is found to be an interesting indicator. In high profitability industries, education is positively related to new venture performance while the diametrical opposite is found in high uncertainty industries. Nevertheless, highly educated individuals are found to enter less profitable and more uncertain industries. Future research should investigate this further. One approach could be to examine if these findings could be explained by more causal compared to effectual reasoning for highly educated individuals. As expected, in uncertain industries, individual tolerance of ambiguity and ownership with others are more important for new venture performance.

Turning to the geographical environment, survival in urban areas are initially found to be less likely for new ventures. Even though the three indirect measures of individual creativity are found to have a positive effect on the likelihood of being an entrepreneur, independent of geographical setting, the direct measure is only found to have a positive effect in urban areas. The latter supports the view of individual creativity as being only a latent capacity for entrepreneurship which calls for a supportive environment to be utilised. However, taking all four indicators together, more research needs to be done in this area. Moreover, the recent political focus on the importance of learning to be creative and innovative with the aim of future occupational choice and labour market performance further emphasises this research. Nevertheless, none of the indicators for creativity are found to be important for firm survival in urban and rural areas. More unambiguous findings occur when turning to the role of the social network. The social network indicators – network contact and presence of entrepreneurial role models – are significant predictors of new venture founding. However, a positive effect of the network on survival is almost exclusively present in rural areas. Future research should further pursue whether the assumed general importance of the social network is non-existing in urban areas. Especially, if entrepreneurship allegedly is an urban phenomenon.

Most importantly, this dissertation assesses whether the entry decision is right or wrong by understanding the opportunity cost of entrepreneurship, learning from entrepreneurship experience, and whether some environments are more fit for certain individuals. It is the hope of the author that a better understanding of these mechanism through multidisciplinary research will be pursued in the future, resulting in a more in-depth political debate about the fostering of entrepreneurship.

Resumé

Iværksætteri er undersøgt inden for en bred vifte af forskellige forskningsområder, herunder psykologi, sociologi og økonomi. De tre hovedspørgsmål er dog som regel: Hvorfor de handler (årsager til iværksætteri), hvordan de handler (iværksætter-adfærd) og hvad sker der, når de handler (effekter af iværksætteri). Denne afhandling forfølger de brede forskningsspørgsmål *"Hvem bliver iværksætter"* og *"Hvem foretager det rigtige valg at blive iværksætter"* ud fra en tværfaglig tilgang, hvor det indre og ydre miljø bringes sammen. Det indre miljø er i afhandlingens fire hovedkapitler defineret som personens tre kategorier af ressourcer: Hvem de er (deres identitet), hvad de ved (deres vidensbase) og hvem de kender (deres netværk). Det ydre miljø er i afhandlingens første del defineret som iværksætter-miljøet, hvor de to forskningsspørgsmål er undersøgt for henholdsvis (potentielle) førstegangs-iværksættere og genstartere. I afhandlingens anden del, omhandlende (potentielle) førstegangs-iværksættere, er det ydre miljø defineret ved branche-karakteristika og geografisk område.

Indikatorer for identitet indbefatter nogle af de mest anvendte personlige karaktertræk inden for psykologien samt indre og ydre arbejdsværdier og arbejdsinvolvering (dvs. værdi-orientering til arbejde og mulig arbejde-familie konflikt) fra sociologi-litteraturen. Indikatorer for vidensbase er baseret på human-kapital-litteraturen inden for økonomi; dvs. betydningen af evner og færdigheder ofte målt ved forskellige typer af uddannelse og erhvervs erfaring. Sidst dominerer litteraturen omhandlende det egocentriske personlige netværk inden for sociologien indikatorerne for netværk: Kontaktfrekvensen og kontaktvilligheden til forskellige svage relationer samt tilstedeværelse og opbakning fra iværksætter-rollemodeller blandt stærke og svage relationer.

For førstegangs-iværksættere gælder, at både hvem de er – karaktertræk

og værdier – og hvem de kender – anvendelse af netværk og iværksætterrollemodeller – er vigtigt for at starte en ny virksomhed. For genstartere er ikke inkluderet mål for identitet, men optimisme synes at være til stede hos iværksættere, siden virksomhedslukning ikke afholder iværksættere fra at starte op igen. Følgelig afvises argumentet om passiv læring; iværksættere opnår viden om deres evner som iværksætter gennem iværksætteri. Det er dog interessant, at aktiv læring fra iværksætteri synes at være mulig for bestemte personer. Især længden af videregående uddannelse og ægteskab (moralsk opbakning) er bestemmende for en persons kapacitet til at lære fra virksomhedslukning. Disse personer er dog ikke mere tilbøjelige til at blive genstartere, hvilket indikerer Type I fejl – personer starter ikke op igen selv om de burde – men denne konklusion hviler udelukkende på virksomhedsoverlevelse som succesmål. Videre forskning kan udfordre konklusionen ved at undersøge de alternative muligheder for iværksættere, der er lukket ned med deres virksomhed. Eksempelvis ved at studere indkomsten og arbejdstilfredsheden for tidligere iværksættere i forskellige stillinger.

Indkomst og arbejdstilfredshed er netop inddraget i studiet af førstegangs-iværksættere med henblik på at vurdere alternativomkostningen af iværksætteri for personer med forskellige ressourcer. Det findes, at en iværksætter-identitet medfører højere arbejdstilfredshed både som iværksætter og lønmodtager, men modsat forventet, medfører det udelukkende en højere indkomst som lønmodtager. At tilskynde disse entreprenante personer til at blive iværksætter er derfor ikke nødvendigvis den bedste politik, men mere forskning er tiltrængt. Generelt har det personlige netværk ikke indflydelse på indkomsten som iværksætter eller lønmodtager, men det personlige netværk er afgørende, når det gælder overlevelse og høj arbejdstilfredshed som iværksætter. Sidst gælder, at selvom længden af videregående uddannelse ikke har indflydelse på sandsynligheden for at blive iværksætter for første gang, så burde færre højtuddannede vælge at starte som følge af alternativomkostningen ved iværksætteri; både målt ved indkomst og arbejdstilfredshed. Set i lyset af det politiske fokus på akademisk iværksætteri er begge kapitler derfor interessante som udgangspunkt for videre forskning.

Resultaterne vedrørende branche-karakteristika af geografisk område understreger betydningen af at bringe personen og det ydre miljø sammen i forskningen af iværksætteri. Startende med branche-karakteristika understøttes forventede hypoteser omkring betydningen af personlige evner og opstarts-strategier,

men der afdækkes også nye resultater, der kræver videre forskning. Indledningsvist findes profitabilitet og usikkerhed inden for en branche at have henholdsvis den forventede positive og negative effekt på virksomhedens succes. Resultaterne knyttet til længden af videregående uddannelse er, som i første del af afhandlingen, interessante. I brancher med høj profitabilitet er uddannelse positivt forbundet med virksomhedssucces, mens det diametralt modsatte er tilfældet i brancher kendetegnet ved høj usikkerhed. Alligevel er højtuddannede mere tilbøjelige til at starte op i brancher kendetegnet ved lav profitabilitet og høj usikkerhed. Videre forskning kan med fordel belyse dette yderligere. En mulighed ville være at undersøge, om disse resultater skyldes en mere kausal tankegang (i forhold til en "effectual" tankegang) hos højtuddannede. I brancher med høj usikkerhed findes individuel usikkerhedstolerance og medejerskab, som forventet, at have en større betydning for virksomhedens succes.

Angående det geografiske område findes indledningsvist, at nye virksomheder i større byområder har en mindre sandsynlighed for at overleve. Tre indirekte mål for personlig kreativitet findes at have en positiv indflydelse på sandsynligheden for at blive iværksætter, uafhængig af geografisk område, men det direkte mål for kreativitet har udelukkende en positiv indflydelse i byområder. Sidstnævnte understøtter, at kreativitet udelukkende er en latent kapacitet for virksomhedsopstart, der kun anvendes, hvis det ydre miljø er tilskyndende. Baseret på alle mål gælder dog, at mere forskning er krævet for at understøtte dette. Det nylige politiske fokus på individuel kreativitet og innovationsevne med henblik på fremtidig beskæftigelsesvalg og præstation på arbejdsmarkedet motiverer yderligere videre forskning. Ingen af de fire mål for kreativitet findes dog at have en positiv indflydelse på virksomhedsoverlevelse i by- eller landområder. Mindre tvetydige resultater fremkommer, når fokus rettes mod det personlige netværk. Kontakt til flere og tilstedeværelse af iværksætter-rollemodeller er signifikante indikatorer for virksomhedsopstart. Den positive effekt af det personlige netværk på virksomhedsoverlevelse er dog næsten udelukkende tilstede i landområder. Videre forskning kunne derfor forfølge, hvorvidt det positive billede af det personlige netværk fra litteraturen ikke inkluderer byområder. Især hvis iværksætteri angiveligt er et bymæssigt fænomen.

Af størst betydning vurderer denne afhandling, hvorvidt opstartsbeslutningen er den rigtige eller forkerte ved at forstå alternativomkostningen af iværksætteri, læring fra iværksætteri, og ydermere om nogle iværksætter-miljøer passer bedre til bestemte personer. Det er forfatterens håb, at en bedre forståelse af disse mekanismer gennem tværfaglig forskning vil blive forfulgt i fremtiden, resulterende i en mere dybdegående politisk debat omkring iværksætteri.

Contents

Preface	I
Summary	V
Resumé	IX
Contents	XIII
1 Synopsis	1
1.1 Research path-dependency	2
1.2 Research designs	4
1.3 Delimitating choices	8
1.4 The two main parts	14
1.5 The political context	19
1.6 Limitations and future research	21
I Entering and Re-entering the Entrepreneurship Environment	31
2 The Opportunity Cost of Entrepreneurship	33
2.1 Introduction	33
2.2 Theory	36
2.3 Method	49
2.4 Results	54
2.5 Discussion	64
2.6 Conclusion	67

3	Passive and Active Learning from Entrepreneurship	81
3.1	Introduction	81
3.2	Theory	84
3.3	Method	89
3.4	Analysis	95
3.5	Results	99
3.6	Discussion	104
3.7	Conclusion	105
II	The Entrepreneurship Environment: Industry and Geography	121
4	Entrepreneurship and Industry Environment	123
4.1	Introduction	123
4.2	Theory	126
4.3	Methodology	135
4.4	Results	139
4.5	Discussion	150
4.6	Conclusion	152
5	Entrepreneurship within Urban and Rural Areas	161
5.1	Introduction	161
5.2	Theory	164
5.3	Methodology	170
5.4	Results	176
5.5	Discussion	183
5.6	Conclusion	185
III	Appendix	199
A	Methodology	201
A.1	Register and survey data	201
A.2	Sampling design and issues	203
A.3	Non-response analysis	204
A.4	The economic context of the survey	211

1

Synopsis

Entrepreneurship is studied in a broad range of disciplines using theories from psychology, sociology, and economics to name some of the most common frameworks. However, the main research questions of interest can be traced back to one of the three basic questions (Stevenson and Jarillo, 1990; Landström, 1999): (1) Why they act? - the causes of entrepreneurship, (2) How they act? - the entrepreneurial behaviour, and (3) What happens when they act? - the effects of entrepreneurship.

This dissertation pursues the causes and effects of entrepreneurship by answering the broad research questions: *"Who becomes an entrepreneur?"* and *"Who makes the right decision to become an entrepreneur?"*.

These questions are studied within psychology by focusing on personal traits, cognitive styles, attitudes, and values. In comparison, sociologists have emphasised the importance of inter-personal networks, culture, and environment. Finally, within economics the focus is usually on human capital (often different types of education and work experiences) and the opportunity costs of becoming an entrepreneur (often the income from working in an established firm).

As a consequence of the multidisciplinary nature of entrepreneurship theory, boundary breaking theoretical frameworks have appeared in the literature. For instance, Sarasvathy (2008) refers to the three categories of entrepreneurial means as the point of departure for expert entrepreneurs when making new venture opportunities. These means are: (1) Who they are - their identity, (2) What they know - their knowledge base, and (3) Whom they know - their networks. Even though this framework calls for empirical studies including explanatory variables from each category, this is rarely done, most likely because

1. Synopsis

of data availability and path-dependency in research focus.

This dissertation contributes to the few existing multidisciplinary empirical studies by adopting the above framework by Sarasvathy (2008).

1.1 Research path-dependency

Outlining a satisfactory review of the directions taken within entrepreneurship research over time is a task that deserves a dissertation in itself. The following short review will be based on the exhaustive work on the roots of entrepreneurship research by Landström (1999, 2010).

	Transformation	Research	Focus
1845-1875	Mechanized factories and railways	Economics	<i>Entrepreneurship as a function of the market</i>
1890-1920	Modern industrial society	Economics	<i>Entrepreneurship as a function of the market</i>
1930-1960	Electrification and automobiles	Behavioral sciences	<i>The entrepreneur as an individual (traits)</i>
1975-2000	Electronics	Industrial organization and management studies	<i>Entrepreneurship and small business as a process</i>

Table 1.1: Linkage between societal development and entrepreneurship research (Landström, 2010).

Table 1.1, taken from Landström (2010), shows the linkage between societal development (transformation) and the influence on entrepreneurship research. Landström (2010) makes the argument that entrepreneurship research thrives in periods of powerful dynamics and developments in society with the research peak occurring at the end of the period of transformation. From the table can be seen that the economics era of entrepreneurship research took place in the period 1845-1920. The research focus in this period was on entrepreneurship as a function of the market. Different theories of these functions were propounded and later categorized into (Parker, 2004; van Praag, 2005): arbitrage and the bearing of uncertainty (Cantillon, Kirzner, and Knight), co-ordination of factors of production (Say, and Casson), innovation (Schumpeter), and leadership and motivation (Liebenstein). After World War II the research focus changed as a consequence of the present need for entrepreneurship and development in the post-war society (Landström, 1999). The research changed from seeing the entrepreneur as a function of the market to seeing the entrepreneur as an individual with certain traits; being able to identify these entrepreneurial traits means being able to identify the entrepreneur in the crowd. Hence, entrepreneurship was now being widely studied within the behavioral sciences. Since

the role of personality traits have been devoted a great deal of attention in the entrepreneurship literature - and in this dissertation - it is worth elaborating more.

1.1.1 Importance of personal traits

Numerous traits have been connected to entrepreneurs within the literature but some are by far more common in the paper-and-pencil empirical research (Hisrich et al., 2005; Parker, 2004; Kirby, 2003; Cromie, 2000): Tolerance of ambiguity, risk taking ability, feelings about locus of control, creativity and innovativeness, need for achievement, and desire for autonomy. As an example, individual tolerance of ambiguity, i.e. the ability to deal with situations characterized by uncertainty and incomplete information, is assumed to be related to: the realization of a new business, the management of a new business, and the performance of a new business. The arguments put forth are that individuals with a high tolerance of ambiguity are: more likely to found a new venture in light of the great uncertainty of the future performance of the venture, more willing to manage the new business alone or start up in more uncertain environments, and more likely to thrive and continue the entrepreneurial career which creates the basis for venture growth.

Although, some studies find many of these traits to successfully differentiate entrepreneurs from others (Caird, 1991; Cromie and O'Donaghue, 1992; Koh, 1996), the general consensus is that the empirical research taken together provides inconclusive results (Sarasvathy, 2004; Cromie, 2000; Gartner, 1988). Critical assessments of the traits approach to entrepreneurship – with Gartner (1988) being one of the most popular – have now resulted in very few studies following this approach. The critical points are many and includes the following: different definitions of an entrepreneur make comparisons between studies difficult (see the theories of the entrepreneur above), different assumptions about the association between behaviour and inferred personality, lack of agreement on the context for behaviour (e.g. all situations, work situations, or entrepreneurial situations), lack of agreement on the essential traits that define the entrepreneur, personality traits are not innate and stable over time, different types of entrepreneurs call for the use of different personality traits, entrepreneurial capacity in the form of personality traits is only a latent capacity that needs a precipitating event for entrepreneurial behaviour, entrepreneurship is behavioural and these behaviours cease once organization creation is over (Cromie, 2000; Gartner, 1988; Sarasvathy, 2004).

1. Synopsis

The solution to this harsh critique, according to Gartner (1988), is to change the research from focusing on causes of entrepreneurship within psychology to entrepreneurial behaviour within management. Or put another way, to ask the question "how do entrepreneurs act?" instead of asking "why do entrepreneurs act?". The move in this research direction is also what is indicated in Table 1.1. However, other directions have also been pursued in studying the causes of entrepreneurship. Aldrich and Zimmer (1986) and Granovetter (1985) were among the first to criticize that the decision to become (or remain) an entrepreneur is dependent on individual rationality or personal traits. Instead they emphasised the role of significant others in an individual's environment, e.g. family, friends, co-workers, employers, and casual acquaintances, which has given rise to the many social network studies within entrepreneurship research. Economists, on the other hand, still focus on the individual and explain entrepreneurial entry and exit by occupational choice models where individuals maximize their income (or utility) by choosing between the uncertain income in entrepreneurship and the more certain income from working in an established firm. Finally, psychologists still try to answer the question but now by focusing on cognitive styles, attitudes, and values or trying to cope with the personal traits critique by ensuring validity and reliability in the measures. For instance by using the acknowledged "Big Five" personality traits: i.e. openness, conscientiousness, extraversion, agreeableness, and neuroticism. Recently, however, entrepreneurship researchers have called for more multidisciplinary studies in order to make significant contributions to the literature (Landström, 1999; Sarasvathy, 2004, 2008). Or as it is stated in Grebel (2007):

"Research on entrepreneurship has to take into account the complexity of all possible determinants that induce entrepreneurship. Traits may not be a unique determinant which is crucial for an individual's entrepreneurial actions but they will definitely increase an individual's propensity to entrepreneurial behaviour given a certain economic, sociological and cultural background." (Grebel, 2007, p.152)

1.2 Research designs

This section discusses the general research design used for the analyses in the dissertation. Special emphasis is on bringing theories from different disciplines together as well as bringing the inner and outer environment together. How this is done is best explained from Figure 1.1 which represents common research designs within entrepreneurship. Through the four chapters making up this dissertation, the inner environment is an individual's three categories of

1.2. Research designs

means, i.e. identity, knowledge, and networks. The outer environment is in the first part of the dissertation the entrepreneurship environment where the two research questions are studied for (potential) novice and habitual entrepreneurs. For the second part, the outer environment is defined by industry and geography for (potential) novice entrepreneurs.

The remainder of the synopsis is devoted to: a discussion of the delimitating choices in order to conduct the empirical analyses, a summary of the main contribution and findings of the two parts, a description of the entrepreneurship policy context of the findings, and, finally, an outline of the main limitations of the analyses with suggestions for future research.

1.2.1 The inner and outer environment

The general research design for this dissertation is best illustrated from Figure 1.1 inspired by Sarasvathy (2004, 2008), Shane (2003), Parker (2004), and Landström (1999).

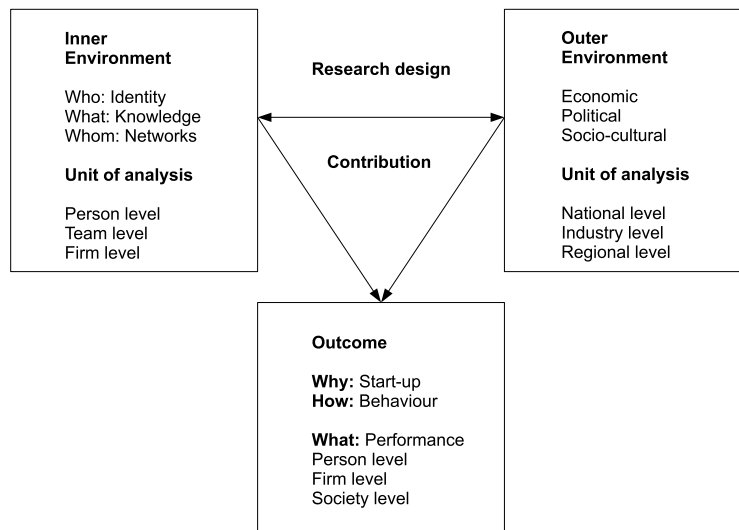


Figure 1.1: Common designs found in entrepreneurship research. Inputs from Sarasvathy (2004, 2008), Shane (2003), Parker (2004), and Landström (1999).

The upper left corner of Figure 1.1 illustrates what Sarasvathy (2004) named the inner environment in entrepreneurship research. Studies here include those linking personal traits to new venture founding. More general, these studies try

1. Synopsis

to link the three categories of entrepreneurial means, i.e. identity, knowledge, and networks (Sarasvathy, 2008), to a specific outcome of interest in entrepreneurship research. Examples are: Koh (1996) looking at personal traits and entrepreneurial inclination among business students, Agarwal et al. (2004) looking at generation, development, and survival of "spin-out" ventures (i.e. employees leaving their firm to start their own venture), and Nanda and Sørensen (2010) looking at whether the likelihood of becoming an entrepreneur is affected by the entrepreneurial experience of workplace peers. The unit of analysis, however, do not need to be the individual. For instance, more focus on the founding team (Davidsson, 2005, 2008) or all the human resources present in the firm is often called for in the literature. For comprehensive work on the role of human resources within the firm and firm performance using longitudinal register data, see Timmermans (2010).

The outer environment in entrepreneurship research can be found in the upper right corner of Figure 1.1. Shane (2003) introduces three main categories for the outer environment with multiple subcategories: The economic, political, and socio-cultural environment. Also here the level of analysis becomes important. For instance, should the economic environment of a new firm be measured on national, industry, or regional level? (e.g. demand measured by national, industry, or regional growth). The same choices have to be made when looking at the political environment (e.g. regulations and legal proceedings of IP violations) or the socio-cultural environment (e.g. social attitudes to entrepreneurship and entrepreneurial activity). Examples of empirical studies on these three levels are: Carree et al. (2002) looking at the linkage between number of business owners and economic development in 23 OECD countries, Dean et al. (1998) looking at the impact of industry characteristics on large and small business formation in US manufacturing industries, and Bosma and Nieuwenhuisen (2002) looking at the effect of firm entry and exit on productivity in 40 Dutch regions.

The outcome of interest in entrepreneurship research can be related to the three main questions mentioned before, i.e. the "why?, how?, and what?"; see the bottom of Figure 1.1. Answering the why question often means comparing entrepreneurs with non-entrepreneurs (or nascent entrepreneurs with non-nascent entrepreneurs) while answering the how question often means comparing how the resources necessary for new venture creation and management are acquired and used (e.g. skills and abilities, information, customers and suppliers, capital and labour). Answering the question – "what happens when entrepreneurs act?" – can be studied from different levels of performance. The highest level is the

1.2. Research designs

society level where research often focus on productivity growth, competition enhancement, and job creation created by new ventures in society. The middle level is the firm level where popular measures of performance are survival and growth in profits, sales, and employees. The general results in research using data from advances economies show that around half of new ventures closes within the first three years (Mata and Portugal, 1994; Dahl et al., 2009; van Praag, 2005) which has labelled this period "the valley of death" in the literature (Stam et al., 2008). Moreover, only a small share of new ventures experience high growth (Dahl et al., 2009). Finally, the lowest level is the personal level. This level has been given less attention in the empirical research perhaps as a consequence of data availability on individual earnings, work satisfaction, work-family conflict, stress, and health; for a unique study of the latter see Dahl et al. (2010). This data is often less available than data on firm performance but in the literature is emphasised that the success of the entrepreneur is not necessary equal to the success of the new venture. A short-lived firm is not a failure for the entrepreneur from the real options view of entrepreneurial learning and high firm growth could be stressful and conflicting with the entrepreneur's plan for the new firm.

The main problem with the existing empirical studies is that they only focus on one of the environments, the inner or outer environment, in studying a specific outcome of interest in entrepreneurship (Sarasvathy, 2004). Hence, they do not take into account the interdependency of inner and outer environment explanatory factors which is also the basic idea of the "individual-opportunity nexus" put forth by Shane (2003).

1.2.2 The born and made view

The need to combine the inner and outer environment in order to push the frontiers of entrepreneurial research is in accordance with the made view of entrepreneurship. Table 1.2, taken from (Nielsen et al., 2009), outline important differences between the born and made view in entrepreneurship research.

The born view originates from the behavioral science period of entrepreneurship research; see Table 1.1. Researchers taking the born view see entrepreneurs as super-individuals given that they possess certain inborn personality traits, e.g. high tolerance of ambiguity and high need for achievement. Hence, once an entrepreneur always an entrepreneur. The harsh critique of the born view, outlined earlier, changed the research into different directions. However, the made view of entrepreneurship provides a more general framework for future

1. Synopsis

	Born	Made
Who is the entrepreneur?	A special super-individual	Everyone is a potential entrepreneur
View of the entrepreneur	Stable over time - once an entrepreneur always an entrepreneur	The entrepreneur is created through a process
Stimulation	Internal characteristics	Internal and external factors
Focus in research	Characteristics associated with the entrepreneurial personality	The interacting individual and contextual factors that create individuals, cognitive processes, and identity
Goals of research	To be able to predict and spot the entrepreneur in the crowd	To understand the entrepreneur and how an entrepreneur is created

Table 1.2: The born and made view of entrepreneurship (Nielsen et al., 2009).

research, taking into account both individual and contextual factors.

In the made view, the entrepreneur is created through a process which means that everyone is a potential entrepreneur. This is in line with the argument made by Sarasvathy (2004) that the group of natural-born entrepreneurs and non-entrepreneurs, respectively, will be relatively small if even existing. Nevertheless, the made view still regard individual factors – e.g. identity, knowledge, and networks – but they have to be seen in relation to contextual factors – e.g. the economic, political, and socio-cultural environment. Hence, individual and contextual factors are both only latent capacities for entrepreneurship. Sarasvathy (2004) suggests that researchers still interested in personal traits should improve the research design by focusing on a bounded sample. Examples could be to study if traits can explain who chooses to found a new venture for a sample of individuals in the same situation; e.g. they are confronted with occupational choices (e.g. experience lay-off) or they have a possible idea for a business (e.g. invent a patent). The latter is studied in Markman et al. (2002), using a bounded sample of patent inventors where some founded a business while others did not. Summing up, the made view focus on the interaction of individual and contextual factors with the goal of understanding the entrepreneur and how an entrepreneur is created. This is in contrast with the born view where the goal of the research is to predict and spot the entrepreneur in the crowd.

1.3 Delimitating choices

In order to answer the main research questions *"Who becomes an entrepreneur?"* and *"Who makes the right decision to become an entrepreneur?"* using explanatory variables from different disciplines and taking into account both personal

1.3. Delimitating choices

and environmental characteristics, several delimitating choices have to be made. This section will discuss these starting with the most important: the definition of an entrepreneur and entrepreneurship.

1.3.1 The entrepreneur

For defining an entrepreneur, it is important to recognise the different theories of the entrepreneur outlined earlier; e.g. the entrepreneur as a bearer of uncertainty, a co-ordinator of resources, or an innovator.

The simple solution – which has been widely used in the empirical studies – is to define new business owner managers as entrepreneurs. The objection against this is that it contains individuals that do "business as usual" – i.e. that they do not introduce products or services that are new to the firm or new to the market (Davidsson, 2008) – and, therefore, are not innovators that contribute to advances in society. Furthermore, these individuals might not be very likely to experience high growth and contribute to job creation in society; e.g. business owner managers in lawn care and hair salons (Bhidé, 2000).

These objections have led to more focus on entrepreneurship in high-tech industries to better capture the likely innovators and job creators but many do not see the problem of including "business as usual" entrepreneurs in their studies. Even if a new business is founded with an existing business in mind, the process of realising and running the new business cannot be completely imitated, thus, rejecting the "business as usual" possibility (Davidsson, 2008). Moreover, Bhidé (2000) shows that entrepreneurs behind promising start-ups (i.e. Inc. 500 companies in the US) often lack a novel idea and valuable experience and are, as a consequence, capital constrained. Nevertheless, these entrepreneurs experience high growth with their venture.

Finally, separating innovative from non-innovative entrepreneurs is not an easy task which requires a more qualitative approach. As a consequence, this dissertation defines entrepreneurs as all new business owner managers within the private sector. Furthermore, the business has to have "real activity" based on industry-specific turnover and full-time equivalent employee requirements. Accordingly, entrepreneurship is defined as the creation of a new business (legal unit) with real activity.

With the research questions in mind, the unit of analysis is chosen to be person level and not team level or firm level (see Figure 1.1), both when explaining

1. Synopsis

start-up and subsequent performance. This can be justified by the fact that most new ventures only have one founder or very few co-founders; new firms usually start with a phase of self-employment with no employees (Carree and Thurik, 2003). Even if the new business contains a founding team and employees, it most likely still involves too few persons to effectively allow for analyses including indicators for founding team structure or firm human resources. It is also likely that the founders (and employees) of a new small business share the same characteristics given that strong ties are characterised by homophily and strong ties are more likely to start a business together (Ruef et al., 2003). Hence, controlling for co-founders and employees in the analyses are assumed to be sufficient.

The next section will be devoted to a short description of the data used in the dissertation followed by a discussion of methodological issues related to the sampling of entrepreneurs. More information on the data, including a non-response analysis of the survey, can be found in Appendix A.

1.3.2 Methodological issues

The data used is longitudinal register data which can be connected to a one-off questionnaire survey conducted in 2008. The longitudinal registers in IDA (Integrated Database for Labour Market Research) contain information on the entire population of individuals and firms in Denmark from 1980 onwards and the main founder behind every new business started in the period 1994 onwards can be found in the entrepreneurship registers. IDA information up to 2004 was used for the sampling of the survey. The following four strata, covering the working age population, was chosen: *first-time entrepreneurs, experienced entrepreneurs, former entrepreneurs, and never entrepreneurs*. Approximately 10,000 individuals were sampled, largely oversampling the first-time entrepreneurs, and around one third returned the questionnaire.

Even though this data is more detailed compared to that often used in other studies, some methodological issues still exist. The first concerns the population from which the random sample for the questionnaire survey is drawn. A broad population, e.g. all entrepreneurs in a country, is often seen as desirable. However, this might result in a highly heterogenous sample which the theory can not embrace. Or as it is put in Sarasvathy (2004): "*All entrepreneurs are not alike: nor are all non-entrepreneurs similar*" (Sarasvathy, 2004, p.711). There are more ways of dealing with this issue: (1) Choose a bounded sample (e.g.

1.3. Delimitating choices

novice entrepreneurs, urban entrepreneurs, or high-tech entrepreneurs), (2) Include control variables to account for different entrepreneurs (e.g. first business, urban area, high-tech industry), or (3) Use the sources of heterogeneity as moderator variables (e.g. first business, urban area, high-tech industry).

Solution (3) includes the research design combining the person and environment – e.g. the role of tolerance of ambiguity for new venture start-up in high and low tech industries, respectively – but also other combinations. This could be the role of X on Y for different values Z , X and Z being two factors both related to either the person or the environment. Solution (3) is less common in the empirical literature but will be pursued in this dissertation.

Closely connected to this issue is the need for appropriate control groups when comparing entrepreneurs and non-entrepreneurs. An often used approach has been to compare entrepreneurs and managers (an assumed matched sample) while it might be theoretically more valid to compare individuals that have experienced the same situation (e.g. lay-off or patenting) or have the same means (e.g. identity, knowledge, and networks).

Finally, the researcher has to be aware of the three common types of bias when using survey data to study entrepreneurship: selection bias, non-response bias, and retrospective bias. This research is well suited for the first two types given that the longitudinal register data for the entire Danish population was used for the survey sampling and non-response analysis; see Appendix A. However, the possibility of retrospective bias exist as only information up to 2004 could be used for the sampling. To avoid retrospective bias in answering why some people become entrepreneurs, it would be desirable to survey individuals before they become entrepreneurs or not.

The problem can be illustrated by the following example. If entrepreneurs and non-entrepreneurs are asked about their risk-taking propensity – post-start-up for the group of entrepreneurs – entrepreneurs might be found to be more risk-taking than non-entrepreneurs because their perception of self changes after the start-up; for instance due to reactions from others (Cromie, 2000). Hence, in this example it might not be higher risk-taking that caused entrepreneurship even though the data indicates this; it might as well have been situational factors like unemployment or an unsatisfying work situation. Nevertheless, if personality traits like risk-taking propensity is seen as inborn and stable over time, it is not an issue to survey individuals many years after start-up (Gartner, 1988).

1. Synopsis

Some authors have tried to accomodate retrospective bias by focusing on nascent entrepreneurs instead af entrepreneurs who already have some venturing experience (Davidsson and Honig, 2003; Koh, 1996). However, this often creates problems of its own. If just drawing a random sample of individuals of working age, the sample size needs to be very large in order to get enough individuals that later become (nascent) entrepreneurs. Given the capital constraint of researchers, this options is not feasible. Instead, the sample has to be drawn from populations where the likelihood of becoming an entrepreneur is high, e.g. a sample of business students, which trades of the possible retrospective bias with possible selection bias.

The empirical studies looking at nascent entrepreneurs could be misleading if the dependent variable is intended start-up. Based on a sample of previously failed entrepreneurs, Schutjens and Stam (2006) find that out of the many factors that can explain intended start-up, only being located in an urban region can explain realized start-up.

Retrospective bias is not seen as a significant problem in this research because of the short time-lag between start-up and survey time for the oversampled group of novice entrepreneurs. On the contrary, the time-lag can be used as an advantage as the survey contains information about entrepreneurial performance.

1.3.3 Entrepreneurial means

This research takes up the task of pursuing a multidisciplinary approach. This will be most visible when looking at the indicators created for the individual's three categories of means: identity, knowledge, and networks. IDA is the basis for creating knowledge indicators (and personal demographic controls) while the survey is the basis for identity and ego-centric social network indicators (and controls regarding start-up circumstances and strategies). In the following is shortly outlined the underlying theory for the indicators created. For a more detailed review of theory and existing surveys used for inspiration for the questionnaire, see Chapter 2 (theories) and Appendix A (surveys).

Identity indicators include some of the most common entrepreneurial personality traits from the psychology literature (Hisrich et al., 2005; Parker, 2004; Kirby, 2003; Cromie, 2000): Tolerance of ambiguity, Risk taking ability, feelings about locus of control, creativity and innovativeness, need for achievement,

1.3. Delimitating choices

and desire for autonomy. Moreover, intrinsic and extrinsic work values studied in the sociology literature are included (Kalleberg, 1977). The former are values related to the work tasks, e.g. the work strengthens skills and abilities, while the latter are values not related to the work tasks, e.g. the work provides a high income. Finally, work involvement is included by indicators for the value-orientation towards work (Lodahl, 1964), e.g. work serves more functions than a source of income (Fagin and Little, 1984; Furnham, 1990), and the possibility of work-family conflict (Parasuraman and Simmers, 2001) indicated by neglecting family life activities because of work. Indicators for knowledge are based on the human capital literature within economics; i.e. the importance of skills and abilities often measured by different types of education and work experiences (Parker, 2004; Davidsson and Honig, 2003). Finally, the ego-centric social network literature within sociology dominates the indicators for networks: the contact frequency and contact willingness to different groups of the social network regarding work-related help (Dubini and Aldrich, 1991; Brüderl and Preisendörfer, 1998), the use and characteristics of different groups in the social network regarding important decisions (Burt, 2000), and the presence and encouragement of entrepreneurial role models among different groups of the social network (Davidsson and Honig, 2003; Nanda and Sørensen, 2010; Bosma et al., 2011).

Summing up, the data allows for the creation of several indicators within each of the three categories of means. All, *a priori*, assumed to be important for explaining entrepreneurship based on different theoretical frameworks. For instance, within the identity category can be constructed indicators for all traits and all values included in the survey. This calls for reflections on the number of indicators to be included in the statistical analyses. On the one hand, including all possible indicators and relying on statistical test for rejecting specific hypotheses could make the theory section extensive and the purpose of the study confusing. Hence, the study should focus on core indicators based on theory even though this in reality often means the core theory included being the theory behind (the most interesting) significant findings. On the other hand, including more indicators allows for comparing the importance of different theories on a given sample with specific characteristics. Hence, it contains more information. As noted earlier, this research already goes further than many existing studies in including indicators from all three categories of means. Therefore, this dissertation only includes a limited number of aggregate indicators from each category.

In general the above is part of an ongoing debate in the theory of science where the view taken in this dissertation tends to be in accordance with that

1. Synopsis

of Popper's student Lakatos: *"In Lakatos's view, Popper's methodological rule to reject a theory that is falsified is useless because every theory is falsified on some dimension. Instead, he proposes to judge the success of a research program both by what it explains (novel facts predicted, anomalies resolved) and by what it fails to explain (anomalies discovered or reinstated)."* (Hoover, 2005, p.14).

Finally, it should be noted that the many different theories included in the questionnaire survey come at a price. Each theory (indicator) is based on only a few survey items which is conflicting with the extent of some established scales in the literature. However, this relates mainly to the measurement of personality traits.

1.4 The two main parts

With the personal factors of importance outlined above, i.e. the three categories of means, this section will be devoted to the environment. The dissertation answering the questions *"Who becomes an entrepreneur?"* and *"Who makes the right decision to become an entrepreneur?"* can be divided into two main parts based on the environment. The two chapters of the first part deal with entry and re-entry into the entrepreneurship environment while the two chapters of the second part deal with entry into different entrepreneurship environments given by industry and geography. The general findings for each part can be found in the following while detailed findings are reserved to the chapters.

1.4.1 The environment: Entrepreneurship

The reasons why the entrepreneurship environment is assumed to be different from the employee environment can perhaps best be deduced from the theories outlined so far. From the identity literature is emphasised that entrepreneurship involves the undertaking of risk and uncertainty (Cromie, 2000), as well as high work involvement, but allows for the enjoyment of intrinsic work characteristics like autonomy, flexibility, and skill utilization (Hundley, 2001). However, the enjoyment of extrinsic work characteristics like high income and fringe benefits are foregone (Hamilton, 2000). The network literature emphasises the social skills required in entrepreneurship given the constant search for information, customers and suppliers, capital and labour (Brüderl and Preisendörfer, 1998; Aldrich and Zimmer, 1986). Hence, entrepreneurship is a networking activity. These characteristics make certain individuals more likely to successfully found and continue a new venture.

1.4. The two main parts

The first two chapters explore this for two types of entrepreneurs: first-time entrepreneurs (novice entrepreneurs) and restarters (habitual entrepreneurs). Many studies do not differentiate entrepreneurs on the basis of entrepreneurial experience which is problematic as the research taken together shows differences related to the motivation for starting a new venture, the characteristics of the founder, and the performance of the new venture for novice and habitual (i.e. serial and portfolio) entrepreneurs (Ucbasaran et al., 2006).

The first chapter stands out from previous studies by going further than explaining entry into entrepreneurship by given entrepreneurial means. After confirming these relationships for individuals with no previous entrepreneurial experience, the chapter explores the role of all three categories of entrepreneurial means for success, not just as an entrepreneur, but also as an employee working for an established firm. While studies of the former can be found in the existing literature, studies of the latter are non-existing – Hartog et al. (2010) being an exception – even though both are needed for assessing whether entering entrepreneurship is the right or wrong decision dependent on entrepreneurial means. The individual level measures of success are earnings and work satisfaction which can be compared for both full-time employers and employees.

The second chapter explores if there exist a Type I or Type II error in entrepreneurship when it comes to the decision to re-enter; i.e. individuals that should re-enter, do not, and individuals that should not re-enter, do. Also, this study stands out from the few existing studies on habitual entrepreneurship for more reasons: it studies actual re-start instead of intended re-start, it includes firm performance – measured by survival – of both ventures started, it uses longitudinal register data instead of survey data, and it applies statistical models accounting for selection bias in the re-start population. Special emphasis is on whether there exist a learning effect of previous failure or whether that effect is dependent on entrepreneurial means given by human and social capital.

Looking at the novice entrepreneurs, both who they are – traits and values – and who they know – network use and entrepreneurial role models – are found to be important for new venture founding as expected from the psychology and sociology literature. Turning to the habitual entrepreneurs, no direct measures of identity are included but optimism seems to be prevalent among entrepreneurs since failure experience do not prevent entrepreneurs from starting again. Hence, the passive learning argument – entrepreneurs learn about their own entrepreneurial abilities only through entrepreneurship – is not supported. Interestingly, however, active learning from previous venture failure is possible but

1. Synopsis

only for certain individuals. Especially, years of education and marriage (moral support) seem to affect the adaptive capacity needed for learning from failure. However, these individuals are not more likely become habitual entrepreneurs which indicates a Type I error, i.e. they do not start-up a second time even though they should, but this conclusion is based on survival as the criteria for success. Future research should challenge this conclusion by investigating the alternative options for failed entrepreneurs. For instance, by looking at earnings and work satisfaction of previously failed entrepreneurs in different occupations.

Exactly these outcome variables – earnings and work satisfaction – are used in the study of novice entrepreneurs to assess the opportunity cost of entrepreneurship for individuals with different means. An entrepreneurial identity is found to lead to greater work satisfaction in both entrepreneurship and employment but, contrary to the expected, only to higher earnings in employment. Hence, encouraging individuals with an "entrepreneurial mindset" to enter entrepreneurship might not be the best policy but more research in this area is needed. In general, the social network is found not to influence earnings in both entrepreneurship and employment but when it comes to survival and work satisfaction among entrepreneurs, the social network is found to be crucial. Or as stated earlier, entrepreneurship does seem to be a networking activity. Finally, even though years of education has no effect on the likelihood of entering entrepreneurship for the first time, these individuals should enter to a lesser extent when assessing opportunity cost both in terms of earnings and work satisfaction. Given the political focus on encouraging academic entrepreneurship, which will be evident later, both chapters provide important findings to spur future research.

1.4.2 The environment: Industry and Geography

While the first two chapters focus on the entrepreneurship environment for novice and habitual entrepreneurs, the last two chapters focus on the industry and geographical environment for novice entrepreneurs.

The industry environment is important because of differences related to knowledge conditions, demand conditions, industry life cycles, appropriability conditions, and industry structure which all influence opportunity exploitation (Shane, 2003). This research will follow the direction of Shane (2003) by mainly looking at the economic factors of the industry environment. Based on the theoretical framework provided by Bhidé (2000) and the data available, this study

1.4. The two main parts

will further delimit the industry indicators to industry growth and growth instability, industry investment requirements, and industry profit structure. The main argument put forth in Bhidé (2000) is that promising start-ups – i.e. likely high growth ventures – are founded in industries characterized by low investment requirements, low expected profits, and, most importantly, high profits uncertainty. However, successful venturing in this environment requires certain personal abilities (Bhidé, 2000) and strategies (Shane, 2003).

In the same way, the regional environment is important for entrepreneurship for a variety of reasons which span the economic, political, and socio-cultural sphere. The economic factors are many of the same that are mentioned under the industry environment; e.g. knowledge conditions, demand conditions, and industry structure in the different regions. Examples of political factors could be industrial policy initiatives (e.g. institutions and networks) that are decentralized to different regions. Finally, socio-cultural factors could be differences in values and attitudes towards entrepreneurship among the population in different regions. The environment for entrepreneurship is assumed to be better in urban areas when looking at all types of factors (Sternberg, 2009): economic (e.g. more educated population and higher demand for specialized goods and services), political (e.g. more formal institutions and networks supporting entrepreneurship), and socio-cultural (e.g. more entrepreneurial role models and more individuals from the "creative class"). Only the greater competition among firms in urban areas makes the environment less supportive for entrepreneurship.

The first chapter explores if the impact of personal abilities and start-up strategies on firm performance – measured by survival and employee growth – are dependent on the industry environment. Complex variables for industry dynamics (Dess and Beard, 1984) and structure (Bhidé, 2000) are created and used together with indicators for personal abilities (Bhidé, 2000) and start-up strategies (Shane, 2003). The many variables for industry environment are reduced to two key variables based on principle component analysis: industry profitability and uncertainty. Furthermore, the study assess which persons enter the right industry environment and if the right strategy is chosen for the environment.

In the same way, the second chapter explores if the role of personal creativity and the social network are different in urban and rural areas regarding the likelihood of start-up and survival. Because of more opportunities and a more supportive environment in urban areas, many studies researching (successful) entrepreneurship uses a bounded sample from the urban population, arguing

1. Synopsis

that (influential) entrepreneurship is an urban phenomenon (Acs et al., 2011). Advocates of research outlining the different entrepreneurial dynamics in urban and rural areas are many (Sternberg, 2009) but the empirical studies do often not go further than univariate analyses of socio-demographic differences between urban and rural entrepreneurs without non-entrepreneurial control groups. Two notable exceptions, however, are Babb and Babb (1992) looking at personal traits and Bauernschuster et al. (2010) looking at social contacts.

The findings in both chapters emphasise the importance of bringing the person and environment together in explaining entrepreneurship. Starting with the industry environment, the study supports expected hypotheses related to the role of personal abilities and start-up strategies but it also reveals novel findings that call for further research. Initially, industry profitability and uncertainty are found to have the expected positive and negative effect, respectively, on new venture performance. As is the case with the first part of the dissertation, the years of education is found to be an interesting indicator. In high profitability industries, education is positively related to new venture performance while the diametrical opposite is found in high uncertainty industries. Nevertheless, highly educated individuals are found to enter less profitable and more uncertain industries. Future research should investigate this further. One approach could be to examine if these findings could be explained by more causal compared to effectual reasoning for highly educated individuals. As expected, in uncertain industries, individual tolerance of ambiguity and ownership with others are more important for new venture performance.

Turning to the geographical environment, survival in urban areas are initially, and as expected, found to be less likely for new ventures. Even though the three indirect measures of individual creativity are found to have a positive effect on the likelihood of being an entrepreneur, independent of geographical setting, the direct measure is only found to have a positive effect in urban areas. The latter supports the view of individual creativity as being only a latent capacity for entrepreneurship which calls for a supportive environment to be utilised. However, taking all four indicators together, more research needs to be done in this area. Moreover, the recent political focus on the importance of learning to be creative and innovative with the aim of future occupational choice and labour market performance further emphasises this research. Nevertheless, none of the indicators for creativity are found to be important for firm survival in urban and rural areas. More unambiguous findings occur when turning to the role of the social network. As expected, the social network indicators – network contact and presence of entrepreneurial role models – are significant predictors

1.5. The political context

of new venture founding. However, a positive effect of the network on survival is almost exclusively present in rural areas. Future research should further pursue whether the assumed general importance of the social network is non-existing in urban areas. Especially, if entrepreneurship allegedly is an urban phenomenon.

Next, these findings is viewed in an entrepreneurship policy context.

1.5 The political context

Initially, it is important to emphasise the growing political focus on entrepreneurship in advanced economies (Storey, 2003). Traditional macro-economic policy instruments aiming at growth and job creation are being replaced or supplemented with policies generating and promoting entrepreneurship (Carree and Thurik, 2003). The relatively young field of entrepreneurship research has grown into an established field with an advanced infrastructure (Landström, 2010), making clear the importance of new ventures for the economy through productivity growth (Caves, 1998; Bosma and Nieuwenhuijsen, 2002), competition enhancement (Carree et al., 2002), and job creation (Haltiwanger et al., 2010; Ibsen and Westergaard-Nielsen, 2011; Dahl et al., 2009); for a comprehensive overview, see van Praag and Versloot (2007). New ventures are important for the productivity and efficiency of an economy as new firms are more flexible in introducing new technologies and can pressure incumbent firms towards a production level closer to optimum for society. Furthermore, the net job creation of new firms is in Dahl et al. (2009) found to be positive, while it is negative in old firms, which has important policy implications. Based on recent studies, Carree and Thurik (2003) argue that the change in industry structure in advanced economies (after the 1970's) has given small firms a more important role in the economy:

"... Technological change, globalization, deregulation, shifts in labour supply, variety in demand, and the resulting higher level of uncertainty have rendered a shift in industry structure away from greater concentration and centralisation towards less concentration and decentralisation." (Carree and Thurik, 2003, p.438)

The policy response to this change in advanced economies has been not only to recognize that entrepreneurship is worth fostering but also that entrepreneurship needs fostering – to use the terminology in Sarasvathy (2004) – because of market failures. In a comprehensive overview of policy initiatives in developed countries, Storey (2003) relates these initiatives to three broad categories of

1. Synopsis

market failures, all due to imperfect information: *"(1) Individuals do not realise (are ignorant of) the private benefits of starting a business, (2) Small business owners do not realise the private benefits of obtaining expert advice from "outside" specialists, and (3) Financial institutions are unable to assess accurately the viability of small firms and (on balance) overestimate the risks of lending to this group"* (Storey, 2003, p.476). Hence, policy initiatives aimed at entrepreneurs and small businesses include subsidised training, education, information provision and finance as well as initiatives aiming at changing the attitudes and aspirations of the population (Storey, 2003).

Others, contributing to the political debate, are still sceptical about the positive influence of entrepreneurship on society and the need for government support. About half of new ventures close down within the first three years after start-up (Mata and Portugal, 1994; Dahl et al., 2009; van Praag, 2005), labelling this period "the valley of death" in the literature (Stam et al., 2008). Moreover, new ventures experiencing high employee growth, i.e. contributing significantly to job creation, constitute a small share of the total number of new ventures (Dahl et al., 2009). Or as it is argued in Carree et al. (2002):

"... A glut of self-employment will cause the average scale of operations to remain below optimum. It will result in large numbers of marginal entrepreneurs, absorbing capital and human energy that could have been allocated more productively elsewhere." (Carree et al., 2002, p.276)

Nevertheless, the jobs created in the new ventures might be important for reducing unemployment given that new ventures mostly are able to attract employees who have poor job prospects (Bhidé, 2000) or might attract part-time employees originating from outside of the labour force (Storey, 2003). Given the persistent political focus of reducing unemployment, initiatives to motivate unemployed to become self-employed have also been pursued in some countries. In the case of Denmark, which is the country used for the empirical analyses in this dissertation, subsidizing unemployed into entrepreneurship was initiated in 1988 but abandoned in 2000 as a result of the poor performance of the ventures started. Instead, much effort has now been devoted to foster entrepreneurship among university graduates.

The aim of encouraging certain promising individuals, like university graduates, to become entrepreneurs is the core of what is challenged in this dissertation. As already outlined in Dahl et al. (2009), the start-up rate and success

1.6. Limitations and future research

rate of new ventures taken together suggests that it might be worth to direct entrepreneurship policy towards promoting promising new ventures instead of new ventures in general. If continuing the example of fostering high education entrepreneurship, this dissertation has elucidated whether these individuals enter entrepreneurship for the first or second time and, furthermore, enter certain entrepreneurship environments. But most important is assessed whether the entry decision is right or wrong by understanding the opportunity cost of entrepreneurship, learning from entrepreneurship experience, and whether some environments are more fit for these individuals. It is the hope of the author that a better understanding of these mechanism through multidisciplinary research will be pursued in the future, resulting in a more in-depth political debate about the fostering of entrepreneurship.

1.6 Limitations and future research

The data used for the analysis in this dissertation has many advantages given the longitudinal aspect and the detail level of the registers. However, the one-off questionnaire survey uncovering the identity and network of entrepreneurs and non-entrepreneurs restricts the research possibilities and questions the causality of the findings. Future research should try to overcome this limitation by taking on the task of designing and conducting a multidisciplinary longitudinal survey.

Specific suggestions for future research are reserved to the chapters but, in general, one interesting research question has not been answered even though it was possible with the data at hand: "Are the different categories of entrepreneurial means substitutes or complementaries?". This has not been left unanswered because of lack of interest but for reasons mentioned earlier. As this dissertation investigates the importance of many indicators within each of the three categories – i.e. identity, knowledge, and networks – in different environments, this additional question should be pursued in separate work in the future.

The abstracts of the four chapters making up the dissertation follows.

1. Synopsis

Abstracts

Part 1:

Entering and Re-entering the Entrepreneurship Environment

The Opportunity Cost of Novice Entrepreneurship An Empirical Study of Earnings and Work Satisfaction

Abstract: Several research fields study how individual resources are important for founding, surviving, and growing a new venture. This study contributes to this literature by exploring the role of identity, knowledge, and networks for individual level success measured by earnings and work satisfaction. By estimating these relationships for both full-time working entrepreneurs and employees, it is possible to assess the opportunity cost of entering entrepreneurship. The study is based on longitudinal register data connected to a questionnaire survey conducted in 2008. The resulting sample consists of 972 first-time entrepreneurs in 2004 (635 survived to 2008) and 282 full-time employees that have never been entrepreneurs. Both identity and social network indicators are found to influence the decision to enter entrepreneurship but, contrary to conventional wisdom, individuals with an entrepreneurial identity are not found to be worse off working for an established business.

Passive and Active Learning from Entrepreneurship An Empirical Study of Re-entry and Firm Survival

Co-authored with Saras D. Sarasvathy (University of Virginia)

Abstract: The purpose of this study is to contribute to the movement in entrepreneurship research from explanations of performance based exclusively on traits or luck to those based on skills and learning. Both conventional wisdom and extant research in this regard argue for the importance of persistence after failure and learning from failure. Our study of 1,789 entrepreneurs who re-entered entrepreneurship after a failed venture supports both persistence and learning, but with a twist. Persistence paid off for entrepreneurs who already had certain kinds of human and social capital, even when controlling for unemployment record and opportunity costs. Yet the individuals with those human capital and social capital characteristics were not as likely to become re-starters. A Type I error, therefore, appears to hinder the development of habitual entrepreneurship.

Abstracts

Part 2:

The Entrepreneurship Environment: Industry and Geography

Entrepreneurship and Industry Environment An Empirical Study of Personal Abilities and Start-up Strategies

Abstract: This research brings together two different directions within the entrepreneurship literature in explaining new venture performance. The first takes personal abilities and start-up strategies as the point of origin while the second focus on the industry environment that the new venture is founded in. Longitudinal register data combined with responses from 1,151 first-time entrepreneurs in 2004 are used for exploring the importance of personal abilities and start-up strategies for new venture performance under different industry environments; the latter derived from principle component analysis. Based on these findings is, moreover, assessed who makes the right and wrong decision to enter a certain industry environment. As expected, both the person and strategy are found to be important for performance in different environments but it seems that highly educated individuals are more likely to choose the wrong industry.

Entrepreneurship within Urban and Rural Areas An Empirical Study of Individual Creativity and Social Network

Co-authored with Lucio Carlos Freire-Gibb (Aalborg University)

Abstract: The entrepreneurial dynamics within urban and rural areas are often assumed to be very different. This study explores the importance of individual creativity and the social network in both places regarding the probability of becoming an entrepreneur and of surviving the crucial three years after start-up. The results are based on longitudinal register data combined with a questionnaire survey from 2008, utilizing responses from 1,108 first-time entrepreneurs (out of which 670 survived) and 420 non-entrepreneurs (without previous entrepreneurial experience). Creativity is only found to lead to start-up in urban areas but it does not influence the chances of survival in any of the two areas. On the contrary, the social network matters particular in rural areas. By combining the person and the environment in the research design, common entrepreneurship beliefs are questioned which opens up for region specific policy initiatives.

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Part I

Entering and Re-entering the Entrepreneurship Environment

The Opportunity Cost of Entrepreneurship

An Empirical Study of Earnings and Work Satisfaction

Abstract Several research fields study how individual resources are important for founding, surviving, and growing a new venture. This study contributes to this literature by exploring the role of identity, knowledge, and networks for individual level success measured by earnings and work satisfaction. By estimating these relationships for both full-time working entrepreneurs and employees, it is possible to assess the opportunity cost of entering entrepreneurship. The study is based on longitudinal register data connected to a questionnaire survey conducted in 2008. The resulting sample consists of 972 first-time entrepreneurs in 2004 (635 survived to 2008) and 282 full-time employees that have never been entrepreneurs. Both identity and social network indicators are found to influence the decision to enter entrepreneurship but, contrary to conventional wisdom, individuals with an entrepreneurial identity are not found to be worse off working for an established business.

2.1 Introduction

Entrepreneurship is gaining more and more interest among academic researchers and policymakers as new firms are recognised for productivity growth (Caves, 1998; Bosma and Nieuwenhuijsen, 2002), competition enhancement (Carree et al., 2002), and job creation (Haltiwanger et al., 2010; Ibsen and Westergaard-Nielsen, 2011; Dahl et al., 2009). Moving from society level outcomes of entrepreneurship to individual level outcomes, the positive picture does not change. Although entrepreneurs are found to earn less than employees (Parker, 2004;

2. The Opportunity Cost of Entrepreneurship

Hamilton, 2000), they express higher work satisfaction (Hundley, 2001; Blanchflower and Oswald, 1998). Thus, the policies generating and promoting entrepreneurship in advanced economies (Carree and Thurik, 2003) seem to be justified on multiple levels.

Determining the individual resources that are pivotal for founding a new venture has a long history within the entrepreneurship literature. The question "why do some individuals become entrepreneurs?" has been pursued within very different disciplines like psychology, sociology, and economics (Landström, 1999, 2010). In psychology, measures of individual personality traits, cognitive styles, attitudes, and values have been used. On the other hand, sociologists have emphasised the importance of inter-personal networks, culture, and environment. The focus in economics has mainly been on the importance of individual human capital and the opportunity cost of becoming an entrepreneur. Even though interdisciplinary theoretical frameworks have been developed, empirical studies including concepts from different disciplines are rare and encouraged. In Sarasvathy (2008), expert entrepreneurs are found to start out with their three categories of means when creating new ventures: 1) Who they are - their identity, (2) What they know - their knowledge base, and (3) Whom they know - their networks.

The vast majority of studies including these entrepreneurial means compare entrepreneurs with non-entrepreneurs (Sarasvathy, 2004). The remaining studies try to link entrepreneurial means to measures of firm performance, e.g. survival or growth in profits, turnover, or employees. These studies take advantage of the fact that it is hard to argue why theories explaining "why do some individuals become entrepreneurs?" should not be valid in explaining "why do some entrepreneurs become successful?". For instance, having a high tolerance of ambiguity (i.e. the ability to deal with situations characterised by uncertainty and incomplete information) is very likely to influence the decision to enter entrepreneurship. However, it is hard to argue why this personal trait does not also influence new venture performance. The same applies when replacing firm level outcomes with individual level outcomes but these studies are rare, and, non-existing, if including indicators for all three categories of means as well as control groups of non-entrepreneurs. A recent comprehensive study in this direction is Hartog et al. (2010) looking at the returns to cognitive and social ability among entrepreneurs and employees.

This research contributes to these rare studies by exploring which individuals

should enter entrepreneurship when looking at how individual resources influence earnings and work satisfaction; not just in entrepreneurship but also in the alternative of employment in an established firm. The specific identity, knowledge, and networks associated with individual success in entrepreneurship are likely also to be related to success in the alternative of employment; e.g. having a high tolerance of ambiguity (identity), having industry experience (knowledge), and being willing to contact others for work-related help (networks). The impact of knowledge on employee earnings has already been established within labour market economics (Borjas, 2005) while studies relating identity and networks to employee earnings on the labour market are rare when applying the same indicators as in entrepreneurship research. Exceptions are Hartog et al. (2010) and Granovetter (1995), the former looking at ability and the latter looking at personal contacts. This picture does not change when replacing earnings with work satisfaction. In exploring the role of entrepreneurial means for start-up together with the impact on earnings and work satisfaction for both entrepreneurs and employees, this study assess which individuals make the right or wrong decision to enter entrepreneurship.

The data used is longitudinal register data from IDA (Integrated Database for Labour Market Research) combined with data from a questionnaire survey conducted on Danish entrepreneurs and non-entrepreneurs in 2008. IDA contains data on the entire Danish population of individuals and firms in the period 1980 onwards. The sample used in this study consists of full-time workers including both first-time entrepreneurs and employees that have never been entrepreneurs. Indicators for identity include (common) entrepreneurial personality traits (Cromie, 2000), intrinsic and extrinsic work values (Kalleberg, 1977), and work involvement measured by value-orientation towards work (Fagin and Little, 1984) and the possibility of work-family conflict (Parasuraman and Simmers, 2001). Indicators for knowledge are human capital measures given by education, industry experience, and unemployment history (Parker, 2004; Borjas, 2005). Finally, indicators for networks covers both behaviour – contact frequency and contact willingness (Burt, 2000) – and characteristics – presence of entrepreneurial role models (Nanda and Sørensen, 2010; Bosma et al., 2011) – of the social network. Moreover, control variables are created from IDA, the most important being predicted earnings in employment (for both entrepreneurs and employees) based on personal characteristics, industry, and labour market region.

Results show that all indicators for identity and networks are found to successfully differentiate entrepreneurs from employees. However, those that have

2. The Opportunity Cost of Entrepreneurship

an "entrepreneurial identity" are not found to be worse off in employment, suggesting that these individuals are able to act entrepreneurial in their environment. Furthermore, the statement that entrepreneurship is a networking activity is supported as individuals with an "entrepreneurial social network" seem to be better off in entrepreneurship. Finally, high education seems to provide significant opportunity costs for entrepreneurs; both in terms of earnings and work satisfaction. These findings are important for understanding the entry choice and for assessing whether entrepreneurship policy should encourage certain individuals to enter entrepreneurship.

2.2 Theory

This section outlines the arguments put forth in the literature, explaining why entrepreneurial means – identity, knowledge, and networks – are important for entry into entrepreneurship. Hence, the arguments origin from different disciplines like psychology, economics, and sociology. Furthermore is discussed why these factors explaining entrepreneurship are also used to predict successful entrepreneurship. However, compared to other studies pursuing the latter by including measures of new venture performance (e.g. growth in sales, profits, or employees), this study sets up hypotheses of how the three categories of means are related not only to success in entrepreneurship but also success in the alternative of employment. This requires introducing broad indicators for entrepreneurial success also applicable for employee success.

2.2.1 Earnings and work satisfaction

Two indicators often used when assessing work-life success are earnings and work satisfaction. Studies focusing only on the former are important as earnings are expected to be positively related to work satisfaction. However, empirical research suggests that this relationship might be less strong among entrepreneurs than among employees based on the following empirical findings. First, entrepreneurs are generally found to earn less than employees (Parker, 2004); also when controlling for several problems arising when comparing earnings in these two occupations (Hamilton, 2000). Second, entrepreneurs express higher work satisfaction than employees (Parker, 2004; Hundley, 2001; Blanchflower and Oswald, 1998). Hence, entrepreneurs seem to be more satisfied then employees which can be explained by non-pecuniary benefits like "being one's own boss" more than outweigh the earnings penalty.

The remainder of this section argues why identity, knowledge, and networks

influence the decision to enter entrepreneurship, followed by a discussion of how these means influence earnings and work satisfaction in both entrepreneurship and employment.

2.2.2 Identity and entrepreneurship

The entrepreneurial identity will be explored in this study by looking at three concepts: Personality traits, work values, and work involvement. Starting within the psychology literature, the following personal traits (or psychological characteristics) are often used to differentiate (successful) entrepreneurs from others (Hisrich et al., 2005; Parker, 2004; Kirby, 2003; Cromie, 2000): *tolerance of ambiguity, risk taking ability, feelings about locus of control, creativity or innovativeness, need for achievement, and desire for autonomy.*

Risk taking ability

Compared to wage earners, entrepreneurs have undertaken a considerable risk in the light of the low survival rates for new venture. Nevertheless, entrepreneurs are willing to give up the regular wage income for the uncertain future earnings of the new venture. According to Mill (1965), the key difference between entrepreneurs and managers is the willingness to run a risk. In addition to the financial risk of founding a new venture (which the entrepreneur not necessarily bears alone) there are socio-psychological risks related to, for instance, prestige and income status, which are dependent on the success of the new venture (De Vries, 1977). Closely related to risk taking ability is tolerance of ambiguity measuring a persons ability to deal with situations characterised by incomplete information which the entrepreneur, undoubtedly, to a smaller or larger extent is going to experience. Therefore, it is often argued that entrepreneurs are more tolerant of situations characterised by ambiguity or actually like the challenge in managing these situations.

Feelings about locus of control

The term locus of control originate from Rotter (1966) and indicate the extent that a person feels that she has control over her own situation. The original indicator from Rotter (1966) is dichotomised in internal and external locus of control. A high degree of internal control is tantamount to the feeling that your situation is determined by your decisions and actions as opposed to your environment while a high degree of external control is tantamount to the diametrical opposite. The indicator is later broadened in Levenson (1973) so that external control is divided into control from powerful others and chance control (i.e. luck and coincidence). Entrepreneurs are assumed to have a high feeling of internal

2. The Opportunity Cost of Entrepreneurship

control given that they are responsible for decisions and priorities of critical importance for their venture in light of the low survival rates for new ventures. Self-efficacy, over-confidence, and over-optimism are terms closely related to locus of control.

Creativity

High creativity or innovativeness is often emphasised as an important characteristic of an entrepreneur. According to Schumpeter (1934), the essential function of the entrepreneur is the ability to recognise and realise new opportunities, where the entrepreneur is driven by the will to found a private kingdom and prove oneself superior to other as well as the joy of exercising one's energy and ingenuity (Andersen, 2007). The entrepreneur has to possess the ability to look beyond conventional procedures and instead try to combine existing ideas and resources in different ways, thereby obtaining experience through experimentation and trial and error (Cromie, 2000). Indeed, entrepreneurs are often in the literature identified as creative persons characterised by thinking in non-conventional ways, challenge existing assumptions, and to be flexible and adaptable in their problem solving (Cromie, 2000).

Need for achievement

Entrepreneurs are often assumed to differ from wage earners by having a high need to perform and achieve results in their work. The term need for achievement (nAch) was introduced in McClelland (1961) where it is argued that a society with a general high level of nAch will produce more energetic entrepreneurs resulting in rapid economic development; successful entrepreneurs are motivated by nAch rather than money. Furthermore, according to McClelland (1961), entrepreneurs prefer to be proactive and committed, to take personal responsibility, to take moderate (not high) risks, and to receive feedback on their performance, while they dislike repetitive and routine work (Parker, 2004).

Desire for autonomy

A great desire for autonomy or independence is associated with entrepreneurs since this is considered an attractive feature of this kind of employment (Parker, 2004). Entrepreneurs want to be in control of their own work situation and therefore appreciate "being one's own boss"; a thought that can be traced back to Knight (1921). Furthermore, Cromie (2000) argues that entrepreneurs prefer to avoid restrictions in the form of rules, procedures, and social norms because a restrictive work environment stifles the opportunity to be creative and the need for achievement. This opposition against a restrictive work environment could,

however, be the reason why entrepreneurs in the literature sometimes also are portrayed as deviants or misfits as in De Vries (1977).

These are the personal traits often associated with entrepreneurs in the literature. However, it is very likely that some of these traits are correlated, e.g. locus of control and tolerance of ambiguity, locus of control and need for achievement, or creativity and desire for autonomy. The empirical studies of the entrepreneurial traits are not unambiguous regarding whether entrepreneurs really are different from wage earners; for a comprehensive review of these studies see Cromie (2000). Only Caird (1991) and Cromie and O'Donaghue (1992) find that entrepreneurs are different than other group of persons regarding all the traits while many, including (Koh, 1996), find that they are different regarding some, but not all, traits.

Work values

Numerous studies find higher work satisfaction among entrepreneurs than among wage earners which often is attributed to differences in the work characteristics for the two types of employment (Parker, 2004; Hundley, 2001; Blanchflower and Oswald, 1998); Hundley (2001) outlines the significance of autonomy, flexibility, skill utilization, and job security.

In Kalleberg (1977) work characteristics are categorised into six dimensions: *intrinsic, convenience, financial, relations with co-workers, career opportunities, and resource adequacy*. The intrinsic dimension covers work characteristics associated with the work tasks itself (e.g. whether the work is interesting, allows the worker to develop and use her abilities, allows the worker to be self-directive, and allows the worker to see the results of her work) while the following dimensions (except resource adequacy) represent an extrinsic dimension where the work characteristics are not related to the work tasks (e.g. whether the work has good hours, pays good, has friendly and helpful co-workers, and has good chances for promotion)¹ (Kalleberg, 1977). Finally, work characteristics under resource adequacy cover the access to different resources that influence on the extent to which the person can do her work satisfying and, thereby, receive the desired intrinsic or extrinsic work rewards. Given that the intrinsic dimension covers work characteristics that can be related to the personal traits associated

¹Intrinsic and extrinsic work characteristics are in the "two-factor theory of job satisfaction" mentioned as motivators and hygienes, where the former more often are found to be associated with job satisfaction and the latter more often are found to be associated with job dissatisfaction (Herzberg et al., 1959; King, 1970).

2. The Opportunity Cost of Entrepreneurship

with entrepreneurs, it is assumed that entrepreneurs appreciate the intrinsic work values, in particular.

Work involvement

High job satisfaction among entrepreneurs – as a result of intrinsic work characteristics combined with the financial and socio-psychological risks related to starting a venture – makes it reasonable to assume that entrepreneurs experience high work involvement as well. Work (or job) involvement can be defined in different ways:

”For this work, job involvement was defined as the degree to which a person’s work performance affects his self-esteem. Elsewhere (Lodahl, 1964) it was hypothesized that its main determinant is a value-orientation toward work that is learned early in the socialization process.” (Lodahl and Kejner, 1965, p.25)

In continuation of the work values above, it would be relevant to look at work involvement as a persons value-orientation towards work and, hence, the different functions work have according to the literature. In reviewing eight other authors work on the subject, Fagin and Little (1984) identify seven major functions of work (Furnham, 1990): *a source of identity, a source of relationships outside the nuclear family, a source of obligatory activity, an opportunity to develop skills and creativity, a factor which structures time, a sense of purpose, and a source of income and control*. From these functions it is reasonable to assumed that entrepreneurs have higher value-orientation toward work than wage earners; e.g. work is not just a source of income or a factor that structures time but it is also an opportunity to develop skills and abilities. However, it is also possible that high work involvement leads to greater work-family conflict which is found in Parasuraman and Simmers (2001).

2.2.3 Identity and work-life success

The reasons why having an entrepreneurial identity is important for new venture performance and, hence, entrepreneurial earnings should be obvious from the previous section. However, it is less obvious if these individual qualities are also valued for employees working in established firms. In advanced economies where assembly line labour to a great extent is either replaced by machines or outsourced to developing countries this is very likely to be the case. Entrepreneurship within an established firm is labelled ”intrapreneurship” and differ mainly from entrepreneurship in that the established firm can create advantages (e.g. access to resources like capital and labour) or disadvantages (e.g. lack

2.2. Theory

of acceptance of new ideas) for the intrapreneurs. Besides the organisational characteristics (e.g. management support, work discretion, and organisational boundaries), individual characteristics (e.g. risk-taking propensity, desire for autonomy, and need for achievement) are assumed to be very important for the individual decision to act intrapreneurial in the model put forth in Hornsby et al. (1993). In reviewing empirical studies of intrapreneurship in Denmark (which is the national setting of this study), Nielsen et al. (2009) find a positive attitude towards intrapreneurship from both employers and employees, a high priority of intrapreneurship in large and small firms, and a high work discretion for employees. As a result, individuals with an entrepreneurial identity are expected to earn a higher income than individuals without; both in entrepreneurship and employment.

Hypothesis 1a: Entrepreneurs with an entrepreneurial identity will have a higher income than entrepreneurs without this identity.

Hypothesis 1b: Employees with an entrepreneurial identity will have a higher income than employees without this identity.

Turning to work satisfaction, the effect of having an entrepreneurial identity is expected to be different in entrepreneurship and employment, taking the view that work satisfaction is determined by the degree of fit between identity and work environment. Starting with entrepreneurship, individuals with an entrepreneurial identity are expected to be more satisfied than individuals without this identity because the identity of the former group fits better with the work environment. The expected effect of having an entrepreneurial identity on work satisfaction in employment is less clear. On the one hand, employees might be able to act intrapreneurial as suggest above which has a positive influence on both earnings and work satisfaction for entrepreneurial individuals. On the other hand, entrepreneurial individuals still have to act within organisational boundaries. After all, the positive influence on earnings and challenging work tasks might not outweigh "being your one's boss" which is often the most desired feature of being an entrepreneur (Dahl et al., 2009). Hence, the latter effect is assumed to be greatest.

Hypothesis 2a: Entrepreneurs with an entrepreneurial identity will be more satisfied than entrepreneurs without this identity.

Hypothesis 2b: Employees with an entrepreneurial identity will be less satisfied than employees without this identity.

2. The Opportunity Cost of Entrepreneurship

2.2.4 Knowledge and entrepreneurship

The human capital of the entrepreneur is in the literature often assumed to be given by certain types of work experience and education.

Work Experience

More people with work experience are expected to be entrepreneurs given that they as employee or self-employed have had time to learn about the business environment, build important networks in this environment, and, therefore, are more able to create opportunities in this environment (Parker, 2004). Hence, entrepreneurs that have been working in the same industry as they start up in are expected to be better suited for successful entrepreneurship; many studies find that these spin-off entrepreneurs do perform better than other entrepreneurs (Phillips, 2002; Agarwal et al., 2004; van Praag, 2005). Furthermore, work experience related to business development, sales and marketing, and management (from small businesses, in particular) are assumed to be important. Finally, it would be relevant to look at the different work roles the entrepreneurs have had in the past, if entrepreneurs are expected to be "jacks of all trades" (i.e. persons with multiple skills but no expert proficiency) because they have to complete many different tasks. In support of this, Hartog et al. (2010) find that balance in different abilities is rewarded in entrepreneurship but not in employment. In closing, it should be noted that as people with work experience are older, they are more likely to hold the necessary financial capital for starting a business; either received from inheritance or obtained through capital accumulation (Parker, 2004).

Education

From the literature it is not clear whether more educated individuals are expected to be entrepreneurs. On the one hand, more educated individuals might be better informed about business opportunities and select themselves into occupations or industries where entrepreneurship is more common. van Praag (2005) finds, contrary to conventional wisdom, that the returns to education is higher in entrepreneurship than in employment, likely because entrepreneurs have more influence on how to put their skills and abilities from education to best use. On the other hand, the skills and abilities that make a successful entrepreneur are not necessarily the same as those embodied in formal qualifications (Parker, 2004). For instance, this is true if successful entrepreneurs have the personal traits or work values described in the previous section, are "jacks of all trades", or use the process of effectuation instead of causation. Effectual reasoning is shown to be the preferred choice by "expert" entrepreneurs (Sarasvathy,

2008) while causal reasoning is often what is taught at universities and business schools. Furthermore, Hartog et al. (2010) find that general ability has a stronger impact on income in entrepreneurship than on income in employment. The question is then to what extent general ability is a result of formal education. The significance of education is therefore ambiguous but, nevertheless, assumed to be dependent on the industry (Parker, 2004).

2.2.5 Knowledge and work-life success

Unlike entrepreneurial traits, the role of more tangible indicators of human capital for employee earnings and work satisfaction have been heavily studied within labour market economics. The general findings are that both education and work experience are rewarded in employment. According to Borjas (2005), empirical studies show that differences in education and labour market experience among workers account for about a third of the variation in wage rates in the population. Even though the labour market institutions in many countries are different, the general finding is an upward-sloping and concave age-earnings profile explained by older workers investing less in human capital while receiving more from previous investments compared to younger workers (Borjas, 2005). Hence, knowledge is expected to increase earnings in employment. In entrepreneurship, however, the answer is less straight forward based on the discussion earlier. Therefore, a more conservative position is adopted regarding the role of knowledge and earnings in entrepreneurship.

Hypothesis 3a: Entrepreneurs with more knowledge will not have a higher income than entrepreneurs with less knowledge.

Hypothesis 3b: Employees with more knowledge will have a higher income than employees with less knowledge.

The empirical findings that employees with more knowledge have higher earnings, and appertaining more challenging work tasks, result in high knowledge employees being both extrinsically and intrinsically rewarded. Hence, more knowledge is assumed to lead to greater work satisfaction among employees. Again, this relationship is questioned in entrepreneurship given that knowledge is not necessary extrinsically rewarded while the entrepreneurial setting is intrinsically rewarding independent of individual knowledge. Based on the higher opportunity cost of entrepreneurship for high knowledge individuals, the following is hypothesized.

2. The Opportunity Cost of Entrepreneurship

Hypothesis 4a: Entrepreneurs with more knowledge will be less satisfied than entrepreneurs with less knowledge.

Hypothesis 4b: Employees with more knowledge will be more satisfied than employees with less knowledge.

2.2.6 Social network and entrepreneurship

Within the sociology literature, the study of entrepreneurs emerged as a critique to the view that the decision to become (or remain) an entrepreneur is dependent on individual rationality or personal traits (Granovetter, 1985; Aldrich and Zimmer, 1986):

"Persons do not make decisions in a vacuum but rather consult and are subtly influenced by significant others in their environments: family, friends, co-workers, employers, casual acquaintances, and so on." (Aldrich and Zimmer, 1986, p.6)

The importance of the social network² for the entrepreneur is, according to the literature, mainly related to (Parker, 2004; Brüderl and Preisendörfer, 1998; Aldrich and Zimmer, 1986): *motivation, access to resources (information, customers and suppliers, capital and labour), and network compensation (resources).*

Motivation

Often is emphasised that it is importance for the entrepreneur to have a moral support network (Hisrich et al., 2005; Parker, 2004; Brüderl and Preisendörfer, 1998). The decision to start a venture involves an accept of risk and uncertainty which is why understanding, backing, and support from close family, in particular, but also from other relatives, friends and acquaintances can be essential for the decision. Add to this the following running of the venture which can give rise to difficult, busy, and lonely periods as well as the opposite. Moral support from the social network is especially important because the entrepreneur to a greater extent can confide in people close to them without fear of harsh criticism but, nevertheless, receive more honest advice than from people in a

²In the literature numerous definitions of networks exist. In this study the focus is on the social network (just as often labelled the personal network) seen from an egocentric perspective. That is the relationships and interactions from a particular individual (e.g. entrepreneur and employee) to other non-professional individuals (e.g. family and friends).

professional network (Hisrich et al., 2005). Empirical support for the importance of family relations and the moral support network can be found in Hanlon and Saunders (2007) and Brüderl and Preisendörfer (1998). Furthermore, the social network gets an even greater importance if it contains (former) entrepreneurs who can act as mentors or role models (Bosma et al., 2011). Thereby, it is possible to gain a realistic insight into the personal traits, abilities, and skills that are important for starting and running a (successful) venture (Nanda and Sørensen, 2010; Hisrich et al., 2005). This is empirically supported for nascent entrepreneurs in Davidsson and Honig (2003) where variables for the following are included: if the person's parents have entrepreneurial experience, the person's close friends or neighbours are entrepreneurs, and if the person's family and close friends were encouraging about the business start-up. Moreover, the study shows positive effects of having contact with an agency, being a member of a start-up group, and being a member of a business network.

Information

According to Burt (2000), information benefits from the social network occur in three forms: *access, timing, and referrals*. Access covers receiving valuable information, and knowing who can use this information best, which is important, given that the entrepreneur is restricted in the processing of all available information. Timing covers receiving valuable information before others which gives the entrepreneur the possibility to take action before others. Finally, referrals cover the mentioning of the entrepreneur's name in the right places at the right times as the entrepreneur, as others, only can be present one place at a time (Burt, 2000). Information from the entrepreneur's network ties is in the literature often assumed to be more useful, reliable, exclusive, and less redundant than information from formal sources (Brüderl and Preisendörfer, 1998).

Customers and suppliers

The social network can give access to both customers and suppliers (through the above mentioned information benefits) but the access to customers is, in particular, emphasised in the literature. The motivation, abilities, and skills of the entrepreneur are, undoubtedly, important in starting and running a venture but in the end it is the customer base that determines if the venture survives and becomes profitable. In that connection, it is argued that the social network of the entrepreneur can initiate a fast growing number of customers through what is called "the snowball effect" (Brüderl and Preisendörfer, 1998); i.e. the first customers are among the entrepreneur's family, friends, and acquaintances whereupon they spread the reputation of the firm to their social network and

2. The Opportunity Cost of Entrepreneurship

so forth. Thus, the effect works best if the people in the social network do not know the same people outside of the network.

Capital and labour

Capital and labour are necessary resources for starting and running a venture and help from family, friends, and acquaintances can be very useful, particularly, in the star-up phase (Brüderl and Preisendörfer, 1998). First, the entrepreneur can be restricted with regard to capital from banks or other formal sources due to lack of confidence in the entrepreneur and the new venture; for a more thorough description, see Chapter 4. This confidence is, however, often present in the social network where the individuals have a more in-depth insight into the motivation, abilities, and skills of the entrepreneur. Second, labour from family, friends, and acquaintances are often cheaper (or free) compared to labour obtained through formal sources. Again, this is particularly appreciated if the entrepreneur is capital restricted. Add to this the entrepreneur's lack of knowledge with regard to hired labour from formal sources which can result in a greater need for control compared to loyal labour from the social network (Brüderl and Preisendörfer, 1998).

Network compensation

It appears from the literature that the social network can be the source of various resources for the entrepreneur; Hanlon and Saunders (2007) mention financial, physical, human, technological, reputational, and organizational resources. The many potential resources in the social network have given rise to the network compensation hypothesis: entrepreneurs, that to a lesser extent possess the necessary human or financial capital, will try to compensate for this by utilising the social network to a greater extent (Parker, 2004; Brüderl and Preisendörfer, 1998). However, it is assumed that the entrepreneur will always try to make use of their social network in order to utilise their resources in the best possible way. According to Burt (2000), this is important as many individuals, competing for the same opportunities, do not differ with respect to human and financial capital.

Ostgaard and Birley (1996) is a comprehensive study of how different types of support from the entrepreneur's network effect the success of the venture measured by both the level and growth in profits, sales, and employees. Regarding the resources outlined above, information from the network is not found to have a significant effect while network support – related to getting contact to customers and getting loans and investors – has a positive significant effect. Furthermore, it is found that the size of the personal network and the time spent

on communication with the personal network have no effect on the success of the venture. However, the number of business relations in the network, a high density of the network, the presence of colleagues in the network, and the time spent on establishing contact to new investors and suppliers, all have a positive effect on the success of the venture.

Optimising the network

It is important to emphasise that the characteristics of social network are not exogenously determined. According to Dubini and Aldrich (1991), networking involves an expansion of the number of strong ties in the social network, where strong ties are characterised by a high degree of trust between the individuals while weak ties, on the other hand, are more superficial acquaintances. Strong ties are often assumed to be spouse, parents, other relatives, and close friends while weak ties are business partners, (former) employers and co-workers, and other acquaintances (Brüderl and Preisendörfer, 1998). Thus, it is natural to presume that a social network mainly consisting of strong ties is optimal. Such a network, however, is often characterised by homophily given that a person often establish strong ties to other persons like themselves with respect to, for instance, education, income, occupation, and age (Burt, 2000).

Besides low *diversity*, this network also has high *density* given that the persons forming strong ties to a particular person usually know each other and, furthermore, have access to the same contacts outside of the network. Thus, it is assumed that this kind of social network only to a small extent supplements the entrepreneur in spite of the trust advantages. A large social network consisting of both strong and weak ties is assumed to be optimal. The size of the social network is, according to Burt (2000), the most common measure for the entrepreneur's potential opportunities; the larger the network, the better opportunities³.

In addition to the structural dimensions of the social network are the interactional dimensions. It is particularly important to continuously maintain the relationships to weak ties since they otherwise will decay over time (Burt, 2000). One way to do this is to keep regular contact given that the strength of a given tie is assumed to be dependent on the *frequency* of contact and on the emotional closeness between the ties⁴. Thus, strategic entrepreneurs will have more

³More advanced analysis methods, however, take account of several network characteristics. In the literature four structural dimensions of the social network are often outlined: *anchorage*, *density*, *reachability* and *range* (O'Donnell et al., 2001).

⁴In the literature five interactional dimensions of the social network are often outlined:

2. The Opportunity Cost of Entrepreneurship

frequent contact to weak ties but in the end, the important thing is whether the entrepreneur is willing to contact to these individuals if it is necessary or beneficial to the entrepreneur.

2.2.7 Social network and work-life success

Based on the above arguments, it is straight forward to see why being extrovert regarding the social network and having entrepreneurial role models in the social network are important for new venture performance and, hence, entrepreneurial earnings. A similar effect could be expected for employees based on the following reasoning. First, extrovert individuals could have higher earnings as these individuals would be better informed about attractive job positions from their social network. Second, having (former) entrepreneurs in the social network could be especially important for receiving valuable information about job opportunities if these individuals are more likely to provide access to additional network ties. Mark Granovetter, who was among the first to bring awareness of the strength of weak ties (Granovetter, 1973), finds that the present income of workers who found their job through personal contacts is higher than for workers who found their job by formal means, direct application, or other methods (Granovetter, 1995). As was the case among entrepreneurs (Brüderl and Preisendörfer, 1998), the workers studied by Granovetter (1995) believed that information from personal contacts is of higher quality than information from other means. Hence, the following are expected.

Hypothesis 5a: Entrepreneurs with more social network resources will have a higher income than entrepreneurs with less social network resources.

Hypothesis 5b: Employees with more social network resources will have a higher income than employees with less social network resources.

Emphasising again that entrepreneurship is a networking activity, individuals who are not extrovert regarding the social network – or have entrepreneurial role models in the social network – are expected to be less satisfied with being an entrepreneur. But as before, the superior information from personal contacts is not only beneficial for the group of entrepreneurs. Not only do Granovetter (1995) find that workers who found their job through personal contacts have a higher income, they also express higher job satisfaction, which is likely to explained by the empirical finding that these individuals are also more likely

content, intensity, frequency, durability and direction (O'Donnell et al., 2001). Again these dimensions call for more advanced analysis methods.

to enter newly created job positions (Granovetter, 1995). The underlying assumption is that these job positions take into account the abilities, skills, and preferences of the worker. Again, a positive effect for both entrepreneurs and employees are expected.

Hypothesis 6a: Entrepreneurs with more social network resources will be more satisfied than entrepreneurs with less social network resources.

Hypothesis 6b: Employees with more social network resources will be more satisfied than employees with less social network resources.

2.3 Method

2.3.1 Data

The data used is longitudinal register data from IDA (Integrated Database for Labour Market Research) combined with a questionnaire survey conducted on Danish entrepreneurs and non-entrepreneurs in 2008. IDA is a matched employer-employee dataset containing the entire Danish population of individuals and firms in the period 1980 to 2007 (the latest year available at the time of writing). Furthermore, the entrepreneurship register in IDA contains the main founder behind every new business from 1994 onwards. IDA was used for the survey sampling and afterward for creating control variables and indicators for knowledge, e.g. education and work experience.

The questionnaire is divided into three parts where the first two – used in this study – are answered by both entrepreneurs and non-entrepreneurs. Initially are asked about current work status and work satisfaction whereafter the first part covers identity measured by work values, value-orientation towards work, work-family conflict, and personality traits. Part two covers social network measured by networking behaviour, network characteristics, and entrepreneurial role models.

2.3.2 Sample

The random sample for the questionnaire survey was chosen to be the entire Danish population in the working age, defined as people in the 15-66 age range in 2004 (the latest available year in IDA at the time of sampling). The population was then divided into four subpopulations: novice entrepreneurs, experienced entrepreneurs, former entrepreneurs, and never entrepreneurs in 2004. This

2. The Opportunity Cost of Entrepreneurship

study only utilises the responses from the first-time entrepreneurs and the individuals that have never been entrepreneurs. The former group was defined as having started an incorporated or unincorporated business with "real" activity⁵.

Strata	Number of individuals in:		
	Population	Sample	Respondents (rate)
Entrepreneurs	7,250	4,389	1,384 (32%)
Non-entrepreneurs	2,712,525	1,514	606 (40%)
Total	2,719,775	5,903	1,990 (34%)

Table 2.1: Survey population, sample, and response population.

The population, sample, and response population for the two strata used in this study can be seen in Table 2.1. Disproportionate stratified sampling was used, largely oversampling the first-time entrepreneurs. 3,178 individuals returned the questionnaire resulting in an overall response rate of 34%; the response rate being significantly higher for the non-entrepreneurs. In order to make the sample more fit for the analysis of earnings in 2007 (based on IDA data) and work satisfaction in 2008 (based on survey data), further reductions are needed. First, individuals not full-time employed in 2007 are excluded as this influences the earnings in 2007⁶. This reduces the population of first-time entrepreneurs and never entrepreneurs to 5,592 and 1,678,183 individuals, respectively.

The number of respondents from the total population is 1,625 which is further reduced to the final sample of 1,254 individuals used in the study. First, individuals not full-time employed in 2004 (IDA) and full-time employed in 2008 (survey) are excluded. Furthermore, the few individuals with conflicting entrepreneurship status from IDA and the survey are excluded (30 individuals). Finally, the few individuals with a missing work satisfaction score are excluded (14 individuals). Among the 1,254 respondents used in this study, 635 are full-time entrepreneurs, 337 are full-time employed former entrepreneurs, and 282 are full-time employed never entrepreneurs in 2008.

⁵For the business to be "real" active in a given year, the work effort and/or the earnings (calculated from turnover) have to be above given industry specific levels set by Statistics Denmark; in the start-up year the earnings level is set to half.

⁶Also a few observations with missing values in 2007 are excluded.

2.3.3 Independent variables

Predicted earnings

From the population of 1,678,183 never entrepreneurs (see previous section) are randomly drawn 10,000 individuals to be used for estimating a predicted earnings in 2007 for all respondents based on personal demographics, geographical area, and industry in 2007. Given that it is only possible to confirm entrepreneurship status in 2007 for the first-time entrepreneurs in 2004 from the survey, the predicted earnings in 2007 for the entrepreneurs are assumed to be equal to that of the never entrepreneurs plus an earnings premium (because of the greater risk) or penalty (because of the more attractive work characteristics). Taking an equilibrium point of view, the assumption is as follows. If what a given individual, within a given area and industry, can earn from entrepreneurship, rises, compared to the earnings as an employee, then more of these individuals choose to become entrepreneurs and vice versa.

Variable	Coefficient
Age	0.045** (0.004)
Age2	-0.000** (0.000)
Female	-0.210** (0.014)
Non-Danish	-0.184** (0.029)
Married	0.030* (0.013)
21 Region D	YES
10 Industry D	YES
R-squared	0.07
Observations	10000

Note: **, *, and † is significant at the 1%, 5%, and 10% level, respectively.

Table 2.2: OLS regression with the natural logarithm to 2007 earning as dependent variable. Negative values are set to 0. Control variables included (but not shown) are 21 labour market regions and 10 industries.

The OLS regression used to estimate the predicted earnings for the respondents can be seen in Table 2.2; the dependent variable are the natural logarithm to earnings in 2007. The design takes advantage of the general finding within labour market economics showing a curve-linear relationship of age on wage income (Borjas, 2005). This is supported in Table 2.2, although, the coefficient for age squared is very small. Furthermore, being a female or foreigner has a significant negative effect on income while married individuals, on the contrary, have a higher income. These findings are likely to be explained by discrimination and/or occupational choice. Finally, earnings are allowed to be dependent on industry and region; 21 labour market regions and 10 two-digit industries

2. The Opportunity Cost of Entrepreneurship

are included.

IDA and survey indicators

Four indicators for each of the three categories of entrepreneurial means – identity, knowledge, and networks – are created. Indicators for identity and network are based on the survey. The former includes an indicator for: intrinsic work motivation (dummy), high value-orientation towards work (dummy), high work-family conflict (dummy), and number of entrepreneurial traits (discrete). The latter includes an indicator for: number of groups with frequent contact (discrete), number of groups with high contact willingness (discrete), entrepreneurs in the family (dummy), and entrepreneurs among friends (dummy). Indicators for knowledge are based on information from IDA and cover: years of further education (discrete), years of industry experience (discrete), number of different industries worked in (discrete), and unemployment history (continuous). A detailed description of these variables can be found in Table 2.8. Descriptive statistics on the independent and dependent variables can be found in Table 2.9 for the employees and Table 2.10 for the entrepreneurs.

As expected from paper-and-pencil surveys, a small percentage of missing values for each indicator is present. The problem increases if more indicators are used together in, for instance, regression analysis, as all respondents with one or more missing values are excluded (assuming that the respondents with missing values for each indicator are not the same). In this study, each indicator is used separately in the regression analyses but in order to have the same number of observations, the missing values for each indicator are imputed using regression imputation with gender, age, and education as explanatory variables; see Levy and Lemeshow (2008). The number of imputations for each indicator can be seen in Table 2.8.

2.3.4 Dependent variables and model specification

Important indicators for individual success on the labour market are in this study assumed to be earnings and work satisfaction. Information on earnings can be found in IDA based on tax records while information on work satisfaction is indicated in the questionnaire on a scale from 0 (very dissatisfied) to 10 (very satisfied) with 5 being (neutral). The natural logarithm of earnings are used in the regression analyses as this allows to interpret the percentage change in earnings from given changes in the independent variables. Because of a strong centering of responses around high values of work satisfaction, a binary variable was used for these analyses with a score above the mean value of 8 was considered

highly satisfied. This is in line with the literature where individuals "satisfies" instead of continuously evaluating and optimizing their situation (Simon, 1996).

Earnings equation

The earnings equation for entrepreneurs and employees is estimated from Equation 2.1:

$$\ln(E_{2007}) = \alpha + \beta_1 \ln(P(E_{2007})) + \beta_2 Mj_{2008} \quad j = 1, 2, \dots, 12 \quad (2.1)$$

where E_{2007} is the realized income in 2007, $P(E_{2007})$ the predicted income in 2007, and Mj_{2008} are the 12 entrepreneurial means measured in 2008 (survey) or before (IDA). The predicted income and the realized income are expected to be closely correlated for both entrepreneurs and employees with the earnings premium or penalty of entrepreneurship being incorporated in the constant term. The expected influence of the entrepreneurial means on earnings in both entrepreneurship and employment are reflected in the hypotheses set up earlier.

Satisfaction equation

The satisfaction equation for entrepreneurs and employees is estimated from Equation 2.2:

$$S_{2008} = \alpha + \beta_1 [\ln(P(E_{2007})) - \ln(E_{2007})] + \beta_2 Mj_{2008} \quad j = 1, 2, \dots, 12 \quad (2.2)$$

where the difference between the predicted earnings and the realized earnings in 2007, $[\ln(P(E_{2007})) - \ln(E_{2007})]$, is assumed to negatively affect work satisfaction in 2008. Again, the expected influence of the entrepreneurial means on work satisfaction for entrepreneurs and employees, respectively, can be found in the hypotheses.

Selection bias

A problem that arises when estimating Equation 2.1 and 2.2 for the entrepreneurs are the possibility of selection bias. Only 65% of the first-time entrepreneurs in 2004 survives to 2008 and are, therefore, included in the analyses. A solution to this is to estimate a Heckman selection model for entrepreneurial earnings/satisfaction which takes into account the likelihood of surviving "the valley of death" (i.e. the critical three years after start-up). As will become

2. The Opportunity Cost of Entrepreneurship

evident later, an important finding in this study is that the entrepreneur's social network does not influence entrepreneurial earnings but is, nevertheless, important for new venture survival.

Therefore, Equation 2.1 is specified as the main equation in a Heckman selection model with the selection equation containing the same variables plus an additional variable as instrument. Besides being theoretically consistent, the general rule of thumb is that the instrument needs to be correlated with survival (the selection equation) but uncorrelated with earnings (the main equation). Based on this, household wealth the year before startup (2003) is chosen to be a suitable instrument. Equation 2.2 is problematic to specify as a Heckman model given that realized earnings in 2007 needs to be included in the selection equation. However, as will become evident later, selection bias does not seem to be a problem.

Before presenting the results, a few changes to the model specifications above should be noted. When estimating the impact of human capital on earnings in 2007 and work satisfaction in 2008, IDA information up to 2007 are used for the employees while IDA information up to 2004 are used for the entrepreneurs. This is done because the human capital indicators for survived entrepreneurs are either fixed after startup (e.g. years of further education) or vary systematically (e.g. years of industry experience). The latter creates a problem when estimating the selection equation (i.e. survival 2004-2008) in the Heckman model. Variables with * in the tables indicate that the years up to 2004 are used (i.e. the start-up year for the entrepreneurs) instead of the years up to 2007.

2.4 Results

2.4.1 Becoming an entrepreneur

Initially is tested whether the three categories of entrepreneurial means are important for becoming an entrepreneur as expected from theory. Table 2.3 estimates the likelihood of being a novice entrepreneur compared to being a non-entrepreneurs (never entrepreneur). Model 1-4 include each of the four indicators for knowledge together with control variables (see table text). Model 5-8 and Model 9-12 do the same with the four indicators for identity and network, respectively.

Table 2.3 supports the theory in general. Starting with knowledge indicators, the years of further education do not have an influence on the likelihood of

2.4. Results

	Model 1	Model 2	Model 3	Model 4
Education Y*	0.039 (0.031)			
Experience Y*		-0.173** (0.019)		
Experience N*			0.196** (0.058)	
Unemployment*				0.099* (0.045)
Controls	YES	YES	YES	YES
Pseudo R^2	0.06	0.12	0.07	0.06
Log-likelihood	-629	-587	-624	-627
Observations	1254	1254	1254	1254
	Model 5	Model 6	Model 7	Model 8
Intrinsic	0.636** (0.153)			
Value		0.725** (0.158)		
Conflict			1.076** (0.154)	
Traits				0.324** (0.050)
Controls	YES	YES	YES	YES
Pseudo R^2	0.07	0.07	0.10	0.09
Log-likelihood	-621	-618	-603	-607
Observations	1254	1254	1254	1254
	Model 9	Model 10	Model 11	Model 12
Frequency	0.160* (0.075)			
Willingness		0.304** (0.062)		
Family E			1.013** (0.156)	
Friends E				1.257** (0.171)
Controls	YES	YES	YES	YES
Pseudo R^2	0.06	0.08	0.09	0.10
Log-likelihood	-627	-616	-609	-603
Observations	1254	1254	1254	1254

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 2.3: Logistic regression for the likelihood of starting a business for the first-time in 2004. Control variables (2004) included (but not shown) are Female, Age, Age2, Non-Danish, Married, Income (ln 2003).

startup while the number of years in the same industry have a negative effect on start-up. Contrary, the number of different industries that the individual has worked in and the number of weeks of unemployment have a significant and positive effect on start-up. This supports the view of entrepreneurs as being "jacks of all trades". However, spin-off entrepreneurs (i.e. entrepreneurs with work experience from the start-up industry) are shown to have better chances of survival (Phillips, 2002; Agarwal et al., 2004; van Praag, 2005).

Furthermore, all four indicators assumed to be related to an entrepreneurial identity - being more motivated by intrinsic than extrinsic work values, having

2. The Opportunity Cost of Entrepreneurship

a high value-orientation towards work, having a high probability of work-family conflict, and possessing more of the entrepreneurial psychological traits - have a strong and significant effect on the likelihood of being an entrepreneur. The same is evident for the network indicators where entrepreneurs: have frequent contact to more groups, are willing to contact more groups for work-related help, and have more (former) entrepreneurs in their network, both among family and friends.

These findings are an interesting starting point for the following analyses uncovering whether these entrepreneurial means also are important for work-life success in general.

2.4.2 Success measured by earnings

Estimation of earnings, based on Equation 2.1, can be found in Table 2.4 for employees and in Table 2.5 for entrepreneurs. In each Table is again included 12 Models, one for each of the entrepreneurial means.

Earnings as an employee

Starting with earnings among employees, Table 2.4 shows that predicted earnings, as expected, has a strong and significant effect on realized earnings in all models. An increase in predicted earnings of 10% (controlling for person, area, and industry), increases realized earnings of between 7.6% and 8.9%, depending on the entrepreneurial means included in the model.

Looking at means within the knowledge category, each additional year of further education significantly increases earnings by 4.7% while a 10% increase in the number of weeks unemployed decreases earnings by 0.5%. The two measures of industry experience, however, are not found to significantly influence earnings.

Turning to identity, all four indicators are significant. Being intrinsically compared to extrinsically motivated, having a high value-orientation towards work, and having a high probability of work-family conflict, increases earnings by 8.0%, 14.5%, and 16.5%, respectively. Moreover, for each additional entrepreneurial trait that the employee possesses, earnings increases by 6.5%. All findings, the latter in particular, are interesting for the debate about whether it is more economic rational for entrepreneurial individuals not to become entrepreneurs.

2.4. Results

	Model 1	Model 2	Model 3	Model 4
Predicted	0.766** (0.113)	0.886** (0.121)	0.877** (0.121)	0.794** (0.116)
Education Y	0.046** (0.007)			
Experience Y		-0.002 (0.005)		
Experience N			0.001 (0.014)	
Unemployment				-0.055** (0.012)
Constant	2.859* (1.422)	1.553 (1.525)	1.656 (1.536)	2.755 [†] (1.475)
R^2	0.27	0.16	0.16	0.22
Observations	282	282	282	282
	Model 5	Model 6	Model 7	Model 8
Predicted	0.851** (0.119)	0.862** (0.117)	0.891** (0.116)	0.830** (0.114)
Intrinsic	0.077* (0.036)			
Value		0.135** (0.039)		
Conflict			0.153** (0.038)	
Traits				0.063** (0.012)
Constant	1.937 (1.501)	1.807 (1.477)	1.432 (1.467)	2.136 (1.439)
R^2	0.18	0.20	0.21	0.24
Observations	282	282	282	282
	Model 9	Model 10	Model 11	Model 12
Predicted	0.875** (0.119)	0.876** (0.117)	0.879** (0.119)	0.865** (0.118)
Frequency	0.013 (0.018)			
Willingness		0.048** (0.015)		
Family E			-0.016 (0.036)	
Friends E				0.071 [†] (0.037)
Constant	1.668 (1.506)	1.615 (1.482)	1.636 (1.509)	1.761 (1.499)
R^2	0.16	0.19	0.16	0.17
Observations	282	282	282	282

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 2.4: OLS regression with the natural logarithm to 2007 earning as dependent variable. Negative values are set to 0. Sample of 282 full-time equivalent employees.

Finally, only one of the network indicators is significant on a 5% level: the number of different groups that the employee are willing to contact for work-related help. For each additional group, earnings increases by 4.9%. If accepting a 10% level of significance, having (former) entrepreneurs among friends increases earnings by 7.4%. However, this result could be subject to reverse causality; i.e. employees with high earnings attract, or are attracted to, entrepreneurs.

2. The Opportunity Cost of Entrepreneurship

Earnings as an entrepreneur

	Model 1	Model 2	Model 3	Model 4
Predicted	2.914** (0.584)	2.970** (0.573)	2.993** (0.573)	2.728** (0.576)
Education Y*	0.034 (0.038)			
Experience Y*		0.030 (0.024)		
Experience N*			-0.042 (0.062)	
Unemployment*				-0.150** (0.049)
Constant	-24.819** (7.392)	-25.468** (7.285)	-25.557** (7.304)	-22.081** (7.341)
R^2	0.04	0.04	0.04	0.06
Observations	635	635	635	635
	Model 5	Model 6	Model 7	Model 8
Predicted	3.015** (0.574)	3.002** (0.572)	3.001** (0.572)	2.896** (0.579)
Intrinsic	0.001 (0.209)			
Value		0.196 (0.173)		
Conflict			-0.228 (0.170)	
Traits				0.071 (0.054)
Constant	-25.957** (7.287)	-25.855** (7.276)	-25.639** (7.276)	-24.609** (7.348)
R^2	0.04	0.04	0.04	0.04
Observations	635	635	635	635
	Model 9	Model 10	Model 11	Model 12
Predicted	3.014** (0.573)	3.013** (0.573)	2.992** (0.574)	2.891** (0.575)
Frequency	-0.018 (0.088)			
Willingness		0.017 (0.063)		
Family E			-0.158 (0.234)	
Friends E				0.486 [†] (0.271)
Constant	-25.907** (7.287)	-25.956** (7.283)	-25.519** (7.309)	-24.811** (7.292)
R^2	0.04	0.04	0.04	0.05
Observations	635	635	635	635

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 2.5: OLS regression with the natural logarithm to 2007 earning as dependent variable. Negative values are set to 0. Sample of 635 first-time entrepreneurs.

A similar analysis is done for the novice entrepreneurs based on the models in Table 2.5. It can be seen that an increase in predicted earnings as employee of 10% (controlling for person, area, and industry), results in a large increase in earnings, ranging between 29.7% and 33.3%. However, this should be seen in connection with the large and negative constant, indicating that the general earnings level for the entrepreneurs are lower than for the employees. This finding is generally supported in empirical studies, indicating an earnings penalty

of entrepreneurship (Parker, 2004; Hamilton, 2000).

Surprisingly, only one out of the 12 indicators for entrepreneurial means are significant on a 5% level: unemployment. An increase in the weeks of unemployment of 10% decreases entrepreneurial earnings by 1.4%. None of the identity indicators are significant but one of the network indicators are significant on 10% level. Having (former) entrepreneurs among friends increases earnings by 62.6%. As before, however, this finding is likely to be caused by reverse causality.

In general, the models seem to explain very little of the variance in entrepreneurial earnings (based on R^2 values) indicating that entrepreneurial means, although important for the start-up decision, do not influence subsequent earnings.

Nevertheless, a sensitivity analysis of this conclusion is conducted by removing predicted earnings as employee from the independent variables and replacing this by all the variables used to estimate the predicted earnings; i.e. age, age squared, female, non-Danish, married, industry (10 categories), and labour market region (21 categories). This is possible for the group of entrepreneurs given the larger number of observations compared to the group of employees. These findings, which can be seen in Table 2.11, are similar to the previous, except for the weakly significant coefficient for (former) entrepreneurs among friends in Table 2.5 now becomes insignificant. Moreover, the explanatory power of all models are now higher than before which was expected given the strict assumption of parallel earnings in entrepreneurship and employment.

As explained earlier, these results could also be influenced by selection bias given that only entrepreneurs surviving from 2004 to 2008 are used in the analysis. Table 2.12 mirrors Table 2.11 except that the results are from Heckman selection models. It can be seen that controlling for selection bias does not change the results except for the coefficient for (former) entrepreneurs among friends again is insignificant. In addition, Table 2.13 shows the results from the pertaining selection models estimating the likelihood if surviving.

The instrument used in Table 2.13 is household wealth the year before start-up. Although the coefficients for wealth are significant, a doubling of wealth only increases the likelihood of survival by between 1.0% and 1.1%. None of the knowledge indicators are significant while only one of the indicators for identity is significant. Entrepreneurs with a high probability of work-family conflict have a 60.8% higher likelihood of survival. In addition, all of the four indicators for

2. The Opportunity Cost of Entrepreneurship

network are significant. Increasing the number of groups that the entrepreneur have frequent contact to and are willing to contact for work-related help, increases the likelihood of survival by 16.4% and 9.3%, respectively. Moreover, having (former) entrepreneurs among family and friends increases the likelihood of survival by 32.3% and 28.0%, respectively, although the latter only is significant on 10% level. Hence, the network seems to be most important for survival besides hard work indicated by possible work-family conflict.

The next section turns to analyses with work satisfaction as the measure of work-life success. Based on the findings so far, it is of special interest to examine whether individuals with an entrepreneurial identity are trading off higher earnings in employment with greater work satisfaction in entrepreneurship because of a more suitable work environment.

2.4.3 Success measured by satisfaction

Table 2.6 and 2.7 estimates the likelihood of high work satisfaction in 2008 from logistic regression of Equation 2.2. Each Model includes one of the 12 indicators for entrepreneurial means together with the difference between the predicted and realized income in 2007.

Satisfaction as an employee

The findings for employees can be found in Table 2.6. Initially it can be seen that although the coefficient for earnings difference is negative in all models, it is only significant on a 5% level when including years of further education and work-family conflict, respectively. In these two models an increase in the percentage earnings difference of 100% is associated with a decrease in the likelihood of high satisfaction of 65.4% and 66.5%.

Starting with the four indicators for knowledge, only unemployment is significant. An increase in unemployment of 10% decreases the likelihood of high satisfaction by 2.3%. This is likely to be explained by long periods of unemployment force individuals to compromise with their work values when accepting a job offer. On the contrary, three out of four indicators for identity are significant. Individuals more motivated by intrinsic than extrinsic work values are more than twice as likely to have high satisfaction. Moreover, for each additional entrepreneurial trait that an employee possesses, the likelihood of high satisfaction increases by 24.2%. This is contrary to the expected given that these entrepreneurial individuals are assumed not to be satisfied in the more restrictive environment in an established firm. Therefore, the findings suggest

2.4. Results

that these employees are able to receive job positions with work characteristics not too different from those in newly founded firms. Again, this challenges the view of venture start-up being the optimal choice for entrepreneurial individuals. Finally, none of the indicators for network significantly influence work satisfaction.

	Model 1	Model 2	Model 3	Model 4
Difference	-1.061* (0.504)	-0.874 [†] (0.468)	-0.867 [†] (0.467)	-0.621 (0.480)
Education Y	-0.070 (0.063)			
Experience Y		0.019 (0.035)		
Experience N			-0.066 (0.107)	
Unemployment				-0.244* (0.119)
Constant	-0.834** (0.285)	-1.217** (0.246)	-0.965** (0.275)	-0.913** (0.170)
Pseudo R^2	0.01	0.01	0.01	0.02
Log-likelihood	-161	-161	-161	-159
Observations	282	282	282	282
	Model 5	Model 6	Model 7	Model 8
Difference	-0.748 (0.473)	-0.759 (0.476)	-1.094* (0.493)	-0.559 (0.489)
Intrinsic	0.738* (0.313)			
Value		0.316 (0.305)		
Conflict			-0.594 [†] (0.337)	
Traits				0.217* (0.101)
Constant	-1.611** (0.271)	-1.186** (0.167)	-0.988** (0.161)	-1.495** (0.240)
Pseudo R^2	0.03	0.01	0.02	0.02
Log-likelihood	-159	-161	-160	-159
Observations	282	282	282	282
	Model 9	Model 10	Model 11	Model 12
Difference	-0.828 [†] (0.468)	-0.763 (0.475)	-0.871 [†] (0.466)	-0.819 [†] (0.470)
Frequency	0.211 (0.136)			
Willingness		0.127 (0.121)		
Family E			0.286 (0.288)	
Friends E				0.263 (0.303)
Constant	-1.372** (0.230)	-1.238** (0.194)	-1.297** (0.242)	-1.290** (0.258)
Pseudo R^2	0.02	0.01	0.01	0.01
Log-likelihood	-160	-161	-161	-161
Observations	282	282	282	282

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 2.6: Logistic regression with high work satisfaction in 2008 as dependent variable. Sample of 282 full-time equivalent employees.

2. The Opportunity Cost of Entrepreneurship

Satisfaction as an entrepreneur

Table 2.7 shows the findings for novice entrepreneurs. Contrary to before, it can be seen that the difference between predicted earnings in employment and realized earnings in entrepreneurship has a negative effect on work satisfaction in all models, although by much less than among employees. An increase in the percentage earnings difference of 100% decreases the likelihood of high work satisfaction of between 10.4% and 11.8%. In addition, the constant in all models has a higher value than was the case among employees, indicating a higher general level of work satisfaction among entrepreneurs.

The only indicator significant in the knowledge category is education. For each year of further education the likelihood of high work satisfaction decreases by 7.6%. The lower satisfaction for highly educated entrepreneurs could be explained by the opportunity cost for these individuals given by the high earnings that could be achieved as an employee in an established firm.

As before, intrinsic motivation and entrepreneurial traits increase the likelihood of high work satisfaction when looking at the identity indicators. Entrepreneurs more motivated by intrinsic work values are 51.3% more likely to be highly satisfied while adding an additional entrepreneurial trait increases the likelihood by 12.3%. Moreover, entrepreneurs with a high value-orientation toward work have a 53.6% higher likelihood of indicating high work satisfaction. These findings are in accordance with the expected since entrepreneurs with an "entrepreneurial identity" are assumed to match their environment better. Interestingly, work-family conflict is significant for employees but not entrepreneurs suggesting that working hard only decreases work satisfaction when working for someone else.

Contrary to the findings among employees, the network of the entrepreneurs is important for work satisfaction. First, entrepreneurs willing to contact more groups for work-related help have a higher likelihood of high work satisfaction. For each additional group the likelihood increases by 15.3%. Second, entrepreneurs with (former) entrepreneurs among family member have an increased likelihood of high work satisfaction of 45.4%. Interestingly, the two related variables – the number of groups with frequent contact and having (former) entrepreneurs among friends – seem not to be important for work satisfaction. Hence, in accordance with theory, being extrovert when it comes to asking for help and being able to get moral and professional support from family role models seem to be very important factors, not just for new venture survival, but also

for satisfaction as an entrepreneur.

	Model 1	Model 2	Model 3	Model 4
Difference	-0.126** (0.045)	-0.116** (0.044)	-0.118** (0.044)	-0.110* (0.044)
Education Y*	-0.079* (0.036)			
Experience Y*		0.025 (0.023)		
Experience N*			-0.013 (0.058)	
Unemployment*				-0.073 (0.047)
Constant	0.515** (0.181)	0.093 (0.103)	0.197 (0.172)	0.269* (0.105)
Pseudo R^2	0.02	0.01	0.01	0.01
Log-likelihood	-432	-434	-434	-433
Observations	635	635	635	635
	Model 5	Model 6	Model 7	Model 8
Difference	-0.118** (0.044)	-0.115** (0.044)	-0.117** (0.044)	-0.112* (0.044)
Intrinsic	0.414* (0.198)			
Value		0.429** (0.166)		
Conflict			-0.121 (0.162)	
Traits				0.116* (0.052)
Constant	-0.164 (0.177)	-0.001 (0.103)	0.232 [†] (0.122)	-0.123 (0.151)
Pseudo R^2	0.01	0.02	0.01	0.02
Log-likelihood	-432	-431	-434	-432
Observations	635	635	635	635
	Model 9	Model 10	Model 11	Model 12
Difference	-0.120** (0.044)	-0.118** (0.044)	-0.122** (0.045)	-0.119** (0.045)
Frequency	0.133 (0.084)			
Willingness		0.142* (0.061)		
Family E			0.374 [†] (0.222)	
Friends E				-0.050 (0.258)
Constant	-0.031 (0.147)	-0.050 (0.122)	-0.151 (0.204)	0.209 (0.244)
Pseudo R^2	0.01	0.02	0.01	0.01
Log-likelihood	-433	-432	-433	-434
Observations	635	635	635	635

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 2.7: Logistic regression with high work satisfaction in 2008 as dependent variable. Sample of 635 first-time entrepreneurs.

The natural next step would be to compare the influence of having an entrepreneurial profile – measured by work values and personality traits – for work satisfaction in both entrepreneurship and employment; since these two coefficients are significant in both Table 2.6 and 2.7. However, comparing coefficients from logit and probit models (with statistical tests) is not straight forward as

2. The Opportunity Cost of Entrepreneurship

it is when dealing with OLS models. The problem in the former two models arises as *"differences in the degree of residual variation across groups can produce apparent differences in coefficients that are not indicative of true differences in causal effects"* (Allison, 1999, p.187). After approaches to deal with the problem was outlined by Allison (1999), several additional practices have been added (Hoetker, 2007; Breen et al., 2011). An easy solution implemented in Hoetker (2006) – with interpretive value for this study – is not to compare one coefficient between two groups, e.g. β_1^A with β_1^B , but to compare the ratio of two coefficients between two groups, e.g. β_1^A/β_2^A and β_1^B/β_2^B . This can be done by comparing the trade-off between earnings difference (predicted minus actual earnings) on the one side and work values and personality traits on the other side. The former has a negative effect on work satisfaction while the latter two have a positive effect on work satisfaction; both in Table 2.6 and 2.7⁷.

For employees, the negative effect on work satisfaction of an increased earnings difference of 100% is just offset by having intrinsically work values (ratio=0.99). On the contrary, the negative effect of the increased earnings difference is more than offset by having intrinsically work values for entrepreneurs (ratio=3.5). Conducting the same analysis on personality traits, a similar pattern can be seen. For entrepreneurs, the negative effect of the increased earnings difference is just offset by having an additional entrepreneurial traits (ratio=1.0) while this is not the case for employees (ratio=0.4). Hence, comparing the size of the coefficients for work values and personality traits across the two groups could lead to a misleading conclusion: an entrepreneurial profile leads to more satisfaction in employment. This seems not to be the case but more research in this area is needed.

2.5 Discussion

2.5.1 Identity

Surprisingly, an entrepreneurial identity is found not to have an influence on earnings in entrepreneurship but, nevertheless, to have a positive and significant influence on earnings in employment. Thus, Hypothesis 1a is rejected while 2b is not. Hence, entrepreneurial individuals are monetarily rewarded in employment, although, initial findings show that entrepreneurial individuals are

⁷The coefficient for earnings difference is not significant in Table 2.6 (employees) but in Model 5 (one of the two models of interest) it is very close to being significant on 10%-level ($p=0.113$). Based on the smaller sample size of employees and the need to include two coefficients from the same sample, the comparisons are conducted.

less likely to pursue job opportunities in established firms. On the contrary, it takes more than an entrepreneurial mindset to survive "the valley of death" as well as achieving a high income from the new venture. Only working hard, measured by possible work-family conflict, seems to be of great importance for survival. Nevertheless, the self-selection into venturing for entrepreneurial individuals could be justified by a better fit of these individuals as entrepreneurs. The results, however, show that although individuals with entrepreneurial traits and work values are more likely to be highly satisfied among the entrepreneurs, the same is evident among the employees. This supports Hypothesis 2a while 2b is rejected. Still, having an entrepreneurial identity means being willing to forego more earnings in entrepreneurship than in employment, holding work satisfaction constant. Overall, it seems that entrepreneurial individuals are no worse off in working for an established business, although it is less likely that they will make this choice.

2.5.2 Knowledge

The only indicators for knowledge that are generally significant in all analysis are years of further education and unemployment history. These indicators represent possibilities on the labour market where highly educated individuals often are in high demand while individuals with long periods of unemployment often lack the skills and abilities demanded. First, Hypothesis 3a and 3b, concerning earnings, can not be rejected. Although, the period of unemployment has a negative impact on earnings in both entrepreneurship and employment, more education only increases earnings for employees. Second, Hypothesis 4a can not be rejected as entrepreneurs with more education – possibly due to the higher opportunity cost measured in foregone earnings – are less satisfied than entrepreneurs with less education. Hypothesis 4b can be rejected for education while it can not for unemployment; employees with a longer history of unemployment are less likely to be satisfied. In general, the findings concerning knowledge are as expected. If comparing these results with the decision to enter entrepreneurship, the higher likelihood of start-up for unemployed individuals can only be justified by work satisfaction. Furthermore, the likelihood of start-up is not dependent on education, even though individuals with more education ought to enter entrepreneurship to a lesser extent; both when assessing opportunity cost both in terms of earnings and work satisfaction.

2.5.3 Networks

The social network is assumed to be important for earnings both for entrepreneurs and employees. For entrepreneurs, the network is crucial for motivation,

2. The Opportunity Cost of Entrepreneurship

moral support, and getting access to vital resources for venturing (i.e. information, customers and suppliers, and capital and labour) while employees receive valuable information (e.g. about attractive job openings). Furthermore, both groups can benefit from including network ties in meeting work-related challenges. Surprisingly, Hypothesis 5a is rejected and 5b only weakly supported. None of the network indicators increase earnings for the entrepreneurs while only one, contact willingness, is significant and positive for employees. However, it should be noted that the prerequisite for high entrepreneurial earnings are surviving "the valley of death" which is positively influenced by all network indicators. The benefits of the network in entrepreneurship can also be seen when turning to work satisfaction. As expected, being willing to contact others for work-related help and having entrepreneurial role models among family members – giving access to both moral and professional support – increase the likelihood of high satisfaction among the entrepreneurs. These effects are not found among employees. Hence, Hypothesis 6a can not be rejected while Hypothesis 6b can. The strong link between social network indicators and the likelihood of starting a business therefore seem to be justified; both when it comes to survival and satisfaction.

2.5.4 Implications and limitations

The main findings of this study are that entrepreneurship does seem to be a networking activity while individuals with an entrepreneurial identity, contrary to conventional wisdom, seem to be better rewarded in employment. This has important policy implications as the focus often is on generating more new ventures by promoting entrepreneurial behaviour, intrinsic work values, and positive attitudes towards entrepreneurship. This might not be a wrong strategy but more research is needed on how acting entrepreneurial affects society level outcomes – as well as firm and individual level outcomes – depending on whether the individual chooses to act entrepreneurial in their own firm or in an established firm. This also needs to be explored further for the role of education in light of the recent political focus on academic entrepreneurship. This study emphasises significant opportunity costs for highly educated entrepreneurs but opposite findings are present in the few existing studies.

The advantage of this study is the inclusion of indicators from all three categories of entrepreneurial means – identity, knowledge, and networks – in analyses based on representative samples of both first-time entrepreneurs and employees with no previous entrepreneurial experience. However, because the survey uncovering identity and network is not longitudinal, conclusions about

causality are questionable. The most notable example is the positive, although weak, relationship between having (former) entrepreneurs among friends and earnings for entrepreneurs. One explanation is that these friends possess valuable knowledge which causes better firm performance and, thus, higher earnings for the entrepreneur. However, the causality might be the opposite. Entrepreneurs behind high performing ventures are more attractive to other entrepreneurs than low performing entrepreneurs. This problem is recognised in the literature but studies of how the social network of the entrepreneur changes, depending on firm performance, are yet to be seen. Concerning the identity indicators, reverse causality could also be present for values, which can change over time, but personality traits, however, are assumed to be stable; especially after the age at which the majority of individuals choose to start up a new venture. Finally, it should be noted that longitudinal data where the same individual is observed in both entrepreneurship and employment – regarding earnings, work satisfaction, and entrepreneurial means – would remedy the potential bias caused by unobservable individual characteristics.

2.6 Conclusion

Numerous studies within a broad range of disciplines have tried to establish a relationship between individual resources and founding, surviving, and growing a new venture. The current study contributes to this literature by assessing whether the decision to found a new venture for the first time is the right one based on individual resources and work-life success: earnings and work satisfaction. The general consensus is that entrepreneurs earn less than employees but, nevertheless, express higher work satisfaction. Accordingly, more individuals should found a new venture. Interpreting individual resources broadly by identity, knowledge, and networks, this study initially finds that entrepreneurs differ from employees regarding identity and network. But surprisingly, individuals with an "entrepreneurial identity" are found to be no worse off in employment while individuals with an "entrepreneurial social network", as expected, are better off in entrepreneurship. Finally, high education seems to provide a significant opportunity cost for entrepreneurship.

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2. The Opportunity Cost of Entrepreneurship

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2. The Opportunity Cost of Entrepreneurship

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2.6. Conclusion

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2.6. Conclusion

Indicator	Description	Imputations
Identity		
Intrinsic motivation	Dummy: The value 1 if the respondent finds more intrinsic values "very important" compared to extrinsic values if the respondent were to say yes to a new job. 8 intrinsic values (e.g. "the work entails responsibility", "the work tasks are varying", "you can work independently", and "you can strengthen skills and abilities") and 8 extrinsic values (e.g. "the work provides a high income", "the work is a good stepping stone for my further career", "the work tasks are tailored to the working hours", and "the colleagues show a personal interest in me" are included. The extrinsic values covers the financial, career, convenience, and co-worker dimension with two values for each.	79 - 6%
Value-orientation	Dummy: The value 1 if the respondent disagrees with the statement "Work is mainly an economic necessity" and furthermore agrees with at least one of the following three statements: "Work is the best way to develop skills and abilities", "Without work you often become lazy", or "You identify with your work".	44 - 4%
Work-Family conflict	Dummy: The value 1 if the respondent "regularly" (compared to "occasionally", "rarely", and "never") within the last 5 years because of their work have done at least one of the following three things: "Neglected family gatherings", "Neglected your work tasks at home", or "Worked in your vacation or on days off".	29 - 2%
Entrepreneurial traits	Discrete: The number of entrepreneurial traits that the respondent posses derived from 12 mixed and reversed statements related to the six traits: Tolerance of ambiguity (e.g. "I often pursue the attractive but uncertain opportunities"), need for achievement (e.g. "I prefer result-oriented and innovatory tasks"), locus of control "I think that success is the result of hard work", optimism (e.g. "I always expect the best outcome of a situation", desire for autonomy ("I like to determine myself how tasks are completed"), and creativity or innovativeness ("I often think of new ideas and ways to solve tasks"). The value 1 is given for each trait if there is agreement and disagreement with the two reversed statements.	48 - 4%
Knowledge		
Further education	Discrete: Highest achieved education in 2007 measured in years (based on the minimum number of years possible to achieve the education). The present compulsory number of years in elementary school is deducted (i.e. nine years). The variable can range from -X (i.e. less than present compulsory elementary school) to 11 (i.e. doctoral degree). For the entrepreneurs (start-up in 2004) the year used is 2003.	0 - 0%
Industry experience - Years	Discrete: The number of years in the period 1997-2006 that the individual worked in the same industry as the present in 2007. Hence, the variable can range from 0 to 10. For the entrepreneurs (start-up in 2004) the period is 1994-2003.	0 - 0%
Industry experience - Number	Discrete: The number of different industries (6 digit level) in the period 1997-2006 that the individual has worked in. Hence, the variable can range from 0 to 10. For the entrepreneurs (start-up in 2004) the period is 1994-2003.	0 - 0%
Unemployment - Number	Continuous: The natural logarithm to the total weeks of unemployment in the period in the period 1997-2006. For the entrepreneurs (start-up in 2004) the period is 1994-2003.	0 - 0%
Networks		
Contact frequency	Discrete: The number of different groups that the respondent talks to every or almost every week (including over telephone, mail, social network software, etc.). The four different groups included are: "Present colleagues or business relations outside of the work place", "Persons mainly known as former colleagues or business relations", "Persons mainly known as former schoolmates or fellow students", and "Persons mainly known from associations (e.g. sport and leisure).	36 - 3%
Contact willingness	Discrete: The number of different groups that the respondent "to a great extent" (compared to "some extent" and "not at all") would be willing to contact for work-related help (i.e. "Would you contact one of these persons if that person could help you with an important work task"). The four different groups included are: "Present colleagues or business relations outside of the work place", "Persons mainly known as former colleagues or business relations", "Persons mainly known as former schoolmates or fellow students", and "Persons mainly known from associations (e.g. sport and leisure).	22 - 2%
Family entrepreneurs	Dummy: The value 1 if the respondent if one or more of the following family member are running, or have been running, their own business as their main occupation: Close family (i.e. spouse/partner, parents, siblings, and children) or other family.	27 - 2%
Friends entrepreneurs	Dummy: The value 1 if the respondent if one or more among the following groups of friends are running, or have been running, their own business as their main occupation: Present colleagues, former colleagues, or other friends/acquaintances.	53 - 4%

Table 2.8: Indicators for human capital and start-up strategy from IDA and the survey.

2. The Opportunity Cost of Entrepreneurship

Variable	Type	Obs.	Mean	St.d.	Min.	Max.
Female	dummy	282	0.482	0.501	0	1
Age	discrete	282	43.695	9.383	23	62
Non-Danish	dummy	282	0.028	0.166	0	1
Married	dummy	282	0.663	0.473	0	1
Predicted (ln)	continuous	282	12.676	0.145	12.234	12.978
Earnings (ln)	continuous	282	12.770	0.316	11.429	14.077
Difference (ln)	continuous	282	-0.094	0.290	-1.419	1.230
Satisfaction	dummy	282	0.266	0.443	0	1
Education Y	discrete	282	4.297	2.267	-2	11
Experience Y	discrete	282	5.408	3.869	0	10
Experience N	discrete	282	2.223	1.297	1	8
Unemployment (ln)	continuous	282	0.831	1.395	0	5.170
Intrinsic	dummy	282	0.652	0.477	0	1
Value	dummy	282	0.259	0.439	0	1
Conflict	dummy	282	0.270	0.444	0	1
Traits	discrete	282	1.812	1.395	0	6
Frequency	discrete	282	1.213	0.986	0	4
Willingness	discrete	282	1.046	1.110	0	4
Family E	dummy	282	0.635	0.482	0	1
Friends E	dummy	282	0.684	0.466	0	1

Table 2.9: Descriptive statistics: employees.

Variable	Type	Obs.	Mean	St.d.	Min.	Max.
Female	dummy	635	0.241	0.428	0	1
Age	discrete	635	42.765	9.108	23	68
Non-Danish	dummy	635	0.054	0.225	0	1
Married	dummy	635	0.693	0.462	0	1
Predicted (ln)	continuous	635	12.716	0.147	12.169	12.975
Earnings (ln)	continuous	635	12.388	2.169	0	14.689
Difference (ln)	continuous	635	0.328	2.144	-1.858	12.919
Satisfaction	dummy	635	0.532	0.499	0	1
Education Y*	discrete	635	4.433	2.260	-3	11
Experience Y*	discrete	635	2.850	3.566	0	10
Experience N*	discrete	635	2.608	1.371	0	9
Unemployment* (ln)	continuous	635	1.348	1.644	0	5.572
Intrinsic	dummy	635	0.794	0.405	0	1
Value	dummy	635	0.386	0.487	0	1
Conflict	dummy	635	0.567	0.496	0	1
Traits	discrete	635	2.476	1.569	0	6
Frequency	discrete	635	1.474	0.962	0	4
Willingness	discrete	635	1.518	1.337	0	4
Family E	dummy	635	0.846	0.362	0	1
Friends E	dummy	635	0.890	0.313	0	1

Table 2.10: Descriptive statistics: entrepreneurs.

2.6. Conclusion

	Model 1	Model 2	Model 3	Model 4
Education Y*	0.023 (0.042)			
Experience Y*		0.014 (0.025)		
Experience N*			-0.063 (0.066)	
Unemployment*				-0.176** (0.051)
Constant	8.790** (2.148)	8.802** (2.147)	9.120** (2.166)	8.387** (2.130)
Controls	YES	YES	YES	YES
R^2	0.12	0.12	0.12	0.14
Observations	635	635	635	635
	Model 5	Model 6	Model 7	Model 8
Intrinsic	0.025 (0.211)			
Value		0.199 (0.178)		
Conflict			-0.235 (0.173)	
Traits				0.060 (0.057)
Constant	8.812** (2.154)	8.623** (2.153)	9.137** (2.155)	8.682** (2.150)
Controls	YES	YES	YES	YES
R^2	0.12	0.12	0.12	0.12
Observations	635	635	635	635
	Model 9	Model 10	Model 11	Model 12
Frequency	-0.046 (0.091)			
Willingness		-0.006 (0.064)		
Family E			-0.168 (0.235)	
Friends E				0.267 (0.278)
Constant	8.896** (2.150)	8.841** (2.149)	8.946** (2.152)	8.709** (2.149)
Controls	YES	YES	YES	YES
R^2	0.12	0.12	0.12	0.12
Observations	635	635	635	635

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 2.11: OLS regression with the natural logarithm to 2007 earning as dependent variable. Negative values are set to 0. Control variables included (but not shown) are Female, Age, Age2, Non-Danish, Married, Labour market region (21 categories), and Industry (10 categories). Sample of 635 first-time entrepreneurs.

2. The Opportunity Cost of Entrepreneurship

2.6.1 Earnings entrepreneurs - Heckman model

	Model 1	Model 2	Model 3	Model 4
Education Y*	0.023 (0.041)			
Experience Y*		0.014 (0.025)		
Experience N*			-0.063 (0.064)	
Unemployment*				-0.177** (0.050)
Constant	8.726** (2.114)	8.738** (2.114)	9.056** (2.128)	8.312** (2.095)
Controls	YES	YES	YES	YES
Log-likelihood	-1903	-1902	-1902	-1896
Observations	972	972	972	972
	Model 5	Model 6	Model 7	Model 8
Intrinsic	0.030 (0.206)			
Value		0.199 (0.173)		
Conflict			-0.215 (0.185)	
Traits				0.060 (0.056)
Constant	8.731** (2.119)	8.557** (2.118)	9.024** (2.140)	8.622** (2.116)
Controls	YES	YES	YES	YES
Log-likelihood	-1902	-1902	-1888	-1902
Observations	972	972	972	972
	Model 9	Model 10	Model 11	Model 12
Frequency	-0.042 (0.092)			
Willingness		-0.003 (0.064)		
Family E			-0.162 (0.236)	
Friends E				0.273 (0.274)
Constant	8.842** (2.136)	8.770** (2.122)	8.903** (2.135)	8.656** (2.125)
Controls	YES	YES	YES	YES
Log-likelihood	-1898	-1900	-1900	-1901
Observations	972	972	972	972

Note: **, *, and † is significant at the 1%, 5%, and 10% level, respectively.

Table 2.12: Main equations from a Heckman selection model. The natural logarithm to earnings 2007 is dependent variable in the main equation and survival 2004-2008 is dependent variable in the selection equation. Control variables included (but not shown) are Female, Age, Age2, Non-Danish, Married, Labour market region (21 categories), and Industry (10 categories). Sample of 972 first-time entrepreneurs in the selection equation and 635 survived entrepreneurs in the main equation.

2.6. Conclusion

	Model 1	Model 2	Model 3	Model 4
Wealth - ln	0.015* (0.008)	0.015 [†] (0.008)	0.015 [†] (0.008)	0.015 [†] (0.008)
Education Y*	-0.004 (0.021)			
Experience Y*		0.010 (0.013)		
Experience N*			-0.014 (0.034)	
Unemployment*				-0.027 (0.026)
Constant	-0.538 (1.071)	-0.539 (1.072)	-0.464 (1.085)	-0.566 (1.073)
Controls	YES	YES	YES	YES
Log-likelihood	-1903	-1902	-1902	-1896
Observations	972	972	972	972
	Model 5	Model 6	Model 7	Model 8
Wealth - ln	0.015* (0.008)	0.015* (0.008)	0.016* (0.008)	0.015* (0.008)
Intrinsic	0.141 (0.107)			
Value		-0.020 (0.092)		
Conflict			0.475** (0.092)	
Traits				-0.004 (0.030)
Constant	-0.664 (1.075)	-0.514 (1.077)	-1.117 (1.084)	-0.525 (1.075)
Controls	YES	YES	YES	YES
Log-likelihood	-1902	-1902	-1888	-1902
Observations	972	972	972	972
	Model 9	Model 10	Model 11	Model 12
Wealth - ln	0.015 [†] (0.008)	0.015* (0.008)	0.015 [†] (0.008)	0.015 [†] (0.008)
Frequency	0.152** (0.047)			
Willingness		0.089* (0.035)		
Family E			0.280* (0.116)	
Friends E				0.247 [†] (0.132)
Constant	-0.839 (1.079)	-0.781 (1.074)	-0.724 (1.077)	-0.703 (1.073)
Controls	YES	YES	YES	YES
Log-likelihood	-1898	-1900	-1900	-1901
Observations	972	972	972	972

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 2.13: Selection equations from a Heckman selection model. The natural logarithm to earnings 2007 is dependent variable in the main equation and survival 2004-2008 is dependent variable in the selection equation. Control variables included (but not shown) are Female, Age, Age2, Non-Danish, Married, Labour market region (21 categories), and Industry (10 categories). Sample of 972 first-time entrepreneurs in the selection equation and 635 survived entrepreneurs in the main equation.

Passive and Active Learning from Entrepreneurship

An Empirical Study of Re-Entry and Survival

Abstract *The purpose of this study is to contribute to the movement in entrepreneurship research from explanations of performance based exclusively on traits or luck to those based on skills and learning. Both conventional wisdom and extant research in this regard argue for the importance of persistence after failure and learning from failure. Our study of 1,789 entrepreneurs who re-entered entrepreneurship after a failed venture supports both persistence and learning, but with a twist. Persistence paid off for entrepreneurs who already had certain kinds of human and social capital, even when controlling for unemployment record and opportunity costs. Yet the individuals with those human capital and social capital characteristics were not as likely to become re-starters. A Type I error, therefore, appears to hinder the development of habitual entrepreneurship.*

3.1 Introduction

"The fact is I lived through that (failure) and I saw a set of reasons why a company goes under and now I'm much more prepared to handle whatever the market sends to me." ("Jake" in Cope (2010)).

"You learn much more from failure... I mean just success coming along is just waiting for that big disaster to get you, because you're not thinking and whole bits of your brain shut down. You think you're invincible, you think you're Teflon coated and you're not." ("Colin" in Cope (2010)).

3. Passive and Active Learning from Entrepreneurship

Entrepreneurship as a field has been moving from an almost exclusive emphasis on the traits of entrepreneurs (McClelland, 1961; Brockhaus, 1982; Stanworth et al., 1989; Woo et al., 1991) to a deeper understanding of the role of experience and learning (Baron and Ensley, 2006; Gompers et al., 2006; Eesley and Roberts, 2006a,b; Sarasvathy, 2008). However, the relationships between the three are far from clear.

Even though some proponents of traits continue to resurface (Baum et al., 2007; Gartner, 1988; McClelland, 1961; Zhao and Seibert, 2006), the attitude is more nuanced, acknowledging that traits can at best be only a part of the story. For example, Rauch and Frese (2007) state in their conclusion "... a model of the effects of personality traits on business creation and business success must include other individual differences variables as well as non-personality variables, such as action strategies, cognitive ability, and environment, which are additional predictors of performance." (Rauch and Frese, 2007).

When it comes to the role of learning and experience, the focus has mostly been on the impact of the entrepreneur's experience on the performance of the venture he or she starts. Westhead et al. (2005) demonstrate the superior performance of portfolio entrepreneurs over serial and novice entrepreneurs; Baron and Ensley (2006) find support for the superior performance of experienced entrepreneurs at opportunity recognition tasks; and Gompers et al. (2006) provide compelling evidence for the superior performance of serial founders over first-time entrepreneurs among those backed by venture capital funding. They conclude, in fact, that skills acquired through learning by doing better explain entrepreneurial performance than luck. Eesley and Roberts (2006a,b) also argue the same and provide further evidence for the links between learning by doing and key performance measures.

This stream of literature on the links between the entrepreneurs' experience and firm performance raises very interesting questions worthy of empirical attention: Is it merely the fact of starting more than one firm key to better performance, or are there certain types of learning and experience in the early firms that cue in better performance in later firms? Does it matter whether the first firm was a success or a failure? If the latter, is it more likely or less likely that the entrepreneur will start another firm? And even more important, who is most likely to become successful with the second firm?

Conventional wisdom as well as some recent academic evidence (Cope, 2010)

3.1. Introduction

argues that learning from failure is essential to improving the entrepreneur's preparedness for future ventures. Given that about half of all new ventures fail (Headd, 2003; Mata and Portugal, 1994; Dahl et al., 2009), and that entrepreneurs acquire expertise over multiple ventures, it might behoove us to more carefully consider the factors that explain (1) who moves from exiting a failed venture to starting another one and also (2) how well they perform in that second venture.

In the ensuing study, we overcome some limitations of existing studies of renascent entrepreneurship and add to the burgeoning understanding of the role of learning and experience in habitual entrepreneurship. Specifically, we (1) study actual renascent instead of intended renascent entrepreneurship; (2) use measures of performance of both ventures in evaluating which individuals actually improved their entrepreneurial skills and which did not; (3) study the above with longitudinal register data and not longitudinal or cross sectional survey data; and (4) apply statistical models that account for selection bias for the observed re-starters.

Longitudinal register data from IDA (Integrated Database for Labour Market Research) - a matched employer-employee database that covers all individuals and firms in Denmark in the period 1980-2007 - enabled us to identify all entrepreneurs starting up one or two businesses in the period 1980-2007 with the first business started in the period 1988-1998.

The entrepreneurs that started up a second business within six years after the first start-up constitutes the sample of re-starters while those that did not startup again constituted the sample of one-time entrepreneurs. Econometric analyses of the data allowed us to test competing hypotheses about the role of learning from failure for re-entry and subsequent performance in the next venture. Results show that while failure of the first firm did not deter re-entry, performance was contingent on human and social capital and, furthermore, sometimes conditioned on previous failure.

In other words, the mere fact of failing did not result in learning effects. Instead, some form of absorptive capacity (in terms of education and moral support) was necessary for entrepreneurs to benefit from the learning possibilities inherent in their experience of failure in the first firm. Moreover, precisely those individuals with the necessary absorptive capacity seemed not to take advantage of this by becoming habitual entrepreneurs.

3.2 Theory

3.2.1 What explains re-entry?

The classic model of entry into entrepreneurship consists in the choice between starting a venture and staying in wage employment. The choice is usually modeled under conditions of economic rationality as the maximisation of income given the expected income from entrepreneurship and the opportunity cost of entrepreneurship offered by the wage income that can be earned as an employee in an established business (Stam et al., 2008; Parker, 2004; Jovanovic, 1994, 1982). That model leads to the following career pattern: The entrepreneur behind a successful business will continue his or her entrepreneurial career whereas the entrepreneur behind an unsuccessful business will choose the alternative occupation of being an employee for an established business.

Recent studies focusing on (intended) renascent entrepreneurship reveal that when compared with the general population, a significantly larger share of individuals with past entrepreneurial experience exhibit a preference or revealed preference for re-entering entrepreneurship (Stam et al., 2008). These studies seem to be in opposition to the simple occupational choice model described above where there is no room for habitual entrepreneurship (serial or portfolio), especially after a low performance or failed exit.

We can observe a similar dichotomy in the literature when we approach the re-entry decision from the point of view of psychological traits and passive learning about those traits. On the one hand, because failure is associated with negative emotions such as grief, entrepreneurs are less likely to re-enter after a business closure (Shepherd, 2003; Shepherd et al., 2009). On the other hand, certain traits such as optimism or even overconfidence is likely to be associated with positive emotions that allow entrepreneurs with those traits to be more likely to re-enter (Hayward et al., 2009).

There is a large literature on the biases exhibited by entrepreneurs (Busenitz and Barney, 1997). Prominent among these is overconfidence bias (Camerer and Lovallo, 1999; Forbes, 2005) - namely the tendency among entrepreneurs to overestimate the probability of their own success and the efficacy of their own abilities. A related bias is called comparative optimism (i.e., the tendency of people to report that they are less likely than others to experience negative events, and more likely than others to experience positive events (Helweg-Larsen and Shepperd, 2001). Most studies of these biases have occurred in laboratory

3.2. Theory

settings and almost exclusively focus on entry into the first venture rather than re-entry, especially re-entry after failure. A notable exception is provided by Ucbasaran et al. (2010), where a survey of a representative sample of 576 British entrepreneurs found that serial entrepreneurs were less likely to report a reduction in optimism after business failure.

Besides the lens of occupational choice and the psychology of biases and emotions, scholars have also approached the question phenomenologically. And again the evidence seems to point to a competing hypothesis with regard to re-entry after failure. According to Cope (2010), business failure can be a "harsh teacher" and "have a serious and detrimental impact on an entrepreneur's life" when looking at the financial, emotional, physiological, social, professional, and entrepreneurial sphere. Thus, experiencing failure can make it impossible (e.g. unable to attract necessary resources like capital and labour) or discourage entrepreneurs (e.g. failure stigmatisation and loss of social capital) from starting up again. However, failure in opposition to success could also be the catalyst for learning, an argument supported in Cope (2010) through the two statements quoted at the beginning of the chapter.

Of course, the simplest lesson of failure – following Stam et al. (2008) we call this passive learning from failure – is that when individuals have imperfect information about their own abilities, failure signals a lack of entrepreneurial abilities and the rational conclusion they would draw would be not to start another venture. In other words, when we examine what entrepreneurs may learn merely from the fact that their venture failed (irrespective of emotional consequences and biases that refract their perception), the simple result would be a lowering of the likelihood that they would re-enter entrepreneurship.

In sum, we are led to the following competing hypotheses with regard to the re-entry decision:

Hypothesis 1a: Entrepreneurs that close down with their first business are more likely to start up a business again (positive emotions and/or active learning).

Hypothesis 1b: Entrepreneurs that close down with their first business are less likely to start up a business again (negative emotions and/or passive learning).

3. Passive and Active Learning from Entrepreneurship

3.2.2 What explains firm performance after re-entry?

Several of the arguments and much of the evidence that motivated the competing hypotheses above also have competing implications for the performance of the firm started after re-entry. For example, overconfident entrepreneurs are not only more likely to re-enter, they are also more likely to fail - by definition. Using large population surveys from 18 countries, Koellinger et al. (2007) found "a significant negative correlation between this reported level of entrepreneurial confidence and the approximate survival chances of nascent entrepreneurs." In a survey of over 200 entrepreneurs drawn from a national random sample in the US, Hmieleski and Baron (2009) also found a negative correlation between optimism and new venture performance. When Cooper et al. (1991) found, contrary to their expectation, that novice entrepreneurs sought more information than habitual entrepreneurs, they attributed this finding to the overconfidence of habitual entrepreneurs.

Hypothesis 2a: Entrepreneurs that close down with their first business are more likely to close down with a second business (psychological biases / inadequate abilities).

Yet, there is considerable evidence that failure itself may be an instrument of learning. Again, following Stam et al. (2008), we call this "active learning" - the idea that entrepreneurs can learn useful lessons from failure that add to their competence in building the next venture. Moreover, some may even actively start and close businesses with an explicit focus on experimental learning (Harper, 1996). Evidence for the latter is also found in studies of industrial organisation: *"To put the point provocatively, we have thought many entrants fail because they start out small, whereas they may start with small commitments when they expect their chances of success to be small. At the same time, small-scale entry commonly provides a real option to invest heavily if early returns are promising. Consistent with this, structural factors long thought to limit entry to an industry now seem more to limit successful entry: if incumbents earn rents, it pays the potential entrant to invest for a "close look" at its chances."* (Caves, 1998, p.1961).

The possibility of superior active learning is also supported by the phenomenological evidence in Cope (2010). Finally, there is a growing body of evidence based on entrepreneurial expertise that suggests that both successful and failed ventures may contribute to the development of expertise (Dew et al., 2009a;

3.2. Theory

Mitchell et al., 2004). Sarasvathy (2008) finds that expert entrepreneurs, having started and managed multiple ventures - both successes and failures, tend to use a distinct effectual logic (non-predictive control) in contrast to causal logic (predictive control) when facing entrepreneurial decisions; the former logic shown to be the better choice for novice entrepreneurs and experienced managers.

Taken together, these studies point to the following hypothesis about performance after re-entry:

Hypothesis 2b: Entrepreneurs that close down with their first business are less likely to close down with a second business (superior active learning from failure).

In sum, existing literature on the subject argues for at least three theoretically informed explanations for competing hypotheses for re-entry after failure: (1) traits and emotions; (2) passive learning; and (3) active learning.

Empirically, however, a handful of recent studies, many of them as yet unpublished but summarised in Table 3.1, point to two possible stylised facts: First, all entrepreneurs irrespective of whether they succeeded or failed in their first venture, are more likely to start another venture than novice entrepreneurs (Amaral and Baptista, 2007; Metzger, 2006, 2007, 2008; Stam et al., 2008). Second, entrepreneurs who start again after failure are significantly more likely to fail (Metzger, 2007).

Additionally, in any test of theoretical explanations of entrepreneurial entry or re-entry, one has to account for and rule out the simple alternate empirical hypothesis that people enter and re-enter entrepreneurship due to lack of alternative wage employment opportunities (often labeled "push" entrepreneurship in contrast to "pull" entrepreneurship (Parker, 2004)). And we will do exactly that after testing the main competing hypotheses. Furthermore, we loosen the definition of failure to include only those entrepreneurs that close their business and have negative change in their personal wealth to account for the cost of the entrepreneurial experience. Before we proceed to describing the method of the study and data analyses, we outline a few additional hypotheses.

3. Passive and Active Learning from Entrepreneurship

Study	Dependent	Independent	Finding
Metzger (2006)	Re-start performance (employment growth)	Previous entrepreneurial experience and success	Previous entrepreneurial experience increases firm performance but the effect is eliminated if the previous firm has failed measured by firm or personal bankruptcies.
Schutjens and Stam (2006)	Intended versus realised re-entry	Various variables	Many factors have a significant influence on start-up intentions while only "being located in an urban region" transpired to have a significant effect on the start of a new business.
Amaral and Baptista (2007)	Direct versus latent serial entrepreneurship	Previous exit type	Individuals who close (instead of leave) their first firm are more likely to become direct serial entrepreneurs (starts a new firm directly after having been in the previous firm) than latent serial entrepreneur (starts a new firm after a period as employee or unemployed).
Metzger (2007)	Re-start failure (survival)	Previous entrepreneurial experience and success	Successful entrepreneurial experience has no great effect on the risk of failing again while unsuccessful entrepreneurial experience has a negative effect when previous success is measured by bankruptcy and voluntary closure of a firm in financial distress.
Metzger (2008)	Re-start likelihood	Firm closure and financial losses	Private losses of the entrepreneurs do not affect the likelihood of a re-start but losses at banks and public institutions make re-start less likely. The likelihood of re-start is not affected by different types of previous venture closures that usually are considered to be failures.
Stam et al. (2008)	Re-start abstinence	Prior entrepreneurial experience and nature of firm exit	Having started more than one business in the past has a negative effect on abstinence from re-nascent entrepreneurship. If the previous firm (or parts of it) were sold that has a negative effect on abstinence while prior exit due to personal circumstances has a positive effect on abstinence.
Hessels et al. (2009)	Entrepreneurial activity	Recent entrepreneurial exit (within the past 12 month)	Recent exit is found to decrease the likelihood of no entrepreneurial activity while increase the likelihood of engagement on all other levels (divided into potential, intentional, nascent, young, and established entrepreneurship).

Table 3.1: Existing studies of entrepreneurial re-start and re-start performance.

3.2.3 The role of human and social capital in active learning

Both human capital (Diochon et al., 2002; Klepper, 2002; Phillips, 2002; Kim et al., 2006; Reynolds et al., 2004; Lazear, 2004; Wagner, 2005) and social capital

(Bosma et al., 2004; Stam and Elfring, 2008) have been shown to be of considerable importance in entrepreneurship whether in influencing the startup decision or in subsequent performance of the venture started. Stam et al. (2008) suggest at least two ways that human capital may impact nascent entrepreneurship - first, by increasing the number of opportunities to choose from and second by providing the absorptive capacity needed for ex-entrepreneurs to learn useful lessons from their experience. It is reasonable to assume that social capital has similar impacts on nascent entrepreneurship. Hence the following two sub-hypotheses:

Hypothesis 1bb: Entrepreneurs with higher levels of human and social capital are more likely to start up a business again, but the effect is greater for entrepreneurs that close down with their first business (superior active learning dependent on human and social capital).

Hypothesis 2bb: Entrepreneurs with higher levels of human and social capital are less likely to close down with a second business, but the effect is greater for entrepreneurs that close down with their first business (superior active learning dependent on human and social capital).

3.3 Method

Longitudinal register data from IDA (Integrated Database for Labour Market Research) is used for the analysis. IDA is a matched employer-employee database that covers all individuals and firms in Denmark in the period 1980-2007. From IDA, we identified the founder(s) behind every new business with real activity that was started in the period from 1980 till 2007¹. The founders were sampled using the procedure followed in Sørensen (2007) and Nanda and Sørensen (2010): (i) The founders of a business with personal liability (unincorporated) are the individuals in the business with an occupational code as employer or self-employed (ii) The founders of a business with limited liability (incorporated) are all individuals present in the firm if there is three or less (iii) The founders of a business with limited liability (incorporated) are the individuals with an occupational code as CEO or executive if there is more than three; if no one has these occupational codes, the three individuals with the highest

¹A new business is identified as a new work place (or new work places) under a new legal unit (employer). Businesses from the primary sector and the energy sector are excluded because of government subsidies and control. Real activity requires the business to have fulltime equivalent employees and turnover of above a given limit dependent on the industry.

3. Passive and Active Learning from Entrepreneurship

wage are identified as the entrepreneurs².

From the total set of founders in IDA we identified all entrepreneurs starting up one or two businesses in the period 1980-2007 with the first business started in the period 1988-1998. In the ensuing analysis, the entrepreneurs that started a second business within six years after the first start-up constitute the sample of re-starters (including both serial and portfolio entrepreneurs) while those that do not start-up again constitute the sample of one-time entrepreneurs. A second start-up has to be within six years after the first start-up given the need to study what is learned from the first business experience and not from other labour market experiences. Entrepreneurial experience before 1980 is not seen as a problem given that the entrepreneurs have no entrepreneurial experience between 1980 until the start up in 1988-1998. However, individuals with an occupational code as employer or self-employed the year before the start-up are excluded. Finally, the limited group of serial entrepreneurs behind more than two start-ups in the period is also excluded. Descriptive statistics on the sample can be found in Table 3.5 and 3.6.

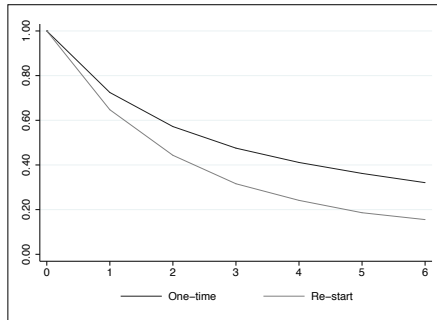


Figure 3.1: Kaplan Meier survivor function (x-axis is years) for the first business divided into one-time entrepreneurs and re-starters.

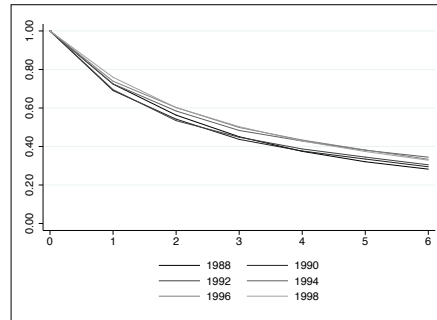


Figure 3.2: Kaplan Meier survivor function (x-axis is years) for the first business divided by start-up year 1988-1998.

The survival curve for the first business for the resulting 1.789 re-starters and 45.185 one-time entrepreneurs can be seen in Figure 3.1. It can be seen that one-time entrepreneurs perform better with their first business. Figure 3.2 shows the survival curve for the first business for all 46.974 entrepreneurs dependent on start-up year. The figure shows no great difference in the likelihood of survival dependent on start-up year.

²A limited number of the identified entrepreneurial firms were excluded based on the following further restrictions: No more than five founders or 20 persons present in the startup year (founders and employees).

One-timers			Restarters					
Failure First	n	%	Failure First	n	%	Failure Last	n	%
0	20,956	46	0	547	31	0	283	16
						1	264	15
1	24,229	54	1	1,242	69	0	536	30
						1	706	39
N	45,185	100	N	1,789	100	N	1,789	100

Table 3.2: Failure with the first and second business started.

Following the notion of surviving the "valley of death" in Stam et al. (2008), entrepreneurial failure is defined as not surviving three years after start-up. Not surviving means that the business is closed down and not continued by others. In Table 3.2, the frequency and percentage share of successful and unsuccessful first start-ups can be seen for the re-starters and one-time entrepreneurs. Here we can see again the abovementioned pattern that one-time entrepreneurs perform better with their first venture. 69% of the re-starters close down with their first business within three years while this statistic for the one-time entrepreneurs is 54%. For the re-starters, 39% of the failed 69% also fail with their second venture while 16% of the successful 31% also becomes successful with their second venture.

However, to test the competing hypotheses we are interested in, multivariate analysis is called for.

Dependent variables:

- Second business failure:
The business is not real active three years after the start-up year (2)
- Second business start-up:
A new real active business is founded within six years after the first (2)

Independent variables:

- Person: Gender (2), Age (4), Urban area (2)
- Firm: Household wealth* - ln, Firm size - ln(workers), Industry (6)
- Firm (extra): Same industry start-up (2), Years between start-ups
- Entrepreneurial ability: First business failure (2)
- Human capital: Years of further education, Years in start-up industry**, Number of industries**, Unemployment** (2)
- Social capital: Founding team (2), Parent entrepreneur** (2), Peer (sibling/spouse) entrepreneur** (2), Married (2)

3. Passive and Active Learning from Entrepreneurship

In parentheses can be seen the number of categories for categorical variable; the specific categories can be seen in the tables with regression results. Personal demographics, human capital, and social capital variables are created with information up till the first start-up year (given that they are assumed to be fairly constant until second start-up) while firm demographics variables are created with information from the second start-up year. Variables with * and ** indicate that information the year prior to start-up (*) or five years prior to start-up (**) is used. Descriptive statistics of these variables can be found in Table 3.7.

3.3.1 Human capital

Previous entrepreneurial experience. In the discussion leading to hypotheses development, we showed the importance of this variable for our analysis. Both published articles such as Ucbasaran et al. (2010) and Stam et al. (2008) and unpublished works such as Metzger (2006, 2007, 2008) use this variable to capture human capital.

Education. This is the most commonly used operationalisation of human capital. But the role of education for start-up and success is ambiguous. On the one hand, more educated people might be better informed about business opportunities and select themselves into occupations or industries where entrepreneurship is more common. On the other hand, however, the skills that make good entrepreneurs are unlikely to be the same as those embodied in formal qualifications (Parker, 2004). The significance of education is therefore ambiguous but, nevertheless, assumed to be dependent on the industry. Both Wagner (2002) and Hessels et al. (2009) find education not to have an effect on the likelihood of re-start while Stam et al. (2008) find education to have a negative effect on abstinence from renascent entrepreneurship. Turning to the likelihood of successful entrepreneurship, Metzger (2007) and Metzger (2006) find education to lower the likelihood of firm closure and increase the likelihood of growth, respectively.

Work experience. People with more work experience are expected to be entrepreneurs. More time on the job, whether as an employee or self-employed, allows more time to learn about the business environment, build important networks in this environment, and, therefore, enables access to more opportunities within the work environment (Parker, 2004). From the literature, industry specific experience appears very important for entrepreneurial success. Many

studies including Phillips (2002) and Agarwal et al. (2004) find that spin-off entrepreneurs are more likely to survive than other entrepreneurs. Explanations include the transfer of knowledge, resources, and routines from the spin-out company to the new venture. Therefore, the performance of the new venture is also shown to be dependent on the performance of the spin-out company (Phillips, 2002; Agarwal et al., 2004). Looking at abstinence of renaissance entrepreneurship, however, prior industry experience is not found to have an effect in Stam et al. (2008).

Generalist as opposed to specialised skills. According to Lazear (2005), individuals characterised as "jacks-of-all-trades", i.e. persons with multiple skills but no expert proficiency, are more likely to become entrepreneurs. If these individuals also are more likely to become successful entrepreneurs, this contrasts the view of successful entrepreneurship triggered by more education and work experience from the same industry. However, it could be that these generalists, with diversified labour market experience, are more likely to be pushed into entrepreneurship because of lack of expert skills demanded on the labour market. Also unemployment is assumed to push individuals into entrepreneurship (Parker, 2004).

3.3.2 Social capital

The positive impact of social capital on entrepreneurial performance is usually argued to work through two mechanisms: motivation and access to valuable resources like information, customers and suppliers, and capital and labour (Parker, 2004; Brüderl and Preisendörfer, 1998; Aldrich and Zimmer, 1986).

Family Support. Several studies emphasise the importance of a moral support network (Hisrich et al., 2005; Parker, 2004; Brüderl and Preisendörfer, 1998). The decision to start a business involves risk and uncertainty which is why understanding, backing, and support from family and close friends can be essential for the decision. Empirical support for the importance of family relations and the moral support network can be found in Sanders and Nee (1996) looking at marriage status, Hanlon and Saunders (2007) looking at key supporters for success, and Brüderl and Preisendörfer (1998) looking at survival and growth of newly founded businesses.

Mentors. The social network gets an even greater importance for start-up and success if it contains entrepreneurs who can act as mentor or role model (Bosma et al., 2011); also labelled "peer effects" in the literature. Thereby, it

3. Passive and Active Learning from Entrepreneurship

is possible to gain a realistic insight into the values, abilities and skills that are important for starting and running a business as well as important resources and contacts (Hisrich et al., 2005). This is supported in Nanda and Sørensen (2010) where individuals are more likely to become entrepreneurs if their parents or former work colleagues have entrepreneurial experience, and in Davidsson and Honig (2003) where the likelihood of being a nascent entrepreneur is higher for individuals with entrepreneurial parents, entrepreneurial friends or neighbors, or if family and friends have been encouraging about entrepreneurship.

Also, in studies of habitual entrepreneurship, the peer effect for starting up a second time is generally supported: Personal contact with a young entrepreneur makes it more likely to take a second chance (Wagner, 2002), having an entrepreneurial role model makes abstinence from renascent entrepreneurship less likely (Stam et al., 2008), and knowing an entrepreneur increases entrepreneurial engagement (Hessels et al., 2009). In addition, Metzger (2008) finds that team foundation has a positive effect on starting again and team foundation has a positive effect on second venture growth (Metzger, 2006).

3.3.3 Control Variables

Given our focus on illuminating the relationship between previous venture exit, and subsequent venture start-up and performance, we will include in our analysis, control variables for individual demographics as well as business demographics.

3.3.4 Personal demographics

Gender. Females are a minority of the self-employed workforce in all developed countries (Parker, 2004) and Hessels et al. (2009) find that the entrepreneurial engagement after exit is higher for males.

Age. Individuals in mid-career are found to be more likely to found a venture in general (Parker, 2004) while older individuals with previous entrepreneurial experience are less likely to do so (Metzger, 2008; Wagner, 2002; Stam et al., 2008). Moreover, the inverse u-shaped curve for age and entrepreneurship in general could be explained by younger individuals lacking all types of capital: Human (work experience), social (work networks), and financial capital necessary for start-up while older individuals are more risk averse and unwilling to work long hours (Parker, 2004). Metzger (2007) also finds a u-shape for age on

the likelihood of closing with a second business.

3.3.5 Business demographics

Size. According to the literature, it is important to control for "the liability of smallness" as separate from "the liability of newness" when controlling for business demographics. Freeman et al. (1983) find that small organisations have a lower likelihood of survival when controlling for age. On way of controlling for "the liability of smallness" is to include variables for financial capital and number of employees in the business (Brüderl et al., 1992). More capital allows the business to cope with random shocks from the environment during the critical start-up period (Brüderl et al., 1992) while larger businesses are better at attracting capital and qualified labour, have lower production cost and can take advantage of economies of scale (Hager et al., 2004). Metzger (2006) finds that previous venture size (number of employees) has a positive effect on the likelihood of starting up again while Metzger (2007) and Metzger (2006) find that size has a surprisingly positive and negative effect on firm survival and growth, respectively.

Industry and Geography (Urban/Rural). The nature of competition and resources necessary for start-up in different industries and areas (e.g. urban and rural), respectively, call for control variables for industry and area in both analysis of survival and start-up. Schutjens and Stam (2006) find that being located in an urban region is the only factor leading to realised re-start while Stam et al. (2008) find an urban location leading to abstinence of re-nascent entrepreneurship. Finally, Metzger (2006) find a metropolitan district to have a positive effect on firm growth with a second venture. In both Metzger (2008, 2006) industry dummies have a significant effect while this is not the case in Stam et al. (2008). Additionally, since we are interested in explaining the performance of a second venture, it would also be relevant to include a variable for whether the second business is started in the same industry as the first (if entrepreneurial learning is industry specific versus general) and the time between the first and second start-up (the time the entrepreneur had to learn from the experience).

3.4 Analysis

The analyses in the chapter are done in three steps:

First, both the likelihood of restart and the likelihood of failure with the

3. Passive and Active Learning from Entrepreneurship

restart are estimated through a Heckman probit regression where the latter is treated as the main equation and the former as the selection equation. The benefit of this approach is that the estimates for the likelihood of restart failure take into account that some individuals are *a priori* more likely to be observed with a second business, e.g. push entrepreneurs. In other words, the Heckman probit minimises possible selection bias. However, the cost of this approach is that exactly the same variables have to be included in the main and selection equation aside from at least one extra instrument in the selection equation. Hence, variables not observed for the one-time entrepreneurs (e.g. variables related to the second business) cannot be included. Two interaction terms are included: failure interacted with one indicator for human and social capital, respectively. The inclusion of these is based on probit regressions where these were the only significant terms.

Second, the Heckman probit regressions are repeated with a subsample excluding possible push entrepreneurs (operationalised through the exclusion of pre-startup long term unemployed and pre-startup low income individuals). Furthermore, a sensitivity analysis is done where failure is defined not just as closing down but closing down and reducing personal wealth. This significantly reduces the number of failed entrepreneurs compared to successful entrepreneurs (see Table 3.4). Third, and finally, to further control for variables related to the last business, the likelihood of failure with the restart is estimated using simple probit regression. The size and significance of the interaction terms are assessed graphically following the approach in Ai and Norton (2003) and Norton et al. (2004).

3.4.1 The Heckman selection model - accounting for selection bias in the re-start decision

The Heckman probit models including both human and social capital variables can be seen in Table 3.8. The selection equation estimating the *a priori* likelihood of being observed is presented at the bottom of the table while the likelihood of failure with the second venture can be seen at the top. The latter takes into account the likelihood of being observed estimated in the former. In order for the Heckman model to work properly, at least one extra variable is needed for the selection equation; one that is correlated with the likelihood of starting up again but uncorrelated with the likelihood of failure with the second venture. For this we chose a dummy variable indicating whether the first venture was started with others or not. This seems to be a good instrumental variable both logically and according to Table 3.3.

Team First	Start again		Failure second	
	No	Yes	No	Yes
No	24,555 (54%)	805 (45%)	370 (45%)	435 (45%)
Yes	20,630 (46%)	984 (55%)	449 (55%)	535 (55%)
Total	45,185 (100%)	1,789 (100%)	819 (100%)	970 (100%)
Pearson χ^2	Pr=0.000		Pr=0.888	

Table 3.3: Dependence of first firm founding team on second business start-up and failure.

In Table 3.8, Model 1 includes variables for personal demographics and previous business failure while Model 2 further adds variables for human and social capital. Model 3 and 4 includes an interaction term for failure and education, and, failure and marriage, respectively. These were the only significant interaction terms based on simple probit regressions with graphical assessment. The variables for last business demographics and one variable for social capital (last business founding team) had to be excluded from the Heckman model given that these included information not available for one-time entrepreneurs.

3.4.2 Excluding push entrepreneurs - long unemployment records and low opportunity costs

The Heckman models in Table 3.8 are replicated in Table 3.9 and 3.10 where "push" entrepreneurs are excluded. This is done to separate out the probability of re-entry by those with viable labour market alternatives as opposed to those without. In Table 3.9, individuals with more than 25 weeks of unemployment within the five years before first start-up are excluded. Another approach to isolate "pull" entrepreneurs, in Table 3.10, was to remove individuals with an income of less than 200,000 DKR (approximately 35,250 USD) the year before the first start-up. Excluding the previously long term unemployed reduces the sample of re-starters from 1,789 to 1,302 individuals and the total number of entrepreneurs from 46,974 to 34,104. Excluding the low opportunity cost individuals results in a sample of 863 re-starters and 19,858 entrepreneurs.

3.4.3 Is firm closure equal to firm failure? Including loss in personal wealth in the definition

In previous studies, the definition of failure with a business almost always involve firm closure but in some cases it is limited to personal bankruptcy or closure of a firm in financial distress. Hence, firm closure is not necessary equal to entrepreneurial failure if the financial loss and/or the opportunity cost of the entrepreneurial experience is insignificant. Following this line of thought, the

3. Passive and Active Learning from Entrepreneurship

Heckman models in Table 3.8 are repeated in Table 3.11 but this time failure with the first and last business are defined as not surviving three years after start-up *and* have a negative change in personal wealth³. The resulting number of failed entrepreneurs can be seen in Table 3.4 and compared to Table 3.2. Now only 29% of the first-timers fail with their first business compared to 54% using the old measure. For the re-starters the number is 38% compared to 69%.

One-timers			Restarters					
Failure First	n	%	Failure First	n	%	Failure Last	n	%
0	31,995	71	0	1,116	62	0	864	48
						1	252	14
1	13,190	29	1	673	38	0	458	26
						1	215	12
N	45,185	100	N	1,789	100	N	1,789	100

Table 3.4: Failure with the first and second business started (survival and wealth).

3.4.4 Assessing selection bias, interaction effects, and last business demographics

Table 3.12 shows the likelihood of failure with a second venture using probit regression utilising responses from the 1,789 re-starters. Model 1 in Table 3.12 includes control variables for personal demographics and a dummy variable indication failure with the previous venture. Model 2 introduces variables for human capital while Model 3 further adds variables for business demographics; industry dummies are included but not shown in the table. Finally, Model 4 introduces an interaction term for failure and years of education. An interaction term for failure and all human capital variables was introduced but only education turned out to be significant. Because of possible problems of interpretation of the coefficient for the interaction term in logit and probit models (Ai and Norton, 2003; Norton et al., 2004), all interaction effects were assessed with two plots (1) the interaction effect as a function of the predicted probability and (2) the z-statistic of the interaction effect as a function of the predicted probability. Again, only the interaction term with education was found to be significant. The two plots can be seen in Figures 3.3 and 3.4.

³For simplicity, the difference in personal wealth is calculated as the difference between wealth two years after start-up and wealth one year before start-up regardless of how long the failed business survives. Furthermore, it is possible for the change in wealth around the first and second business to overlap in years if the entrepreneur starts the second business one or two years after the first.

The models in Table 3.13 are similar except that variables for social capital are included instead of variables for human capital. Again an interaction term of previous venture failure and all variables for social capital was included and again only one was found to be significant. The significant interaction term is failure and marriage and can be seen in Model 4 of Table 3.13 and the two plots (interaction effect and z-statistic as a function of predicted probability) can be seen in Figures 3.5 and 3.6.

3.5 Results

3.5.1 Likelihood of re-entry after failure

Hypothesis 1a: Entrepreneurs that close down with their first business are more likely to start up a business again (positive emotions and/or active learning).

Hypothesis 1b: Entrepreneurs that close down with their first business are less likely to start up a business again (negative emotions and/or passive learning).

As the Selection Equation in Table 3.8 shows (Model 1 and 2), the likelihood of starting again is significantly higher for previously failed entrepreneurs. Even after excluding possible push entrepreneurs, i.e. the long-term unemployed (Table 3.9) and the low opportunity cost individuals (Table 3.10), the effect remains strongly significant and fairly constant. Furthermore, the effect is also strongly significant when failure is dependent on a reduction in personal wealth (Table 3.11), although the size of the effect is somewhat smaller. Hence, the passive learning argument behind hypothesis 1b is rejected while hypothesis 1a is not. Previously failed entrepreneurs are more likely to start up a second time. Although we do not specifically measure traits or optimism, the result does seem to cohere with Ucbasaran et al. (2010) findings about serial entrepreneurs continuing to be optimistic in the face of failure as well as with Metzger (2007), which also does not measure optimism directly.

Next, we check whether such optimism is justified.

3.5.2 Likelihood of success after failure

Hypothesis 2a: Entrepreneurs that close down with their first business are more likely to close down with a second business (psychological biases / inadequate

3. Passive and Active Learning from Entrepreneurship

abilities).

Hypothesis 2b: Entrepreneurs that close down with their first business are less likely to close down with a second business (superior active learning from failure).

The main equation in Table 3.8 do not show a significant effect of previous failure on subsequent failure when interaction terms involving previous failure are excluded (Model 1 and 2). This changes when interaction terms are included (Model 3 and 4) but because the coefficients now have to be interpreted in a different way, these results are related to hypothesis 2bb below. A missing effect of previous failure is also found when excluding possible push entrepreneurs, although the coefficients are smaller when excluding long term unemployed (Table 3.9) and turn negative when excluding low opportunity cost entrepreneurs (Table 3.10) compared to the positive coefficients in Table 3.8. However, failure is found to lead to failure if loss in personal wealth is included in the definition of failure (Table 3.11) which could be due to lower entrepreneurial ability among these entrepreneurs. Expert entrepreneurs are found to be more likely to try out an idea for a new venture without risking any money (Dew et al., 2009b; Sarasvathy, 2008); this is labelled the affordable loss principle in the literature. Finally, when controlling for business demographics in Table 3.12 and 3.13 (Model 3), failure is again found to lead to failure. However, these regressions do not control for the selection bias of previously failed entrepreneurs being more likely to start up again. Hence, the findings only support Hypothesis 2a, and only when including wealth loss in the measure of failure or allowing for selection bias. Support of this hypothesis is also found in Metzger (2007).

The final part of the analysis is exploring whether the general findings of failure experience described above are dependent on the individual's human and social capital.

3.5.3 Impact of human and social capital on probability of re-entry

Hypothesis 1bb: Entrepreneurs with higher levels of human and social capital are more likely to start up a business again, but the effect is greater for entrepreneurs that close down with their first business (superior active learning dependent on human and social capital).

Human capital (H 1bb)

Independent of previous failure, only the number of different industries worked in has a significant positive effect on the likelihood of starting up a second time in Table 3.8 (Selection Equation Model 2-4). This could support the "jacks-of-all-trades" theory of entrepreneurial entry or be explained by these individuals lack of steady employment possibilities. Education is also found to have a positive influence on the likelihood of restart in Table 3.8 but the variable becomes insignificant when the interaction term of failure and education is included (Model 3). Excluding the possible push entrepreneurs in Table 3.9 and 3.10 does not change these results while the change in failure definition (Table 3.11) only makes the positive education effect significant but not dependent on previous failure. Thus, hypothesis 1bb is rejected.

Social capital (H 1bb)

In addition to having founded a previous business with others (the instrument variable), having entrepreneurial peers (i.e. sibling or spouse) significantly, and independent of previous failure, increases the likelihood of starting a business again in Table 3.8 (Selection Equation Model 2-4). These findings still hold when excluding possible push entrepreneurs in Table 3.9 and 3.10 or including wealth in the definition of failure; with the only exception of the peer effect being insignificant when excluding low opportunity cost individuals in Table 3.10. Finally, the effect of marriage under both previous success and failure is found to be insignificant in Model 3 in Table 3.8-3.11. Again, hypothesis 1bb is rejected.

Hypothesis 2bb: Entrepreneurs with higher levels of human and social capital are less likely to close down with a second business, but the effect is greater for entrepreneurs that close down with their first business (superior active learning dependent on human and social capital).

Human capital (H 2bb)

Out of the four variables for human capital, only the number of years in the same industry (as the first start-up) significantly lowers the likelihood of failure with the second venture independent of previous failure; see Main Equation Model 2-4 in Table 3.8. Furthermore, can be seen that education also lowers the likelihood of failure but only for individuals that failed with their previous venture (Model 3). Finally, previous failure for individuals with no further education are significantly more likely to fail with their subsequent venture (Model

3. Passive and Active Learning from Entrepreneurship

3).

Excluding possible push entrepreneurs (Table 3.9 and 3.10) changes these findings in the following ways. First, the effect of industry experience (number of years) becomes insignificant. Second, for individuals with no long term unemployment (Table 3.9), industry experience (number of industries) reduces the likelihood of failure with the second venture. Third, previous failure do not have an effect on subsequent failure for individuals with no education. Including wealth in the definition of failure (Table 3.11) also changes the findings somewhat. Again, the effect of industry experience (number of years) becomes insignificant. Furthermore, education is now found to reduce the likelihood of failure regardless of whether the individuals failed or not with their previous venture.

Finally, the results from Table 3.8 are fully supported in Table 3.12 when controlling for last business demographics. The size and significance of the interaction effect (failure x education) as a function of predicted probabilities of failure can be seen in Figure 3.3 and 3.4.

Overall, These findings support hypothesis 2bb in the following way. First, industry experience is important for reducing the likelihood of restart failure but only when push entrepreneurs are not excluded. Second, years of education is important for reducing the likelihood of restart failure but only when having failed with the previous venture. Hence, the years of further education positively affects the absorptive capacity of individuals, needed for learning from failure experience. This result is stable when excluding push entrepreneurs but not when including wealth in the definition of failure; in the latter case, education is beneficial regardless of previous performance.

Social capital (H 2bb)

Only one out of the three variables for social capital are found to have a significant influence on the likelihood of failure with the second venture independent of previous failure: Having entrepreneurial parents lowers the likelihood of failure (see Main Equation Model 2-4 in Table 3.8). Furthermore, can be seen that married individuals (at the time of their first business) also have a lower likelihood of restart failure but only if these individuals failed with their first business (Model 4). Finally, previous failure for individuals that were not married are significantly more likely to fail with their subsequent venture (Model 4).

These findings do not differ significantly when excluding push entrepreneurs (Table 3.9 and 3.10). For individuals with no long term unemployment (Table 3.9), previous failure do not have an effect on subsequent failure for individuals that were not married. This is also supported for high opportunity cost individuals (Table 3.10) where the effect of marriage under failure moreover disappears. Including wealth in the definition of failure (Table 3.11) only changes the results from Table 3.8 regarding one variable: The effect of marriage under failure disappears.

A variable for entrepreneurial team (second business) could not be included in the Heckman regressions due to reasons explained earlier. However, this variable is included together with second business demographics in Table 3.13. The findings from Table 3.8 are fully supported and being in an entrepreneurial team furthermore significantly reduces the likelihood of failure with the second venture. The size and significance of the interaction effect (failure x marriage) as a function of predicted probabilities of failure can be seen in Figure 3.5 and 3.6.

Again hypothesis 2bb cannot be rejected. First, having entrepreneurial parents is important for reducing the likelihood of restart failure independent of previous venture performance. Second, being married is important for reducing the likelihood of restart failure but only when having failed with the previous venture. Because the decision to found a venture not only affects the entrepreneur but also the spouse of the entrepreneur (see (Dahl et al., 2010) for a study of the use of psychotropics), failure processing might be more exhaustive for married restarters leading to the latter result. However, the finding is not significant for high opportunity cost entrepreneurs or when including wealth in the definition of failure.

Finally, results related to the control variable are briefly assessed.

3.5.4 Controls: Personal and firm demographics

All personal demographics are found to be insignificant at 5% level in Table 3.8-3.11 (Model 2) and Table 3.12-3.13 (Model 3) regarding the likelihood of failure with a second venture with the following two exceptions. When excluding long term unemployed in Table 3.9, females are found to be significantly more likely to fail with a second business while individuals aged 41-50 are more likely to fail when excluding low opportunity cost individuals in Table 3.10. However, Table

3. Passive and Active Learning from Entrepreneurship

3.8-3.11 consistently reveals that females and individuals over 50 years are significantly less likely to start-up again while the opposite is true for individuals in urban areas.

From Table 3.12 and 3.13 (Model 3) can be seen that being wealthy and waiting more years before starting again significantly lowers the likelihood of failure with the second venture. The former supports the theory regarding "the liability of smallness" while the latter could be due to recovery and learning from a previous venture takes time. When controlling for human capital (Table 3.12), starting a bigger venture also lowers the likelihood of failure, while when controlling for social capital (Table 3.13), starting in the same industry as the previous venture also lowers the likelihood of failure.

3.6 Discussion

Surprisingly, none of the human and social capital variables (alone or combined with failure) that appear to reduce the probability of failure in the second venture are likely to increase the probability of re-entry. This result raises an interesting possibility of Type I error in habitual entrepreneurship - namely, the individuals who have a higher likelihood of doing well in the second venture are choosing not to start them. Future research should use the above results to take on more detailed analysis of why some individuals make Type I errors with regard to becoming habitual entrepreneurs. That is, do they have more attractive occupations waiting for them in terms of income and work satisfaction? If that is indeed the situation, then the label of Type I error do not fit their decision.

An opportunity cost measure of entrepreneurial success was considered but dropped for the following reasons: (1) if the entrepreneur owns two businesses at the same time the income from each businesses cannot be separated from the personal income tax records, (2) often the entrepreneur is not able to achieve an income from entrepreneurship equal to or above the income from working in an established business (Parker, 2004; Hamilton, 2000), (3) the majority of studies reveal that entrepreneurs are more satisfied with their work than wage earners (Hundley, 2001; Blanchflower and Oswald, 1998). If the motivation for starting up a business is to a higher degree intrinsic than extrinsic, then survival (being able to keep being an entrepreneur) is a better measure of entrepreneurial success. As shown in Dahl et al. (2009), being one's own boss and enjoying intrinsic work characteristics seems to be the main motivation for entrepreneurship compared to the pursued of high earnings. However, survival could be complemented with a measure of growth in full-time equivalent employees in

future studies.

Finally, an important message from this study is that future research should be careful not to investigate the learning effects of failure independent of the means of the entrepreneur in the broad sense (using the terminology in Sarasvathy (2008)): (1) Who they are - identity; (2) What they know - knowledge base; and (3) Whom they know - networks.

3.7 Conclusion

The field of entrepreneurship research, as we pointed out in the beginning of this chapter, appears to be moving away from an exclusive focus on traits or luck as the explanation for positive performance to a deeper understanding of entrepreneurial decision-making, learning and expertise development. The current study contributes to this movement by providing additional support for the role of human capital (education and prior industry experience), social capital (entrepreneurial parents and moral support) and active learning. Yet, while it also points to the validity of traits such as optimism in serial entrepreneurs who persist in venturing after a failure, it raises normative questions as to whether they should indeed do so. Or more importantly, whether those who should be persisting actually lack the optimism to do so or find more attractive alternatives. Limiting the focus to firm survival, it seems that persistence pays, but apparently not for everyone. And optimism is prevalent among entrepreneurs, but not among those with the greatest chance of success.

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3.7. Conclusion

Year first start-up	Total	One-timers	Re-starters	Years to second start-up					
				1	2	3	4	5	6
1988	4,763	4,589	174	29	34	31	34	25	21
1989	4,735	4,567	168	30	48	25	30	16	19
1990	4,836	4,652	184	35	50	39	21	20	19
1991	4,544	4,400	144	32	27	31	13	25	16
1992	4,242	4,079	163	45	29	26	26	21	16
1993	3,762	3,622	140	26	21	15	22	26	30
1994	3,917	3,779	138	25	18	21	15	25	34
1995	3,744	3,590	154	23	21	26	33	25	26
1996	3,897	3,740	157	23	26	30	34	10	34
1997	4,157	3,995	162	28	30	31	23	25	25
1998	4,377	4,172	205	41	35	39	31	26	33
N	46,974	45,185	1,789	337	339	314	282	244	273

Table 3.5: The sample divided by first start-up year and years to second start-up.

Failure first				Years to second start-up					
start-up	Total	One-timers	Re-starters	1	2	3	4	5	6
Closure									
0	21,503	20,956	547	66	82	82	111	87	119
1	25,471	24,229	1,242	271	257	232	171	157	154
Closure + Wealth									
0	33,111	31,995	1,116	189	192	190	191	162	192
1	13,863	13,190	673	148	147	124	91	82	81
N	46,974	45,185	1,789	337	339	314	282	244	273

Table 3.6: The sample divided by first start-up performance and years to second start-up.

Variable	Type	Obs.	Mean	St.d.	Min.	Max.
Female	dummy	46,974	0.358	0.479	0	1
Age	continuous	46,974	34.828	11.115	15	66
Urban	dummy	46,974	0.429	0.495	0	1
Failure first	dummy	46,974	0.542	0.498	0	1
Education further	continuous	46,974	2.965	2.541	-3	11
Industry years	continuous	46,974	0.740	1.454	0	5
Industry number	continuous	46,974	1.745	0.957	0	5
Unemployment	dummy	46,974	0.478	0.500	0	1
Entrepreneur parent	dummy	46,974	0.169	0.375	0	1
Entrepreneur peer	dummy	46,974	0.159	0.366	0	1
Married	dummy	46,974	0.444	0.497	0	1
Own others first	dummy	46,974	0.460	0.498	0	1
Own others last	dummy	1,789	0.477	0.500	0	1
Wealth last	continuous	1,789	72,006.536	2,236,166.712	-18,262,722	61,517,672
Wealth last (ln)	continuous	1,789	4.906	6.061	0.000	17.935
Size persons	continuous	1,789	2.752	2.281	1	20
Size persons (ln)	continuous	1,789	0.782	0.647	0.000	2.996
Industry same	dummy	1,789	0.345	0.475	0	1
Years between	continuous	1,789	3.322	1.708	1	6
Failure first (wealth)	dummy	46,974	0.295	0.456	0	1
Unemployment (long)	dummy	46,974	0.274	0.446	0	1
Income high pre-first	dummy	46,974	0.423	0.494	0	1

Table 3.7: Descriptive statistics of explanatory variables.

3. Passive and Active Learning from Entrepreneurship

	Model 1		Model 2		Model 3		Model 4	
MAIN EQUATION								
Female	0.200*	(0.092)	0.126	(0.100)	0.122	(0.103)	0.126	(0.102)
31-40	0.016	(0.069)	0.040	(0.074)	0.040	(0.075)	0.035	(0.075)
41-50	0.070	(0.077)	0.067	(0.087)	0.085	(0.088)	0.065	(0.087)
51+	0.161	(0.139)	0.105	(0.150)	0.105	(0.152)	0.105	(0.151)
Urban	-0.014	(0.067)	0.004	(0.069)	0.002	(0.070)	0.006	(0.070)
Failure	0.135	(0.111)	0.146	(0.113)	0.442**	(0.158)	0.309*	(0.135)
Education			-0.033**	(0.012)	0.027	(0.023)	-0.035**	(0.012)
Years I			-0.050*	(0.021)	-0.050*	(0.022)	-0.050*	(0.021)
Number I			-0.038	(0.034)	-0.038	(0.035)	-0.038	(0.035)
Unemployment			-0.016	(0.061)	-0.021	(0.062)	-0.026	(0.061)
Parent E			-0.249**	(0.086)	-0.246**	(0.085)	-0.259**	(0.086)
Peer E			0.061	(0.086)	0.067	(0.087)	0.058	(0.086)
Married			-0.090	(0.068)	-0.106	(0.069)	0.155	(0.113)
F x Education					-0.084**	(0.027)		
F x Marriage							-0.359**	(0.132)
Constant	0.557	(0.693)	0.703	(0.765)	0.411	(0.807)	0.566	(0.788)
SELECTION EQUATION								
Female	-0.291**	(0.025)	-0.284**	(0.025)	-0.284**	(0.025)	-0.284**	(0.025)
31-40	0.018	(0.027)	0.001	(0.029)	0.001	(0.029)	0.001	(0.029)
41-50	-0.010	(0.030)	-0.022	(0.034)	-0.022	(0.034)	-0.022	(0.034)
51+	-0.222**	(0.044)	-0.224**	(0.047)	-0.224**	(0.047)	-0.224**	(0.047)
Urban	0.120**	(0.022)	0.119**	(0.022)	0.119**	(0.022)	0.119**	(0.022)
Failure	0.333**	(0.023)	0.338**	(0.023)	0.340**	(0.038)	0.339**	(0.031)
Own others	0.211**	(0.022)	0.211**	(0.022)	0.211**	(0.022)	0.211**	(0.022)
Education			0.011*	(0.004)	0.012	(0.007)	0.011*	(0.004)
Years I			0.003	(0.008)	0.003	(0.008)	0.003	(0.008)
Number I			0.061**	(0.011)	0.061**	(0.011)	0.061**	(0.011)
Unemployment			0.014	(0.022)	0.014	(0.022)	0.014	(0.022)
Parent E			-0.032	(0.030)	-0.032	(0.030)	-0.033	(0.030)
Peer E			0.087**	(0.030)	0.087**	(0.030)	0.087**	(0.030)
Married			0.008	(0.026)	0.008	(0.026)	0.010	(0.039)
F x Education					-0.001	(0.009)		
F x Marriage							-0.004	(0.046)
Constant	-2.031**	(0.030)	-2.193**	(0.042)	-2.195**	(0.047)	-2.194**	(0.045)
Constant	-0.301	(0.330)	-0.227	(0.337)	-0.186	(0.342)	-0.208	(0.341)
Pseudo R^2								
Log-likelihood	-8588		-8551		-8546		-8547	
Observations	46974		46974		46974		46974	

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 3.8: Heckman probit model for the likelihood of failure with the second business from 1,789 re-starters (main equation) and the likelihood of starting up again from 46,974 first-time entrepreneurs (selection equation). Failure is defined as not surviving three years after the start-up year.

3.7. Conclusion

	Model 1		Model 2		Model 3		Model 4	
MAIN EQUATION								
Female	0.272**	(0.077)	0.200*	(0.088)	0.201*	(0.090)	0.204*	(0.089)
31-40	0.035	(0.072)	0.077	(0.082)	0.079	(0.083)	0.070	(0.083)
41-50	0.127	(0.080)	0.149	(0.094)	0.174 [†]	(0.097)	0.146	(0.095)
51+	0.275*	(0.125)	0.239 [†]	(0.141)	0.251 [†]	(0.142)	0.238 [†]	(0.142)
Urban	-0.029	(0.067)	-0.008	(0.071)	-0.014	(0.071)	-0.009	(0.072)
Failure	0.022	(0.108)	0.040	(0.115)	0.308 [†]	(0.180)	0.226	(0.150)
Education			-0.033*	(0.013)	0.017	(0.023)	-0.035**	(0.013)
Years I			-0.031	(0.021)	-0.032	(0.021)	-0.030	(0.021)
Number I			-0.082*	(0.032)	-0.084**	(0.032)	-0.085**	(0.032)
Parent E			-0.219*	(0.093)	-0.215*	(0.093)	-0.230*	(0.094)
Peer E			0.038	(0.090)	0.037	(0.091)	0.032	(0.090)
Married			-0.116	(0.076)	-0.131 [†]	(0.077)	0.157	(0.116)
F x Education					-0.076*	(0.030)		
F x Marriage							-0.404**	(0.142)
Constant	1.289*	(0.503)	1.516**	(0.554)	1.314*	(0.607)	1.394*	(0.587)
SELECTION EQUATION								
Female	-0.295**	(0.030)	-0.286**	(0.030)	-0.286**	(0.030)	-0.286**	(0.030)
31-40	0.071*	(0.032)	0.054	(0.036)	0.054	(0.036)	0.055	(0.036)
41-50	0.046	(0.034)	0.041	(0.041)	0.040	(0.040)	0.041	(0.041)
51+	-0.187**	(0.052)	-0.180**	(0.056)	-0.180**	(0.056)	-0.180**	(0.056)
Urban	0.136**	(0.026)	0.130**	(0.026)	0.130**	(0.026)	0.130**	(0.026)
Failure	0.342**	(0.026)	0.346**	(0.027)	0.327**	(0.046)	0.323**	(0.036)
Own others	0.210**	(0.026)	0.211**	(0.027)	0.211**	(0.027)	0.211**	(0.027)
Education			0.012*	(0.005)	0.009	(0.009)	0.012*	(0.005)
Years I			0.002	(0.008)	0.002	(0.008)	0.002	(0.008)
Number I			0.061**	(0.013)	0.061**	(0.013)	0.061**	(0.013)
Parent E			-0.003	(0.035)	-0.003	(0.035)	-0.002	(0.035)
Peer E			0.087*	(0.036)	0.087*	(0.036)	0.087*	(0.036)
Married			-0.003	(0.031)	-0.003	(0.031)	-0.035	(0.045)
F x Education					0.005	(0.011)		
F x Marriage							0.050	(0.053)
Constant	-2.071**	(0.035)	-2.231**	(0.048)	-2.218**	(0.054)	-2.216**	(0.051)
Constant	-0.754*	(0.348)	-0.655 [†]	(0.350)	-0.638 [†]	(0.356)	-0.647 [†]	(0.358)
Pseudo R ²								
Log-likelihood	-6240		-6211		-6207		-6206	
Observations	34104		34104		34104		34104	

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 3.9: Heckman probit model for the likelihood of failure with the second business from 1,302 re-starters (main equation) and the likelihood of starting up again from 34,104 first-time entrepreneurs (selection equation). Failure is defined as not surviving three years after the start-up year. Individuals with more than 25 weeks of unemployment within the five years before first start-up are excluded.

3. Passive and Active Learning from Entrepreneurship

	Model 1		Model 2		Model 3		Model 4	
MAIN EQUATION								
Female	0.217*	(0.086)	0.169 [†]	(0.094)	0.175 [†]	(0.095)	0.169 [†]	(0.094)
31-40	0.085	(0.078)	0.082	(0.087)	0.086	(0.087)	0.074	(0.087)
41-50	0.220*	(0.086)	0.204*	(0.103)	0.242*	(0.105)	0.199 [†]	(0.103)
51+	0.348*	(0.136)	0.273 [†]	(0.154)	0.308*	(0.153)	0.266 [†]	(0.155)
Urban	−0.096	(0.068)	−0.075	(0.073)	−0.081	(0.073)	−0.076	(0.073)
Failure	−0.028	(0.122)	−0.008	(0.129)	0.373	(0.242)	0.084	(0.169)
Education			−0.021	(0.015)	0.048 [†]	(0.029)	−0.021	(0.015)
Years I			−0.041 [†]	(0.024)	−0.039	(0.024)	−0.041 [†]	(0.024)
Number I			−0.067 [†]	(0.039)	−0.070 [†]	(0.039)	−0.069 [†]	(0.039)
Unemployed			0.087	(0.074)	0.084	(0.074)	0.083	(0.074)
Parent E			−0.238*	(0.103)	−0.213*	(0.101)	−0.238*	(0.103)
Peer E			0.036	(0.101)	0.033	(0.102)	0.036	(0.101)
Married			−0.046	(0.078)	−0.064	(0.079)	0.078	(0.126)
F x Education					−0.102**	(0.038)		
F x Marriage							−0.183	(0.153)
Constant	1.505**	(0.418)	1.681**	(0.467)	1.422*	(0.561)	1.632**	(0.491)
SELECTION EQUATION								
Female	−0.206**	(0.041)	−0.199**	(0.042)	−0.199**	(0.042)	−0.199**	(0.042)
31-40	−0.028	(0.040)	−0.020	(0.042)	−0.020	(0.042)	−0.020	(0.042)
41-50	−0.099*	(0.043)	−0.080	(0.049)	−0.080	(0.049)	−0.080	(0.049)
51+	−0.313**	(0.063)	−0.281**	(0.067)	−0.282**	(0.067)	−0.281**	(0.067)
Urban	0.115**	(0.032)	0.108**	(0.032)	0.108**	(0.032)	0.108**	(0.032)
Failure	0.398**	(0.033)	0.401**	(0.033)	0.395**	(0.060)	0.418**	(0.047)
Own others	0.217**	(0.032)	0.220**	(0.032)	0.219**	(0.032)	0.219**	(0.032)
Education			0.006	(0.007)	0.005	(0.011)	0.006	(0.007)
Years I			0.001	(0.010)	0.001	(0.010)	0.001	(0.010)
Number I			0.065**	(0.018)	0.065**	(0.018)	0.065**	(0.018)
Unemployed			−0.066 [†]	(0.034)	−0.066 [†]	(0.034)	−0.067 [†]	(0.034)
Parent E			0.053	(0.046)	0.053	(0.046)	0.054	(0.046)
Peer E			0.006	(0.047)	0.006	(0.047)	0.006	(0.047)
Married			−0.002	(0.036)	−0.002	(0.036)	0.019	(0.054)
F x Education					0.002	(0.013)		
F x Marriage							−0.033	(0.066)
Constant	−1.990**	(0.044)	−2.134**	(0.070)	−2.129**	(0.077)	−2.144**	(0.074)
Constant	−0.983*	(0.398)	−0.883*	(0.390)	−0.886*	(0.418)	−0.885*	(0.398)
Pseudo R^2								
Log-likelihood	−4017		−4002		−3997		−4001	
Observations	19858		19858		19858		19858	

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 3.10: Heckman probit model for the likelihood of failure with the second business from 863 re-starters (main equation) and the likelihood of starting up again from 19,858 first-time entrepreneurs (selection equation). Failure is defined as not surviving three years after the start-up year. Individuals with an income less than 200,000 DKR (approximately 35,250 USD) the year before the first start-up are excluded.

3.7. Conclusion

	Model 1		Model 2		Model 3		Model 4	
MAIN EQUATION								
Female	0.086	(0.122)	0.021	(0.124)	0.020	(0.124)	0.022	(0.124)
31-40	-0.057	(0.077)	-0.038	(0.081)	-0.038	(0.081)	-0.040	(0.081)
41-50	-0.055	(0.087)	-0.054	(0.094)	-0.054	(0.094)	-0.059	(0.094)
51+	0.175	(0.161)	0.126	(0.168)	0.126	(0.168)	0.105	(0.168)
Urban	-0.025	(0.078)	-0.003	(0.079)	-0.002	(0.079)	-0.003	(0.079)
Failure	0.293**	(0.086)	0.279**	(0.083)	0.263*	(0.120)	0.365**	(0.102)
Education			-0.035*	(0.014)	-0.037*	(0.018)	-0.036*	(0.014)
Years I			-0.040	(0.024)	-0.040 [†]	(0.024)	-0.038	(0.024)
Number I			0.004	(0.040)	0.005	(0.040)	0.002	(0.040)
Unemployment			0.047	(0.067)	0.047	(0.067)	0.042	(0.067)
Parent E			-0.210*	(0.091)	-0.210*	(0.091)	-0.215*	(0.092)
Peer E			0.023	(0.095)	0.022	(0.095)	0.018	(0.095)
Married			-0.049	(0.073)	-0.048	(0.073)	0.040	(0.091)
F x Education					0.005	(0.027)		
F x Marriage							-0.223	(0.138)
Constant	-0.794	(0.881)	-0.776	(0.928)	-0.770	(0.933)	-0.811	(0.929)
SELECTION EQUATION								
Female	-0.283**	(0.024)	-0.280**	(0.025)	-0.279**	(0.025)	-0.280**	(0.025)
31-40	0.013	(0.026)	0.002	(0.029)	0.001	(0.029)	0.002	(0.029)
41-50	-0.009	(0.029)	-0.012	(0.034)	-0.012	(0.034)	-0.013	(0.034)
51+	-0.207**	(0.044)	-0.202**	(0.047)	-0.201**	(0.047)	-0.203**	(0.047)
Urban	0.119**	(0.022)	0.119**	(0.022)	0.118**	(0.022)	0.119**	(0.022)
Failure	0.188**	(0.023)	0.189**	(0.023)	0.216**	(0.036)	0.218**	(0.030)
Own others	0.185**	(0.022)	0.185**	(0.022)	0.185**	(0.022)	0.185**	(0.022)
Education			0.010*	(0.004)	0.013*	(0.005)	0.010*	(0.004)
Years I			-0.004	(0.008)	-0.004	(0.008)	-0.004	(0.008)
Number I			0.059**	(0.011)	0.059**	(0.011)	0.058**	(0.011)
Unemployment			0.023	(0.022)	0.023	(0.022)	0.023	(0.022)
Parent E			-0.030	(0.030)	-0.030	(0.030)	-0.030	(0.030)
Peer E			0.089**	(0.030)	0.089**	(0.030)	0.089**	(0.030)
Married			-0.003	(0.025)	-0.003	(0.025)	0.021	(0.030)
F x Education					-0.009	(0.009)		
F x Marriage							-0.070	(0.046)
Constant	-1.880**	(0.027)	-2.030**	(0.039)	-2.039**	(0.041)	-2.040**	(0.040)
Constant	0.021	(0.409)	0.091	(0.414)	0.091	(0.415)	0.094	(0.414)
Pseudo R^2								
Log-likelihood	-8454		-8422		-8422		-8420	
Observations	46974		46974		46974		46974	

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 3.11: Heckman probit model for the likelihood of failure with the second business from 1,789 re-starters (main equation) and the likelihood of starting up again from 46,974 first-time entrepreneurs (selection equation). Failure is defined as not surviving three years after the start-up year AND also have a reduced after three years compared to the year before start-up.

3. Passive and Active Learning from Entrepreneurship

	Model 1		Model 2		Model 3		Model 4	
Female	0.135 [†]	(0.070)	0.092	(0.071)	0.056	(0.073)	0.061	(0.074)
31-40	0.014	(0.071)	0.035	(0.072)	0.041	(0.073)	0.035	(0.073)
41-50	0.062	(0.079)	0.086	(0.081)	0.095	(0.083)	0.108	(0.084)
51+	0.098	(0.129)	0.079	(0.129)	0.158	(0.134)	0.157	(0.134)
Urban	0.018	(0.060)	0.037	(0.060)	0.049	(0.061)	0.044	(0.061)
Failure	0.215**	(0.065)	0.202**	(0.065)	0.172**	(0.067)	0.472**	(0.114)
Education			-0.034**	(0.013)	-0.022 [†]	(0.013)	0.042 [†]	(0.023)
Years I			-0.053*	(0.022)	-0.052*	(0.023)	-0.052*	(0.023)
Number I			-0.032	(0.032)	-0.016	(0.032)	-0.017	(0.032)
Unemployment			0.015	(0.061)	-0.011	(0.063)	-0.017	(0.063)
Wealth					-0.015**	(0.005)	-0.016**	(0.005)
Size					-0.133**	(0.049)	-0.134**	(0.049)
Same I					-0.096	(0.068)	-0.089	(0.068)
Years					-0.050**	(0.018)	-0.050**	(0.018)
F x Education							-0.089**	(0.027)
Constant	-0.107	(0.073)	0.096	(0.109)	0.395**	(0.151)	0.180	(0.166)
Industry dummies	YES		YES		YES		YES	
Pseudo R^2	0.01		0.01		0.03		0.03	
Log-likelihood	-1226		-1218		-1197		-1192	
Observations	1789		1789		1789		1789	

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 3.12: Probit model for the likelihood of failure with the second business from 1,789 re-starters. Failure is defined as not surviving three years after the start-up year.

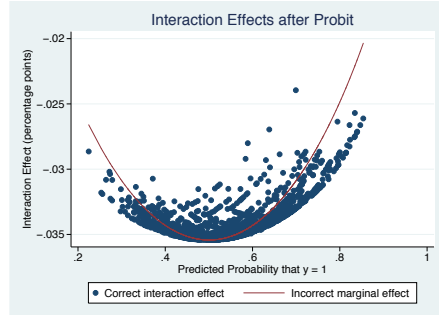


Figure 3.3: Interaction effect (failure x education) as a function of predicted probability of failure (second business).

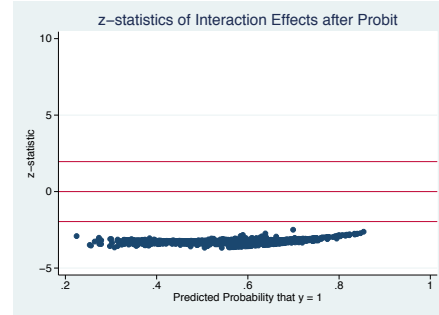


Figure 3.4: Significance of interaction effect (failure x education) as a function of predicted probability of failure (second business).

3.7. Conclusion

	Model 1		Model 2		Model 3		Model 4	
Female	0.135 [†]	(0.070)	0.124 [†]	(0.071)	0.069	(0.073)	0.074	(0.074)
31-40	0.014	(0.071)	0.005	(0.075)	0.023	(0.076)	0.019	(0.076)
41-50	0.062	(0.079)	0.005	(0.088)	0.045	(0.090)	0.047	(0.090)
51+	0.098	(0.129)	0.073	(0.138)	0.161	(0.141)	0.168	(0.141)
Urban	0.018	(0.060)	0.017	(0.060)	0.036	(0.061)	0.037	(0.061)
Failure	0.215**	(0.065)	0.216**	(0.065)	0.185**	(0.067)	0.335**	(0.089)
Parent E			−0.285**	(0.083)	−0.243**	(0.084)	−0.250**	(0.084)
Peer E			0.078	(0.083)	0.074	(0.084)	0.069	(0.084)
Married			−0.104	(0.068)	−0.078	(0.069)	0.159	(0.114)
Own others			−0.258**	(0.060)	−0.252**	(0.076)	−0.258**	(0.076)
Wealth					−0.015**	(0.005)	−0.015**	(0.005)
Size					−0.022	(0.060)	−0.016	(0.061)
Same I					−0.156*	(0.067)	−0.154*	(0.067)
Years					−0.049**	(0.018)	−0.049**	(0.018)
F x Married							−0.345**	(0.132)
Constant	−0.107	(0.073)	0.115	(0.085)	0.367**	(0.130)	0.258 [†]	(0.137)
Industry dummies	YES		YES		YES		YES	
Pseudo R^2	0.01		0.02		0.03		0.04	
Log-likelihood	−1226		−1210		−1191		−1188	
Observations	1789		1789		1789		1789	

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 3.13: Probit model for the likelihood of failure with the second business from 1,789 re-starters. Failure is defined as not surviving three years after the start-up year.

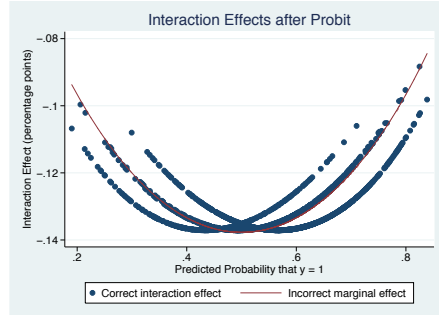


Figure 3.5: Interaction effect (failure x married) as a function of predicted probability of failure (second business).

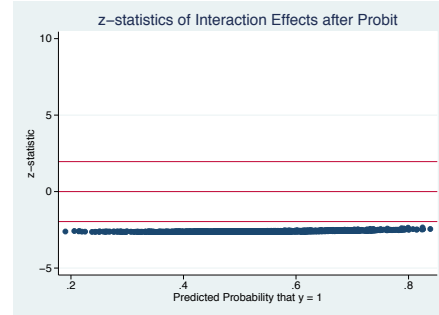


Figure 3.6: Significance of interaction effect (failure x married) as a function of predicted probability of failure (second business).

Part II

The Entrepreneurship Environment: Industry and Geography

Entrepreneurship and Industry Environment

An Empirical Study of Abilities and Strategies

Abstract *This research brings together two different directions within the entrepreneurship literature in explaining new venture performance. The first takes personal abilities and start-up strategies as the point of origin while the second focus on the industry environment that the new venture is founded in. Longitudinal register data combined with responses from 1,151 first-time entrepreneurs in 2004 are used for exploring the importance of personal abilities and start-up strategies for new venture performance under different industry environments; the latter derived from principle component analysis. Based on these findings is, moreover, assessed who makes the right and wrong decision to enter a certain industry environment. As expected, both the person and strategy are found to be important for performance in different environments but it seems that highly educated individuals are more likely to choose the wrong industry.*

4.1 Introduction

Entrepreneurship has recently been recognised as crucial for job creation in advanced economies (Haltiwanger et al., 2010; Ibsen and Westergaard-Nielsen, 2011; Dahl et al., 2009). However, about half of the new ventures close down within the first three years after start-up (Mata and Portugal, 1994; Dahl et al., 2009; van Praag, 2005) which has labelled this period "the valley of death" in the literature (Stam et al., 2008); after this period the survival curve flattens out. Likewise, the experience of high employment growth among the surviving ventures are reserved very few (Dahl et al., 2009). As a result, more political focus has been devoted to the factors behind successful entrepreneurship

4. Entrepreneurship and Industry Environment

defined by firm performance. Determinantes of new venture performance have been studied within a broad range of disciplines often focusing on either the inner environment (e.g. the entrepreneur, the entrepreneurial team, or the entire stock of human capital in the firm) or the outer environment (e.g. the economic, the political, or the socio-cultural environment) (Sarasvathy, 2004; Shane, 2004). While theoretical frameworks integrating these two environments do exist, empirical studies are rare and recently encouraged within the entrepreneurship field.

The area focusing on the person has a long history within the entrepreneurship literature. Early research studied innate personality traits assumed to lead to entry into entrepreneurship and subsequent superior performance with the new venture. The most common traits found in the empirical research are: tolerance of ambiguity, risk taking ability, tolerance of ambiguity, creativity and innovativeness, feelings about locus of control, need for achievement, and desire for autonomy (Parker, 2004; Cromie, 2000). In addition to traits, cognitive styles, attitudes, and values have been studied but to a lesser extent. However, as a result of inconclusive findings (Cromie, 2000; Gartner, 1988), recent research on successful entrepreneurship now seems to study the role of more tangible measures of human capital (e.g. different kinds of education and work experience) or specific strategies (e.g. growth from small scale, flexibility and adaptability, and stakeholder commitments) (Shane, 2004; Sarasvathy, 2008). Research focusing on start-up strategies is often preferred among policy makers as the underlying thought is that everyone can enhance their chances of founding a successful new venture. The view taken in this study is that both personal abilities and start-up strategies are important for new venture performance. However, the role of abilities and strategies are not, *a priori*, seen as independent of the environment that the entrepreneur find herself in.

Exploring how the environment influences the chances of new venture success constitutes another substantial research area within the literature. Overall, the environment represents the opportunities for entrepreneurial exploitation. Shane (2004) divides what he calls the institutional environment into three broad categories: The economic environment, the political environment, and the socio-cultural environment. Specifically, this research follows a more micro level approach by focusing on the industry environment that the entrepreneur chooses to enter. Several studies have tried to identify the industry differences that influence new venture performance. According to Shane (2004), these differences can be linked to: knowledge conditions, demand conditions, industry

life-cycles, appropriability conditions, and industry structure. As before, however, very few empirical studies allow for the abilities and strategies of the entrepreneur to influence the effect of the environment on new venture performance.

Following the theoretical framework in Bhidé (2000), individuals with a certain human capital profile (related to education, traits, and skills) are assumed to thrive in certain industry environments (related to required investments, expected profits, and uncertainty in profits). On the contrary, Shane (2004) and Sarasvathy (2008) outline the role of the start-up strategy for the chance of success in uncertain environments. Taking these theoretical frameworks as point of origin, this study explores the role of personal abilities and start-up strategies for new venture performance in different industry environments. Often studies are not able to use industry indicators as moderator variables. Hence, they might either suffer from insignificant results on a general sample (due to industry heterogeneity) or significant results on a bounded sample (of homogenous industries) without being able to test for generalisability. Moreover, this study assess who (based on abilities and strategies) makes the right or wrong decision to enter a certain industry environment by comparing the findings with analyses of industry choice.

The data used is longitudinal register data combined with a questionnaire survey from 2008 containing first-time entrepreneurs in 2004. The registers are used to create seven indicators for industry environment in the period 1999-2004 which through principal component analysis are reduced to two components: industry profitability and industry uncertainty. Furthermore, the registers are used to create a categorical variable for firm performance divided into non-survival, survival without growth, and survival with growth. Finally, the registers and the survey are used to create four indicators for personal abilities (i.e. education, tolerance of ambiguity, creativity, and contact willingness) and four indicators for start-up strategies (i.e. investments, ownership, co-operation, and take-over).

While some aspects of the theoretical framework in Bhidé (2000) is supported – e.g. the positive role of tolerance of ambiguity under uncertainty – others are not. Even though industry uncertainty is found to increase the chance of growth for resource constrained entrepreneurs, the likelihood of surviving in this environment is reduced. While commitment from others – as emphasised in Shane (2004) and Sarasvathy (2008) – is found to be a beneficial strategy,

4. Entrepreneurship and Industry Environment

growth from small scale was not found to be an advantage in uncertain industries. However, the most striking result concerns highly educated entrepreneurs. While they, as expected, perform better in high profitability industries, they are more likely to start-up in uncertain industries where they perform worse.

4.2 Theory

This section outlines theoretical arguments and empirical findings concerning the role of the industry environment, personal abilities, and, finally, start-up strategies for new venture performance.

4.2.1 Industry environment

In studying important dimensions of organizational task environments, Dess and Beard (1984) categorise five out of the six important dimensions from Aldrich (1979) into three broad categories: *munificence (capacity)*, *dynamism (stability-instability, and turbulence)*, and *complexity (homogeneity-heterogeneity, and concentration-dispersion)*. The three organisational task environments influence an organisations ability to: obtain sustained growth and slack resources (munificence), predict and plan for the future (dynamism), and acquire inputs and divest outputs (Dess and Beard, 1984). Applying factor analyses to seventeen environmental (or industry) variables, Dess and Beard (1984) find that the three factors covering the above categories have high loadings on growth variables, instability variables, and geographical concentration variables, respectively.

Bhidé (2000) focuses on what he calls "promising start-ups" (exemplified by Inc. 500 companies in the US) defined from an investments-uncertainty-profits diagram. Promising start-ups are characterised by: low investments (i.e. irreversible commitment of resources), high uncertainty (i.e. unmeasurable and unquantifiable risk), and low likely profits. Other initiatives include marginal start-ups (low investments, low uncertainty, and low profits) and corporate initiatives (high investments, low uncertainty, and high profits) (Bhidé, 2000). As will be evident later, a promising start-up will be the best start-up choice for certain individuals based on initial conditions, traits, and skills. According to Shane (2004), the following broad categories have been used to study industry characteristics that favors or hinders opportunity exploitation through entrepreneurship: *knowledge conditions*, *demand conditions*, *industry life-cycles*, *appropriability conditions*, and *industry structure*. Based on the work of Dess and Beard (1984) and Bhidé (2000), this study focus on demand conditions given by industry growth and instability (in firms and profits) as well as industry

structure given by industry investments, uncertainty, and profits.

Industry growth

Industry munificence, represented by industry growth, is primarily beneficial for new entrants as these will not necessarily have to compete with existing firms for customers (Shane, 2004). Several studies have shown that growing industries do attract more new ventures. The growth rate in industry value of shipments is found to have a significant and positive effect on the (log) number of new firms appearing in the industry (Dean and Brown, 1995; Dean and Meyer, 1996; Dean et al., 1998). Dividing new firms into small and large size, Dean et al. (1998) find that industry growth is important for both small and large firm formation with the greatest effect on the former. Using the net entry rate as dependent variable, Acs and Audretsch (1989) also find the industry growth rate in value of shipments to have a significant and positive effect. Dean and Meyer (1996) and Dean et al. (1998) include an additional measure for growth, labelled niche dynamism, defined as the growth in value of shipments for the major product class in the industry. Again, the finding is that greater industry niche dynamism increases new firm formation, both large and small, but the effect is greater on small formation.

The empirical studies above all support the positive effect on industry growth on new firm formation. Whether the decision to start up in a high growth industry is also the right one, evaluated by new firm performance, will be assessed next. Starting with new firm survival (or exit), Mata and Portugal (1994) find a negative effect of industry growth and firm exit, Gimeno et al. (1997) a negative effect of gross state product growth on firm exit, and Eisenhardt and Schoonhoven (1990) a positive effect of industry growth on firm survival. Industry growth is in the latter study defined as the industry having at least 100 million dollars in annual sales and an annual growth rate of at least 20 percent. Only Audretsch and Mahmood (1995) do not find the industry growth rate, measured by the percentage change in employment, to have an effect on new firm survival. Other measures of firm performance have also been investigated but to a lesser extent. Eisenhardt and Schoonhoven (1990) find a positive and significant effect of industry growth on firm growth, the latter measured as the absolute change in sales. Creating a variable for the money taken of the firm after three years, i.e. entrepreneurial earnings, Gimeno et al. (1997) find that gross state product growth increases entrepreneurial earnings.

The above studies rarely include the instability of industry growth or the

4. Entrepreneurship and Industry Environment

dynamic aspects of industry growth (e.g. a more competitive environment for new ventures). Exceptions are Mata and Portugal (1994) and Gimeno et al. (1997). The former study finds that the (log) number of new firms in the industry increases the likelihood of failure for new ventures. Utilising responses from the entrepreneurs on expected changes in the number of competitors as well as expectations about how rapidly the business is changing, the latter study does not find a significant effect of subjective environmental dynamism on firm exit or entrepreneurial earnings, respectively.

Industry profits

The profitability of the industry is only a subcategory of the industry structure where the others are: *cost of inputs*, *capital intensity of the industry*, *advertising intensity of the industry*, *industry concentration*, and *average firm size* (Shane, 2004). This study will follow the theoretical framework of Bhidé (2000) where expected profits, profits uncertainty, and investment requirements are the fundamental sizes that constitute the industry environment for promising new ventures. It is straight forward to argue that (expected) high industry profits will lead to more firm formation and, using the munificence arguments above, better performance of new ventures. Nevertheless, Bhidé (2000) argues that high expected profit opportunities also call for high investments. As the nascent entrepreneur is capital constrained, for reasons that will be discussed later, these opportunities are more likely to be exploited by corporate initiatives. Hence, the nascent entrepreneur is forced to pursue low investment and, therefore, low expected profit opportunities which gives uncertainty in profits a vital role. Even though the expected profits are low, opportunities with a very skew distribution of profits increase the chance of success (promising start-up) compared to opportunities with a narrow distribution of profits (marginal start-up).

Many studies include variables for industry investment requirements and profitability in exploring new venture formation and performance. Starting with investment requirements, Dean et al. (1998) find that industry sunk costs (adjusted average establishment asset size) have a significant negative effect on small firm formation while there is no effect on large firm formation. Moreover, Dean and Brown (1995) and Dean and Meyer (1996) find a significant negative effect of (log) capital requirements (average establishment value of assets) on (log) number of new establishments. Finally, Acs and Audretsch (1989) do not find the industry capital-labour ratio to have a significant effect on the industry net entry rate. Turning to the survival of new ventures, Audretsch (1991) and Audretsch and Mahmood (1995) both find the industry capital-labour ratio to

have a negative effect on ten year firm survival, while the former study, nevertheless, finds a positive effect on short run survival (four years). Overall, investment requirements seem to discourage start-up and reduce the survival of new firms; at least in the long run.

Some of these studies also include different indicators for industry profitability. Measuring profitability as the industry price-cost margin, Dean et al. (1998) find profitability to have a negative – although only significant on a 10% level – effect on small firm formation and a positive effect on large firm formation while Acs and Audretsch (1989) find profitability to increase the industry net entry rate. Surprisingly, Audretsch and Mahmood (1995) find the industry price-cost margin to have a negative effect on long run survival (ten years) which could be due to explanations within the framework of Bhidé (2000); i.e. high profits are associated with high investment requirements and are, therefore, more appropriate for corporate exploitation. Based on Weiss (1990), Audretsch (1991) argues for industry concentration being positively related to industry prices and, all else equal, industry profits. The study finds industry concentration to increase short run survival (four years) but to have no effect on long run survival (ten years). Again, this is not contradictory to the framework of Bhidé (2000). However, no indicator for profit uncertainty was included in the above studies.

4.2.2 Personal abilities

Based on Bhidé (2000), four indicators for personal abilities are chosen to be important for new venture performance when starting up in an uncertain but promising environment. This study does not go further into the discussion of whether some of these abilities are inborn, shaped by the environment, or can be learned. The theory behind each indicator will be discussed in the following while the operationalisation of the indicators can be found in Table 4.13.

Years of education

The importance of education for new venture performance is ambiguous when looking through the literature. On the one hand, highly educated individuals might be better informed or more alert to opportunities (Parker, 2004; Shane, 2003). Moreover, these individuals are in a better position to receive finance for the new venture given that education signals ability to the outside investor. On the other hand, the skills that make a good entrepreneur are not necessarily the same as those embodied in formal education (Parker, 2004). First, the literature often portrays successful entrepreneurs by having a certain entrepreneurial personality (e.g. high tolerance of ambiguity) or certain cognitive styles, work

4. Entrepreneurship and Industry Environment

values, attitudes, etc. Disregarding whether these characteristics are inborn or not, they are not the main focus of formal education. Second, higher education could lead to more causal thinking than effectual thinking where the former is better in established firms and the latter better in newly founded firms. Causal logic is based on the premise "to the extent we can predict the future, we can control it" while effectual logic is based on the premise "to the extent we can control the future, we do not need to predict it" (Sarasvathy, 2008). Hence, according to the former view, market opportunities are waiting to be found (e.g. by intensive market research and business planning) while market opportunities are made according to the latter view (e.g. by using the available means to create different ends along the way). The opportunity cost of entrepreneurship, caused by education, also affects the chance of entrepreneurial success. According to Bhidé (2000), high education discourage uncertain - but promising - start-up because of the low expected payoff compared to the risk. Low education, however, are expected to lead to marginal start-up where there is low expected payoff and, furthermore, no chance of high payoff. Individuals with medium education are most likely to enter promising entrepreneurship resulting in an inverted u-shape relationship between education and promising start-up.

Tolerance of ambiguity

Following the above line of reasoning, personality traits related to dealing with uncertainty could be more important than high education. After all, the promising new ventures, exemplified by the successful Inc. 500 companies in Bhidé (2000), start up without novel ideas and with few assets. Nevertheless, risk and uncertainty unquestionable characterises the choices that the entrepreneur has to make, starting with the decision to found a new venture. This aspect has widely been studied in the personal traits literature within entrepreneurship where measures of risk taking propensity and tolerance of ambiguity usually always are present (Cromie, 2000). Empirical studies supporting the view of entrepreneurs having a higher risk-taking propensity than others include Caird (1991), Cromie and O'Donaghue (1992), and van Praag (2005) while Brockhaus (1980) does not support this view. Begley (1995) and Koh (1996) include measures of both risk-taken propensity and tolerance of ambiguity. The former study only finds risk-taken propensity to be significant, although, the correlation between the two measures is high. The latter study finds both indicators to be significant. Even though these two measures seem to cover the same underlying trait, there is a fundamental theoretical difference between the two. Risk-taking propensity measures how willing the individual is to take a risk when the probability of a successful outcome can be calculated. An example

is an individual asked to pick a red ball from an urn with red and blue balls and a known distribution of the two colors. Tolerance of ambiguity describes an individual's ability to deal with uncertainty exemplified by making decisions under incomplete information. Relating this to the previous example, uncertainty is when an individual is asked to pick a red ball from an urn, also containing red and blue balls, but the content is disclosed; i.e. the distribution (or even presence) of red and blue balls or not known. Stylized facts from experiments concerning an individual's choice between picking from these two urns are the following (Bhidé, 2000): (1) Individuals prefer - and will pay a premium - to draw from the urn with the known distribution, although, they do not know if this is better or worse than drawing from the other urn, (2) Increasing the range of possible probabilities of the urn with the unknown probabilities increases aversion against this urn, (3) Individuals are more averse against the urn with the unknown probabilities if the content of the urn will be revealed to other participants afterward, and (4) Attitudes toward risk and attitudes toward ambiguity are uncorrelated. These general findings suggest that successful entrepreneurs indeed need to have a high tolerance of ambiguity to be comfortable; not only because of the financial risk undertaken but also because of the aversion against socio-psychological risks. The latter is emphasised in de Vries (1977) and could be an explanation of why individuals with "nothing to loose" from promising start-up do not enter entrepreneurship.

Creativity or innovativeness

The reason why being creative or innovative is important for entrepreneurial success is straight forward when thinking of entrepreneurship in the schumpeterian sense. In this line of thought an entrepreneur is someone who: (1) Creates a new product, (2) Uses a new method of production, (3) Creates a new market, (4) Captures a new source of supply, or (5) Uses a new form of organization (Parker, 2004). Creativity or innovativeness, however, becomes less important when thinking of entrepreneurship as starting and running a business regardless of the novelty of the product produced or service provided. Disregarding the definition used, the literature often portrays the entrepreneurs as creative individuals characterised by thinking in non-conventional ways, challenge existing assumptions, and to be flexible and adaptable regarding problem solving (Cromie, 2000). The assumption that entrepreneurs differ from others when looking at creativity or innovativeness is supported in Caird (1991), Cromie and O'Donaghue (1992), and Koh (1996). Furthermore, Utsch and Rauch (2000) find that innovativeness has a positive and significant effect on both profits and firm growth when used as a mediator between achievement orientation and venture

4. Entrepreneurship and Industry Environment

performance. These findings support the importance of creativity and innovativeness regardless of the definition of entrepreneurship. It could be argued that even though the goal is to start a business identical to an existing business, the entrepreneurial process forces the individual to be creative, ultimately leading to a different business. Going back to the idea of causal and effectual thinking from Sarasvathy (2008), it is clear that creativity plays a vital role in the latter thinking which is found to be used by expert entrepreneurs. Instead of fixing the end of the business – after comprehensive market research and business planning – and then gather the necessary means for realising the business, the effectual entrepreneur initially takes the available means – (1) Who they are - identity, (2) What they know - knowledge base, and (3) Whom they know - networks – as the point of origin (Sarasvathy, 2008). These means are then used to imagine different ventures where the ultimate one is the result of a creative journey for the entrepreneur(s). The advantage of effectuation compared to causation can be explained by the inherent knightian uncertainty in entrepreneurial decision making; the future is unknown and can by definition not be known. The need to adapt to unforeseen events is emphasised in Bhidé (2000) where the capacity for adaptation is dependent on: decisiveness, open-mindedness, capacity to manage inner conflict, and talent for good attribution. Hmieleski and Ensley (2004) find that improvisational behaviour improves new venture performance when deviating from the original business plan in a rapidly changing and uncertain environment.

Contact willingness

Successful venturing requires that the entrepreneur is able to obtain the necessary resources: e.g information, customers and suppliers, and capital and labour. In obtaining these resources, the social network of the entrepreneur is often assumed to play a significant role. Information from the entrepreneur's network ties is in the literature often assumed to be more useful, reliable, exclusive, and less redundant than information from formal sources (Brüderl and Preisendörfer, 1998). Moreover, network ties are important for building a customer base through what is labelled "the snow ball effect" (Brüderl and Preisendörfer, 1998); the first customers from the entrepreneur's network spread the reputation of the business to their social network and so forth. As the entrepreneur often is capital constrained from formal sources, network ties are important because these individuals have better knowledge of the entrepreneur's motivation, abilities and skills. In the same way, labour from the social network is attractive for more reasons. First, the entrepreneur has better knowledge of the skills and abilities of persons in the social network which is important if the

entrepreneur is inexperienced in hiring people. Furthermore, network labour is likely to be cheaper and more loyal compared to labour hired through formal channels. Ostgaard and Birley (1996) find that hours per week spend on making contact with new suppliers and new investors, respectively, have positive effects on firm performance. Lee and Tsang (2001) find that extroversion influences the frequency and breath of external communication, respectively, which both have a significant and positive effect on firm performance. Finally, it should be mentioned that contact willingness to network ties not solely is important for obtaining resources. The need for entrepreneurs to receive moral support is often emphasised in the literature and supported in empirical studies (Hisrich et al., 2005; Hanlon and Saunders, 2007). Entrepreneurship is a process leading to periods of emotional distress – e.g. high work pressure, unexpected events, and poor performance – as well as the opposite. However, the entrepreneur can confide in network ties without fear of harsh criticism but, nevertheless, receive more honest advice than from people outside of the social network (Hisrich et al., 2005).

4.2.3 Start-up strategies

According to Shane (2004), several strategies can be pursued to deal with uncertainty and information asymmetry: *growth from small scale, entry by acquisition, focus strategy, flexibility and adaptability, forming alliances, and legitimization*. Based on the available data, four indicators are created for start-up strategies. The theoretical foundation of these is discussed in the following while a detailed description of the operationalisation of the indicators can be found in Table 4.13.

Small scale investments

Small scale investments are often seen as a superior strategy for dealing with the uncertainty of starting a new venture; especially when starting in a highly uncertain environment. However, small initial investments do not necessary need to be a deliberate choice since entrepreneurs that lack breakthrough ideas and have limited verifiable human capital find it difficult to receive outside funding (Bhidé, 2000). That capital constraints both hinder start-up and subsequent venture performance are supported in van Praag (2005), van Praag et al. (2005), and Parker and van Praag (2006). Shane (2004) ascribes the capital constraints of the entrepreneurs to problems related to information asymmetry (the entrepreneur has more information than the financier about own entrepreneurial abilities and the business opportunity) and uncertainty (about the business

4. Entrepreneurship and Industry Environment

opportunity and performance of the new venture). The former contains problems concerning *disclosure difficulties, opportunism, excessive risk taking, and adverse selection* while the latter problems concern *inability to evaluate, bargaining problems, and need for collateral*. One way of dealing with most of these problems of new venture financing, aside from using own funds to start the venture, can be found in what is called the real options approach (McGrath, 1999; Shane, 2004). The basic idea is that the financier only commits to small initial investments in the new venture whereafter she has an option of making another investment if the business meets certain milestones: e.g. developed the product or service, hired an employee, contacted customers, made the first sale, or filed for a patent (Shane, 2004). Importantly, the real options approach is also seen as an attractive approach when the entrepreneurs is not capital constrained (McGrath, 1999). Small initial investments are a way for the entrepreneurs to deal with the uncertainty of the business opportunity given that the only way to get more information about the attractiveness of this is to pursue it. If the business opportunity turns out to be unattractive, the loss is minimal. This has further given rise to the view that business failure do not necessary equal entrepreneurial failure if the entrepreneurs is able to learn from the experience for future entrepreneurial endeavors; this is supported in Cope (2010) but not in Metzger (2007) or Chapter 3. Finally, it can be argued that the real options approach is best when starting a new firm in a highly dynamic environment. Here the firm needs to adapt in order to find its place in the market. In more stable environments, new firms starting from small scale are more likely to be outperformed by incumbent firms given that the latter produces at a more optimal scale or might even have production over-capacity to discourage new firm entry. Over-capacity, nonetheless, is a more dangerous strategy in highly uncertain markets.

Ownership and co-operation with others

One way of looking at the benefits of getting others committed in the venture is to look at the dynamic model of effectuation presented in Sarasvathy (2008). In the static model, the effectual entrepreneur starts out with looking at the three categories of means available – i.e. (1) Who they are - identity, (2) What they know - knowledge base, and (3) Whom they know - networks – and then imagines the possible goals of the new venture. The next step is when the entrepreneur begins to interact with others in order to get stakeholder commitments. For each successful negotiation with others – e.g. customer, supplier, investor, partner, or co-owner – the new stakeholder brings new means (and new goals) into the initial stock of means available to the entrepreneur (Sarasvathy,

2008). Hence, what the entrepreneur(s) can do increases for each stakeholder that makes a commitment. This relates back to the discussion about the importance of contact willingness for successful entrepreneurship. A commitment of co-operation from an established well-reputed firm can buy the new venture, without a previous track record, credibility. The same can be done by attracting a high profile individual (e.g. entrepreneur) as co-owner. However, getting commitments from well-reputed firms or individuals can be difficult given that these as point of departure have more to loose from this. One important difference between starting a business with others as owners, compared to starting with co-operation with others, is the role of moral support outlined earlier. Being able to share the emotional rolecoaster ride of a new venture with co-owners is very likely to enhance the positive experiences as well as reduce the negative ones. Indirect support of the latter can be deduced from the findings in Metzger (2008) and Chapter 3 where entrepreneurs that fail with their first business are more likely to start up again if they failed with others.

Existing firm take-over

Another way of reducing the uncertainty of starting a new venture is to take over an existing one. In this situation, the entrepreneur has an idea of the likely performance of the new firm before entering as the reputation and customer base of the firm are indirectly included in the take-over. Support of this is found in Bates (1990) where white males that entered existing firms in the period 1976-1982, instead of creating new firms, are found to be more likely to survive to 1986. However, continuation of the pre-take-over performance will depend on whether the new owner is able to produce with the same efficiency as before. If the performance of the firm was heavily dependent on the means of the former owner and his workers, then take-over could lead to worse performance and, consequently, a depreciation of the reputation of the firm. In this case, the possibility of the new owner to absorb these means is crucial.

4.3 Methodology

The analyses are based on register data from IDA (Integrated Database for Labour Market Research) combined with a questionnaire survey from 2008. IDA is a matched employer-employee longitudinal dataset containing all individuals and firms in Denmark in the period from 1980 and onwards. Furthermore, IDA contains an entrepreneurship register with the main founder of all new businesses from 1994 and onwards. IDA is used for creating an indicator for new venture performance and indicators for industry environment as well control variables

4. Entrepreneurship and Industry Environment

for person (entrepreneur) and firm demographics. Furthermore, the sampling for the 2008 survey was based on information from IDA up till 2004 which was the latest year available at the time. The strata containing novice entrepreneurs (i.e. first-time) in 2004 was used for this study. The population, sample, and response population for this strata contain 7,250, 4,389, and 1,384 individuals meaning a sample size close to the population size and a response rate of 32%¹. Based on IDA and the survey, indicators for personal abilities and start-up strategies are created.

4.3.1 New venture performance

Usual applied measures of new venture performance are survival or growth in employees, sales, or profits. Several studies, including studies based on IDA, show that the likelihood of failure for new ventures are high; three years after start-up around half of the new ventures are closed again (Mata and Portugal, 1994; Dahl et al., 2009; van Praag, 2005). In addition, few new ventures experience high growth which makes survival an important performance measure (Dahl et al., 2009). However, the theory presented in Bhidé (2000) relates to new venture growth. Therefore, the performance measure in this study will include both aspects.

Following the approach in Cooper et al. (1994), new venture performance is categorized into: non-survival, survival without employee growth, and survival with employee growth in the period 2004 to 2006 (the latest year available at the time of writing). A firm is considered survived if it exist with real activity in 2006 while growth is defined as growing at least 50% from 2004 to 2006 as well as adding at least one full time equivalent employee². Applying this definition of firm performance resultet in 440 non-survived (38%), 551 survived without growth (48%), and 160 survived with growth (14%).

Cooper et al. (1994) uses the performance measure as dependent variable in a multinomial logit model (MLL). However, it is straight forward to argue that the

¹Only entrepreneurs behind businesses with "real" activity are included. This means requirements to full-time equivalent employees as well as industry specific turnover levels, both set by Statistics Denmark. Furthermore, businesses startet in the agricultural and energy sector are excluded given the level of government regulation.

²The restriction in Cooper et al. (1994) is that at least two employees are added. Adding the same restriction in this study resultet in only 68 growth entrepreneurs which was found to be too low for the statistical analyses. However, a three-year time span for growth and no full-time equivalent correction in Cooper et al. (1994) are likely to reduce the difference in definition in the two studies.

performance measure is naturally ordered with non-survival being least desirable and survival with growth most desirable. This allows for using the ordered logit model (OLM) as the distance between the categories are not required to be the same in this model. Using OLM for the analyses reduces the regression output compared to MLL as there is only one set of regression coefficients. However, the parallel regression assumption (proportional odds assumption) must be tested.

Control variables included in this study are categorical dummy variables for gender, age, marital status, and urban area residence. Furthermore are included continuous variables for the year before start-up (2003) given by the natural logarithm to personal income and household wealth, respectively. More categories for the age variable were considered but due to violations of the proportional odds assumption, a dummy variable was chosen instead.

4.3.2 Industry Environment

Seven indicators are constructed for industry dynamics based on information from the pre-start-up period 1999-2004. These six years are chosen because of a structural break in the data in 1999 and because the start-up decision is likely to be based on industry characteristics in the period close to start-up, assuming adaptive expectations. Industries are separated by six-digit classification with some restrictions reducing the response population. First, new firms not included in the accounting registers in IDA are excluded (turnover and employee requirements). Second, new firms in industries that do not exist in the whole period are excluded (industry classification change). Third, industries with less than 100 firms in one of the years are excluded (niche industries). Finally, two and three respondents are excluded because of extreme values for start-up year fixed assets and industry mean fixed assets, respectively, based on information from IDA. The resulting response population consists of 1,151 individuals starting up in 133 different industries.

Following the method in Dess and Beard (1984), an indicator for industry growth and instability, respectively, are created. Growth is estimated by OLS regression with the number of firms in the industry and the net income after tax in the industry, respectively, as the dependent variable and time (six years) as the only explanatory variable (besides the constant term). To control for industry size, the coefficient (growth indicator) is divided by the mean value of the dependent variable. Industry instability is calculated from the same regressions, dividing the standard deviation (instability indicator) by the mean value

4. Entrepreneurship and Industry Environment

of the dependent variable. This gives a measure of firm and profit growth as well firm and profit instability. Furthermore is calculated the mean and standard deviation of the net income after tax in 2004 for the firms in each industry as suggested in Bhidé (2000). This gives a measure of expected profits and profits uncertainty. Finally, the industry mean fixed assets are calculated as industries with high expected profits are assumed to require high investments (Bhidé, 2000).

As the indicators for industry dynamics are assumed to be correlated, it is appropriate to reduce the number of indicators to be used as moderator variables in the analyses. This is done by using principle component analysis.

4.3.3 Personal abilities and start-up strategies

Based on Bhidé (2000), four indicators for personal abilities are chosen to be important for new venture success. First, the number of years of further education available in IDA. Second, a survey based indication of whether the person can be characterised as being creative (or innovative) and having tolerance of ambiguity, respectively. These concepts have a long history in the personal traits approach to entrepreneurship. This study does not go further into the discussion of whether these abilities are inborn, shaped by the environment, or can be learned. The final indicator is a proxy for personal extroversion measured by the willingness to contact others for work-related help.

According to Shane (2004), several strategies can be pursued to deal with uncertainty and information asymmetry. From IDA is created a dummy indicating large fixed assets in the new venture. Large initial investments in fixed assets are contradictory to the strategy of growth from small scale. From the survey is further included three dummies indicating: ownership with others, co-operation with others, and take-over of an existing business. The first two indicators reflect the available means of the entrepreneurs which influence the flexibility and adaptability of the venture. The last indicator reduces the uncertainty of starting a new venture.

From paper-and-pencil surveys like the one used in this study, a small number of missing values for each indicator are expected. However, if excluding all individuals with one or more missing values, the number of observations would be substantially reduced when conducting analysis including multiple indicators (e.g. multiple regression models). Hence, a better way to deal with this problem is to impute the missing values in a way that do not significantly influence

the main results from the analyses. In this study, missing values for the survey indicators are imputed using regression imputation with gender, age, foreign origin, education, personal income, and household wealth as explanatory variables.

A more detailed description of the eight indicators, as well as the number of imputations for each indicator, can be found in Table 4.13.

4.4 Results

Initially, principal component analysis is conducted to reduce the number of indicators for industry environment. The resulting components are then used as explanatory variables for new venture performance. Finally, the industry components are used as moderator variables in explaining the role of personal abilities and start-up strategies for new venture performance.

4.4.1 Industry environment

The correlation of the seven industry indicators can be seen in Table 4.1. It is evident that the following indicators have a significant (5% level) and strong positive correlation (coefficient above 50): (1) Growth in number of firms and instability in number of firms, (2) Growth in profits and (a) growth in number of firms and (b) instability in number of firms, (3) Mean firm profits and deviation firm profits, (4) Mean firm fixed assets and (a) mean firm profits and (b) deviation firm profits.

	gFIRM	iFIRM	gPROF	iPROF	mPROF	dPROF	mASSE
gFIRM	1.0000						
iFIRM	0.8493*	1.0000					
gPROF	0.6285*	0.5745*	1.0000				
iPROF	0.2579*	0.2208*	0.0192	1.0000			
mPROF	-0.1732*	-0.0455	0.0097	0.0018	1.0000		
dPROF	-0.0995*	0.0328	-0.0190	0.1022*	0.9410*	1.0000	
mASSE	-0.1613*	0.0069	-0.1338*	0.0643*	0.6857*	0.7694*	1.0000

Table 4.1: Correlation table for industry indicators (* = significant 5% level).

Table 4.2 shows the results from the principle component analysis³. The eigenvalues indicate that at least component one and two are important; the third component has an eigenvalue of just below one. The three components explain 39%, 33%, and 14%, respectively, of the variance in the seven variables.

³The PCA is done on 1,151 observations (the entrepreneurs) instead of 233 observations (the industries). This means that the PCA on industry indicators is weighted by the number of start-ups in each industry.

4. Entrepreneurship and Industry Environment

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.72627	0.38551	0.3895	0.3895
Comp2	2.34076	1.35194	0.3344	0.7239
Comp3	0.98883	0.51028	0.1413	0.8651
Comp4	0.47855	0.18464	0.0684	0.9335
Comp5	0.29392	0.16363	0.0420	0.9755
Comp6	0.13028	0.08890	0.0186	0.9941
Comp7	0.04139	.	0.0059	1.0000

Table 4.2: Principal component analysis - number of components.

Interpreting the coefficients of the three industry components in Table 4.3, a high score on component one is roughly associated with: (1) High mean firm profits, (2) High deviation firm profits, and (3) High mean firm fixed assets. For component two, the factors are: (1) High growth in number of firms, (2) High instability in number of firms, and (3) High growth in profits. Finally, for component three, a high score is only associated with high instability in profits.

Variable	Comp1	Comp2	Comp3	Unexplained
gFIRM	-0.3575	0.4823	0.0093	0.1070
iFIRM	-0.2697	0.5246	-0.0239	0.1569
gPROF	-0.2599	0.4261	-0.3751	0.2517
iPROF	-0.0429	0.2234	0.9161	0.0483
mPROF	0.5034	0.2888	-0.1335	0.0963
dPROF	0.5016	0.3361	-0.0211	0.0490
mASSE	0.4744	0.2535	0.0348	0.2349

Table 4.3: Principal component analysis - interpretation of components.

Hence, based on the highest component loading, the three industry indicators covers profitability (component 1), instability in firms (component 2), and instability in profits (component 3). If variations in the latter two reflect industry uncertainty, then an increase in the former indicator can be said to mirror the move from marginal to corporate business environments (or promising to revolutionary) while an increase in the latter two mirror the move from marginal to promising business environments (or corporate to revolutionary); see Figure 4.1.

Uncertainty	Investments Profits		
	Low		High
	Low High	Marginal Promising	Corporate Revolutionary

Figure 4.1: Investments-Uncertainty-Profits diagram (Bhidé, 2000).

The next step is to determine whether industry profitability and uncertainty have an influence on the chance of entrepreneurial success measured by new venture performance.

4.4. Results

Table 4.4 shows the results from ordered logistic regression models of new venture performance. Model 1 includes only the six control variables. Model 2-4 further include one of the three industry indicators – one in each model – while Model 5 includes all variables together. From Table 4.4 it is evident that a one unit increase in profitability increases the likelihood of success while the opposite is true for the two indicators for uncertainty. However, uncertainty regarding profits is only significant at the 10% level. The coefficients for the industry indicators do not change significantly in Model 5 as the components are (close to) uncorrelated. The Brant test for violation of the proportional odds assumption only indicates a problem regarding profitability. A one unit increase in profitability has a greater effect on the likelihood of moving from survival without growth to survival with growth compared to moving from non-survival to survival without growth.

	Model 1	Model 2	Model 3	Model 4	Model 5
Female	-0.341** (0.121)	-0.279* (0.122)	-0.343** (0.121)	-0.351** (0.121)	-0.298* (0.123)
40+ age	-0.160 (0.122)	-0.180 (0.123)	-0.097 (0.124)	-0.165 (0.122)	-0.128 (0.125)
Married	0.148 (0.120)	0.178 (0.120)	0.136 (0.120)	0.154 (0.120)	0.172 (0.121)
Urban	-0.288* (0.115)	-0.220 [†] (0.116)	-0.206 [†] (0.118)	-0.276* (0.115)	-0.134 (0.119)
Income	0.055* (0.028)	0.056* (0.028)	0.061* (0.028)	0.053 [†] (0.028)	0.060* (0.028)
Wealth	0.021* (0.009)	0.021* (0.010)	0.022* (0.009)	0.022* (0.009)	0.022* (0.010)
PROFIT		0.198** (0.039)			0.191** (0.038)
UNCTYf			-0.131** (0.041)		-0.117** (0.040)
UNCTYp				-0.109 [†] (0.063)	-0.118 [†] (0.061)
Constant - cut1	0.097 (0.340)	0.149 (0.342)	0.227 (0.346)	0.079 (0.341)	0.249 (0.350)
Constant - cut2	2.439** (0.348)	2.536** (0.351)	2.585** (0.355)	2.426** (0.349)	2.651** (0.359)
Pseudo R^2	0.01	0.02	0.02	0.01	0.03
Log-likelihood	-1131	-1118	-1126	-1130	-1112
Observations	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.4: Ordered logistic regression models for entrepreneurial success. The categories of the dependent variable are: non-survival, survival without growth, and survival with growth.

As expected, the indicators for industry environment seem to be important for new venture performance. However, based on the principal component analysis (variance explained) and Table 4.4 (level of significance), only industry profitability and uncertainty regarding firms are used as moderator variables in the subsequent analyses. First is explored the role of personal abilities followed by start-up strategies.

4. Entrepreneurship and Industry Environment

4.4.2 Personal abilities

New venture performance is again estimated using ordered logistic regression. The dependent variable and the control variables are the same as used in Table 4.4. Table 4.5 and 4.7 include profitability and uncertainty, respectively, as the moderator variable (interaction variable) for the effect of personal abilities on performance. Model 1 includes the control variables and all four indicators for abilities. Model 2-5 include the four indicators and the interaction term – one at a time – while Model 6 includes all variables together. Table 4.6 and 4.8 supplement the above findings by assessing who makes the right or wrong decision to enter a certain industry environment. Both tables show OLS regressions with the industry component score as dependent variable and the controls and personal ability indicators as explanatory variables. Model 1 includes only the controls, Model 2-5 include each of the personal ability indicators – one at the time – and Model 6 includes all variables. The main results will be summarized in the following.

From Model 1 in Table 4.5 can be seen that a one unit increase in industry profitability is associated with an increased likelihood of firm success. Out of the four indicators of personal abilities, only contact willingness has a significant positive effect on firm success. The main results from Model 2-5, including interaction effects, are the following. Interestingly, for respondents without further education, an increase in profitability does not have an influence on the likelihood of firm success but the interaction of education and profitability is positive and significant. Furthermore, education is insignificant for mean values of profitability. Hence, firm success in industries with high profitability is dependent on the individual's years of further education. Another finding is that the willingness to contact more groups for help has a positive effect on firm success in industries with mean values of profitability but this effect is reduced by two-thirds when profitability increases. Creativity and tolerance of ambiguity seem not to be important for firm success, regardless of industry profitability. These findings do not change significantly in Model 6 when including all variables together. The results are now viewed in light of the decision to start-up in an industry with a high or low profitability. The models in Table 4.6 show that only individual creativity is significant; creative individuals choose an industry with lower profitability. Hence, individuals with a long education are not more likely to use their apparent advantage in high profitability industries.

Next, a similar analysis is conducted based on industry uncertainty. Starting with Model 1 in Table 4.7, a one unit increase in uncertainty is associated

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.267* (0.123)	-0.289* (0.122)	-0.281* (0.122)	-0.263* (0.122)	-0.290* (0.122)	-0.286* (0.123)
40+ age	-0.173 (0.124)	-0.175 (0.123)	-0.183 (0.123)	-0.186 (0.123)	-0.175 (0.123)	-0.176 (0.124)
Married	0.200 [†] (0.121)	0.174 (0.121)	0.176 (0.121)	0.186 (0.121)	0.193 (0.121)	0.199 (0.122)
Urban	-0.259* (0.120)	-0.228 [†] (0.118)	-0.226 [†] (0.117)	-0.251* (0.118)	-0.236* (0.117)	-0.255* (0.120)
Income	0.052 [†] (0.028)	0.056* (0.028)	0.055* (0.028)	0.053 [†] (0.028)	0.057* (0.028)	0.055* (0.028)
Wealth	0.022* (0.010)	0.022* (0.010)	0.021* (0.010)	0.022* (0.010)	0.020* (0.010)	0.021* (0.010)
PROFIT	0.201** (0.039)	-0.076 (0.103)	0.163* (0.063)	0.212** (0.054)	0.288** (0.060)	-0.012 (0.117)
EDUC	-0.008 (0.026)	0.009 (0.025)				-0.004 (0.026)
CREA	-0.005 (0.120)		0.050 (0.116)			0.005 (0.120)
TAMB	0.198 (0.129)			0.222 [†] (0.125)		0.200 (0.129)
WILL	0.089* (0.044)				0.091* (0.043)	0.085 [†] (0.044)
PROFIT x EDUC		0.053** (0.019)				0.060** (0.019)
PROFIT x CREA			0.057 (0.079)			0.073 (0.082)
PROFIT x TAMB				-0.024 (0.076)		-0.072 (0.079)
PROFIT x WILL					-0.059* (0.030)	-0.071* (0.030)
Constant - cut1	0.257 (0.352)	0.170 (0.350)	0.149 (0.343)	0.177 (0.341)	0.278 (0.348)	0.269 (0.353)
Constant - cut2	2.655** (0.362)	2.569** (0.360)	2.536** (0.352)	2.568** (0.351)	2.677** (0.357)	2.687** (0.363)
Pseudo R^2	0.03	0.03	0.02	0.03	0.03	0.03
Log-likelihood	-1114	-1113	-1117	-1116	-1113	-1107
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.5: Ordered logistic regression models for entrepreneurial success.

with a decreased likelihood of firm success; i.e. the opposite of what was found for industry profitability. Contact willingness is again found to have a positive and significant effect on firm success. If a 10% level of significance is accepted, individuals with tolerance of ambiguity are found to be more likely to become successful with the firm. Like before, the interaction effects in Model 2-5 show interesting findings. Surprisingly, individuals with no further education are not less likely to achieve firm success in highly uncertain industries but, on the contrary, more years of further education have a significant and negative effect on firm success. Furthermore, the willingness to contact more groups increases the likelihood of firm success, regardless of industry uncertainty. Finally, tolerance of ambiguity has a positive effect on firm success for mean values of uncertainty, and the effect is larger in highly uncertain industries; the latter being significant on 10% level. Again, individual creativity seems to be of no importance. The

4. Entrepreneurship and Industry Environment

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.321** (0.103)	-0.326** (0.103)	-0.303** (0.103)	-0.324** (0.104)	-0.321** (0.103)	-0.303** (0.104)
40+ age	0.085 (0.105)	0.086 (0.104)	0.119 (0.105)	0.085 (0.105)	0.080 (0.105)	0.115 (0.105)
Married	-0.141 (0.102)	-0.129 (0.102)	-0.120 (0.102)	-0.142 (0.102)	-0.145 (0.103)	-0.113 (0.103)
Urban	-0.391** (0.099)	-0.356** (0.100)	-0.353** (0.099)	-0.386** (0.100)	-0.384** (0.099)	-0.335** (0.101)
Income	0.005 (0.023)	0.007 (0.023)	0.009 (0.023)	0.005 (0.023)	0.005 (0.023)	0.010 (0.023)
Wealth	0.002 (0.008)	0.004 (0.008)	0.001 (0.008)	0.002 (0.008)	0.002 (0.008)	0.002 (0.008)
EDUC		-0.039 [†] (0.021)				-0.027 (0.022)
CREA			-0.312** (0.098)			-0.292** (0.102)
TAMB				-0.033 (0.106)		0.051 (0.108)
WILL					-0.031 (0.037)	-0.014 (0.037)
Constant	0.252 (0.290)	0.367 (0.296)	0.316 (0.289)	0.257 (0.290)	0.291 (0.293)	0.402 (0.298)
R ²	0.02	0.03	0.03	0.02	0.02	0.03
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.6: OLS regression models for uncertain start-up.

results are robust when including all variables together in Model 6. Turning to the decision to start up in highly uncertain industries, all indicators for personal abilities are positive and significant in Table 4.8. Only contact willingness becomes insignificant in Model 6 when including all variables together. Thus, it seems that individuals with long education choose the wrong industry while individuals with tolerance of ambiguity choose the right industry.

The following section will turn the focus from personal abilities to start-up strategies.

4.4.3 Start-up strategies

Table 4.9 shows new venture performance with industry profitability and start-up strategies as explanatory variables. Initially is seen from Model 1 that an increase in profitability increases the likelihood of firm success. The same is true for the decision of large initial investments and ownership with others, respectively. However, these effects become more interesting when including the interaction terms (Model 2-5). Model 2 shows that an increase in profitability results in an increased likelihood of firm success, even though, the initial investments in the business are small. Nevertheless, large investments have a positive and large effect on the likelihood of firm success for mean values of industry

4.4. Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.328** (0.122)	-0.338** (0.121)	-0.347** (0.121)	-0.325** (0.122)	-0.344** (0.121)	-0.324** (0.122)
40+ age	-0.079 (0.125)	-0.098 (0.124)	-0.107 (0.124)	-0.097 (0.124)	-0.080 (0.124)	-0.093 (0.125)
Married	0.152 (0.121)	0.140 (0.121)	0.132 (0.120)	0.141 (0.120)	0.151 (0.120)	0.163 (0.121)
Urban	-0.253* (0.121)	-0.199† (0.120)	-0.216† (0.119)	-0.253* (0.120)	-0.223† (0.119)	-0.257* (0.122)
Income	0.057* (0.028)	0.061* (0.028)	0.061* (0.028)	0.060* (0.028)	0.061* (0.028)	0.061* (0.028)
Wealth	0.022* (0.010)	0.023* (0.010)	0.022* (0.010)	0.023* (0.010)	0.021* (0.010)	0.024* (0.010)
UNCTY	-0.155** (0.043)	0.046 (0.093)	-0.169** (0.061)	-0.199** (0.051)	-0.101† (0.060)	-0.012 (0.105)
EDUC	0.009 (0.026)	0.023 (0.026)				0.011 (0.027)
CREA	-0.014 (0.120)		0.063 (0.117)			0.017 (0.121)
TAMB	0.248† (0.129)			0.256* (0.127)		0.221† (0.130)
WILL	0.090* (0.044)				0.100* (0.043)	0.095* (0.044)
UNCTY x EDUC		-0.042* (0.019)				-0.049* (0.019)
UNCTY x CREA			0.063 (0.080)			0.100 (0.084)
UNCTY x TAMB				0.152† (0.083)		0.164† (0.084)
UNCTY x WILL					-0.026 (0.030)	-0.028 (0.031)
Constant - cut1	0.416 (0.360)	0.286 (0.357)	0.256 (0.348)	0.303 (0.346)	0.363 (0.352)	0.471 (0.361)
Constant - cut2	2.788** (0.370)	2.654** (0.366)	2.615** (0.357)	2.671** (0.355)	2.731** (0.362)	2.860** (0.372)
Pseudo R^2	0.02	0.02	0.02	0.02	0.02	0.03
Log-likelihood	-1121	-1123	-1126	-1122	-1123	-1116
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and † is significant at the 1%, 5%, and 10% level, respectively.

Table 4.7: Ordered logistic regression models for entrepreneurial success.

profitability, and, furthermore, and even greater effect in high profitability industries (although the coefficient for the interaction term is relatively small). The same pattern can be seen for ownership with others in Model 3, except for the interaction effect being relatively large. Hence, ownership with others increases the likelihood of firm success but it is more important in high profitability industries. Taking over an existing business is found to increase the chance of firm success, regardless of industry profitability, but only in Model 5; when including all variables in Model 6, the result becomes insignificant. Finally, co-operation with other firms seems not be important for firm success. Assessing the industry choice decision in Table 4.10, only one indicator for start-up strategy is significant. Surprisingly, large investments in fixed assets are related to start-up in low profitability industries. Hence, the increased chance of new venture success in high profitability industries by large initial investments and

4. Entrepreneurship and Industry Environment

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.046 (0.093)	-0.028 (0.089)	-0.073 (0.092)	-0.010 (0.092)	-0.046 (0.092)	-0.020 (0.089)
40+ age	0.474** (0.094)	0.467** (0.090)	0.424** (0.093)	0.468** (0.093)	0.485** (0.094)	0.439** (0.090)
Married	-0.083 (0.092)	-0.138 (0.089)	-0.114 (0.091)	-0.070 (0.091)	-0.072 (0.092)	-0.138 (0.088)
Urban	0.690** (0.088)	0.538** (0.087)	0.636** (0.088)	0.624** (0.088)	0.674** (0.088)	0.477** (0.087)
Income	0.041 [†] (0.021)	0.032 (0.020)	0.034 [†] (0.021)	0.034 (0.021)	0.040 [†] (0.021)	0.025 (0.020)
Wealth	0.006 (0.007)	-0.001 (0.007)	0.007 (0.007)	0.007 (0.007)	0.006 (0.007)	0.002 (0.007)
EDUC		0.173** (0.018)				0.152** (0.019)
CREA			0.455** (0.087)			0.252** (0.087)
TAMB				0.497** (0.094)		0.343** (0.093)
WILL					0.075* (0.033)	0.014 (0.032)
Constant	-0.965** (0.260)	-1.473** (0.256)	-1.059** (0.257)	-1.032** (0.257)	-1.060** (0.262)	-1.529** (0.255)
R^2	0.09	0.15	0.11	0.11	0.09	0.17
Log-likelihood	-2071	-2027	-2057	-2057	-2068	-2014
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.8: OLS regression models for uncertain start-up.

ownership with others seem not to be exploited.

The analysis above is repeated in Table 4.11 with uncertainty as the main indicator for industry environment. Again, Model 1 shows that large initial investments and ownership with others increase the likelihood of firm success while the opposite is true for an increase in industry uncertainty. Including the interaction terms in Model 2-5 also result in different effects of the start-up strategies, dependent on industry uncertainty. First, an increase in uncertainty reduces the chance of success for new ventures with small initial investments, although this finding is only significant on a 10% level in Model 2. Moreover, large investments increase the likelihood of firm success and the effect is not dependent on industry uncertainty. However, if accepting a 10% level of significance, the effect is somewhat reduced in high uncertainty industries as expected. Ownership with others and take-over of an existing business both increase the chance of firm success regardless of industry uncertainty, although the latter result becomes insignificant in Model 6. Interestingly, co-operation with others is found to have no effect on the likelihood of firm success for mean values of industry uncertainty but, nevertheless, to have a positive effect on firm success when uncertainty increases. Hence, co-operation is only important for firm success in high uncertainty industries. Again, these results are compared to the

4.4. Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.241 [†] (0.126)	-0.223 [†] (0.124)	-0.271* (0.122)	-0.271* (0.124)	-0.309* (0.123)	-0.239 [†] (0.127)
40+ age	-0.245* (0.124)	-0.243 [†] (0.124)	-0.165 (0.123)	-0.180 (0.123)	-0.174 (0.123)	-0.222 [†] (0.125)
Married	0.143 (0.122)	0.147 (0.122)	0.163 (0.121)	0.180 (0.120)	0.184 (0.121)	0.140 (0.122)
Urban	-0.257* (0.119)	-0.245* (0.118)	-0.245* (0.117)	-0.216 [†] (0.116)	-0.199 [†] (0.117)	-0.249* (0.120)
Income	0.042 (0.028)	0.042 (0.028)	0.057* (0.028)	0.055* (0.028)	0.060* (0.028)	0.045 (0.028)
Wealth	0.024* (0.010)	0.024* (0.010)	0.021* (0.010)	0.021* (0.010)	0.021* (0.010)	0.023* (0.010)
PROFIT	0.221** (0.039)	0.152** (0.051)	0.140** (0.046)	0.219** (0.053)	0.195** (0.040)	0.097 (0.064)
INV	0.958** (0.121)	1.003** (0.119)				0.997** (0.122)
OWN	0.309* (0.153)		0.439** (0.154)			0.350* (0.156)
COOP	-0.036 (0.121)			0.036 (0.119)		-0.025 (0.122)
EXIST	0.227 (0.173)				0.473** (0.170)	0.219 (0.174)
PROFIT x INV		0.157* (0.077)				0.215** (0.082)
PROFIT x OWN			0.226* (0.101)			0.272** (0.095)
PROFIT x COOP				-0.047 (0.076)		-0.077 (0.079)
PROFIT x EXIST					0.031 (0.142)	-0.071 (0.149)
Constant - cut1	0.455 (0.353)	0.415 (0.349)	0.217 (0.343)	0.155 (0.345)	0.252 (0.347)	0.499 (0.354)
Constant - cut2	2.973** (0.365)	2.936** (0.361)	2.623** (0.353)	2.542** (0.354)	2.653** (0.356)	3.051** (0.366)
Pseudo R^2	0.06	0.06	0.03	0.02	0.03	0.06
Log-likelihood	-1078	-1079	-1111	-1117	-1114	-1070
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.9: Ordered logistic regression models for entrepreneurial success.

industry choice decision which can be seen in Table 4.12. Co-operation with others is related to start-up in high uncertainty industries which is found to be the right strategy. Moreover, ventures started in high uncertainty industries are more and less likely to own the business with others and take over an existing business, respectively. However, the former strategy is found to be important regardless of industry uncertainty while the latter strategy is not found to be important.

Before turning to a discussion of the above findings, the explanatory power of the models and possible violations of the parallel regression assumption are assessed. Starting with the former, both personal abilities and start-up strategies seem not to be strong predictors of new venture performance. Moreover, this also holds for the prediction of start-up industry environment, although, the

4. Entrepreneurship and Industry Environment

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.321** (0.103)	-0.332** (0.103)	-0.318** (0.103)	-0.308** (0.105)	-0.321** (0.104)	-0.314** (0.106)
40+ age	0.085 (0.105)	0.097 (0.105)	0.085 (0.105)	0.084 (0.105)	0.085 (0.105)	0.097 (0.105)
Married	-0.141 (0.102)	-0.130 (0.102)	-0.142 (0.102)	-0.140 (0.102)	-0.141 (0.102)	-0.130 (0.102)
Urban	-0.391** (0.099)	-0.384** (0.098)	-0.393** (0.099)	-0.390** (0.099)	-0.391** (0.099)	-0.384** (0.099)
Income	0.005 (0.023)	0.009 (0.023)	0.005 (0.023)	0.004 (0.023)	0.005 (0.023)	0.009 (0.023)
Wealth	0.002 (0.008)	0.001 (0.008)	0.002 (0.008)	0.002 (0.008)	0.002 (0.008)	0.002 (0.008)
INV		-0.201* (0.097)				-0.220* (0.099)
OWN			0.087 (0.125)			0.113 (0.126)
COOP				0.070 (0.102)		0.084 (0.102)
EXIST					-0.012 (0.141)	0.031 (0.144)
Constant	0.252 (0.290)	0.295 (0.290)	0.237 (0.291)	0.229 (0.292)	0.255 (0.291)	0.244 (0.294)
R^2	0.02	0.03	0.02	0.02	0.02	0.03
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.10: OLS regression models for uncertain start-up.

models with industry uncertainty as dependent variable (compared to industry profitability) have a significantly higher R^2 value. Nevertheless, significant effects of the included indicators are found which is the main purpose of the study. Whether the findings concerning new venture performance are comprehensive, based on violations of the parallel regression assumption, is examined next.

Results from the Brant test can be seen in Table 4.16 and 4.17 where the former test is for Model 6 in Table 5 and 7 (personal abilities) and the latter is for Model 6 in Table 9 and 11 (start-up strategies). Starting with Table 4.16, the PRA is only violated on a 5% level of significance for creativity. For mean values of industry profitability, creative individuals are more likely to perform better with their firm than others. However, the effect is greater on moving from non-survival to survival without growth than on moving from survival without growth to survival with growth. The diametrical opposite is true for mean values of industry uncertainty, although the effects are small.

Turning to Table 4.17, the positive effects of ownership with others and take-over of an existing business relate only to moving from survival without growth to survival with growth. This is true for both mean values of profitability and uncertainty, respectively. The final two violations are from Table 11. First, an increase in industry uncertainty (when firms do not follow any of the four

4.4. Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.300* (0.125)	-0.303* (0.123)	-0.325** (0.122)	-0.316* (0.123)	-0.375** (0.122)	-0.286* (0.126)
40+ age	-0.150 (0.125)	-0.154 (0.125)	-0.098 (0.124)	-0.101 (0.124)	-0.093 (0.124)	-0.155 (0.126)
Married	0.099 (0.122)	0.108 (0.121)	0.135 (0.120)	0.148 (0.120)	0.142 (0.120)	0.123 (0.122)
Urban	-0.231 [†] (0.121)	-0.219 [†] (0.120)	-0.221 [†] (0.119)	-0.191 (0.119)	-0.189 (0.119)	-0.208 [†] (0.121)
Income	0.048 [†] (0.028)	0.047 [†] (0.028)	0.065* (0.028)	0.062* (0.028)	0.064* (0.028)	0.053 [†] (0.028)
Wealth	0.025* (0.010)	0.024* (0.010)	0.022* (0.010)	0.022* (0.010)	0.021* (0.010)	0.024* (0.010)
UNCTY	-0.160** (0.042)	-0.098 [†] (0.058)	-0.175** (0.045)	-0.217** (0.053)	-0.115** (0.043)	-0.183** (0.068)
INV	0.934** (0.120)	0.968** (0.118)				0.907** (0.120)
OWN	0.358* (0.155)		0.431** (0.154)			0.360* (0.156)
COOP	0.027 (0.121)			0.086 (0.120)		0.040 (0.122)
EXIST	0.176 (0.174)				0.407* (0.177)	0.124 (0.183)
UNCTY x INV		-0.115 (0.079)				-0.149 [†] (0.081)
UNCTY x OWN			0.174 [†] (0.095)			0.154 (0.096)
UNCTY x COOP				0.201* (0.080)		0.174* (0.080)
UNCTY x EXIST					-0.077 (0.132)	-0.048 (0.137)
Constant - cut1	0.570 (0.356)	0.476 (0.351)	0.347 (0.348)	0.300 (0.350)	0.311 (0.349)	0.641 [†] (0.358)
Constant - cut2	3.054** (0.368)	2.956** (0.363)	2.723** (0.358)	2.667** (0.359)	2.681** (0.359)	3.144** (0.370)
Pseudo R^2	0.05	0.05	0.02	0.02	0.02	0.05
Log-likelihood	-1088	-1090	-1120	-1123	-1123	-1083
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.11: Ordered logistic regression models for entrepreneurial success.

strategies) has a negative effect on the likelihood of moving from non-survival to survival but, on the contrary, a positive effect on the likelihood of moving from survival without growth to survival with growth. Hence, founding a new venture in an uncertain industry increases the chance of growth – which is also what Bhidé (2000) argues – but it is important to add that the requisite for growth, survival, is harder in this environment. Finally, the negative effect of large initial investments in high uncertainty industries seems only to be present for the likelihood of moving from survival without growth to survival with growth.

Overall, the ordered logistic regressions conducted in this study seem not to suffer from violations of the parallel regression assumption. However, it is important to keep in mind the opposite effects on new venture performance of an increase in industry uncertainty.

4. Entrepreneurship and Industry Environment

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.046 (0.093)	-0.042 (0.093)	-0.033 (0.092)	0.019 (0.094)	-0.023 (0.092)	0.059 (0.094)
40+ age	0.474** (0.094)	0.470** (0.094)	0.474** (0.093)	0.470** (0.093)	0.472** (0.093)	0.464** (0.093)
Married	-0.083 (0.092)	-0.087 (0.092)	-0.089 (0.091)	-0.079 (0.091)	-0.088 (0.091)	-0.094 (0.091)
Urban	0.690** (0.088)	0.688** (0.088)	0.681** (0.088)	0.693** (0.088)	0.665** (0.088)	0.652** (0.088)
Income	0.041 [†] (0.021)	0.039 [†] (0.021)	0.041 [†] (0.021)	0.037 [†] (0.021)	0.039 [†] (0.021)	0.033 (0.021)
Wealth	0.006 (0.007)	0.006 (0.007)	0.006 (0.007)	0.008 (0.007)	0.006 (0.007)	0.008 (0.007)
INV		0.067 (0.087)				0.070 (0.088)
OWN			0.332** (0.112)			0.355** (0.112)
COOP				0.329** (0.091)		0.312** (0.091)
EXIST					-0.408** (0.126)	-0.458** (0.127)
Constant	-0.965** (0.260)	-0.980** (0.260)	-1.024** (0.260)	-1.077** (0.260)	-0.875** (0.260)	-1.048** (0.260)
R^2	0.09	0.09	0.09	0.10	0.09	0.11
Observations	1151	1151	1151	1151	1151	1151

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 4.12: OLS regression models for uncertain start-up.

4.5 Discussion

The purpose of this study is to go one step further than previous research by exploring the role of personal abilities and start-up strategies when taken into account different industry environments. Starting with personal abilities, the main findings are related to the years of further education. In high profitability industries, education is found to be positively related to firm performance while education is found to be negatively related to firm performance in high uncertainty industries. The former result, could be due to the need for high investments in these industries which highly educated individuals are better at attracting; e.g. due to the preference of causal reasoning (e.g. making a detailed business plan based on market analyses) compared to effectual reasoning (e.g. making an open business plan based on the entrepreneur's resources) among the financiers. Nevertheless, individuals with more years of further education are less likely to enter high profitability industries. The latter result could possibly again be ascribed to more causal reasoning of highly educated entrepreneurs which is problematic in uncertain environments where effectual reasoning is called for (e.g. the need to be flexible and adaptable regarding the business plan). Furthermore, individual tolerance of ambiguity is found to be important for firm success, especially in uncertain environments. However,

both highly educated individuals and individuals with a high tolerance of ambiguity are more likely to enter uncertain industries. These findings challenge the recent entrepreneurship policy of attracting highly educated individuals into entrepreneurship. Further research could go more into detail of this seemingly wrong industry choice of highly educated individuals and study if and how education changes individual work preferences.

Interesting results are also found concerning start-up strategies. High initial investments and ownership with others, respectively, are found to increase firm performance. However, while an increase in industry profitability enhances the effect of high investments, an increase in industry uncertainty reduces the positive effect but only marginally. Hence, even though the industry choice in Bhidé (2000) for capital constrained entrepreneurs is supported, initial investments seem to be important regardless of industry environment. Nevertheless, individuals founding a new venture in high profitability industries are not more likely to have co-owners and are, furthermore, less likely to invest much. A sensitivity analysis (Brant test) shows that although these strategies together reduces the likelihood of firm survival when industry uncertainty increases, the likelihood of firm growth, on the other hand, increases. This emphasises the importance of studying a sample of entrepreneurs without "survival bias". Especially, since the first three years after start-up (also labelled "the valley of death") reduces the start-up population by approximately half (Mata and Portugal, 1994; Dahl et al., 2009; van Praag, 2005). Finally, co-operation with others is found to be more important in uncertain industries which is according to theory. This knowledge seems to be taken advantage of by the first-time entrepreneurs in this study, since entrepreneurs owning and co-operating with others enter more uncertain industries. Further research could explore the role of industry uncertainty for not only firm performance (e.g. survival and growth) but also entrepreneurial success in the broader sense (e.g. work satisfaction). In this regard, it would be important to explore how personal abilities and start-up strategies are substitutes or complementaries concerning firm performance and entrepreneurial success, and, furthermore, how personal abilities determine start-up strategies. This would be a natural next step given the data available.

This study contributes to the literature by bringing together different areas within entrepreneurship research, e.g psychology, management, and industrial dynamics. From such an approach, however, some limitations are difficult to avoid. Even though the register data used is longitudinal and representative, the combination with a one-off questionnaire survey gives rise to possible causality problems. The survey was conducted in 2008 on first-time entrepreneurs started

4. Entrepreneurship and Industry Environment

in 2004. Hence, when arguing that individuals with high willingness to contact others for help are more likely to perform better with their new venture, reverse causality can not be ruled out. That is, entrepreneurs behind successful new ventures are more likely to be willing to contact others for help; e.g. due to lower socio-psychological risks. However, given that personality traits are assumed to be fairly stable over time for middle-aged individuals, and the years of education are based on 2004 information, this is not seen as a major problem in the study. Moreover, the problem is general and hard to accommodate in the survey design as a random sample of individuals of working age would have to be substantial in order to contain a fairly large response population of entrepreneurs. A more notable issue in this study is the validity and reliability of the personal trait measures: tolerance of ambiguity and creativity. These are only measured by two reversed statements instead of multiple items. Nevertheless, even within the psychological literature on personality traits, it is hard to find consensus among researchers about the validity and reliability of the existing scales. On the other hand, the simple measurement used in this study trades off complexity in measurement with transparency.

4.6 Conclusion

Multidisciplinary theoretical frameworks exist within the entrepreneurship literature but few empirical studies try to introduce concepts from different disciplines. This study contributes to these attempts by exploring the importance of personal abilities and start-up strategies for new venture performance in different industry environments. Based on principal component analysis, two industry components are derived; one for profitability (and investments) and one for uncertainty (instability). Using these industry components as moderator variables resulted in expected but also novel findings. Most notable that highly educated individuals seem to enter the wrong environment, given that these individuals perform worse in uncertain industries but better in profitable industries. In the former environment, individual tolerance of ambiguity seems to be more important. This calls for more research on academic entrepreneurship which is often a major focus of entrepreneurship policy. Moreover, entrepreneurs restricted regarding start-up resources are, as expected, found to be better off in uncertain industries regarding the chance of growth; but only if beating the lower odds of surviving.

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4.6. Conclusion

Indicator	Description	Imputations
The person		
Further education	Discrete: Highest achieved education measured in years (based on the minimum number of years possible to achieve the education). The present compulsory number of years in elementary school is deducted (i.e. nine years). The variable ranges from a value of -3 (i.e. less than present compulsory elementary school) to 11 (i.e. doctoral degree). 28 persons have a negative value.	0 - 0%
Tolerance of ambiguity	Dummy: The value 1 if there is agreement and disagreement with the two reversed items covering this entrepreneurial trait ("I like to pursue the attractive but uncertain opportunities" and "I find it hard to make decisions with an uncertain outcome"). The statements are mixed with 10 statements covering other traits.	24 - 2%
Creativity / innovativeness	Dummy: The value 1 if there is agreement and disagreement with the two reversed items covering this entrepreneurial trait ("I often think of new ideas and ways to solve tasks" and "I prefer to accomplish tasks the way I have always done"). The statements are mixed with 10 statements covering other traits.	23 - 2%
Contact willingness	Discrete: The number of different groups that the respondent "to a great extent" (compared to "some extent" and "not at all") would be willing to contact for work-related help (i.e. "Would you contact one of these persons if that person could help you with an important work task"). The four different groups included are: "Present colleagues or business relations outside of the work place", "Persons mainly known as former colleagues or business relations", "Persons mainly known as former schoolmates or fellow students", and "Persons mainly known from associations (e.g. sport and leisure)".	20 - 2%
The strategy		
Large investments	Dummy: The value 1 if the value of the fixed assets in the business is more than 85,000 DKR in 2004 (approximately 14,192 USD in 2004). This value represents the median fixed assets size for the 1,151 new ventures in the sample. The mean and standard deviation are 195,044 DKR and 348,572 DKR, respectively, which, as expected, indicates a skewed distribution caused by few high value. The min and max value are 0 DKR and 5,056,000 DKR, respectively.	0 - 0%
Ownership with others	Dummy: The value 1 if the respondent started the business in joint ownership with others. The variable is an aggregated measure based on the respondent's answer about joint ownership with the following groups: "Family members", "Colleagues from before I started the business", "Other friends through years before I started the business" or "Other persons".	116 - 10%
Co-operation with others	Dummy: The value 1 if the respondent started the business based on one of the following types of co-operation: "Sale for bigger companies", "Subcontractor for bigger companies" or "Sales promotion with other companies".	150 - 13%
Take-over existing business	Dummy: The value 1 if the respondent stated that the business was "inherited" from family or "acquired" from others compared to started from "the bottom".	165 - 14%

Table 4.13: Indicators for personal abilities and start-up strategies from IDA and the survey.

4. Entrepreneurship and Industry Environment

Variable	Type	Obs.	Mean	St.d.	Min.	Max.
Female	dummy	1151	0.326	0.469	0	1
Age 40+	dummy	1151	0.421	0.494	0	1
Married	dummy	1151	0.601	0.490	0	1
Urban	dummy	1151	0.440	0.497	0	1
Income (ln)	continuous	1151	11.953	2.097	0.000	14.769
Wealth (ln)	continuous	1151	6.627	6.366	0.000	15.769
EDUC	discrete	1151	4.338	2.358	-3	11
CREA	dummy	1151	0.513	0.500	0	1
TAMB	dummy	1151	0.313	0.464	0	1
WILL	discrete	1151	1.412	1.326	0	4
INV	dummy	1151	0.498	0.500	0	1
OWN	dummy	1151	0.183	0.387	0	1
COOP	dummy	1151	0.374	0.484	0	1
EXIST	dummy	1151	0.137	0.344	0	1

Table 4.14: Descriptive statistics: controls, abilities, and strategies.

Variable	Type	Obs.	Mean	St.d.	Min.	Max.
gFIRM	continuous	1151	0.075	0.072	-0.046	0.236
iFIRM	continuous	1151	0.023	0.015	0.004	0.083
gPROF	continuous	1151	0.106	0.169	-3.339	0.959
iPROF	continuous	1151	0.078	0.124	0.006	1.672
mPROF	continuous	1151	341.314	319.100	-93.737	4068.891
dPROF	continuous	1151	442.269	557.414	108.341	7039.423
mASSE	continuous	1151	1301.944	1678.472	153.860	15555.260
PROFIT	continuous	1151	0.000	1.651	-2.571	14.303
UNCTYf	continuous	1151	0.000	1.530	-6.270	9.553
UNCTYp	continuous	1151	0.000	0.994	-1.418	19.602

Table 4.15: Descriptive statistics: industry variables.

4.6. Conclusion

	I=PROFIT (Table 5)				I=UNCTY (Table 7)			
	χ^2	$p>\chi^2$	$y>0$	$y>1$	χ^2	$p>\chi^2$	$y>0$	$y>1$
Female	0.31	0.578			0.29	0.588		
40+ age	2.59	0.108			3.04	0.081		
Married	0.04	0.851			0.01	0.904		
Urban	0.19	0.659			0.05	0.825		
Income	2.17	0.140			2.15	0.142		
Wealth	2.22	0.137			1.74	0.187		
I	0.34	0.559			2.07	0.150		
EDUC	0.04	0.841			0.14	0.713		
CREA	4.28	0.038	0.154	0.040	4.92	0.027	0.061	0.086
TAMB	0.63	0.426			0.90	0.343		
WILL	0.12	0.731			1.18	0.278		
I x EDUC	0.00	0.977			0.07	0.794		
I x CREA	0.98	0.323			0.04	0.843		
I x TAMB	0.75	0.385			0.21	0.649		
I x WILL	0.21	0.648			1.06	0.304		
ALL	17.33	0.300			18.47	0.239		

Table 4.16: Brant test for violation of parallel regression assumption.

	I=PROFIT (Table 9)				I=UNCTY (Table 11)			
	χ^2	$p>\chi^2$	$y>0$	$y>1$	χ^2	$p>\chi^2$	$y>0$	$y>1$
Female	0.11	0.741			0.01	0.918		
40+ age	2.81	0.093			3.32	0.069		
Married	0.00	0.967			0.01	0.916		
Urban	0.13	0.717			0.17	0.679		
Income	2.15	0.142			2.27	0.132		
Wealth	1.93	0.165			2.28	0.131		
I	0.03	0.873			16.42	0.000	-0.266	0.164
INV	0.62	0.430			0.24	0.624		
OWN	16.74	0.000	-0.029	0.858	24.13	0.000	-0.047	0.975
COOP	0.26	0.609			0.16	0.693		
EXIST	6.48	0.011	0.004	0.625	3.67	0.055	-0.052	0.450
I x INV	0.19	0.663			14.07	0.000	-0.047	-0.488
I x OWN	2.14	0.144			0.01	0.907		
I x COOP	1.12	0.291			0.66	0.416		
I x EXIST	0.94	0.332			1.14	0.286		
ALL	46.78	0.000			75.59	0.000		

Table 4.17: Brant test for violation of parallel regression assumption.

Entrepreneurship within Urban and Rural Areas

An Empirical Study of Individual Creativity and Social Network

Abstract *The entrepreneurial dynamics within urban and rural areas are often assumed to be very different. This study explores the importance of individual creativity and the social network in both places regarding the probability of becoming an entrepreneur and of surviving the crucial three years after start-up. The results are based on longitudinal register data combined with a questionnaire survey from 2008, utilizing responses from 1,108 first-time entrepreneurs (out of which 670 survived) and 420 non-entrepreneurs (without previous entrepreneurial experience). Creativity is only found to lead to start-up in urban areas but it does not influence the chances of survival in any of the two areas. On the contrary, the social network matters particular in rural areas. By combining the person and the environment in the research design, common entrepreneurship beliefs are questioned which opens up for region specific policy initiatives.*

5.1 Introduction

Entrepreneurship has been recognized as fundamental to regional economic development, and it has been suggested that entrepreneurship policy should pay more attention to the various dimensions of different regions (Tamásy, 2006; Aoyama, 2009). Understanding who becomes entrepreneurs, and more importantly, who achieves success with the new venture across different geographical settings is important to understand economic prosperity. Most entrepreneurship studies have been carried out in urban areas in which entrepreneurship flourishes due to localization effects, urbanization effects and the 'creative class'

5. Entrepreneurship within Urban and Rural Areas

argument (Glaeser et al., 2010). The superiority of larger cities in producing advanced economies has been acknowledged since the time of the ancient Greeks to the time of the Italian city-states (Botero, 1588), and this does not seem to be different today (Glaeser, 2011). The higher economic performance of urban areas has been explained by a wide variety of theories ranging from the division of labour (Smith, 1776) to capital accumulation (Marx and Engels, 1848). Within the entrepreneurship literature, some researchers have put forward the thesis that, with a few exceptions, entrepreneurship is an urban phenomenon (Acs et al., 2011). Unfortunately, the increasing interest in entrepreneurship in cities has left rural areas under-researched.

Individual level studies exploring who becomes an entrepreneur, and who achieves success with the new venture, can be categorized to some extent into studies of identity (e.g. traits and values), knowledge (e.g. education and work experience) and networks (e.g. strong and weak ties). This uses the three categories of entrepreneurial means introduced by Sarasvathy (2008): (1) Who they are, (2) What they know, and (3) Whom they know. However, there has been little research done allowing for the role of these means to be conditioned on the environment, including the geographical setting. Although studies comparing the means of urban and rural entrepreneurs do exist, few studies include the control groups necessary for exploring the two main questions above. That is, they do not include a group of non-entrepreneurs or entrepreneurs behind an unsuccessful business. Exceptions include Babb and Babb (1992) looking at psychological traits and Bauernschuster et al. (2010) looking at personal contacts. Babb and Babb (1992) find no major differences in the psychological traits that differentiated founders and non-founders in urban and rural areas, respectively, except for urban founders expressing higher risk-taking and tolerance of ambiguity than non-founders. Bauernschuster et al. (2010) find the number of club memberships to be more important for entry into self-employment in peripheral areas, as increasing club memberships lead to stronger ties in more dense areas.

In the same way, this study takes on the view that important contributions to the literature can be made by investigating the role of individual means in different environments since few studies have tried to do so (Thornton, 1999; Hisrich and Drnovsek, 2002; Sarasvathy, 2004). More specifically, this research explores the role of individual creativity and the social network for the probability of becoming an entrepreneur and subsequent surviving "the valley of death". The latter refers to the crucial three years after start-up where half of the newly founded ventures close down (Mata and Portugal, 1994; Dahl et al.,

2009; van Praag, 2005); after that the survival curve flattens. Creative individuals could be more or less likely to become entrepreneurs in urban areas because of more opportunities for entrepreneurship, but also more opportunities for intrapreneurship, in these areas. Regarding social network, the more supportive environment in urban areas might, on the one hand, reduce the need for social network support but, on the other hand, increase the need for support because of the more competitive environment. This study utilises four measures of individual creativity and the social network, respectively. However, it does not go further into the debates: 1) Is creativity an inborn personal trait or a behaviour that can be learned? And 2) Is social network a result of personal extroversion, networking behaviour or the success of their business? Shedding light on the role of these individual means for entrepreneurship in urban and rural areas is useful for entrepreneurship education and entrepreneurship policy.

Using a unique Danish dataset of 1,528 individuals, the present research utilises four main groups in the analyses: first-time entrepreneurs in 2004 and non-entrepreneurs (without previous entrepreneurial experience), in both urban and rural areas. The general finding in this study is that there are a few significant differences between what makes an entrepreneur, and, furthermore, a successful entrepreneur, in urban and rural areas regarding individual creativity and the social network. However, some of these differences could be considered as caveats for further research in the field. Creative individuals have a higher probability of establishing a business if they live in an urban area, but not if they live in a rural area. This finding strengthens arguments of the relationship between creativity and larger cities (Florida, 2010; Glaeser, 2011). However, when looking at other indicators related to creativity – such as work motivation, entrepreneurial traits, and risk willingness – the results support the general thesis that more creative individuals tend to start businesses regardless of the geographic setting. The probability of failure is always higher in urban areas, and creativity indicators are not found to be important for new venture survival. Regarding social network indicators, frequent contact with more groups and encouragement from family and friends are found to be important for start-up in both urban and rural areas, but when it comes to survival, the social network is only important in rural areas.

Why the entrepreneurial environment is different in urban and rural areas will be explained next. Then the chapter is divided into four main parts. First, the concepts of individual creativity and the social network will be discussed since these are assumed to be significant factors in explaining new venture entry and performance. Furthermore, is argued for the possible different roles of these

5. Entrepreneurship within Urban and Rural Areas

individual means in urban and rural areas. Second, the concept of urban and rural will be discussed in the methodology for the purpose of creating an indicator for the empirical analysis. Third, an analysis of the results and robustness checks are conducted followed by discussion and conclusion.

5.2 Theory

5.2.1 Entrepreneurship in urban and rural areas

As introduced above, geographical location plays a significant role in explaining entrepreneurship. However, the location per se (e.g. choosing to be in an economic hub), can hardly be disentangled from people's presence. Today, empirical evidence suggests that even though such places have higher competition (Sorenson and Audia, 2000), human proximity (i.e. population density, population growth, and population size) increases entrepreneurship rates (Reynolds et al., 1994; Shane, 2003; Sternberg, 2009).

Many studies attempt to explain why the entrepreneurship environment differs in urban and rural areas. Geographical economics has expanded the research on transportation costs and economies of scale to explain the better performance of urban centres even though entrepreneurs themselves were omitted (Krugman, 1991). Regarding the environment, research shows that rural entrepreneurs lack certain benefits related to *"low density of population and therefore a low density of most markets, and greater distance to those markets as well as to information, labour, and most other resources"* (Malecki, 2003, p.201). Also places with higher population density offer entrepreneurs (and potential ones) more "observation possibilities" before engaging in new projects (Shane, 2003).

Much research has explained the higher performance of entrepreneurship in cities by citing improved availability to externalities (Sternberg, 2009). These include two main research veins. The first, called the Marshall-Arrow-Romer externalities, focus on intra-industry knowledge flows or knowledge flows within the same industry. The second, called Jacobs' externalities, explain how small businesses in cities (in particular) exchange knowledge across diverse industries (Sternberg, 2009).

The higher education of entrepreneurs and their employees is a reason for higher urban entrepreneurial performance (Shane, 2003). Large universities tend to be in cities providing not only formal education but creating knowledge

spillovers that entrepreneurs can benefit from (Saxenian, 1994; Cooke and Schienstock, 2000). The process of spillovers could also be linked to the necessity of face-to-face contact in certain kinds of activities (Jaffe, 1986). Innovation scholars also point out the importance of proximity in entrepreneurial dynamics due to the mode of innovation based on 'doing, using and interacting' (Jensen et al., 2007).

In a review of the literature, Glaeser et al. (2010) cite higher returns, greater supply of ideas, more resources, and differences in the local culture and policies as reasons why entrepreneurship is superior in urban areas. They sum up by saying: *"entrepreneurship can be part of a virtuous cycle where entrepreneurial activity leads to the circumstances that foster further activity. Of course, the flip side of this conclusion is that the absence of entrepreneurship can lead to a vicious cycle."* (Glaeser et al., 2010, p.4) All in all, while the literature points out that urban areas are more supportive, but also more competitive, environments for entrepreneurship, few studies explore how this affects the role of individual means in explaining new venture start-up and performance.

The next two sections will discuss the significance of individual creativity and the social network in relation to entrepreneurship. Studies on the former has been part of the personal traits approach in entrepreneurship which has played a dominant role in the literature (Parker, 2004; Cromie, 2000). However, the paper and pen measures of personal traits have not resulted in robust results, likely contributing to the change in focus from psychology to ego-centric network studies (Parker, 2004; Brüderl and Preisendörfer, 1998; Aldrich and Zimmer, 1986).

5.2.2 Individual creativity and entrepreneurship

In the last decade, the narrative of creativity and entrepreneurship has been dominated by the theories of the 'creative class' (Florida, 2002). Even though critics of these are ad infinitum (Scott, 2006), the concept has many interesting notions for entrepreneurship (Boschma and Fritsch, 2009; McGranahan et al., 2010). However, it is important to keep in mind that the taxonomy of the creative class is not necessarily related to entrepreneurs and that the creative class argument is geared towards urban areas. Scott (2006), among many others, has also cited the importance of creativity in entrepreneurship as related to cultural production, and he also primarily focuses on large metropolitan areas. This study does not use the term of creativity popularised by Florida or Scott but as a personal trait or behaviour labelled individual creativity.

5. Entrepreneurship within Urban and Rural Areas

There is an abundance of research exploring the role of personal traits, behaviours, values, and attitudes for new venture start-up and subsequent performance (Cromie, 2000; Gartner, 1988). Numerous traits such as risk willingness, tolerance of ambiguity, feelings about locus of control, need for achievement, desire for independence or autonomy, and creativity or innovativeness have been included in these studies (Parker, 2004; Cromie, 2000). Despite this, empirical studies trying to verify that entrepreneurs possess certain traits are ambiguous. Exceptions are Caird (1991) and Cromie and O'Donaghue (1992) who find that entrepreneurs are different from other groups regarding five of the most common traits in the literature, including creativity.

Creativity or innovativeness is included based on the assumption that the entrepreneurs, as outlined in Cromie (2000), have to have the ability to recognize and realize new opportunities, look beyond conventional procedures, combine existing ideas and resources in different ways, and obtain experience through experimentation and trial and error. Furthermore, an entrepreneur is someone who thinks in non-conventional ways, challenges existing assumptions, and is flexible and adaptive regarding problem solving¹ (Cromie, 2000). Chen et al. (1998), looking at entrepreneurial self-efficacy (i.e. an individual's belief of her own capabilities regarding different entrepreneurial tasks), find that business founders scored higher than non-founders regarding innovation self-efficacy. Also, Koh (1996) finds innovativeness to be higher among entrepreneurially inclined students compared to those who are non-inclined. As for the differences between successful and unsuccessful entrepreneurs, Utsch and Rauch (2000) find that innovativeness is a mediator between achievement orientation and venture performance; innovativeness has a positive and significant effect on both profit and firm growth.

A major problem in empirical studies using the personal traits approach is the categorisation and distinction between different traits (Cromie, 2000). For example, it is likely that individuals with a great need for independence also display a great need for achievement, creativity or innovativeness, and willingness to take risks because high independence allows these individuals to behave in accordance with these other traits. Indeed, Utsch and Rauch (2000) find innovativeness to be significantly correlated with all other included traits, except locus of control.

¹This is in accordance with (and likely because of) Schumpeter's theory of the entrepreneur.

Another indicator used to gauge an individual's creativity or innovativeness has been an individual's intrinsic (and extrinsic) motivation since intrinsic motivation results in high-quality learning and creativity (Ryan and Deci, 2000). Intrinsically motivated individuals can act for the fun or the challenge of the endeavour while extrinsically motivated individuals act because of external prods, pressures, or rewards. Likewise, intrinsic and extrinsic work values are related; the former is related to the work tasks themselves (e.g. the importance of work for strengthening skills and abilities) and the latter is not (e.g. the importance of work for providing a high income) (Kalleberg, 1977). Hence, work motivation or values could serve as good proxies for creativity instead of trying to construct a direct measure of creativity.

This study investigates individual creativity and proxies for individual creativity for the likelihood of becoming an entrepreneur as well as becoming a successful entrepreneur in rural and urban areas. Hence, the possible different roles of individual creativity in these two areas are discussed in the following.

More opportunities for entrepreneurship in urban areas, as outlined earlier, could result in creative individuals only being more likely to start up in these areas. On the contrary, if also assuming more employee opportunities for creative individuals in urban areas (e.g. intrapreneurship), creative individuals could be less and more likely to start-up in urban and rural areas, respectively. As for survival after start-up, it is reasonable to assume that individual creativity is positively related to venture survival. Especially for entrepreneurs, it is important to deal with the uncertainty of the future by turning to effectual reasoning instead of causal reasoning (Sarasvathy, 2008). This involves being able to adapt the original business plan and the goal of business along the way as the entrepreneurial means can be used to create many different businesses. Hence, creative individuals are more likely to use effectual reasoning. However, it can be argued that individual creativity will have a larger effect in urban areas as a result of greater competition.

In this study, four indicators for creativity have been created: creativity or innovativeness as a personal trait (dummy), higher intrinsic motivation than extrinsic motivation (dummy), risk willingness (continuous) and one indicator covering five other personal traits associated with entrepreneurship (discrete). The operationalisation of these indicators can be seen in Table 5.8. This section has discussed creativity as an alleged crucial factor for entrepreneurship. The next section discusses the second factor studied in this chapter, namely the social network.

5. Entrepreneurship within Urban and Rural Areas

5.2.3 Social network and entrepreneurship

A critique of the individual characteristics approach to understanding entrepreneurship is that the decision to become or remain an entrepreneur can not be explained by looking solely at the individual (Granovetter, 1985; Aldrich and Zimmer, 1986). In other words, *"Persons do not make decisions in a vacuum but rather consult and are subtly influenced by significant others in their environments: family, friends, co-workers, employers, casual acquaintances, and so on."* (Aldrich and Zimmer, 1986, p.6)

The benefits the entrepreneur can reap from a social network are often related to motivation and access to valuable resources like information, customers, suppliers, capital and labour (Parker, 2004; Brüderl and Preisendörfer, 1998; Aldrich and Zimmer, 1986). The motivation to become an entrepreneur, stay an entrepreneur, or achieve high growth with the new venture are all assumed to be positively related to having (former) entrepreneurs in the family or among friends (Bosma et al., 2011). These role models can provide access to the necessary resources, provide realistic insight into the values, abilities and skills important for entrepreneurship, and provide encouragement given the emotional ups and downs entrepreneurship can lead to. Providing moral support, of course, is not dependent on these individuals having entrepreneurial experience.

The importance of family and friends are empirically supported by Sanders and Nee (1996) who look at immigrant self-employment status, Hanlon and Saunders (2007) who study key supporters in achieving business goals, and Brüderl and Preisendörfer (1998) who look at business survival and growth. Furthermore, Nanda and Sørensen (2010) find that individuals are more likely to become entrepreneurs if their parents or former work colleagues have entrepreneurial experience while Davidsson and Honig (2003) find the likelihood of being a nascent entrepreneur higher for individuals with entrepreneurial parents, entrepreneurial friends or neighbours or if family and friends have encouraged entrepreneurship.

Ego-centric social network studies of entrepreneurial start-up and performance often divide network ties into strong ties and weak ties, depending on the degree of trust between persons (Dubini and Aldrich, 1991). Strong ties are often simplified to be spouse, parents, other relatives, and close friends while weak ties are business partners, (former) employers and co-workers, and other acquaintances (Brüderl and Preisendörfer, 1998). On the one hand, a social network mainly consisting of strong ties can be efficient for obtaining resources

given the high degree of trust. On the other hand such a network can be inefficient given the assumed low diversity and high density, i.e. the people share the same characteristics and contacts outside of the network. In addition to the nature of network ties, the size of the social network is the most common measure of an entrepreneur's potential network opportunities (Burt, 2000). One empirical study that includes many network characteristics in explaining new venture growth (sales, profits, and employee growth) is Ostgaard and Birley (1996). They find that having colleagues/partners in the personal network positively affects all performance measures while more profitable entrepreneurs are found to have a denser (less diverse) personal network. However, the personal network size and frequency of communication with the personal network are not found to influence venture performance.

Studies of social network characteristics often demand a more qualitative approach and are, thus, less appropriate for quantitative analyses. Hence, many quantitative studies include simple indicators or proxies for social network, e.g. entrepreneurs among family/friends, marriage status and club/organization membership.

Concerning the different characteristics between urban and rural populations, the work of Granovetter and some of his followers offers some insights. Granovetter (1985) argues that more economic opportunities are created through weak ties. Researchers later posited significant differences in urban and rural areas claiming that individuals in rural areas depend more on their network for learning processes, and individuals in less populated areas often have stronger ties compared to individuals in urban areas who have weaker ties (Benneworth, 2004; Morris et al., 2006). These different network structures may affect the entrepreneurial dynamics in urban and rural areas. Bauernschuster et al. (2010) find that club membership is related to self-employment but with a twist. Memberships are more important in peripheral areas as they lead to closer ties because of low population density.

To sum up, regarding the start-up decision and subsequent survival of a business, support from the social network is expected to be important in both urban and rural areas. According to Burt (2000), the social network is crucial for entrepreneurs because individuals compete for the same resources necessary for business start-up. However, where the social network effect is strongest could be ambiguous. On the one hand, the social network effect could be larger in rural areas as a consequence of the less supportive entrepreneurial environment. On the other hand, the effect could be larger in urban areas given the more

5. Entrepreneurship within Urban and Rural Areas

competitive environment.

Four social network indicators are used in this study in analysing new venture start-up and survival in urban and rural areas: the number of different groups with frequent contact (discrete), social network size (continuous), and start-up encouragement from family and friends (dummy), respectively. The operationalisation of these indicators can be found in Table 5.8.

5.3 Methodology

This section contains four subsections dealing with: 1) The sample of about 1,500 respondents, 2) The specifications of the survey, 3) The conditional variable: urban and rural areas, and 4) The independent variables: the person, firm and circumstances.

Concerning the source of the data, IDA (Integrated Database for Labour Market Research) contains longitudinal data on the entire population of individuals and firms in Denmark from 1980 onward and each individual can be connected to the firm they worked for in any specific year. Furthermore, the main founder behind every new business in Denmark from 1994 onward can be found in the entrepreneur register. IDA is used for the sampling of the questionnaire survey conducted in 2008 and, subsequently, to provide background information about the respondents.

5.3.1 The sample: Entrepreneurs and non-entrepreneurs

The sampling for the survey was based on information from 2004 which was the latest year available in IDA at the time. In Table 5.1 the size of the population, sample and response population can be seen for the two strata used in this chapter: first-time entrepreneurs in 2004 (the entrepreneurs) and non-entrepreneurs before and in 2004². The individuals in both groups are in the age range 15-66.

The entrepreneurs are defined by meeting the following criteria: they started an incorporated or unincorporated business with "real" activity as their main occupation in 2004. For the business to be "real" active in a given year, the work effort and/or earnings (calculated from turnover) have to be above a certain

²Two other strata were included in the survey but not in this study: experienced entrepreneurs in 2004 and former entrepreneurs in 2004.

industry specific level which for businesses started in the same year is set to half. Importantly for this study, businesses from the primary sector (and the energy sector) are not included given the level of government intervention in these sectors.

Strata	Number of individuals in:		
	Population	Sample	Respondents (rate)
Entrepreneurs	7,250	4,389	1,384 (32%)
Non-entrepreneurs	2,712,525	1,514	606 (40%)
Total	2,719,775	5,903	1,990 (34%)

Table 5.1: Population, sample, and response population.

From Table 5.1 it is evident that the entrepreneurs in 2004 are largely over-sampled in the survey. The purpose of this study is to investigate the different dynamics in urban and rural areas regarding: (1) The probability of becoming an entrepreneur, and (2) The probability of surviving as an entrepreneur. Hence, the disproportionate stratified sampling on the dependent variable (entrepreneur versus non-entrepreneur) does not create a problem when applying logistic regression for the analysis (Allison, 1999).

5.3.2 The survey: Survival, creativity, and network

The time-lag between the sampling data (2004) and the survey data (2008) as well as the limited time period covered by IDA (1980/1994-2004) make it necessary to control for entrepreneurial status from the questionnaire. In the questionnaire respondents were asked: 1) If they are an entrepreneur, 2) If they are not an entrepreneur but have previously been one, or 3) If they are not an entrepreneur and have never been one³. Together with the IDA information, the response to this question is used to create an indicator of survival from 2004 to 2008; hence surviving the first three years after start-up also known as "the valley of death"⁴. Other measures of entrepreneurial success were considered, e.g. difference in pre- and post-start-up earnings or growth in sales, profits, or employees, but for simplicity only survival was used. This decision was based on vast studies showing that entrepreneurs are often unable to achieve an income from entrepreneurship equal to or above the income from working in an

³57 non-entrepreneurs were excluded because they could have been entrepreneurs before or after the time period covered by IDA.

⁴Survival is indicated from the question of entrepreneurship status in the 2008 questionnaire. Therefore, surviving entrepreneurs could have started another business that is still active in 2008, and non-survivors could have successfully sold their business before 2008. However, only a few, if any, of the respondents are assumed to fall into these two categories based on the descriptive statistics in Chapter 3.

5. Entrepreneurship within Urban and Rural Areas

established business (Parker, 2004; Hamilton, 2000); yet entrepreneurs are often more satisfied with their work than wage earners (Hundley, 2001; Blanchflower and Oswald, 1998). Hence, survival enables entrepreneurs to enjoy high work satisfaction and is at the same time a prerequisite for growth.

From the questionnaire, creativity and network indicators are also created for all respondents. The construction of these can be seen in Table 5.8. The individual creativity indicators used in this study encompass a direct indicator, i.e. creativity as a behaviour or personal trait, as well as proxies: the importance of intrinsic compared to extrinsic work values from the sociology literature, an aggregate indicator of common entrepreneurial traits from the psychology literature, and an indicator for the degree of risk willingness from the microeconomic literature. The ego-centric social network indicators include the number of different groups with frequent contact, the social network size, and start-up encouragement from family and friends, respectively. Knowledge indicators are only included indirectly as age and education are part of the control variables in this study (see Table 5.8-5.10).

One problem of using survey data for quantitative analysis is missing values. In the case of non-response for an item, the respondent is dropped in the regression, which is problematic when including several variables (if the non-responses for each item are distributed among different respondents). This is not a problem in this study, but in order to have the same number of observations in the regression models, the few missing values for each variable are imputed using regression imputation with gender, age, education, personal income, and household wealth as explanatory variables; see Levy and Lemeshow (2008). The number of imputed observations for each variable can be seen in Table 5.8. Only for the network size variable, the number of imputed observations is high (13%), likely due to the complexity and sensitivity of the question.

5.3.3 The conditional variable: Urban and rural areas

The concept of urban and rural is intricate because both of them are social constructs (Anderson, 2000). Defining an urban area can be done as *"a function of (1) population size, (2) space (land area), (3) ratio of population to space (density of concentration), and (4) economic and social organisation."* (Weeks, 2008, p.354). In the studies that have been referenced in this chapter, researchers use different methodologies and standards. Overall, the use of different measures for each country and region and for what constitutes rural and urban areas are recognised. As in many other studies, while a dichotomy between urban and

rural places is proposed, a large scale of gray area exists. In this study the four functions proposed by Weeks (2008) are directly and indirectly taken into account.

As mentioned above, the main challenge is defining the "gray areas". In the majority of comparative studies, researchers use a figure (e.g. 50,000 inhabitants) to separate rural and urban areas. If someone is an entrepreneur in an administrative unit with 50,000 inhabitants that person becomes an urban entrepreneur. However, if someone lives in a municipality with 49,999 inhabitants then that individual becomes a rural entrepreneur. While this approach is practical for statistical purposes, it can be somewhat biased. In order to better differentiate the rural and the urban areas, this study uses a more conservative approach and creates a semi-urban area. These semi-urban areas are removed from this study. Such gray areas correspond to the third and fourth largest cities in Denmark, Odense and Aalborg, both of which had populations between 150,000 and 200,000 inhabitants in 2004. Following this conservative approach, the surrounding municipalities of within 20 kilometres (centre-to-centre) are included. There are only nine of the remaining municipalities that have over 50,000 inhabitants, and they are also categorised as semi-urban areas together with Odense and Aalborg. As a result, the definition of an urban inhabitant used in this study is a person living in an area within commuting distance to the two significantly largest cities in Denmark: Copenhagen and Aarhus. Figure 5.1 shows the 271 municipalities in Denmark and the 37 and 16 municipalities that are connected to the Copenhagen and Aarhus areas, respectively. These urban, or "metropolitan", areas had 1,605,943 and 475,810 inhabitants, respectively.

Denmark had a population of just below 5,5 million in 2004. There are around two million inhabitants living in rural and urban areas, respectively, and around one million people living in the semi-urban areas. That is, if an individual lives in an area of more than nearly 500,000 inhabitants, the person is considered urban. If an individual lives in an area of less than 50,000 people, the person is considered rural. The areas in the middle – those determined as being semi-urban – account for less than 20% of the total population and remain out of the study. Even though, this is considered to be an appropriate approach, robustness checks are conducted to see if and how changes to the urban and rural area definition changes the main findings. First, the semi-urban areas are included in the population of urban and rural areas, respectively, and, second, the binary variable is replaced with a continuous variable: the number of individuals living in the municipality. A similar approach has been used by Dahl and Sorenson (2009). As will be evident later, the main findings seem to be

5. Entrepreneurship within Urban and Rural Areas

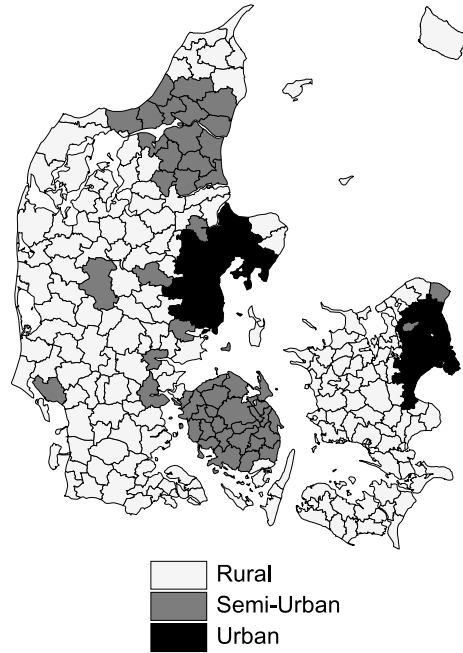


Figure 5.1: Categorisation of Danish Municipalities. The black areas are urban areas (the eastern one represents the Copenhagen area and the western the Aarhus one). The gray areas represent the semi-urban areas (the northern one comprises Aalborg and its surroundings, and the southern one the Odense area). The rest are rural areas.

robust to these changes.

Table 5.2 shows that out of the 1,108 entrepreneurs, 615 (56%) live in urban areas and 493 (44%) in rural areas. For the non-entrepreneurs these numbers are 220 and 200 in urban and rural areas, respectively. Table 5.3 shows the number of successful and unsuccessful entrepreneurs measured by survival. In urban areas, 351 out of 615 entrepreneurs become successful (57%) while 319 out of 493 rural entrepreneurs do (65%).

	Entrepreneurs	Non-entrepreneurs	Total
Urban	615 (56%)	220 (52%)	835
Rural	493 (44%)	200 (48%)	693
Total	1,108 (100%)	420 (100%)	1,528
Excluded	276	129	405

Table 5.2: The individuals used for the analysis.

	Successful	Unsuccessful	Total
Urban	351 (57%)	264 (43%)	615 (100%)
Rural	319 (65%)	174 (35%)	493 (100%)
Total	670 (60%)	438 (40%)	1,108 (100%)
Excluded	157	119	276

Table 5.3: The entrepreneurs used for the analysis.

5.3.4 Independent variables: Person, firm, and circumstances

Table 5.9 and 5.10 depict descriptive statistics of the categorical and continuous variables, respectively, for the four groups: urban and rural entrepreneurs and non-entrepreneurs. Further descriptions of the construction of the main indicators can be found in Table 5.8.

Table 5.9 shows personal demographics such as gender, age, foreign origin (non-Danish), and marital status as well as two variables covering the circumstances prior to potential start-up in 2004. These indicate whether or not the individual has moved between an urban and rural area in the period 1980-2004, and whether the individual has been unemployed at any time in 2003. The main independent variables in Table 5.9 are dummy variables for individual creativity, intrinsic motivation, and start-up encouragement from family and friends, respectively. The last two indicators in Table 5.9 only concern the entrepreneurs: business industry category and business ownership type.

The personal demographics chosen for this study coincide with the extensive entrepreneurship research carried out by Buss et al. (1991), Westhead and Wright (1999), and Lee et al. (2004). Concerning moving between urban and rural areas, the vast majority of people do not move as is supported in Weeks (2008) and Dahl and Sorenson (2009) for Danish entrepreneurs. While rural unemployment in Denmark tends to be slightly higher, the average national unemployment rate in 2004 was as low as 5.8%. As in other Scandinavian countries, low unemployment is combined with a high national GDP per capita, which overall translates into entrepreneurship for opportunity, not necessity (Acs et al., 2004). Regarding industry, it can be seen that a larger share of urban entrepreneurs start-up in service (and manufacturing) while a larger share of rural entrepreneurs start-up in building and construction (and retail). Agriculture is not included in this study.

Table 5.10 includes an indicator for knowledge, years of further education

5. Entrepreneurship within Urban and Rural Areas

(i.e. education beyond elementary school), as well as two variables for circumstances prior to potential start-up: personal income and household wealth in 2003. The main independent variables in Table 5.10 are: entrepreneurial traits score, risk willingness score, number of different groups of individuals with frequent contact, and the number of individuals in the social network. The last variable, only for the entrepreneurs, measures the number of employers/employees in their business. Most of the indicators in Table 5.10 are natural logarithms.

Table 5.10 shows that urban populations have significantly higher education even though, both in urban and rural areas, entrepreneurs have slightly more education than non-entrepreneurs. In both urban and rural areas, entrepreneurs are found to have higher incomes than non-entrepreneurs but this is when not controlling for age. The high standard deviations in urban areas compared to rural implies urban inequality, which is quite acknowledged in the literature. Taking into consideration the caveats of overall high standard deviations in wealth, non-entrepreneurs are found to be more wealthy than entrepreneurs (the year before start-up) in both urban and rural areas.

Overall, it seems that the sample is consistent with most of the entrepreneurship literature in the field. Hence, the Danish population of entrepreneurs is in line with research in other countries. However, the aim of this research is to go further than a univariate analysis in order to learn more about the entrepreneurial dynamics in urban and rural areas from a multivariate analysis. The next section will discuss the main results of the research estimating the probability of becoming an entrepreneur and the probability of surviving as an entrepreneur, respectively.

5.4 Results

The probit coefficients for the probability of being an entrepreneur can be seen in Table 5.4. Six different models are specified for the analysis. Apart from the control variables, Model 1 includes a dummy for urban area and all four indicators of individual creativity. Model 2-5 each include one of the four individual creativity indicators with the matching urban area interaction term. Finally, Model 6 includes all individual creativity indicators as well as all interaction terms. Using these independent variables together with firm controls, the six models in Table 5.5 show the probit coefficients for the probability of surviving as an entrepreneur. Finally, Table 5.6 and Table 5.7 mirror the previous two

tables except that the four creativity indicators are replaced with four indicators for the social network.

5.4.1 Individual creativity

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.602** (0.077)	-0.681** (0.074)	-0.652** (0.075)	-0.693** (0.075)	-0.618** (0.076)	-0.600** (0.077)
31-40 age	0.311** (0.109)	0.333** (0.108)	0.305** (0.108)	0.311** (0.107)	0.332** (0.108)	0.292** (0.110)
41-50 age	0.120 (0.116)	0.168 (0.115)	0.111 (0.116)	0.124 (0.115)	0.157 (0.115)	0.105 (0.117)
51+ age	-0.163 (0.136)	-0.173 (0.134)	-0.182 (0.134)	-0.234 [†] (0.134)	-0.184 (0.133)	-0.194 (0.137)
Foreign	0.284 [†] (0.166)	0.222 (0.164)	0.255 (0.165)	0.217 (0.164)	0.207 (0.165)	0.290 [†] (0.166)
Married	0.256** (0.082)	0.249** (0.081)	0.263** (0.081)	0.273** (0.081)	0.265** (0.080)	0.274** (0.082)
Education	0.002 (0.017)	0.024 (0.016)	0.008 (0.016)	0.017 (0.016)	0.019 (0.016)	0.002 (0.017)
Income - ln	0.037 [†] (0.019)	0.040* (0.018)	0.039* (0.019)	0.036 [†] (0.019)	0.039* (0.018)	0.037 [†] (0.019)
Wealth - ln	-0.015* (0.006)	-0.015* (0.006)	-0.015* (0.006)	-0.016* (0.006)	-0.016* (0.006)	-0.016* (0.006)
Unemployed	0.645** (0.106)	0.614** (0.104)	0.611** (0.104)	0.599** (0.104)	0.621** (0.104)	0.645** (0.107)
Moved	0.097 (0.098)	0.133 (0.097)	0.100 (0.098)	0.140 (0.097)	0.131 (0.097)	0.105 (0.100)
Urban	0.042 (0.078)	0.149 (0.136)	0.097 (0.125)	-0.119 (0.102)	0.113 (0.086)	0.105 (0.163)
Intrinsic	0.289** (0.083)	0.435** (0.116)				0.400** (0.120)
Traits	0.144** (0.034)		0.201** (0.048)			0.207** (0.054)
Creativity	0.062 (0.081)			0.000 (0.109)		-0.265* (0.123)
Risk	0.516** (0.165)				0.712** (0.266)	0.642* (0.281)
U x Intrinsic		-0.095 (0.160)				-0.208 (0.168)
U x Traits			-0.026 (0.062)			-0.103 (0.069)
U x Creativity				0.449** (0.147)		0.585** (0.164)
U x Risk					-0.180 (0.329)	-0.177 (0.343)
Constant	-0.449 [†] (0.243)	-0.348 (0.245)	-0.266 (0.242)	0.055 (0.236)	-0.131 (0.234)	-0.478 [†] (0.255)
Pseudo R^2	0.14	0.12	0.13	0.12	0.12	0.15
Log-likelihood	-770	-789	-782	-790	-792	-763
Observations	1528	1528	1528	1528	1528	1528

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 5.4: Probit models for becoming an entrepreneur: individual creativity.

Initially, Model 1 of Table 5.4 shows that living in an urban area does not influence the probability of being an entrepreneur. The coefficients for the creativity indicators in Model 1 reveal that entrepreneurs have a higher probability of being motivated by intrinsic work values, have more of the commonly studied

5. Entrepreneurship within Urban and Rural Areas

entrepreneurial traits and are more willing to take calculated risks. However, the direct measure of individual creativity is insignificant. Model 2-6 further reveal that the effects of intrinsic motivation, entrepreneurial traits and risk willingness on the probability of being an entrepreneur are no different in urban and rural areas (indicated by the insignificant interaction terms). However, Model 4 and 6 show that the direct measure of individual creativity significantly increases the probability of being an entrepreneur in urban areas. Meanwhile, creativity has no influence (Model 4) or a significantly negative influence (Model 6) in rural areas. Assessing this interaction effect graphically, Figure 5.2 and 5.3 show that the interaction effect is: (1) Significant for all probabilities of being an entrepreneur, (2) Positive for all probabilities of being an entrepreneur, and (3) Ranges from approximately 0.15 (low probabilities) to 0.05 (high probabilities). Overall, these findings show creativity to be a latent capacity for entrepreneurship that is only utilised if the environment is supportive, as is the case in urban areas. Although the four indicators for creativity are found to be important for the probability of being an entrepreneur, none of these indicators are found to be important for the probability of survival in Table 5.5 when assessing significance from the probit coefficients or the interaction effects graphically. However, Model 1 reveals that living in an urban area has a significant negative influence on the probability of survival, which is assumed to reflect the higher competition in these areas.

5.4.2 Social network

Using the same approach as earlier, Model 1 of Table 5.6 again confirms that living in an urban area does not influence the probability of being an entrepreneur. Furthermore, Model 1, including all four indicators for social network, shows that start-up encouragement from family and friends have large positive effects on the probability of being an entrepreneur while the size of the social network (number of persons) has a small negative effect. The latter result, however, is not significant when interaction terms are introduced (Model 3 and 6). Finally, frequent contact (approximately every week) to more groups of individuals does not influence the probability of becoming an entrepreneur when all indicators are included in the same model (Model 1 and 6). However, it does have a small positive effect in Model 2; an effect that is no different in urban and rural areas. Hence, these findings support the previous studies on the importance of "moral support" on the decision to become an entrepreneur. This study further shows that the effect of encouragement is strong in both urban and rural areas. Only if a 10% level of significance is accepted, the effect of family encouragement in urban areas is somewhat reduced (a graphical interpretation

5.4. Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.218*	-0.243**	-0.233*	-0.237**	-0.232*	-0.216*
	(0.093)	(0.091)	(0.091)	(0.091)	(0.092)	(0.093)
31-40 age	0.158	0.159	0.146	0.153	0.156	0.156
	(0.115)	(0.115)	(0.115)	(0.115)	(0.115)	(0.115)
41-50 age	0.146	0.145	0.125	0.140	0.140	0.145
	(0.127)	(0.127)	(0.127)	(0.127)	(0.127)	(0.128)
51+ age	0.108	0.088	0.085	0.085	0.094	0.105
	(0.157)	(0.157)	(0.157)	(0.157)	(0.157)	(0.158)
Foreign	-0.078	-0.094	-0.089	-0.109	-0.111	-0.068
	(0.159)	(0.159)	(0.159)	(0.159)	(0.159)	(0.160)
Married	0.045	0.041	0.044	0.051	0.041	0.051
	(0.087)	(0.086)	(0.086)	(0.087)	(0.086)	(0.087)
Education	-0.005	-0.003	-0.006	0.001	-0.002	-0.005
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Income - ln	-0.009	-0.010	-0.010	-0.008	-0.009	-0.009
	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)
Wealth - ln	0.019**	0.019**	0.019**	0.018**	0.018**	0.019**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Unemployed	-0.031	-0.036	-0.036	-0.041	-0.033	-0.033
	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)
Moved	-0.164†	-0.154	-0.158	-0.140	-0.153	-0.159
	(0.100)	(0.099)	(0.100)	(0.099)	(0.099)	(0.100)
Urban	-0.204*	-0.201	-0.252†	-0.264*	-0.172†	-0.249
	(0.085)	(0.168)	(0.145)	(0.118)	(0.094)	(0.196)
Intrinsic	0.176†	0.194				0.191
	(0.097)	(0.139)				(0.143)
Traits	0.060†		0.043			0.053
	(0.035)		(0.049)			(0.054)
Creativity	-0.123			-0.131		-0.200
	(0.087)			(0.122)		(0.132)
Risk	0.064				0.182	0.152
	(0.112)				(0.179)	(0.180)
U x Intrinsic		-0.007				-0.027
		(0.189)				(0.194)
U x Traits			0.022			0.012
			(0.063)			(0.069)
U x Creativity				0.135		0.139
				(0.161)		(0.173)
U x Risk					-0.166	-0.154
					(0.228)	(0.231)
Employees - ln	0.126	0.121	0.139	0.142	0.138	0.127
	(0.125)	(0.125)	(0.125)	(0.124)	(0.125)	(0.126)
Ownership personal	-0.182†	-0.195†	-0.181†	-0.203†	-0.200†	-0.183†
	(0.108)	(0.107)	(0.107)	(0.107)	(0.107)	(0.108)
Industry control	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.282	0.361	0.433	0.539†	0.471	0.302
	(0.319)	(0.323)	(0.318)	(0.312)	(0.310)	(0.331)
Pseudo R^2	0.06	0.06	0.06	0.06	0.06	0.06
Log-likelihood	-698	-700	-701	-702	-702	-697
Observations	1108	1108	1108	1108	1108	1108

Note: **, *, and † is significant at the 1%, 5%, and 10% level, respectively.

Table 5.5: Probit models for new firm survival: individual creativity.

can be seen in Figure 5.4 and 5.5).

Turning to the probability of entrepreneurial survival in Tabel 5.7, Model 1 confirms that living in an urban area decreases the probability of survival. However, encouragement is not only important for the start-up decision. All models

5. Entrepreneurship within Urban and Rural Areas

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.564** (0.081)	-0.670** (0.075)	-0.673** (0.074)	-0.665** (0.078)	-0.548** (0.078)	-0.554** (0.081)
31-40 age	0.318** (0.115)	0.361** (0.108)	0.306** (0.108)	0.349** (0.112)	0.358** (0.111)	0.322** (0.116)
41-50 age	0.254* (0.124)	0.200 [†] (0.116)	0.135 (0.115)	0.274* (0.121)	0.231 [†] (0.119)	0.259* (0.125)
51+ age	-0.082 (0.144)	-0.143 (0.134)	-0.225 [†] (0.134)	-0.043 (0.140)	-0.108 (0.138)	-0.077 (0.145)
Foreign	0.244 (0.173)	0.220 (0.165)	0.182 (0.164)	0.188 (0.170)	0.264 (0.170)	0.240 (0.173)
Married	0.228** (0.086)	0.263** (0.080)	0.260** (0.080)	0.192* (0.084)	0.284** (0.083)	0.225** (0.086)
Education	0.031 [†] (0.017)	0.024 (0.016)	0.028 [†] (0.016)	0.037* (0.016)	0.015 (0.016)	0.030 [†] (0.017)
Income - ln	0.022 (0.020)	0.040* (0.018)	0.040* (0.018)	0.029 (0.020)	0.029 (0.019)	0.022 (0.020)
Wealth - ln	-0.015* (0.007)	-0.015* (0.006)	-0.016* (0.006)	-0.014* (0.007)	-0.015* (0.007)	-0.015* (0.007)
Unemployed	0.506** (0.109)	0.609** (0.104)	0.594** (0.103)	0.535** (0.107)	0.539** (0.107)	0.507** (0.109)
Moved	0.146 (0.103)	0.146 (0.097)	0.143 (0.096)	0.129 (0.101)	0.155 (0.101)	0.148 (0.103)
Urban	0.052 (0.081)	0.205 [†] (0.121)	0.250 (0.155)	0.187 [†] (0.101)	0.115 (0.105)	0.407* (0.193)
Network frequency	0.009 (0.041)	0.134* (0.056)				0.024 (0.061)
Network size	-0.150* (0.060)		-0.024 (0.080)			-0.073 (0.088)
Family inspiration	0.677** (0.087)			1.078** (0.117)		0.828** (0.129)
Friends inspiration	0.595** (0.087)				0.965** (0.116)	0.645** (0.129)
U x Network frequency		-0.085 (0.075)				-0.035 (0.082)
U x Network size			-0.117 (0.109)			-0.140 (0.119)
U x Family inspiration				-0.272 [†] (0.156)		-0.271 (0.173)
U x Friends inspiration					-0.187 (0.153)	-0.072 (0.173)
Constant	-0.317 (0.266)	-0.243 (0.243)	-0.006 (0.253)	-0.448 [†] (0.250)	-0.411 [†] (0.243)	-0.504 [†] (0.280)
Pseudo R^2	0.22	0.11	0.11	0.19	0.18	0.22
Log-likelihood	-700	-797	-799	-724	-735	-697
Observations	1528	1528	1528	1528	1528	1528

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 5.6: Probit models for becoming an entrepreneur: social network.

including encouragement reveal that encouragement from family increases the probability of survival while encouragement from friends is found to be insignificant. However, when including interaction terms (Model 4 and 6), it becomes evident that the large positive effect of family encouragement is only present in rural areas. Moreover, frequent contact to more groups of individuals has a positive influence on the probability of survival but only in rural areas (Model 2 and 6). Assessing the two interaction effects graphically, Figure 5.8 and 5.9 show that the interaction effect of family encouragement is: (1) Significant for entrepreneurs with a probability of survival less than 80%, (2) Negative for all

5.4. Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Female	-0.216*	-0.234*	-0.227*	-0.252**	-0.224*	-0.213*
	(0.094)	(0.092)	(0.091)	(0.092)	(0.092)	(0.095)
31-40 age	0.141	0.179	0.125	0.154	0.155	0.141
	(0.116)	(0.115)	(0.116)	(0.115)	(0.115)	(0.117)
41-50 age	0.153	0.180	0.102	0.153	0.143	0.147
	(0.129)	(0.127)	(0.128)	(0.127)	(0.127)	(0.129)
51+ age	0.123	0.132	0.038	0.117	0.098	0.102
	(0.161)	(0.159)	(0.158)	(0.158)	(0.157)	(0.162)
Foreign	-0.077	-0.078	-0.110	-0.089	-0.102	-0.051
	(0.160)	(0.159)	(0.159)	(0.160)	(0.159)	(0.161)
Married	0.015	0.047	0.033	0.016	0.048	0.020
	(0.088)	(0.087)	(0.087)	(0.087)	(0.086)	(0.088)
Education	0.002	-0.002	0.002	0.001	-0.003	0.005
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Income - ln	-0.012	-0.011	-0.010	-0.010	-0.011	-0.013
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)
Wealth - ln	0.018**	0.018**	0.018**	0.019**	0.018**	0.018**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Unemployed	-0.030	-0.018	-0.043	-0.035	-0.045	-0.025
	(0.098)	(0.097)	(0.097)	(0.097)	(0.097)	(0.098)
Moved	-0.152	-0.152	-0.150	-0.158	-0.149	-0.160
	(0.100)	(0.100)	(0.099)	(0.100)	(0.099)	(0.100)
Urban	-0.196*	0.090	-0.088	0.035	-0.202	0.231
	(0.086)	(0.137)	(0.166)	(0.130)	(0.139)	(0.215)
Network frequency	0.094*	0.229**				0.196**
	(0.042)	(0.063)				(0.065)
Network size	-0.158*		-0.079			-0.120
	(0.063)		(0.089)			(0.091)
Family inspiration	0.259**			0.521**		0.475**
	(0.089)			(0.125)		(0.136)
Friends inspiration	0.065				0.162	-0.049
	(0.092)				(0.124)	(0.137)
U x Network frequency		-0.223**				-0.186*
		(0.083)				(0.085)
U x Network size			-0.090			-0.072
			(0.120)			(0.124)
U x Family inspiration				-0.392*		-0.393*
				(0.164)		(0.177)
U x Friends inspiration					-0.011	0.211
					(0.167)	(0.183)
Employees - ln	0.138	0.148	0.143	0.123	0.144	0.134
	(0.125)	(0.126)	(0.125)	(0.125)	(0.125)	(0.127)
Ownership personal	-0.194 [†]	-0.193 [†]	-0.189 [†]	-0.216*	-0.201 [†]	-0.197 [†]
	(0.108)	(0.107)	(0.107)	(0.107)	(0.107)	(0.108)
Industry control	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.394	0.185	0.620 [†]	0.220	0.417	0.163
	(0.329)	(0.322)	(0.329)	(0.318)	(0.314)	(0.344)
Pseudo R^2	0.07	0.06	0.06	0.07	0.06	0.08
Log-likelihood	-690	-696	-700	-693	-701	-685
Observations	1108	1108	1108	1108	1108	1108

Note: **, *, and [†] is significant at the 1%, 5%, and 10% level, respectively.

Table 5.7: Probit models for new firm survival: social network.

probabilities of survival less than 80%, and (3) Ranges from approximately -0.15 (mid probabilities) to -0.10 (high probabilities). In the same way, Figure 5.6 and 5.7 show that the interaction effect of frequent contact is: (1) Significant for entrepreneurs with a probability of survival less than 80%, (2) Negative for all probabilities of survival less than 80%, and (3) Ranges from approximately -0.09 (mid probabilities) to -0.06 (high and low probabilities). Finally, social network

5. Entrepreneurship within Urban and Rural Areas

size is found to have a negative effect on the probability of survival in Model 1, but, as before, the effect becomes insignificant when interaction effects (Model 3 and 6) are introduced. Overall, these findings support the literature on the positive role of a social network for successful entrepreneurship but mostly in rural areas.

5.4.3 Robustness check

Robustness analysis of the above results is conducted using the following three steps. All tables are reproduced, but instead of excluding the semi-urban respondents, they are first included in the group of urban individuals and second in the group of rural individuals. This results in only a few significant differences in the main findings. When the semi-urban respondents are included in the group of urban individuals, living in an urban area is found to have an insignificant effect on the probability of survival. Furthermore, the positive effect of family encouragement on start-up is found to be significantly lower in urban areas. On the contrary, when semi-urban respondents are included in the group of rural individuals, living in an urban area is still found to reduce the probability of survival, and the positive effect of family encouragement is still present in both urban and rural areas. However, the positive effect on survival of frequent contact to more groups is not found to be reduced in urban areas as before.

Third, the dichotomy between urban and rural areas is dropped for a continuous variable: the number of individuals living in the respondent's municipality (see Figure 5.1 for the 271 municipalities of Denmark in 2004). In order to get a meaningful interpretation of the results, the variable is normalised by subtracting the 25% percentile (=6,538 inhabitants) and dividing by the standard deviation (=122,152 inhabitants). Again, this results in only a few differences in the main results. First, the negative effect on survival of living in a more populated municipality disappears. Second, the direct measure of creativity is found to be unimportant for start-up, regardless of municipality population size.

Summing up, the results seem to be robust with the following notes. The result regarding individual creativity is dependent on an urban-rural dichotomy. Furthermore, the semi-urban areas are more similar to the urban areas when it comes to survival chances but more like rural areas when it comes to the dependence on family encouragement.

5.5 Discussion

To put this study into context, it must be noted that in the first stages of research, a much larger number of entrepreneurship indicators were analysed: 14 for identity, 12 for start-up motivation, 19 for social network characteristics, and 18 for social network utilisation during start-up. Out of these 63 indicators, only a few showed significant differences between the entrepreneurs in urban and rural settings. The main distinctions found were between entrepreneurs and non-entrepreneurs and not between urban and rural populations. This is in line with the findings in Babb and Babb (1992) but goes against much of the literature claiming significant differences between urban and rural inhabitants, particularly between entrepreneurs. The present chapter has focused on only a few theoretical important variables related to individual creativity and social networks, exploring the need for combining the person with the environment in the study design.

Creative individuals do not have a higher probability of becoming an entrepreneur in rural areas but they do in urban areas. This supports the view of individual creativity being only a latent capacity for entrepreneurship, which is fostered by the supportive environment in urban areas but not in rural areas. Therefore, the results may support the literature that points out the relationship between creativity and larger cities. Taking the view that creativity can be learned, this finding is of special interest for entrepreneurship education. However, turning to the indirect indicators of individual creativity – intrinsic and extrinsic work values, entrepreneurial traits, and risk willingness – all indicators are positively related to being an entrepreneur, regardless of geographical setting. Interestingly, the direct and indirect measures of individual creativity do not seem to have a significant influence on the probability of survival. In other words, individual creativity is not the ingredient for making entrepreneurship to last. Instead, business characteristics such as financial resources, ownership type, and industry are more important for survival. However, starting a business in an urban area reduces the probability of survival which should be taken into account when choosing a start-up location.

Starting with the two size measures of the social network, none of the following indicators have been shown to have an effect on start-up: the number of different groups the respondent talks to every or almost every week and the number of individuals the respondent would talk to about significant considerations of a career change. However, the former indicator increases the probability of survival, but only in rural areas. The same conclusion can be made when

5. Entrepreneurship within Urban and Rural Areas

it comes to having a moral support network indicated by encouragement for start-up by family and friends. Both indicators have a significant and positive effect (of almost equal size) on start-up, independent of geographical setting. However, when turning to chances of survival, only family encouragement is significant and positive, but the effect is close to non-existing in urban areas. Overall, these findings support the view of the social network as being important for start-up, but when it comes to survival, urban entrepreneurs do not seem to have much to gain. This calls into question how network building initiatives for entrepreneurs should be promoted in different areas.

Below, the limitations and possibilities for future research are briefly discussed. Even though the above findings seem to be robust regarding changes in the definition of urban and rural areas, further experiments could be conducted, i.e. do the findings change significantly if the 20 kilometre limit (commuting distance limit) is changed to 10 or 30? Furthermore, it should be noted that the municipality of the respondent's home was the basis for grouping urban and rural inhabitant instead of the municipality of the business. This was necessary in order to categorise the non-entrepreneurs. However, it is safe to assume that the entrepreneurs in most cases live close to the business that they started and are actively involved in. Finally, and perhaps most importantly, control variables for start-up industry was included in the survival analysis but only on an aggregate level; i.e. seven industry categories. It might be that the findings in this study are mainly a result of differences in industry structure instead of different dynamics in urban and rural areas. More disaggregated industry controls could easily be added based on IDA information but given the limited number of respondents, this is not done in this study.

The results in this chapter are based on quantitative analysis of survey data. Using post-start-up survey data could be problematic if creativity and network behaviours have changed after start-up. In other words, the causality could be the opposite of the assumed. Hence, only after new venture founding, or survival, does the entrepreneur see herself as more creative and/or more open to the social network. However, the time-lag between the start-up and survey response is limited to four years which is likely to reduce the problem. The findings of this quantitative study could be supplemented with more in-depth qualitative research or longitudinal survey data.

5.6 Conclusion

This study explores two facets that many consider to be crucial for entrepreneurship in general, namely individual creativity and social network. The former is important given the need to be flexible and adaptable under uncertainty while the latter is important given the constant pursued of resources. Nevertheless, the role of these could be very different in urban and rural settings. An important finding is that creative individuals have a higher probability of establishing a business if they are located in urban areas, but creativity does not influence the chances of survival which is dependent on other factors. Furthermore, the social network is important for start-up in both urban and rural areas, but when it comes to survival, it seems only rural area entrepreneurs are benefitted. Hence, leaving out the environment could lead to insignificant or misleading results, impacting entrepreneurship initiatives. More research bringing together personal and geographical factors in the research design is encouraged.

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5.6. Conclusion

Indicator	Description	Imputations
Intrinsic motivation	Dummy: The value 1 if the respondent finds more intrinsic values "very important" compared to extrinsic values if the respondent were to say yes to a new job. 8 intrinsic values (e.g. "the work entails responsibility", "the work tasks are varying", "you can work independently", and "you can strengthen skills and abilities") and 8 extrinsic values (e.g. "the work provides a high income", "the work is a good stepping stone for my further career", "the work tasks are tailored to the working hours", and "the colleagues show a personal interest in me" are included. The extrinsic values covers the financial, career, convenience, and co-worker dimension with two values for each.	107 - 7%
Entrepreneurial traits	Discrete: The number of entrepreneurial traits that the respondent posses derived from 10 mixed and reversed statements related to the five traits: Tolerance of ambiguity (e.g. "I often pursue the attractive but uncertain opportunities"), need for achievement (e.g. "I prefer result-oriented and innovative tasks"), locus of control "I think that success is the result of hard work", optimism (e.g. "I always expect the best outcome of a situation", and desire for autonomy ("I like to determine myself how tasks are completed"). The value 1 is given for each trait if there is agreement and disagreement with the two reversed statements. Two additional statements covering creativity was removed to create a separate indicator.	67 - 4%
Creativity	Dummy: The value 1 if there is agreement and disagreement with the two reversed items covering this entrepreneurial trait ("I often think of new ideas and ways to solve tasks" and "I prefer to accomplish tasks the way I have always done"). The statements are mixed with 10 statements covering other traits (see previous indicator).	40 - 3%
Risk willingness	Continuous: The respondents reservation price for one out of ten lottery tickets divided by the fair price of this ticket given the one prize (of 100,000 DKK) in the lottery. The respondent is risk averse for values between 0 and 1, risk neutral for the value 1, and risk loving for values above 1.	126 - 8%
Contact frequency	Discrete: The number of different groups that the respondent talks to every or almost every week (including over telephone, mail, social network software, etc.). The four different groups included are: "Present colleagues or business relations outside of the work place", "Persons mainly known as former colleagues or business relations", "Persons mainly known as former schoolmates or fellow students", and "Persons mainly known from associations (e.g. sport and leisure).	53 - 3%
Size of network	Continuous: The natural logarithm to the number of individuals that the respondent would talk to about considerations over a longer period of time regarding a career change. Included are the following individuals: "Close family (i.e. spouse/partner, parents, siblings, and children)", "Other family", "Present colleagues", "Former colleagues", "Other friends and acquaintances", and "Professionals" (e.g. coach).	201 - 13%
Family encouragement	Dummy: The value 1 if the respondent has been inspired or encouraged by close family (i.e. spouse/partner, parents, siblings, and children) or other family to start a business.	59 - 4%
Friends encouragement	Dummy: The value 1 if the respondent has been inspired or encouraged by present colleagues, former colleagues, or other friends/acquaintances to start a business.	71 - 5%

Table 5.8: Indicators for identity and network from the survey.

5. Entrepreneurship within Urban and Rural Areas

	Entrepreneur				Non-Entrepreneur			
	Urban		Rural		Urban		Rural	
	<i>frq.</i>	<i>pct.</i>	<i>frq.</i>	<i>pct.</i>	<i>frq.</i>	<i>pct.</i>	<i>frq.</i>	<i>pct.</i>
Gender								
Male	423	69%	349	71%	100	45%	82	41%
Female	192	31%	144	29%	120	55%	118	59%
Age								
-30 years	120	20%	99	20%	65	30%	47	24%
31-40 years	232	38%	193	39%	60	27%	43	22%
41-50 years	180	29%	144	29%	55	25%	69	35%
51+ years	83	13%	57	12%	40	18%	41	21%
Foreign origin								
Danish	561	91%	470	95%	206	94%	198	99%
Other	54	9%	23	5%	14	6%	2	1%
Married								
No	279	45%	177	36%	114	52%	101	51%
Yes	336	55%	316	64%	106	48%	99	50%
Move to area								
No move	501	81%	357	72%	186	85%	163	82%
Move	114	19%	136	28%	34	15%	37	19%
Unemployed								
No	486	79%	364	74%	200	91%	178	89%
Yes	129	21%	129	26%	20	9%	22	11%
Intrinsic								
No	128	21%	118	24%	71	32%	78	39%
Yes	487	79%	375	76%	149	68%	122	61%
Creativity								
No	252	41%	274	56%	131	60%	115	57%
Yes	363	59%	219	44%	89	40%	85	43%
Family encouragement								
No	252	41%	172	35%	161	73%	162	81%
Yes	363	59%	321	65%	59	27%	38	19%
Friends encouragement								
No	192	31%	178	36%	148	67%	155	78%
Yes	423	69%	315	64%	72	33%	45	23%
Industry								
Service	300	49%	169	34%	-	-	-	-
Hotel/Restaurant	48	8%	48	8%	-	-	-	-
Wholesale	29	5%	17	5%	-	-	-	-
Retail	84	14%	89	18%	-	-	-	-
Building/Construction	71	12%	123	25%	-	-	-	-
Manufacturing	83	13%	45	9%	-	-	-	-
Ownership type								
Personal	465	76%	400	81%	-	-	-	-
Other	150	24%	93	19%	-	-	-	-

Table 5.9: Descriptive statistics of categorical variables.

5.6. Conclusion

		N	mean	std. dev.	min	max
Education - Years further						
Entrepreneur	Urban	615	4.987	2.402	-2	11
	Rural	493	3.872	2.286	-3	11
Non-Entrepreneur	Urban	220	4.488	2.630	-2	11
	Rural	200	3.433	2.262	-2	8
Income - ln						
Entrepreneur	Urban	615	12.093	2.095	0	14.769
	Rural	493	11.940	1.823	0	14.251
Non-Entrepreneur	Urban	220	11.660	2.438	0	14.118
	Rural	200	11.684	1.689	0	14.033
Wealth - ln						
Entrepreneur	Urban	615	7.623	6.373	0	15.510
	Rural	493	6.194	6.269	0	15.769
Non-Entrepreneur	Urban	220	8.371	6.031	0	15.805
	Rural	200	7.458	6.030	0	14.897
Traits score						
Entrepreneur	Urban	615	2.085	1.316	0	5
	Rural	493	1.777	1.238	0	5
Non-Entrepreneur	Urban	220	1.550	1.179	0	5
	Rural	200	1.240	1.014	0	4
Risk score						
Entrepreneur	Urban	615	0.204	0.362	0	4
	Rural	493	0.181	0.418	0	5
Non-Entrepreneur	Urban	220	0.101	0.209	0	1
	Rural	200	0.083	0.163	0	1
Contact score						
Entrepreneur	Urban	615	1.354	0.969	0	4
	Rural	493	1.343	0.995	0	4
Non-Entrepreneur	Urban	220	1.214	0.963	0	4
	Rural	200	1.145	0.964	0	4
Size - ln						
Entrepreneur	Urban	615	1.222	0.643	0	3.401
	Rural	493	1.141	0.673	0	3.912
Non-Entrepreneur	Urban	220	1.361	0.668	0	3.401
	Rural	200	1.212	0.682	0	3.219
Employees (fte) - ln						
Entrepreneur	Urban	615	0.069	0.292	0	2.708
	Rural	493	0.104	0.398	0	2.833

Table 5.10: Descriptive statistics of continuous variables.

5. Entrepreneurship within Urban and Rural Areas

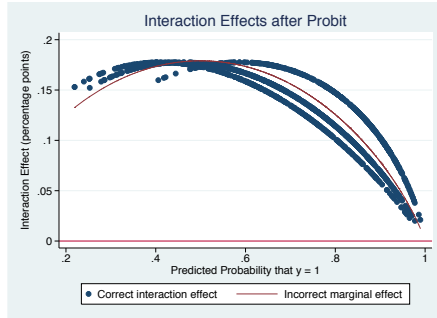


Figure 5.2: Interaction effect (Urban x Creativity) as a function of predicted probability of being an entrepreneur.

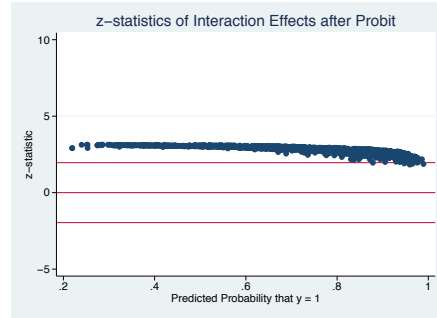


Figure 5.3: Significance of interaction effect (Urban x Creativity) as a function of predicted probability of being an entrepreneur.

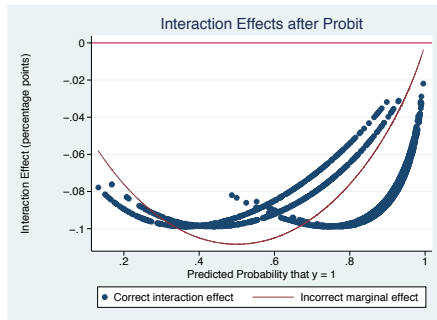


Figure 5.4: Interaction effect (Urban x Family E) as a function of predicted probability of being an entrepreneur.

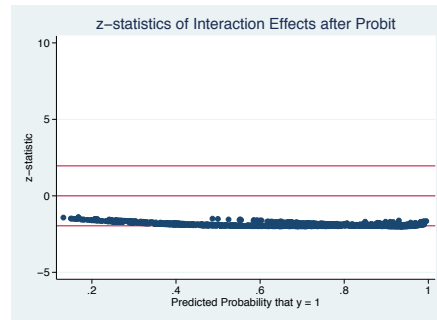


Figure 5.5: Significance of interaction effect (Urban x Family) as a function of predicted probability of being an entrepreneur.

5.6. Conclusion

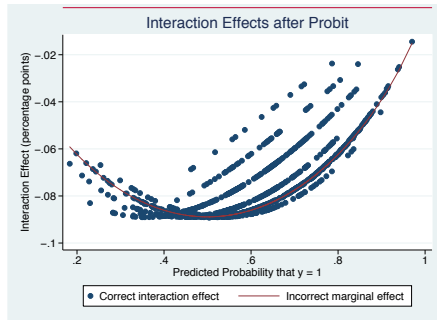


Figure 5.6: Interaction effect (Urban x Contact) as a function of predicted probability of having survived as an entrepreneur.

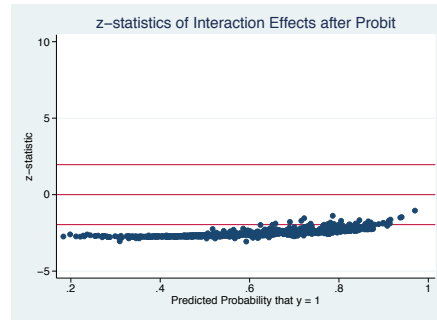


Figure 5.7: Significance of interaction effect (Urban x Contact) as a function of predicted probability of having survived as an entrepreneur.

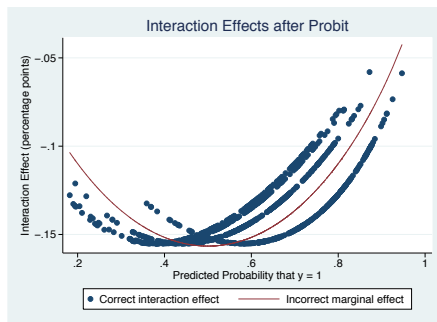


Figure 5.8: Interaction effect (Urban x Family E) as a function of predicted probability of having survived as an entrepreneur.

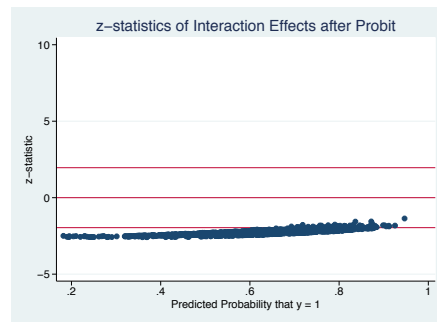


Figure 5.9: Significance of interaction effect (Urban x Family) as a function of predicted probability of having survived as an entrepreneur.

Part III

Appendix

A

Methodology

This appendix describes more detailed the data used for the analyses in the dissertation and, furthermore, discusses important issues when dealing with designing and analysing complex survey data.

A.1 Register and survey data

The data used for the dissertation is longitudinal register data from IDA (Integrated Database for Labour Market Research) combined with a questionnaire survey conducted in 2008 including both entrepreneurs and non-entrepreneurs. Both register and survey data are used for the analyses in Chapter 2, 4, and 5 while only register data is used in Chapter 3.

IDA is a matched employer-employee database covering the entire population of individuals and firms in Denmark from 1980 onwards; see Timmermans (2010) for a detailed description of IDA in English. Information for individuals include gender, age, education, and income while information for firms include turnover, employees, ownership type, and industry. Moreover, the main founder behind every new business in Denmark from 1994 onwards can be found in the entrepreneurship register; see Erhvervs- og Byggestyrelsen (2005) for the identification method. Hence, the chapters that include the survey in the analyses also apply this identification of the main founder which will be elaborated below. Chapter 3, on the other hand, defines an entrepreneur without using the entrepreneurship register following the approach by Sørensen (2007) and Nanda and Sørensen (2010). This allows for identification of not only the main founder but also co-founders; see Chapter 3.

A. Methodology

The questionnaire survey consists of three parts where the first two parts, covering identity and networks, are answered by both entrepreneurs and non-entrepreneurs. The final part is only answered by present or former entrepreneurs and concerns the circumstances related to the (latest) start-up: start-up strategies, start-up motivation, and start-up network utilisation. The theory used for developing the questions and items included in the survey is elaborated in Chapter 1 and 2. Moreover, several existing surveys were taken into account. For the identity questions (traits and values) these were the GET2 test (General Enterprising Tendency v2 test) and the EVS (European Values Study) while for the network questions (social and professional) these were the EVS and the GSS (General Social Survey). Finally, for start-up circumstances, start-up motivation, and start-up network utilisation, FOBS 2005 (survey on Factors Of Business Success) was used.

Including more items and answering possibilities for each question in the survey allows for the indicator to be created in different ways. On the one hand, the indicator can be made to a continuous measure (e.g. average score of tolerance of ambiguity) which gives more variation in the variable. On the other hand, the indicator can be made to a categorical variable (e.g. dummy indicating high tolerance of ambiguity) which is likely to be more accurate; i.e. what is the difference between "highly agree", "somewhat agree", and "agree" with a statement like "I find it hard to make decisions with an uncertain outcome". The binary variable – divided into "agreement" and "disagreement" – reduces the problems of different perceptions of level of agreement/disagreement as well as highly agreement/disagreement bias for some individuals. With the purpose of reducing these problems, the indicators created from the survey are mainly categorical variables based on few questions or items. This furthermore makes the questionnaire easier to answer (i.e. enhancing the response rate) and allows for more theories to be included in the questionnaire (without making it insurmountable for the respondents to answer). However, in order to compensate for the fewer questions and items for intangible measures like personal traits (e.g. tolerance of ambiguity), reverse items are used to control for response consistency.

The next section will explain the sampling design followed by a non-response analysis. The final section discusses the economic context of the survey.

A.2 Sampling design and issues

IDA information updated to 2004 was used for the survey sampling. In order to economise on the sample size while still including interesting control groups, disproportionate stratified sampling was chosen.

Initially, the population of interest was chosen to be the entire population of individuals of working age (i.e. 15-66) in Denmark in 2004. Subsequent, this population was divided into entrepreneurs and non-entrepreneurs in 2004. Finally, the population was again divided according to if the individuals had been entrepreneurs in the period before 2004 (going back to 1994 in the entrepreneurship register). The resulting four strata, covering the entire population of working age in 2004, are: *novice entrepreneurs (first-time start-up in 2004)*, *experienced entrepreneurs (first-time start-up before 2004)*, *former entrepreneurs*, and *never entrepreneurs*. The novice entrepreneurs were largely oversampled as will be evident later.

The entrepreneurs in 2004, novice and experienced, started a new business in the period 1994-2004 with real activity in 2004 determined by industry specific requirements for turnover and full-time equivalent employees set by Statistics Denmark; these requirements being lower in the start-up year. Furthermore, entrepreneurs behind businesses in the primary and energy sector were excluded given the level of government regulation and lack of competition in these sectors. When dividing the population according to entrepreneurial experience before 2004, the requirement for real activity was reduced. This was done in order to keep the two main groups of interest more clean: first-time entrepreneurs in 2004 and individuals with no entrepreneurial experience before and in 2004.

To further clean the four strata, individuals with conflicting entrepreneurship status (going back to 1990) or start-up year (2004 or before) in the different registers in IDA were removed; for more details, see Dahl et al. (2009). From the resulting four strata was randomly drawn 10,000 individuals with 4,600 from the strata of first-time entrepreneurs and 1,800 from each of the remaining three strata. Finally, the individuals that had a special status on the labour market, were outside of the labour force, or had retired were removed from the four strata. After the questionnaire was conducted, IDA has been updated beyond 2004 and the preliminary 2004 firm register updated. As a result, the populations of the four strata have changed marginally (see Table 9.2 in Dahl et al. (2009) and Table A.1 below). However, the marginal changes do not call for post-stratification or representativeness issues.

A.3 Non-response analysis

The questionnaire survey was send out two times, the latter with a reminder, and the resulting response population for each strata can be seen in Table A.1 together with the population and sample.

Strata	Number of individuals in:		
	Population	Sample	Response (%)
Novice	7,250	4,389	1,384 (32%)
Experienced	42,840	1,769	556 (31%)
Never	2,712,525	1,514	606 (40%)
Former	68,491	1,707	632 (37%)
Total	2,831,106	9,379	3,178 (34%)

Table A.1: Population, sample, and response population divided by strata.

Table A.1 shows that the overall response rate is 34% with first-time entrepreneurs largely over-represented as a consequence of the disproportionate stratified sampling. Moreover, it is evident that the response rates of the entrepreneurs (32% and 31%) are somewhat smaller than the response rates of the non-entrepreneurs (40% and 37%). This could possible be explained by the higher work involvement of these individuals (see Chapter 2) and, hence, less time to participate in the survey. Moreover, from Table A.2 can be seen that 68% answer the questionnaire in the first round with novice entrepreneurs being least likely to answer in the first round (65%) and experienced entrepreneurs most likely (72%).

Strata	The response divided into:		
	Total	1st round (%)	2nd round (%)
Novice	1,384	901 (65%)	483 (35%)
Experienced	556	402 (72%)	154 (28%)
Never	606	414 (68%)	192 (32%)
Former	632	432 (68%)	200 (32%)
Total	3,178	2,149 (68%)	1,029 (32%)

Table A.2: Answering round for the response population.

However, it is more interesting to examine if socio-demographic factors influence the likelihood of being included in the sample and the likelihood of returning the questionnaire; both resulting in response population bias. Starting with the former, only "research protection" (i.e. not allowing to be contacted for research purposes) for certain individuals can result in a sample that is not representative for the population. Research protection can be chosen by contacting Statistical Denmark but many only select this when confronted by the possibility in relation to registering a change af adress. Given that younger individuals are more likely to move, younger individuals are also more likely to have chosen

A.3. Non-response analysis

	Population		Sample		Response	
	<i>freq</i>	<i>pct</i>	<i>freq</i>	<i>pct</i>	<i>freq</i>	<i>pct</i>
<i>Gender</i>						
Male	5,207	71.82	3,297	75.12	962	69.51
Female	2,043	28.18	1,092	24.88	422	30.49
<i>Age</i>						
< 26	345	4.76	157	3.58	28	2.02
26-30	1,064	14.68	528	12.03	107	7.73
31-40	2,888	39.83	1,705	38.85	509	36.78
41-50	1,942	26.79	1,283	29.23	473	34.18
> 50	1,011	13.94	716	16.31	267	19.29
<i>Foreign origin</i>						
Danish	6,177	85.20	3,789	86.33	1,288	93.06
Non-Danish	1,073	14.80	600	13.67	96	6.94
<i>Marital status</i>						
Married	4,135	57.03	2,699	61.49	933	67.41
Non-married	3,115	42.97	1,690	38.51	451	32.59
<i>Further education</i>						
0 ≤ years < 3	1,687	23.27	945	21.53	201	14.52
3 ≤ years < 6	4,112	56.72	2,477	56.44	763	55.13
6 ≤ years < 8	899	12.40	597	13.60	246	17.77
8 ≤ years	552	7.61	370	8.43	174	12.57
<i>Income</i>						
< 200,000 DKR	2,152	29.68	1,146	26.11	233	16.84
200,000-300,000 DKR	1,515	20.90	879	20.03	281	20.30
> 300,000 DKR	3,583	49.42	2,364	53.86	870	62.86
<i>Household wealth</i>						
< 200,000 DKR	2,132	29.41	1,037	23.63	203	14.67
≥ 200,000 DKR	5,118	70.59	3,352	76.37	1,181	85.33
Total	7,250	100%	4,389	100%	1,384	100%

Table A.3: Descriptive statistics for the population, sample, and response population within strata 1 (first-time entrepreneurs 2004).

research protection. Concerning non-response, it is commonly accepted that the response rate is dependent on gender and age (Levy and Lemeshow, 2008). Others find that demographic factors are less important than social factors – e.g. employment and education – when correcting for non-response bias (Fangel et al., 2007).

In order to test for these two types of bias, several socio-demographic variables are created based on IDA 2007 information (i.e. the year before answering the survey)¹. Table A.3 (strata: novice) and A.4 (strata: never) show the distribution of the population, sample, and response population based on the

¹For 2% of the respondents, IDA information from 2004 is used instead. This is not seen as a problem as most of the variables are assumed not to change.

A. Methodology

	Population		Sample		Response	
	<i>freq</i>	<i>pct</i>	<i>freq</i>	<i>pct</i>	<i>freq</i>	<i>pct</i>
<i>Gender</i>						
Male	1,331,712	49.09	750	49.54	269	44.39
Female	1,380,813	50.91	764	50.46	337	55.61
<i>Age</i>						
< 26	455,819	16.80	228	15.06	71	11.72
26-30	293,964	10.84	162	10.70	57	9.41
31-40	644,206	23.75	347	22.92	154	25.41
41-50	608,511	22.43	350	23.12	159	26.24
> 50	710,025	26.18	427	28.20	165	27.23
<i>Foreign origin</i>						
Danish	2,491,684	91.86	1,399	92.40	581	95.87
Non-Danish	220,841	8.14	115	7.60	25	4.13
<i>Marital status</i>						
Married	1,331,260	49.08	798	52.71	344	56.77
Non-married	1,381,265	50.92	716	47.29	262	43.23
<i>Further education</i>						
0 ≤ years < 3	804,083	29.64	437	28.86	122	20.13
3 ≤ years < 6	1,307,844	48.22	730	48.22	303	50.00
6 ≤ years < 8	417,556	15.39	243	16.05	125	20.63
8 ≤ years	183,042	6.75	104	6.87	56	9.24
<i>Income</i>						
< 200,000 DKR	802,978	29.60	444	29.33	122	20.13
200,000-300,000 DKR	784,034	28.90	438	28.93	176	29.04
> 300,000 DKR	1,125,513	41.49	632	41.74	308	50.83
<i>Household wealth</i>						
< 200,000 DKR	1,093,847	40.33	585	38.64	182	30.03
≥ 200,000 DKR	1,618,678	59.67	929	61.36	424	69.97
Total	2,712,525	100%	1,514	100%	606	100%

Table A.4: Descriptive statistics for the population, sample, and response population within strata 3 (first-time entrepreneurs 2004).

seven socio-demographic categorical variables: gender, age, foreign origin, marital status, further education (beyond elementary school), personal income, and household wealth. Only the strata with novice and never entrepreneurs are shown as these are the only two used in this dissertation. Furthermore, Table A.5 (strata: novice) and A.6 (strata: never) show the p-value of the χ^2 test for independence of the socio-demographic variable and: (1) The population divided into sample and non-sample, (2) The sample divided into response population and non-response population, and (3) The response population divided into 1st round respondents and 2nd round respondents. Possible bias will be discussed next.

Initially can be seen from Table A.5 and A.6 that the distribution of several

A.3. Non-response analysis

	Sample Non-sample	Response Non-response	1st round 2nd round
	p-value	p-value	p-value
Gender	0.000**	0.000**	0.104
Age	0.000**	0.000**	0.000**
Foreign origin	0.001**	0.000**	0.020*
Marital status	0.000**	0.000**	0.000**
Further education	0.000**	0.000**	0.046*
Income	0.000**	0.000**	0.008**
Household wealth	0.000**	0.000**	0.010**
Parents wealth	0.486	0.001**	0.057 [†]

Note: **, * og [†] angiver henholdsvis 1, 5 og 10% signifikansniveau.

Table A.5: Test for the independence of sample, response population, and answering round within strata 1 (first-time entrepreneurs 2004). The p-value of the χ^2 test is displayed.

	Sample Non-sample	Response Non-response	1st round 2nd round
	p-value	p-value	p-value
Gender	0.730	0.001**	0.172
Age	0.206	0.003**	0.000**
Foreign origin	0.437	0.000**	0.686
Marital status	0.005**	0.010**	0.379
Further education	0.857	0.000**	0.886
Income	0.969	0.000**	0.006**
Household wealth	0.181	0.000**	0.075 [†]
Parents wealth	0.148	0.000**	0.013*

Note: **, * og [†] angiver henholdsvis 1, 5 og 10% signifikansniveau.

Table A.6: Test for the independence of sample, response population, and answering round within strata 3 (first-time entrepreneurs 2004). The p-value of the χ^2 test is displayed.

socio-demographic variables are not independent of the division of the population into sample and non-sample, the sample into response and non-response, and the response into 1st and 2nd round.

Investigating these differences from Table A.3 and A.4, the following can be seen. Starting with differences between the population and the sample, Table A.3 shows that the sample contains more males, more elderly, more Danes, more married, more educated, more with higher incomes, and more wealthy compared to the population. As noted before, most of these differences can be ascribed to the higher prevalence of research protection among younger individuals who, every thing else equal, are less likely to be married, educated, wealthy and have high incomes. While the 3.3% more females in the population is likely to be explained by the subsequent update of the firm register to include more small firms, the 1.1% more foreigners in the population is likely to be a result of greater research protection among these individuals. In general, however, the differences are small even though the χ^2 tests are significant. Turning to Table A.4, exactly the same pattern as before can be seen, except for no difference in the distribution of men and women in the population and sample. When

A. Methodology

assessing the differences from the χ^2 tests, only marriage is significant, which might be a consequence of the size of the never entrepreneurs population.

Regarding differences between the response population and the non-response population, Table A.5 and A.6 reveal significant differences for all socio-demographic variables. In assessing these differences, Table A.3 and A.4 both show that the response population contains more females, more elderly, more Danes, more married, more educated, more wealthy and more with higher incomes. Hence, the same pattern as before. Younger individuals are not only more likely to have research protection, they are also more likely not to return the questionnaire. Finally, differences related to 1st and 2nd round respondents are assessed from Table A.5 and A.6; the distributions of the socio-demographic variables are not shown. Starting with the significant findings for the novice entrepreneurs, 1st round respondents are more likely to be elderly, Danes, married, educated, wealthy, and have higher incomes. For the never entrepreneurs, only more elderly and higher income individuals are significantly more present among the 1st round respondents.

Overall, the differences between the population and the response population are as expected. Given the magnitude of the differences, the size of the response population, and the opportunity to include the socio-demographic variables as controls in the analyses, weighting of the data are not done in the analyses in this dissertation. Moreover, as shown in Dahl et al. (2009), weighting of the data might be inefficient because of the higher standard errors in the subsequent regressions if the weights are created in the following way based on (Levy and Lemeshow, 2008):

$$w_i = w_{Bi} \cdot w_{NRi} \cdot w_{NCi}, \quad (\text{A.1})$$

where w_i is the final weight of individual i , w_{Bi} is the base weight, w_{NRi} is the non-response adjustment factor, and w_{NCi} is the post-stratification adjustment factor. The three weights, making up the final weight, can be calculated as:

$$w_{Bi} = w_{Bh} = \frac{N_h}{n_h} \quad (\text{A.2})$$

$$w_{NRi} = w_{NRk} = \frac{\sum_{i=1}^{n_k} w_{Bi}}{\sum_{i=1}^{n_{rk}} w_{Bi}} \quad (\text{A.3})$$

$$w_{NCi} = w_{NCk} = \frac{N_k}{\sum_{i=1}^{n_{rk}} w_{Bk} \cdot w_{NRk}} \quad (\text{A.4})$$

A.3. Non-response analysis

where N_h and n_h are the population size and sample size for strata h . In the same way, N_k , n_k , and n_{rk} are the population size, sample size, and response population size for group k ; the groups being socio-demographic variables like gender and age.

The high standard errors are a result of a large base weight for the strata containing never entrepreneurs (because of the large population size compared to the sample size). However, when choosing not to weight the data, the researcher should be cautious in analysing the data. Especially, the base weight corrects for the sampling design – in this case disproportionate stratified sampling – which is crucial when the data is pooled. The analyses in this dissertation deal with this by using logistic regression – with the dependent variable being the strata (Allison, 1999) – or if OLS regression is needed, to run separate regressions for each strata. For more on how to weight the survey data used in this dissertation and the effects on the results, see Dahl et al. (2009).

The final part of the non-response analysis is devoted to two problems: (1) How to determine entrepreneurship status under conflicting information, and (2) How to deal with individuals with missing responses for some but not all questions.

The first issue arises as entrepreneurship status before 1994 (and 1980) and after 2004 (and 2006) can not be determined from IDA. Furthermore, only the main founder of a new firm can be found in the entrepreneurship register. From Mata and Portugal (1994), Dahl et al. (2009), and van Praag (2005) are furthermore known that only around half of new firms survive "the valley of death" which means that half of the first-time entrepreneurs in 2004 will not have their firm in 2008. As a consequence, a control question was included in the questionnaire where the respondent is asked: "Have you been running your own business as your main occupation?". The answering possibilities being: "yes, I am doing it now", "yes, but I am not doing it now", and "no, I have never been running my own business".

Strata	Individuals that answer:			Total
	Present Entrepreneur	Former Entrepreneur	Never Entrepreneur	
Novice	827 (61%)	394 (29%)	134 (10%)	1,355 (100%)
Never	21 (4%)	36 (6%)	521 (90%)	578 (100%)
Total	1,385	780	919	3,084

Table A.7: Entrepreneur status for respondents based on IDA (2004) and survey (2008).

A. Methodology

In Table A.7 can be seen the entrepreneurship status from IDA and the survey, respectively, for the two strata used in this dissertation. Surprisingly, 10% of the first-time entrepreneurs in 2004 indicate that they have never been entrepreneurs while 10% of the never entrepreneurs indicate that they are present entrepreneurs or former entrepreneurs. The former is likely to be the result of first-time entrepreneurs not seeing their firm as their main occupation or not answering "former entrepreneur" because the firm was short-lived. Hence, these individuals are imputed to be former entrepreneurs together with the 29 individuals in this strata that did not answer the question. The 10% never entrepreneurs that indicate present or former entrepreneurship status in 2008 are kept in these categories because they could have been entrepreneurs before or after the time period covered in IDA or they could be co-founders of a firm. The 28 individuals not answering the question are imputed to be never entrepreneurs as this is most likely. The resulting grouping can be seen in Table A.8. The survival rate of 60% for the first-time entrepreneurs does not indicate a significant survival bias based on the findings in Dahl et al. (2009).

Strata	Individuals after imputation:			Total
	Present Entrepreneur	Former Entrepreneur	Never Entrepreneur	
Novice	827 (60%)	557 (40%)	0 (0%)	1,384 (100%)
Never	21 (3%)	36 (6%)	549 (91%)	606 (100%)
Total	1,385	1,244	549	3,178

Table A.8: Entrepreneur status for respondents after imputations.

The second issue mentioned above also concerns imputation. In questionnaire surveys send by mail, it is common that most questions or items have a few missing values when returned. Whether or not these partial non-respondents should be included is an ongoing debate primarily concerning the reasons for incomplete response of the questionnaire. The pragmatic approach is to drop the few missing values for each question or item. However, if several questions or items are used together in regression analysis, the reduction in the number of individuals included could be significant if the non-responses are distributed among many individuals. In order to avoid this loss of information without dangerous guesstimating of the missing values, a variety of imputation methods exist; hot and cold deck imputation and regression imputation to mention some of the more common (Levy and Lemeshow, 2008). In this dissertation, regression imputation is conducted after the survey indicators are created. For each indicator with missing values, the non-missing values are used in OLS or logistic regression as dependent variable while socio-demographic factors (e.g. gender, age, education, and income) are used as independent variables. The estimated

A.4. The economic context of the survey

coefficients together with the socio-demographic factors of the non-respondents can then be used to predict a value for the indicator. The number of imputations for each indicator can be seen in the descriptive statistics in each chapter where imputation is applied.

A.4 The economic context of the survey

The final section outlines the economic context up to the time of start-up (2004) and answering of the questionnaire (2008). Furthermore, the economic context with influence on entrepreneurship is included not only for Denmark but also for the US and the EU. This is done to assess the representativeness of the findings in Denmark. The economic indicators for the three areas from 2000-2008 can be seen in Table A.9.

Indicator	Area	2000	2001	2002	2003	2004	2005	2006	2007	2008
GDP per capita (1,000 USD)	DK	28.8	29.4	30.8	30.4	32.3	33.2	35.2	36.3	36.8
	US	35.1	35.9	36.8	38.1	40.3	42.5	44.6	46.4	47.2
	EU27	21.9	23.0	24.0	24.5	25.7	26.8	28.3	30.0	30.7
GDP growth (annual % growth)	DK	3.5	0.7	0.5	0.4	2.3	2.4	3.4	1.7	-0.9
	US	4.2	1.1	1.8	2.5	3.6	3.1	2.7	2.1	0.4
	EU27	3.9	2.0	1.2	1.3	2.5	2.0	3.2	2.9	0.8
Government exp. (% of GDP)	DK	53.3	53.9	54.2	54.7	54.3	52.5	51.3	50.7	51.5
	US	33.9	35.0	35.9	36.3	36.0	36.2	36.0	36.8	38.8
	EU27	-	-	-	-	-	-	-	-	-
Long-term interest rates %	DK	5.66	5.09	5.06	4.31	4.30	3.40	3.81	4.29	4.28
	US	6.03	5.02	4.61	4.02	4.27	4.29	4.79	4.63	3.67
	EU27	-	-	-	-	-	-	-	-	-
Employment (share of working age)	DK	76.4	75.9	76.4	75.1	76.0	75.5	76.9	77.3	78.4
	US	74.1	73.1	71.9	71.2	71.2	71.5	72.0	71.8	70.9
	EU27	-	-	-	-	-	-	-	-	-
Unemployment (% of labour force)	DK	4.3	4.5	4.6	5.4	5.5	4.8	3.9	3.8	3.4
	US	4.0	4.7	5.8	6.0	5.5	5.1	4.6	4.6	5.8
	EU27	8.7	8.5	8.9	9.0	9.1	8.9	8.2	7.1	7.0
Self-employment (% of total employment)	DK	8.7	8.9	9.0	8.8	8.7	8.7	8.9	8.9	8.8
	US	7.4	7.4	7.2	7.6	7.6	7.5	7.4	7.2	7.0
	EU27	18.3	18.2	17.6	17.6	17.5	17.3	17.0	16.8	16.5

Table A.9: Economic indicators for Denmark, United States, and EU-27 in the time period 2000-2008. Source: OECD.Stat 2011 - source.oecd.org.

From Table A.9 can be seen that the Danish economy experienced a decline in GDP growth after 2000 (the dot-com bubble) but after 2003 the GDP growth increased significantly up to the decline again after 2006 (the financial crisis). Not surprisingly, similar patterns can be seen in the US and EU given the reasons for the crises and the interdependence of the economies. Hence, the first-time entrepreneurs in the survey started their business in a favorable economic climate for surviving "the valley of death" but at the time of the survey, the financial crisis was present.

A. Methodology

More importantly, however, is the need to assess whether Denmark is very different than the US or the EU when it comes to the entrepreneurial climate; given that most entrepreneurship studies are conducted in these areas. Initially, it can be seen that Denmark, like the US, over the period had a low unemployment rate compared to that of the EU. Furthermore, the GDP per capita in Denmark was higher than in the EU but lower than in the US. Both factors are assumed to result in low necessity entrepreneurship in Denmark and in the US. This is also reflected in the self-employment rate where Denmark and the US have close to similar rates around half of that in the EU.

Overall, Denmark and the US do not seem to differ regarding employment rate, unemployment rate, and long term interest rates; the latter being important for the finance of a new business. However, one difference is the size and role of the government sector. As can be seen from the table, government expenditures as percentage of GDP is significantly higher in Denmark than in the US. Because of the different welfare systems, Denmark has low income inequality compared to the US which could result in less necessity entrepreneurs. Measured by the Gini-coefficient, Denmark is ranked 1 and the US 27 (OECD, 2010). The assumed consequences of this – from neoclassical economic theory – are low work incentives and efficiency. Although no great differences in employment and unemployment rates are indicated from the table, low productivity growth in Denmark has recently been a growing source of concern. From 2001-2008 the annual growth in GDP per hours worked has been 0.47% in Denmark and 1.96% in the US (OECD, 2010). Nevertheless, Denmark is ranked next to the US in the top ten of the 2011 Index of Economic Freedom by The Heritage Foundation and The Wall Street Journal based on: business freedom, trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, freedom of corruption, and labour freedom.

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Work life in Denmark

Questions about work and values

1. What describes your present working situation best?

I am working full time.....

I am working part time.....

I am not working.....

<input type="checkbox"/>	}	→
<input type="checkbox"/>		
<input type="checkbox"/> Please go to question 3		

Number of work hours last week?

37 hours or less

Between 37 and 45 hours.....

45 hours or more.....

Don't know

Yes No

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

2. How satisfied are you with your present work on a scale from 0 to 10?

(0 is very dissatisfied and 10 is very satisfied)

0	1	2	3	4	5	6	7	8	9	10
Very dissatisfied					Neutral					Very satisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. If you today were to say "yes" to a new job/work, how important are the following intrinsic values for you?

	Very important	Important	Not important	Don't know
The work is meaningful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The work is useful to society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The work entails responsibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The work is interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The work tasks are varying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You get the feeling of accomplishment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You can work independently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You can see the results of your work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You can strengthen skills and abilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. How much do you agree or disagree with following statements?

	Completely agree	Agree	Neutral	Disagree	Completely disagree	Don't know
I find it hard to make decisions with an uncertain outcome.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer result-oriented and innovative tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often think that coincidences determine my success	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer to decide myself how tasks are accomplished.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I rarely think that the situation develops to my advantage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like to pursue the attractive but uncertain opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer to accomplish tasks the way I have always done.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I always expect the best outcome of a situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer explicit guidelines for the accomplishment of tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not mind routine tasks without challenges.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think that success is the result of hard work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often think of new ideas and ways of solving tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Imagine a lottery with 10 tickets and only one price of 10,000 kr.

How much would you be willing to pay for one ticket? kr. _____

10. Imagine a lottery with 10 tickets and only one price of 100,000 kr.

How much would you be willing to pay for one ticket? kr. _____

Questions about your personal network

11. How often do you typically talk to at least one of the following persons? (Including contact over telephone, mail, etc.)

	Every or almost every week	1-2 times each month	Few times each year	Less	Never	Don't know	Not relevant
Present colleagues or business relations outside of the workplace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persons you mainly know as former colleagues or business relations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persons you mainly know as former schoolmates or fellow students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persons you mainly know from associations, e.g. sport and leisure.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Would you contact one of these persons if that person could help you with an important work task?

	Yes, to a great extent	Yes, to some extent	No, not at all	Don't know	Not relevant
Present colleagues or business relations outside of the workplace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persons you mainly know as former colleagues or business relations.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persons you mainly know as former schoolmates or fellow students.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Persons you mainly know from associations, e.g. sport and leisure time.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Imagine that you have been in low spirits over a longer period of time. Which of the following persons would you talk to?

	Yes, to a great extent	Yes, to some extent	No, not at all	Don't know
<i>"Close family" is spouse/partner, parents, siblings, and children</i>				
Close family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Present colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Former colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other friends and acquaintances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professionals (e.g. psychologist)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. How many people would you talk to about this? Number: _____

15. To what extent do these people know each other?

They all know each other	<input type="checkbox"/>
Most of them know each other	<input type="checkbox"/>
Few of them know each other	<input type="checkbox"/>
None of them know each other	<input type="checkbox"/>
Don't know/Not relevant	<input type="checkbox"/>

16. Imagine that you over a longer period of time have considered a career change. Which of the following persons would you talk to?

	Yes, to a great extent	Yes, to some extent	No, not at all	Don't know
<i>"Close family" is spouse/partner, parents, siblings, and children</i>				
Close family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Present colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Former colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other friends and acquaintances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professionals (e.g. coach)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. How many people would you talk to about this? Number: _____

18. To what extent do these people know each other?

They all know each other	<input type="checkbox"/>
Most of them know each other	<input type="checkbox"/>
Few of them know each other	<input type="checkbox"/>
None of them know each other	<input type="checkbox"/>
Don't know/Not relevant	<input type="checkbox"/>

19. Is one or more of the following persons running, or have been running, their own business as their main occupation?

	Yes, 1-2 persons	Yes, 3 or more persons	No	Don't know
Close family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Present colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Former colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other friends and acquaintances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. Have these persons inspired or encouraged you to start up your own business?

	Yes, to a great extent	Yes, to some extent	No, not at all	Don't know
Close family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Present colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Former colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other friends and acquaintances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Have you been running your own business as your main occupation?

Yes, I am doing it now	<input type="checkbox"/>		Yes	No
Yes, but I am not doing it now	<input type="checkbox"/>	I am thinking about starting my own business	<input type="checkbox"/>	<input type="checkbox"/>
No, I have never been running my own business	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Go to question 37 if you have never been running your own business

Questions about your present or latest business

22. What year was your present (latest) business founded?

Year? _____

23. Are/Were you running the business in joint ownership with others?

Own/owned alone	<input type="checkbox"/>		Yes	No
Own/owned with others	<input type="checkbox"/>	With whom? Family members	<input type="checkbox"/>	<input type="checkbox"/>
		Colleagues from before I started the business	<input type="checkbox"/>	<input type="checkbox"/>
		Others friends through years before I started the business	<input type="checkbox"/>	<input type="checkbox"/>
		Other persons	<input type="checkbox"/>	<input type="checkbox"/>

24. Which of the following ownership types is/was the business?

A personally owned company or a partnership (I/S)	<input type="checkbox"/>
A private limited company (ApS) or a joint-stock company (A/S)	<input type="checkbox"/>
Other	<input type="checkbox"/>

25. Which of the following statements characterises the business start-up best?

- The company was "inherited" from family..... ☐
- The company was "acquired" from others ☐
- The company was started from the bottom ☐
- Other ☐

26. Was the business from the start-up based on the following types of co-operation?

- | | Yes | No |
|--|--------------------------|--------------------------|
| Sale for bigger companies..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Subcontractor for bigger companies..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Sales promotion with other companies..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Other co-operation with other companies..... | <input type="checkbox"/> | <input type="checkbox"/> |

27. Was the business from the start-up financed one of the following ways?

- | | Yes, to
a great
extent | Yes, to
some
extent | No,
not at all | Don't
know |
|---|------------------------------|---------------------------|--------------------------|--------------------------|
| Personal wealth or savings..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Bank loan with or without security..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Loan or capital from family, friends, and others..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Venture capital..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Public subsidy..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

28. Did you receive finance from the following persons?

- | | Yes | No |
|--------------------------------------|--------------------------|--------------------------|
| Close family..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Other family..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Former colleagues..... | <input type="checkbox"/> | <input type="checkbox"/> |
| Other friends and acquaintances..... | <input type="checkbox"/> | <input type="checkbox"/> |

29. How many employees did the business have at the most during the first year? (Excluding yourself and co-owners)

- | | | | |
|--------------------------|--------------------------|-------------------|---------------|
| No employees..... | <input type="checkbox"/> | Go to question 32 | |
| Full time employees..... | <input type="checkbox"/> | → | Number: _____ |
| Part time employees..... | <input type="checkbox"/> | → | Number: _____ |

30. Were some of the employees the following persons?

- | | Yes, 1-2
persons | Yes, 3 or
more persons | No | Don't know |
|--------------------------------------|--------------------------|---------------------------|--------------------------|--------------------------|
| Close family..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other family..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Former colleagues..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other friends and acquaintances..... | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

31. During the start-up, did you use counselling from the following persons?

By "counselling" is meant professional knowledge and experiences as well as support and backing regarding important decisions

	Yes, to a great extent	Yes, to some extent	No, not at all	Don't know
Close family.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other family.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Former colleagues.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other friends and acquaintances.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public advisors.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other professionals (e.g. entrepreneur, bank advisor, consultant)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. Did you find this counselling useful?

If you for instance did not answer "yes" at "close family" please answer "not relevant"

	Yes, to a great extent	Yes, to some extent	No, not at all	Don't know	Not relevant
Close family.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other family.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Former colleagues.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other friends and acquaintances.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public advisors.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other professionals (e.g. entrepreneur, bank advisor, consultant)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. How important were the following factors for your decision to start-up your own business?

	Very important	Important	Not important	Don't know/ Not relevant
The desire to create a new product or service.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The desire to make my hobby into a career.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The desire to be my own employer.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The desire for new work-related challenges.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The desire to achieve a higher income.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The desire to decide the working tasks.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The desire to decide the working hours.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Support and backing from family and friends.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspiration or encouragement from colleagues or business relations.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disagreement with colleagues or management.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Considerations during an unsatisfying work situation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Considerations while I was in a resignation period or unemployed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

34. How important do you find the following circumstances if you are to become successful with a business?

	Very important	Important	Not important	Don't know
To have work experience.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have industry experience.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have experience with business development.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have experience with sales and promotion.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have experience with management.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have a relevant education.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be an expert or specialist.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be an "all-rounder" (good at many things).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have a large professional network.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have support and backing from family and friends.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

35. Were these circumstances present in your situation?

	Yes, to a great extent	Yes, to some extent	No, not at all	Don't know
To have work experience.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have industry experience.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have experience with business development.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have experience with sales and promotion.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have experience with management.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have a relevant education.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be an expert or specialist.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To be an "all-rounder" (good at many things).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have a large professional network.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To have support and backing from family and friends.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

36. How many employees does the business have today? (Excluding yourself and co-owners)

I have closed/left the business.....	<input type="checkbox"/>	→	Year: _____
No employees.....	<input type="checkbox"/>		
Full time employees.....	<input type="checkbox"/>	→	Number: _____
Part time employees.....	<input type="checkbox"/>	→	Number: _____

37. If you have any comments about the questionnaire, please write them here:

Thank you for your help

