Determinants of Successful Immigrant Entrepreneurship in the Federal Republic of Germany

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Nikolinka Fertala
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Dekan:	Professor Dr. pub. oec. Jörg Baten
Erstberichterstatter:	Professor Dr. pub. oec. Jörg Baten
Zweitberichterstatter:	Professor Dr. rer. pol. Kerstin Pull
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Nikolinka Fertala

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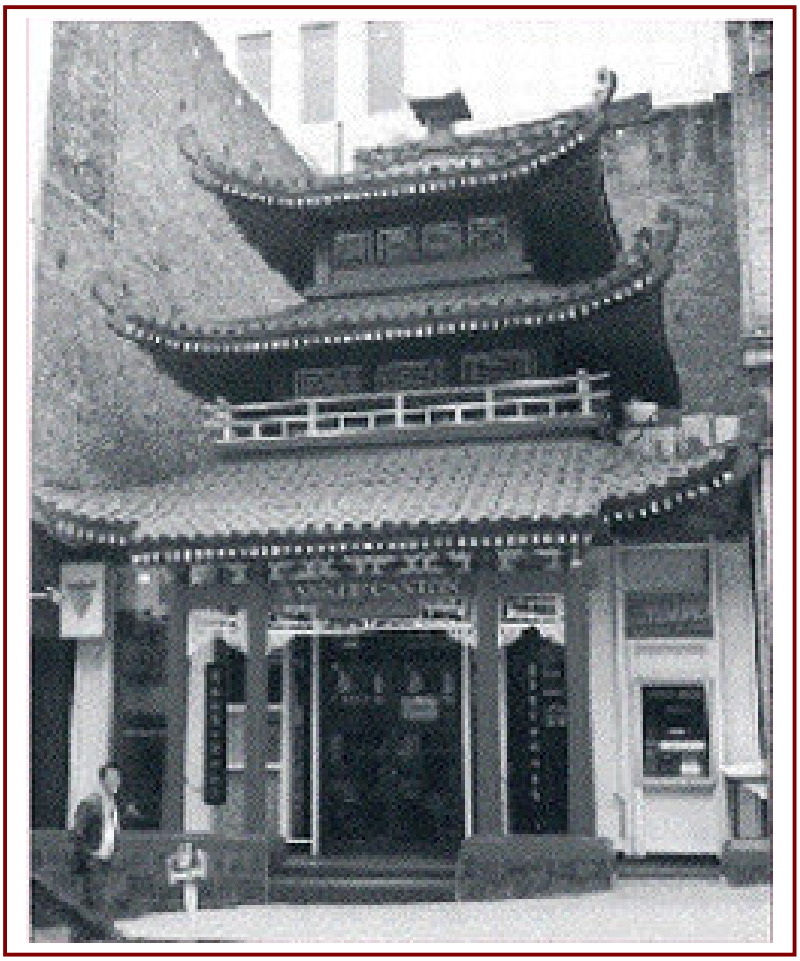

"The entrepreneur is at the same time one of the most intriguing and one of the most elusive characters … in economic analysis. He has long been recognised as the apex of the hierarchy that determines the behaviour of the firm and thereby bears a heavy responsibility for the vitality of the free enterprise society."

W. J. Baumol (1968: 64)

Acknowledgements

During my research years in Tübingen, I received generous assistance from many people and institutions all over the world. I am particularly grateful to my supervisor Professor Jörg Baten for his persistent support during the days of obscurity and suffering, which are the inseparable companions of each and every PhD scholar. Even more importantly, he encouraged me as well to apply for and attend several international conferences, and to present my research there. I wish to thank Professor Werner Neus for his valuable comments, critical questions, and his active role in the discussion when I presented my working papers in the colloquium organised by the graduate school in Tübingen.

My dissertation project is based on five working papers, which contribute to one single story; namely, what are the factors driving immigrants in Germany to establish their own businesses, and on the other hand which are the crucial determinants leading to entrepreneurial success. All five papers were presented at international conferences, thus I wish to express my gratitude for the various comments I received. I am much indebted to Professor Leo Dana who agreed to publish my study entitled 'Do human and social capital investments influence survival? A study of immigrant entrepreneurship in Upper Bavaria' as invited paper in *the International Journal of Entrepreneurship and Small Business*. He even gave me the freedom to write a chapter in the edited book *Ethnic Minorities in Entrepreneurshi*p, London, Edward Elgar, which I entitled 'Immigrant entrepreneurship in Germany: Working on the fringes or deliberate self-decision'. While corresponding with him, I mentioned my study on homophily and economic performance of immigrant entrepreneurs, thus he became fascinated and approved to publication the paper entitled 'Do birds of a feather flock together and perform economically better? A study of homophily paradox among immigrant entrepreneurs in Germany'.

My first paper 'Immigrant's propensity to self-employment in Germany" was presented at the *3rd International Conference 'Entrepreneurship, Employment, and Beyond'* in Krakow 2003. Thus, I wish to thank Professor Jan Targalski and Professor Karl Gratzer for the challenging debates and excellent comments. My paper 'Do human and social capital investments influence survival? A study of immigrant entrepreneurship in Upper Bavaria' was presented at the *24th Babson Kaufmann Entrepreneurship Research Conference*, the most world-wide recognised conference in

the field of entrepreneurship research, which took place in Glasgow 2004. I owe special thanks to Professor Teresa Menzies and Professor Howard E. Aldrich who contributed remarkably to the quality and intensity of the discussion. This paper was also presented at the *2nd Interdisciplinary European Conference on Entrepreneurship Research* in Regensburg 2004. Thus, I wish to thank Professor Michael Dowling who organised the conference for his active role in the discussions. My paper 'Do birds of a feather flock together and perform economically better? A study of homophily paradox among immigrant entrepreneurs in Germany' was presented at the *25th Babson Kaufmann Entrepreneurship Research Conference*, which was held in Boston, the US, 2005, special anniversary year, and at the *2nd AGSE International Entrepreneurship Research Exchange* in Melbourne, Australia, 2005. I highly appreciated the opportunity to present my research there.

Furthermore, the scholarship from the *German Research Foundation* (DFG) supported my research objectives noticeably and helped me considerably to mitigate the financial burden imposed by attending international conferences and workshops. The encouraging atmosphere in the graduate school and in the research group at the department of economic history facilitated my work progress tremendously. Therefore, I wish to thank all members of the graduate school and our research group for their persistent support, especially for the excellent advice of Dominique Adey Balinova concerning language and style as well as for close friendship.

My greatest debt is to my husband Walter Fertala and my mother Argira for their warmth and mental support during my research years in Tübingen. This thesis would not have been feasible without their generosity and understanding for my not being at home in Vienna.

Preface

Before I begin with the serious research issues, I wish to emphasise several basic considerations regarding entrepreneurship as a subject matter, cited literature, language and inherent problems while employing empirical methods to data sets. I do strongly believe in these considerations, and thus I am fully convinced of the fact that they do contribute to the quality of research.

Entrepreneurship is a subject that is commonly taught and researched in business schools, but seldom if at all in economics departments. Consequently, most studies on entrepreneurship tend to be written from a business or management perspective. Such research often downplays, or ignores altogether, the contribution of modern economics to our understanding of the subject. Indeed, it is common to find references to 'the contribution of economics' mainly in terms of the treatises of Frank Knight (1921) and Josef Schumpeter (1934). It is unclear to me why entrepreneurship plays such a marginal role in most economics departments. It is possible that economists are suspicious of a subject with an avowedly mongrel provenance, which reflects a multiplicity of different, and often non-quantitative, perspectives. From a personal standpoint, the multidisciplinary nature of entrepreneurship posed one of the greatest challenges in writing this dissertation. It also offered me some of the greatest rewards. My own view is that the multidisciplinary nature of entrepreneurship is a potential strength, rather than a weakness. But this potential will be achieved only if we, students and researchers, take the trouble of breaking the boundaries of narrow scholarship, an ideal to which my dissertation is dedicated.

Given the multidisciplinary nature of entrepreneurship, fortunately, it is a broad field of research that creates piles of literature every year; thus, I restricted myself to essential contributions published in peer-reviewed journals and outstanding edited volumes. My research also includes topics from econometrics, sociology, and psychology, which increase additionally the quantity of related literature available. Consequently, I cite only important sources that are of significant relevance to my research. In general, I concentrate on the 'working paper style', which avoids long-winded reviews of literature. Conversely, my data sets, methods and results are of main interest.

Moreover, the primary objective of each and every scientific work is to maintain readability. Studying the book written by Woodward (1997) helped me to approach this

objective more swiftly. To avoid roundabout sentence constructions, which in turn sound more impressive, Woodward (1997) suggested the active voice in the common use. ‘I’ and ‘We’ as well as ‘He’ and ‘She’ are alternately chosen in my dissertation.

Finally, empirical researchers wish repeatedly to produce significant results, and generally only these results are published. Do we not run, therefore, into the troubles of publication selectivity bias? However, I strongly believe that stating the limitations of data sets and methods employed is an essential part of each empirical research.

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COMMONLY USED SYMBOLS AND ABBREVIATIONS

SYMBOLS

$a, b, c \ldots$	Vectors of parameters
$\alpha, \beta, \gamma, \delta, \lambda, \upsilon \ldots$	Vectors of parameters
$c_{it}, c_{it}(\cdot) \ldots$	Cost function of entrepreneur i at time t
$E \ldots$	Wage/Salary employment
E…	The expectations operator
$\Phi(\cdot) \ldots$	The distribution function of the standard normal
$f(\cdot), F(\cdot) \ldots$	The density and distribution functions of a random variable
$h_0(t) \ldots$	The baseline hazard rate at time t
$h_i(t) \ldots$	The hazard rate of entrepreneur i at time t
$I_i \ldots$	A binary observed indicator variable: equal to one if individual i is self-employed, otherwise zero
$I_i^* \ldots$	An unobserved binary indicator variable: the probability individual i chooses to be self-employed
$I_{it} \ldots$	Invested effort of entrepreneur i at time t
$I_{it-1} \ldots$	Invested effort of entrepreneur i at time $t-1$
$\underline{I} \ldots$	Entrepreneur's level of dislike working beyond certain point
$L \ldots$	The likelihood function
$n \ldots$	Number of individuals in the sample
$\Omega_{it} \ldots$	The information set of entrepreneur i at time t
$p_{it} \ldots$	True unobserved underlying productivity of entrepreneur i at time t
$\hat{p}_{it} \ldots$	Signal of unobserved productivity of entrepreneur i at time t
$\pi_{it} \ldots$	Observed operating profit of entrepreneur i at time t
$S \ldots$	Self-Employment as occupational choice

$\sigma^2 \ldots$	Variance of a stochastic regression disturbance term
$\theta_{it} \ldots$	Marginal operation costs of entrepreneur i at time t
$t \ldots$	Time
$T \ldots$	The number of time periods
$U(\cdot) \ldots$	A cardinal utility function
$u, \ldots$	Stochastic regression disturbance term
$W, X, Z \ldots$	Vectors of observable characteristics

INDEXES

$i \ldots$	Subscript indexes an individual
$j \ldots$	Subscript indexes an occupation, usually self-employment versus wage/salary employment
$t \ldots$	Subscript indexes a point in time

ABBREVIATIONS

AuslG	Germany's Foreigners Act, German Abbreviation
CEEC	Central and Eastern European Countries
EEA	European Economic Area
EU	European Union
GewO	Trade, Commerce and Industry Regulation Act, German Abbreviation
GSOEP	German Socio-Economic Panel
GZR	Central Register of Trade, Commerce and Industry, German Abbreviation
IfM	Institute for Medium-Sized Business Research, German Abbreviation
ML	Maximum Likelihood Estimation Method
NACE	Classification of Economic Activities in the European Community
OLS	Ordinary Least Square Method
ZfT	Centre for Studies of Turkey in Essen, German Abbreviation

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1. Introduction

1.1 Relevance of the subject immigrant entrepreneurship

By the end of the twentieth century, Europe had evolved into a great magnet for millions of immigrants displaced from their homelands by political and economic circumstances and at the same time attracted by sustainable economic development, liberal democracies and the social policies of the majority of Western European countries. With the recent growth of the new immigrant population in the emerging post-industrial urban economies, immigrant self-employment as an effective form of entrepreneurship is no longer simply a research subject relegated to strictly historical interest, nor is it the epitome of the American dream for immigrants and natives alike. While business ownership and self-employment may be risky undertakings, they offer an intrinsic incentive by affording economic agents a sense of independence, higher self-esteem and life satisfaction. Entrepreneurship as such not only injects new dynamism into an economy, but it is also of great importance for the economic wealth and the future economic development of a particular country. It is also a significant element in combating unemployment and welfare drain through job creation, at the very least for the self-employed themselves.

Entrepreneurial activities serve further as a route of economic advancement and social mobility for most of the successful immigrant groups in their new host countries. In addition to the varying human capital, the venturing behaviour of immigrants depends to a great extent on the characteristics of the labour market in the country of settlement as well as on the type of immigrant's residence place (urban and rural). The effects, therefore, are likely to shift over time as immigrants feature new experiences and acquire new skills in the local market. Interdependencies between location and nationality specific factors such as division of responsibilities, religion, gender specific roles due to country of origin, might impact the entrepreneurial activities of immigrants. In this sense, I completely disagree with the most migration and labour market models which tend to assume that immigrants are unskilled labour (O'Rourke and Williamson, 1999); in this way they underestimate the dynamic component of the human and social capital formation.

Although Germany was among the distinguished countries accepting immigrants (the so-called 'guest workers'), self-employment activities in Germany are still very low

in comparison to the flourishing immigrant entrepreneurship in the United States (US) and other countries with a high proportion of immigrants. Recently, nascent immigrant enterprises show that a growing business culture exists in Germany, and this in turn has attracted the government's attention to ensure its support. In this context, it is noteworthy that after a long period of decline the proportion of the labour force that is self-employed has increased since the middle of the 1970s in several Western countries, including Germany. As a result, on the one hand almost every twelfth entrepreneur in the Federal Republic of Germany is not a German citizen, and on the other hand every tenth immigrant ventures his or her own economic subsistence and establishes a business. Moreover, while during the last ten years the number of German enterprises increased by 14.5 per cent, the number of immigrant-owned ventures in Germany rose by 75.0 per cent, and the trends are still upwards (Leicht and Luber, 2002). As a consequence, the group of self-employed immigrants has gained importance both in an economic and a political sense, and the immigrant entrepreneurship has attracted the attention of many social science researchers due to the fact that Germany is facing the problem of increasing unemployment and economic stagnation at the same time. On the other hand, instruments are needed to obtain fiscal, social, informational and/or educational policy measures to improve the efficiency in the market of immigrant entrepreneurs. Market efficiency is improved whenever the number of successful start-ups increases and/or the number of unsuccessful start-ups decreases. The determinants of entrepreneurial start-ups and success by immigrants to Germany can serve as these instruments.

1.2 Objective of the thesis

Despite the cumulating literature on immigrant entrepreneurship and so-called 'ethnic enclaves'[1] in general, there are only preliminary answers to questions such as why immigrants to Germany establish own businesses and engage in self-employment, and on the other hand, which are the driving factors leading to their economic success. One might argue that it is a combination of individual attributes, for instance human, social and cultural capital, and opportunity structure regarding the host country, which

[1] The ethnic 'niche' or 'enclave' theory was first developed by Wilson and Portes (1980) in their study of the Cuban economy in Miami. According to this theory, the success of immigrant entrepreneurship lies in their very isolation from the market. This isolation protects them from the competition of native businesses, and provides good and service opportunities to new migrants who would not be able to integrate into the mainstream labour market. The current consensus seems to be that the enclave hypothesis is both redundant and misguided (Werbner, 2001).

facilitates or hinders the development of immigrant entrepreneurship (Li, 2001). In other words, due to restricted opportunities in the open market, some immigrants incline towards business venturing to take advantage of the immigrant enclave. I only partially agree with this view as it applies to situations where large immigrant concentrations have produced what many scholars have referred to as enclave economy. However, there exist various types of immigrant entrepreneurship and self-employment activities that need to be considered.

In the contrast, the conjecture of the neo-classical human capital theory implies that immigrants are a self-selected group of rational individuals who are willing to undertake risks pursuing the objectives of maximising their lifetime earnings and improving their lives. They are characterised by a strong incentive to invest in human capital and have the inner drive to succeed in the host country's labour market. By virtue of their willingness to assume the risk of migration, both pecuniary and psychic, and undertake this new and often risky venture they become the first entrepreneurs[2]. In other words, immigrants as risk takers are more dynamic and inherently more prone to incline towards self-employment compared with any other group. For instance, immigrants have higher self-employment rates than natives in North America (see Yuengert, 1995, for the US and Li, 2001, for Canada). Yuengert (1995) investigates the determinants of these differences and finds that immigrants from countries with larger self-employment sectors have higher self-employment rates. Migrants in the US cluster more in high-tax states, and encounter greater opportunities for tax deductions and avoidance as entrepreneurs than as salaried employees. His study is not supportive to the ethnicity enclave hypothesis.

In the field of economics, the prevailing framework is that of income choice (Lucas, 1978). More specifically, an immigrant chooses between self-employment and salaried work based on the monetary rewards of his particular choice. This thesis is supported by various empirical studies on immigrant assimilation. For instance, Borjas's (1986) research on the self-employment experience of immigrants in the US shows that not only do self-employed immigrants have higher annual income than salaried workers, but they also have higher income than comparable self-employed native workers. This line of research is extended by Lofstrom (2002), who finds substantial differences between immigrant workers and self-employed migrants in

[2] In this context, an entrepreneur is an individual who organises, operates, and assumes the risks of a business venture by definition.

earnings and educational attainment. He concludes that entrepreneurs have a better education and earn more than other working immigrants.

However, besides the drive for financial rewards, individuals might choose self-employment as a corrective measure to occupational mismatch or as an option for independence and psychological improvement of their self-worth. For immigrants, one might argue that impediments to well-paid jobs and to upward occupational mobility as well as unemployment and discrimination in the labour market impel them to undertake the self-employment opportunity. In this context, Clark and Drinkwater's findings (1998) suggest that self-employment is an escape from discrimination in the paid-employment sector for immigrants in Great Britain. Britain's non-whites suffer an earnings disadvantage in self-employment as well as that in paid-employment, which has been documented. Indeed the disadvantage, relative to whites, is greater in self-employment. Their analysis implies that this differential in earnings cannot be explained by differences in human capital endowment, but rather is the result of how these endowments are rewarded.

A dearth of both empirical and theoretical evidence is noted on immigrant entrepreneurship in Europe and especially in Germany. Germany is known to have a comparatively low rate of self-employment, but migrants exhibit an even lower rate despite the fact that self-employed immigrants reach earnings parity with self-employed natives, and earn a premium of 30 per cent over immigrant workers in the blue-collar category (Constant, 1998). Hence, it is unclear to me why in a country with a relatively high unemployment rate and rather institutionalised labour market entry, one does not observe more self-employment among immigrants. This situation, for instance, could be explained to a certain extent by the start-up specific human capital constraints faced by prospective immigrant entrepreneurs in Germany.

In this context, my first research objective is to highlight empirically the entrepreneurial behaviour of various immigrant groups in Germany. In particular, my target is to provide evidence to the question: which factors contribute to the observation that some immigrants have a higher propensity to engage in entrepreneurial activities than others do? In other words, which socio-economic characteristics accelerate the decision-making process with regard to immigrant self-employment?

Venturing a new enterprise and being successful as an entrepreneur in a new economic and social environment after a certain period of time are two congregational matters. Unfortunately, a large proportion of enterprises do not survive as identifiable

units beyond their first few years, and only a small proportion achieves significant growth. As the positive impact of the human and social capital investments on the venture's performance has been repeatedly confirmed in the existing entrepreneurship literature in general, my second objective is to answer the question: do investments in human and social capital enhance the survival of enterprises established by immigrants? Based on the findings that companies founded by immigrants compared to those of natives in Germany survive on average shorter (see my conference paper, Fertala, 2004), I develop a theoretical model explaining how fast immigrant entrepreneurs adjust their beliefs, which was so far not done. More precisely, issues such as to what degree do entrepreneurs rely on past experience when making decisions about their business ventures, and to what extent do they utilise new information about their venture's performance to learn about their true (but unknown) abilities and trading environment, I explore in theoretical context. Encouraged by the results of Baten (2001, b, c), I also contribute to data collection on companies established by six different immigrant groups in the city of Hamburg, and test the effect of the 'similar-to-me' hypothesis[3] on the economic performance.

The answers of the above-stated questions imply an answer to the underlying composite questions: 'What are the determinants of successful immigrant entrepreneurship in Germany?' Overall, my research contributes to scant, both empirical and theoretical, evidence of immigrant entrepreneurship in the Federal Republic of Germany.

1.3 Positioning in the scientific field

As other behavioural disciplines such as sociology and social psychology are concerned with entrepreneurship as well, it would be naive not to include their fruitful scientific results in the analysis. I consider some of the common results, but at the same time, I do not wish to assert that I, as an economist, am in a position to address well the psychological approaches to entrepreneurship. Therefore, my thesis can be positioned as an economic one within the field of social sciences.

Within the field of economic research, my dissertation project can be seen as microeconomics as opposed to macroeconomics. The central unit is the individual

[3] Byrne (1971) proposed the 'similar-to-me' hypothesis according to which, individuals rate other people more positively the more similar they are to themselves or the more similar the rating expert believes they are.

immigrant entrepreneur who is compared to other immigrant as well as native entrepreneurs. I do not study the fraction of immigrant entrepreneurs in a specific country and year, and compare it to fractions in other countries and years. However, indications of the macroeconomic environment are incorporated as explanatory factors for individual behaviour.

Regarding the area of microeconomics, the approach is rather labour market-oriented than business-oriented: I focus on the entrepreneur's occupational choice and success rather than on the enterprise's performance. Nevertheless, enterprise related variables are considered in my research as explanatory variables for immigrants' entrepreneurial success.

Finally, someone who expects only case studies and qualitative discussions might be disappointed, as my thesis is oriented towards empirical analysis and favours to a great extent a rigorous implementation of the applied econometric techniques.

1.4 A definition of successful entrepreneurship and measurement issues

The problem of defining the word 'entrepreneur' and establishing the boundaries of the field entrepreneurship has not been solved yet (Bruyat and Julien, 2001). My first and most pressing task, therefore, is to define immigrant entrepreneurs and entrepreneurship for the purpose of my dissertation. Unfortunately, this happens to be one of the most challenging and intractable tasks faced by researchers working in the field. There is a proliferation of theories, definitions and taxonomies of entrepreneurship which often conflict and overlap, resulting in confusion and disagreement among researchers and practitioners about precisely what entrepreneurship is (Parker, 2002). For instance, consider the following illustrative and abbreviated viewpoint. In applied econometric work, labour economists often equate entrepreneurs with the self-employed, on the grounds that self-employment fulfils the entrepreneurial function of being risk-bearing residual claimants. However, others are of the opinion that this definition is too broad, claiming that only business owners who co-ordinate factors of production, in particular, those who employ workers, are really entrepreneurs. Conversely, others think the economist's definition is too narrow, because it excludes entrepreneurship in the corporate and social spheres. Then there are those steeped in the Schumpeterian tradition who argue that entrepreneurship is characterised primarily by the introduction of new paradigm-shifting innovations. Others again have emphasised psychological traits and attitudes supposedly peculiar to entrepreneurship. When it comes to the

subject matter ‘immigrant entrepreneurship’, the task becomes even more complicated as additional dimensions are involved in the discussion. Are only individuals founding enterprises who were not born in the host country, in particular in Germany, immigrant entrepreneurs? And so the list of theories, definitions and taxonomies of entrepreneurship goes on.

1.4.1 Who is an immigrant entrepreneur?

Given the above-addressed problems along with the not yet established boundaries of the field entrepreneurship, within the course of my study, I define the immigrant entrepreneur as follows: (i) an entrepreneur is someone who indicates either that he has established a business venture or has acquired a (family) business alone or with a group of partners; or (ii) an entrepreneur is someone who indicates himself to be self-employed in an incorporated versus unincorporated business.[4] Additionally, I operationalise the migration component within the entrepreneurship field either by country of origin, if available for the data applied in the empirical analysis, or by holding non-German citizenship in the common case. The selection of these definitions is motivated by their availability in German data, and on the other hand they allow for the possibility of a plausible comparison to other empirical micro-oriented studies of immigrant entrepreneurship.

I have readily to admit that the above-given as well as other definitions of an immigrant entrepreneurship are not perfect. In reality, the difference between an entrepreneur and non-entrepreneur does not clearly exist. There is rather a continuum of labour market positions stretching from ‘totally non-entrepreneurial’ to ‘heavily entrepreneurial’. Therefore, it is difficult to define a cut-off point on this continuum such that an immigrant is considered an entrepreneur to one side of the point and not to the other. The concept itself is not that uniformly and unidimensionally defined.

By utilising the above definitions, we circumvent the problem of having to decide whether an immigrant’s labour position is sufficiently entrepreneurial and label him as an ‘entrepreneur’. In representative surveys or case studies, respondents indicate themselves whether they are entrepreneurs or not. In this respect, the definitions are

[4] De Wit (1993) uses a similar definition for self-employed persons and entrepreneurs alike, whose appropriateness he motivates in detail (pp. 2-3). Additionally, as the empirical analysis in the chapter three is based on the German Socio-Economic Panel (GSOEP), I focus on its definition that in turn does not differ from that of the German Federal Statistic Office, which reads: self-employed individuals are individuals that earn no wage or salary, but derive their income by exercising their profession or business on their own account and/or for their own risk.

subjective ones as well. The possibility is acknowledged that two individuals might have identical labour market positions, but one turns out to be an entrepreneur and the other does not.

Finally, to cut through a paralysing and ultimately fruitless debate, and to achieve consistency, I adopt the following convention in my dissertation. At the conceptual level, the terms ‘immigrant entrepreneur’ and ‘immigrant entrepreneurship’ will be used; at the empirical level, where issues of measurement and estimation are involved, I use the closest approximation to the manifestation of immigrant entrepreneurship that appears to be suitable, as I have already defined above.

1.4.2 How should we measure entrepreneurial success?

Determinants of and, as a result, appropriately derived measures of entrepreneurial success, regardless of the definition of success, can be found in the history of the entrepreneurship thoughts, the most relevant of which I will briefly overview in the following subchapter.

Say states that success in entrepreneurship requires qualities such as ‘judgement, perseverance and a knowledge of the world as well as of business’ (Say, 1971). In addition, success requires knowledge of the industry and the occupation gathered through experience. But an entrepreneur may also fail ‘without any fault of his own’, while this chance of failure depends on good luck and general business conditions.

Marshall’s (1930) successful entrepreneur has command over general and specialised abilities, and also over capital and good fortune. According to his view, general ability is essential to attain success in any pursuit. It depends on family background, education and talent. Specialised ability involves vast knowledge of a specific trade as well as leadership qualities. Additionally, an entrepreneur who possesses own capital surely has an advantage when establishing and running a business. Finally, good fortune is also important for the Marshallian entrepreneur.

The function of Schumpeter’s entrepreneur (1934) is to innovate and firms which cease to innovate will not survive for a long period of time. Successful innovation requires leadership, and on the other hand success in entrepreneurship demands strong and scarce motivations to innovate prior to engagement in an entrepreneurial endeavour.

Success as a Knightian entrepreneur requires ‘the power of effective control’ (1921), and it calls, furthermore, for self-confidence and the disposition to act on one’s

own opinion. An entrepreneur should be venturesome and have foresight. The demand for ability to forecast varies with industrial sectors depending on the time length of the production process and on the variability of consumer wants the product satisfied; the more basic the wants, the more stable and predictable they are. A successful entrepreneur should also have superior managerial ability, and belief in his own good luck.

Considering the debate on determinants of successful entrepreneurship from the historical point of view, I derive various measures of success, which are utilised in my dissertation. First, the longer an immigrant entrepreneur survives as such, the more successful he is. More precisely, the time span of survival before exiting the entrepreneurial state voluntarily or involuntarily characterises the business success of an immigrant entrepreneur.[5] Second, I use the extent to which immigrant entrepreneurs utilise new information about their venture's performance to learn about their true (but unknown) abilities and trading environment. In other words, the faster the process of incorporating new information than relying on past experience, the more successful the entrepreneur is. Third and last in the analysis, I employ the nominal volume of sales per employee as operational measure, which takes into account the personnel an entrepreneur has to control, and thus, indicates his efficiency.

1.5 The structure of the thesis

The remainder of my dissertation can be split into three major parts, which are organised as follows.

Chapter two discusses the basic legal conditions for the immigrants' labour participation, in particular, the legal precondition for establishing an enterprise and being self-employed as an immigrant to Germany. Additionally, I analyse the labour market integration and the development trends in a long-term perspective. The idea is to provide the reader with an understanding of the opportunities existing in the host country, and on the other hand to highlight the activities of immigrants from a labour economic standpoint.

Chapter three develops an empirical discrete-choice model to find the determinants, which influence the propensity of immigrants in Germany to engage in self-employment or to remain a salaried employee. An individual is defined to be

[5] A voluntary exit does not necessarily mean a lack of entrepreneurial success.

willing to incline towards self-employment if the valuation of being self-employed versus remaining in wage/salary employment (or any unemployed), for otherwise identical situations, is positive. In other words, one is willing to start whenever entrepreneurship is seen as the best available career option. Consequently, the willingness depends on both individual preferences for the special features of self-employment as well as on the available outside options. Therefore, categories of observed variables, which potentially impact this decision-making process, are psychological, human capital and situational variables.

Chapters four, five and six investigate the success of immigrant entrepreneurs in Germany measured by the indications outlined in the previous subchapter. More precisely, Chapter four quantifies individual-specific determinants of entrepreneurship duration. I estimate a parametric hazard model to predict the survival chance of an immigrant establishing an own business. In Chapter five I propose a theoretical joint model of entrepreneurial adjustment of beliefs, effort, and performance, which links all of these phenomena together in a unified way. Additionally, I provide an econometric formulation of the model that enables to estimate the extent to which entrepreneurs exploit new information when adjusting their expectations, and in this sense, to derive conclusion about their success as entrepreneurs. Thereafter, Chapter six explores the process of working team composition within a specific company, and test the effect of the ‘similar-to-me’ hypothesis on the immigrants’ entrepreneurial performance measured by volume of sales per employee.

Finally, Chapter seven summarises the main findings and conclusions of the preceding chapters, and draws together some suggestions for future research where our understanding of particular issues is especially incomplete.

2. Immigration to Germany and Labour Market

2.1 Extended abstract

Do immigration policy, labour market structure and legal regulations influence immigrants' employment behaviour, and in particular, their self-employment activities? My main aim in this chapter is to outline briefly the migration policy pursued by the German government over the last 50 years, and to illustrate how it impacted the demographic and labour market dynamics, which I see as a major necessity for the further understanding of the phenomenon immigrant entrepreneurship. My main results confirm that institutional characteristics of the host country do impact the labour market behaviour of immigrants to Germany. Most noteworthily, immigrants from EU countries of origin account for much higher self-employment rates, while those from non-EU countries prefer being employees due to additional formal obstacles associated with the enterprise establishing procedure.

2.2 Introduction

By the end of the millennium, the immigrant population in Germany has risen to more than ten per cent, making Germany a *de facto* immigration country. The recruitment ban, and on the other hand, the residence authorisation regulations for immigrants in Germany led to a minimisation of the inter-country fluctuations and an increasing tendency towards permanent settlement among the foreign population. Additionally, the introduction of a general legal framework for family reunification resulted in an enormous change to the political and economic dedication of immigrants to Germany. They started, for instance, establishing own businesses and inclining towards entrepreneurial activities. The self-employment structure of immigrants in Germany has changed since the 1970s.[6] Over the last decade, the absolute number of self-employed foreigners developed more dynamically than the number of self-employed Germans. The stock of self-employed foreigners increased by 23.6 per cent between 1992 and 2001, while the rise in self-employment was 17.0 per cent (Täubner, 2003). Overall, I believe that the idiosyncrasies of the immigration and the naturalisation laws in Germany have shaped considerably both the quantity (flow and stock) and quality

[6] In the early 1970s only 40,000 immigrants were registered as self-employed, and their businesses were tied to restaurants or to catering to the needs of their compatriots (Constant and Shachmurove, 2003).

(human capital endowment) of the immigrants to Germany, and thus, their labour market activities.

2.3 Managing migration in Germany: historical background

In the nineteenth century, Germany was primarily a country of net emigration and it remained until the 1950s the major source of immigrants to the United States (Martin, 1997). More precisely, out of the 66 million immigrants who arrived in the US between 1820 and 2000, over seven million were from Germany, followed by six million from Mexico and five million from Italy. Since the late 1950s, Germany has experienced massive migration comparable to the level of the First American Great Migration of the early 1900s, and has become one of the most important destinations for migrants from all over the world. In this sense, it has been similar to other industrialised countries such as the US, France and the United Kingdom, but strangely, on the contrary the entrepreneurial activities of immigrants have stayed behind those in the countries indicated above.

The post-World War II immigration history of Germany is characterised by the nature of its parallel flows: ethnic Germans returning from abroad, and foreigners with non-German ancestry, the so-called 'guest workers'.[7] In this subchapter, I highlight the essential developments in the guest worker recruitment policy as a significant determinant of the recent trends in the immigrant entrepreneurship in Germany. In addition, I discuss briefly the migration situation of ethnic Germans after the fall of the iron curtain in the 1990s, the asylum policy of the German government, and I conclude with the new guest workers' programmes and the introduction of green cards.

2.3.1 From emigration to guest workers' recruitment

The second half of the 1950s was characterised by the fact that the number of vacant positions exceeded those of registered unemployed, and the employers requested permission to recruit foreign workers. Hermann (1992), for instance, concluded that there was 'no noteworthy discussion' of alternatives to employing guest workers, and social science analysts cite four reasons why recruiting guest workers seemed to be the right decision. Firstly, the German labour force was shrinking for demographic and

[7] The word 'guest worker' is the literal translation of the German word '*Gastarbeiter*' and reflects the notion that those immigrants were invited to work in Germany, yet they were not expected to become permanent residents.

related reasons in the early 1960s, including a delayed 'baby boom', the greater availability of educational opportunities that kept more adolescents in the school system as well as better pensions that prompted earlier retirements. For family political reasons, alternatives to attracting guest workers, such as encouraging more women to seek jobs, were not pursued. Secondly, there was a reluctance to risk what was perceived to be a fragile economic recovery on risky mechanisation and rationalisation substitutes to foreign employees (Kindleberger, 1967). Trade unions did not contest importing foreign labour in that period of full employment after securing a promise that foreigners would be treated equally, and thus would not underbid German employees. Thirdly, Europe was unifying in any case, and Germany had agreed that Italians and other European Community (EC) nationals would have autonomy of movement rights[8] after 1 January 1968 (Böhning, 1972). With Italians soon able to come as they wished to, Germany considered it was simply regulating unilaterally the rate at which EC employees would arrive soon by any means. Fourthly, the early 1960s provided Western Europe with a peculiar economic environment that lasted longer than assumed. Germany and other European nations in the 1960s had undervalued their currencies in a world of fixed exchange rates, so that domestic and foreign capital was invested to manufacture commodities for export markets. The incentive to invest and create employment in Germany was significantly high. Consequently, American multinationals poured enormous capital into Europe, and on the contrary Germany had little encouragement to invest and provide jobs abroad.

However, guest worker recruitment expanded faster and grew larger than anticipated. After the Berlin Wall closed the door from East to West Germany in 1961, bilateral recruitment agreements were signed with seven non-EC countries: Greece, Morocco, Portugal, Spain, Tunisia, Turkey, and Yugoslavia.[9] The core of those agreements included the enrolment of guest workers almost exclusively in the industrial sector, for vacancies with few qualification requirements. Hence, that policy pursued a dual rationale: preventing settlement on the one hand, and exposing the largest possible number of immigrant workers to the industrial sector on the other hand.

[8] Autonomy of movement in the area of the EC means that an employee from any member state may enter another, remain for up to three months in search of a vacancy, and then, if the migrant finds employment, the host country has to grant any necessary work and residence permit.

[9] Greece became a member of the EC in 1981, and Spain and Portugal became members in 1986. Greece had to wait until 1988 before its citizens got full freedom of movement rights, and Spain and Portugal, scheduled to have freedom of movement rights, in 1993, got mobility rights one year early in 1992.

In 1960, there were 686,000 foreigners, which comprised for 1.2 per cent of the total German population. At that point of time, the most important country of origin was Italy. The number of guest workers reached one million in 1964, and increased to a peak of 2.6 million in 1973, when about 12 per cent of the German wage and salary labour force was foreign employees. Most guest workers were ex-farmers between 18 and 35, although a large number of semi-skilled construction workers, miners, and schoolteachers migrated to Germany to work on assembly lines.[10] News of jobs which paid in one month a year's earnings at home, spread rapidly, and there were soon long lists of Turks and Yugoslavs signed up waiting for the chance to go abroad. As a result, by 1973 the most important country of origin was no longer Italy, but rather Turkey, which accounted for 23 per cent of all foreigners in Germany. Other countries of origin included Yugoslavia (17 per cent), Italy (16 per cent), Greece (ten per cent), and Spain (seven per cent).

The demand for immigrant labour declined in 1973, when Germany entered a period of economic recession, partially due to the world oil shock. Accordingly, the German government declared a recruitment ban for foreign workers, and it started to wrestle with the concern of how to administrate the still increasing number of immigrants in the country as two myths discouraged its planning for settlement and integration. First, Germany's so-called 'rotation principle' held that after completing one year of employment, and perhaps another two years for exceptionally efficient workers, the immigrant would return to his country of origin and invest his savings into developing his own country. Second, a fresh recruit would replace the immigrant who left the host county. The myth of return arose from immigrants who proclaimed that they wanted to return to their families and communities, to familiar languages and cultures. Most immigrants did in fact return: between 1960 and 1999, 70 per cent of the 30 million foreigners who stayed in Germany more than 90 days left, but a large proportion of earlier guest workers had already acquired residence permits for a longer or permanent duration, attesting to the limits of the rotation principle. Thus, many immigrants started obviously planning a longer or even permanent residence in

[10] While workers recruited from Turkey, Italy, Greece, Spain and Portugal tended not to possess high skill levels, a relatively large share of those recruited from Yugoslavia were skilled workers. For instance, a representative survey of immigrant employees conducted in 1972 found that 55 per cent of Yugoslav men employed in industry were skilled workers or salaried employees, whereas the corresponding figures for the other groups were much lower: 16 per cent for Turkish, 23 per cent for Italian, and 8 per cent for Greek men. For women the figures were: 14 per cent for Yugoslavs and zero per cent for the other three groups (Koenig, Schulze and Wessel, 1986, Table 55/I, p. 85).

Germany, which on the other hand is the basic requirement for engaging in self-employment activities along with specific human capital constraints.

In this vein, the failure of the rotation principle could be viewed as the first major policy-outcome gap in the German migration. However, several subsequent gaps compounded the sense that the government could not manage the migration issues. When the 1973 recruitment stop was announced, there were 2.6 million employed foreign workers, and four million foreigners, and both numbers were expected to decrease. The number of employed foreigners fell as assumed, to 1.8-1.9 million in the late 1970s. Nevertheless, the foreign population remained at four million, as unemployed immigrants who feared that they could not return to Germany remained in the country. Alternatively, many decided to unify their families, and thus, the foreign population reached 4.5 million in 1980 (Bade, 1984). In addition, newly arrived spouses were not allowed to work, and the ratio of non-workers to workers among immigrants almost doubled, from 0.7 to one in 1973 to 1.3 to one in 1980. The German government attempted to discourage family unification by prohibiting foreigners from moving to cities that were already 'overburdened', defined as cities with 12 per cent or more immigrants. However, that hard-to enforce measure simply reduced the mobility and flexibility of immigrants to Germany that had been their *raison d'être*.

2.3.2 Ethnic Germans and asylum: 1989-2000

The fall of the Berlin Wall in November 1989 opened a new chapter for international migration, and prompted a plethora of immigrants to Germany. In reality, this migration process had started in the late 1980s. Roughly four million immigrants settled in West Germany from 1988 to 1996 (Constant and Shachmurove, 2003) making this migration wave comparable to the mass migration of Jews from the ex-USSR to Israel. The so-called 'ethnic Germans'[11], who according to Article 16 of the Germany's Constitution are eligible for acquiring German citizenship if they suffered persecution after World War II because of their German heritage. In this context, there were two distinct stages of ethnic German migration. The first, between 1950 and 1987, brought 1.4 million ethnic migrants to Germany. The majority of them came from Poland, 62 per cent, followed by 15 per cent from Romania. The second stage, since 1988, brought about

[11] Ethnic Germans are mostly the descendants of Germans who migrated eastward into Romania since the 12th, and into Russia since the late 18th century, as well as Germans who were living in what was Germany when World War II ended, such as the western provinces of Poland (Martin, 2002).

three million ethnic Germans, most from the ex-USSR, and in the late 1990s, 99 per cent of ethnic Germans were from the ex-USSR. The number of ethnic Germans arriving peaked in 1989 at 397,000 (including 250,000 Poles), and consequently prompted legislative changes that made it more difficult to qualify for ethnic German status. However, the number of ethnic Germans moving to Germany fell from 222,000 in the mid-1990s to about 100,000 a year in the late 1990s.[12]

Additionally, Germany included a liberal asylum clause in its 1949 Constitution: Article 16 of the Constitution envisions an open-ended commitment to provide asylum to foreigners fleeing political persecution: 'Persons persecuted for political reasons shall enjoy the right of asylum' (Angenendt, 1997). There were relatively few asylum applications until 1980[13], when a military coup in Turkey and a realisation that Germany would not soon lift the 1973 recruitment stop prompted some Turks to fly to Germany, since visas were not required. The procedure to determine if an asylum applicant was a refugee took several years, and during that period most asylum applicants were allowed to work while waiting for the decision to be taken. As a result, Turks were over half of the 110,000 asylum applicants in 1980. In order to reduce the refugee flow from Turkey, Germany began to require visas, and on the other hand asylum applicants were prohibited from working for a period of five years. Due to the introduction of this policy, the number of asylum application dropped to less than 20,000 in 1983.[14]

The above-mentioned quick solution left Germany unprepared for the upsurge in asylum applications after 1989 and the civil war in ex-Yugoslavia. There were 103,000 asylum applicants in 1988, 193,000 in 1990, 256,000 in 1991, and a peak of 438,000 in 1992, i.e. an average of 1,200 a day. As a result, attacks on foreigners became frequent, while the attackers did not distinguish asylum seekers from other foreigners resident in Germany. Japanese and other foreign investors, for instance, even warned that, if the government could not get under control the attacks on foreigners, they would cease

[12] Those who want to further reduce the movement of ethnic Germans to Germany note that, in 1996, DM 3.1 million was budgeted to help ethnic Germans in Germany to integrate, and DM 150 million was set aside for programmes in the areas where ethnic Germans live now (Martin, 2002).

[13] According to Martin (2002), there were only 1,737 asylum applications in year1967, and 10,000 in year 1970.

[14] Germany was able to deal other asylum surges in similar ad hoc ways. For instance, Germany did not require foreign children under 16 to have visas to come to Germany, so some Sri Lankan Tamils and Iranians sent their children to Germany by air, for instance, 2,500 unaccompanied minors applied for asylum in 1988. Germany then imposed fines on airlines carrying minors without documents, and began to require visas of unaccompanied foreign minors, and the problem was successfully solved (Martin, 2002).

investing in Germany. The government reached a compromise in November 1992, which preserved Article 16, but amended it to require foreigners seeking asylum to apply in the first 'safe country' they reach. However, the 1992 compromise reduced the number of asylum applications to 116,000 in 1996, and 78,600 in 2000. Decisions were made, for instance, on 105,502 asylum applications in 2000, with asylums granted in 3,128 cases; another 8,318 applicants were given permission to remain in Germany at least temporarily. About 60 per cent of the applicants were refused asylum, and 30 per cent of the applications were withdrawn before a decision was taken. Finally, foreigners granted asylum were entitled to live as permanent residents in Germany, and to have their families join them, which in turn would alert the labour market conditions for both immigrants (already resident in Germany) and natives alike.

2.3.3 New guest workers and green cards

In the late 1980s, EC92[15] project measures stimulated economic and job growth in former West Germany just as Eastern European nations eased emigration restrictions. Poles and other Eastern Europeans began to work in Germany during their summer vacations, frequently in the agricultural sector. As Germany was reluctant to 're-create the Berlin Wall' on its eastern borders for foreign policy reasons, but it was also unwilling to tolerate the widespread employment of unauthorised foreigners. As a compromise, several foreign workers' programmes were launched that permitted some 350,000 immigrants to be temporary employed in Germany in the late 1990s (Hönekopp, 1997).[16]

In comparison to the 1960s guest workers' programmes, the 1990s ones had a different purpose and design. The objective of the 1960s guest workers' programmes was to fill job vacancies throughout the labour market, while the 1990s programmes were designed to fill vacancies in particular sectors. Thus, the project-tied workers' programme allowed German construction companies, for instance, to sub-contract to foreign enterprises. Under the subcontract the foreign firm supplied the expertise and workers to complete a phase of the project. The German Employment Service had to check up on the employer-to-employer subcontracting agreement, and the immigrant

[15] During the 1980s the European Community's 12 member nations faced substantial trade disadvantages with the United States and Japan and were battling these disadvantages from an internally divisive base. To correct this problem, the 12 members decided to extend the common market notion to a full-deregulated environment across all national borders by 1992. As a result, EC92 project was born.

[16] The majority of these 'new guest workers' were employed for less than a full year, and so they added the equivalent of about 150,000 full-time employees to the German labour force.

workers who were admitted for up to two years were considered to be Polish or Czech workers while they are in Germany; hence, they were not enrolled in the German social security system. In this sense, the number of project workers peaked at 95,000 in 1992, and averaged 44,000 in 2000.

Moreover, the 1973 recruitment ban applied to unskilled foreign workers coming to Germany for more than 90 days. In the 1990s, Germany launched a seasonal foreign worker programme that admitted workers for up to 90 days. The seasonal worker programme expanded in the 1990s – there were 129,000 admissions in 1991, 226,000 in 1997, and 264,000 in 2000.[17] The majority of the seasonal workers were requested by name predominantly to be employed by German farmers, in restaurants, or by construction contractors.

In addition, there were three other worker programmes introduced in the 1990s to manage inevitable migration and to fill job vacancies in particular sectors. One of the programmes authorised workers from the Czech Republic and Poland to commute to German jobs within 50 km of Germany's eastern borders, and to stay overnight in Germany up to two days a week. Second, a work-and-learn programme allowed 5,900 East Europeans aged 18 to 40 to live and work in Germany for up to 18 months; in 2000, for instance, 1,500 or 25 per cent of these 'new guest workers' were from Poland. Third, Germany launched a programme to admit 1,000 nurses from the former Yugoslavia.

None of the guest worker programmes aforementioned received as much attention as the Green Card programme introduced in August 2000. The programme was an effort of the German government to highlight the economic benefits of the foreign professionals, and was developed in response to a request for more high-tech employees. It allowed non-EU foreigners paid at least $45,000 a year to live and work in Germany for a period up to five years. The first green cards were issued August 1, 2000, and of the 20,000 permits available, about 12,000 were issued by April 2002, mostly to foreigners with computer skills from Eastern Europe and India.

In total, the immigrant population in Germany has risen to more than ten per cent by the end of the millennium, making Germany *de facto* an immigration country. The major lessons of the Germany's migration experience, in my view, seem to be the following two. First, guest worker recruitment programmes are far easier to start than to

[17] In some cases, the same foreign worker returned to Germany twice a year, so there were, for instance, 238,000 employees involved in 2000.

stop, as I have illustrated above, and migration programmes designed for narrow labour market reason, can impact considerably both the immigrant distribution by country of origin and by human capital endowment. They can also open avenues for family and humanitarian immigration, which will pose an additional challenge on the host country from a societal and labour market perspective. Second, policy changes can influence significantly and have visible effects on migration flows that alter public attitudes, and labour market conditions not only for immigrants but for natives as well. In this context, my next objective is to study how the above-stated migration policy of the German government was reflected in the labour market participation of immigrants in the country. I give a special emphasis on the occupational status by indicators such as nationality and region in a chronological framework.

2.4 Labour market participation of immigrants to Germany

Prior to analysing the labour market participation of Germany's immigrants particularly in a descriptive manner, I wish to highlight the demographical developments by indicators such as nationality and regional distribution. Special attention is given to the distinction between EU and non-EU nationals as they experience different obstacles when inclining towards employment activities.

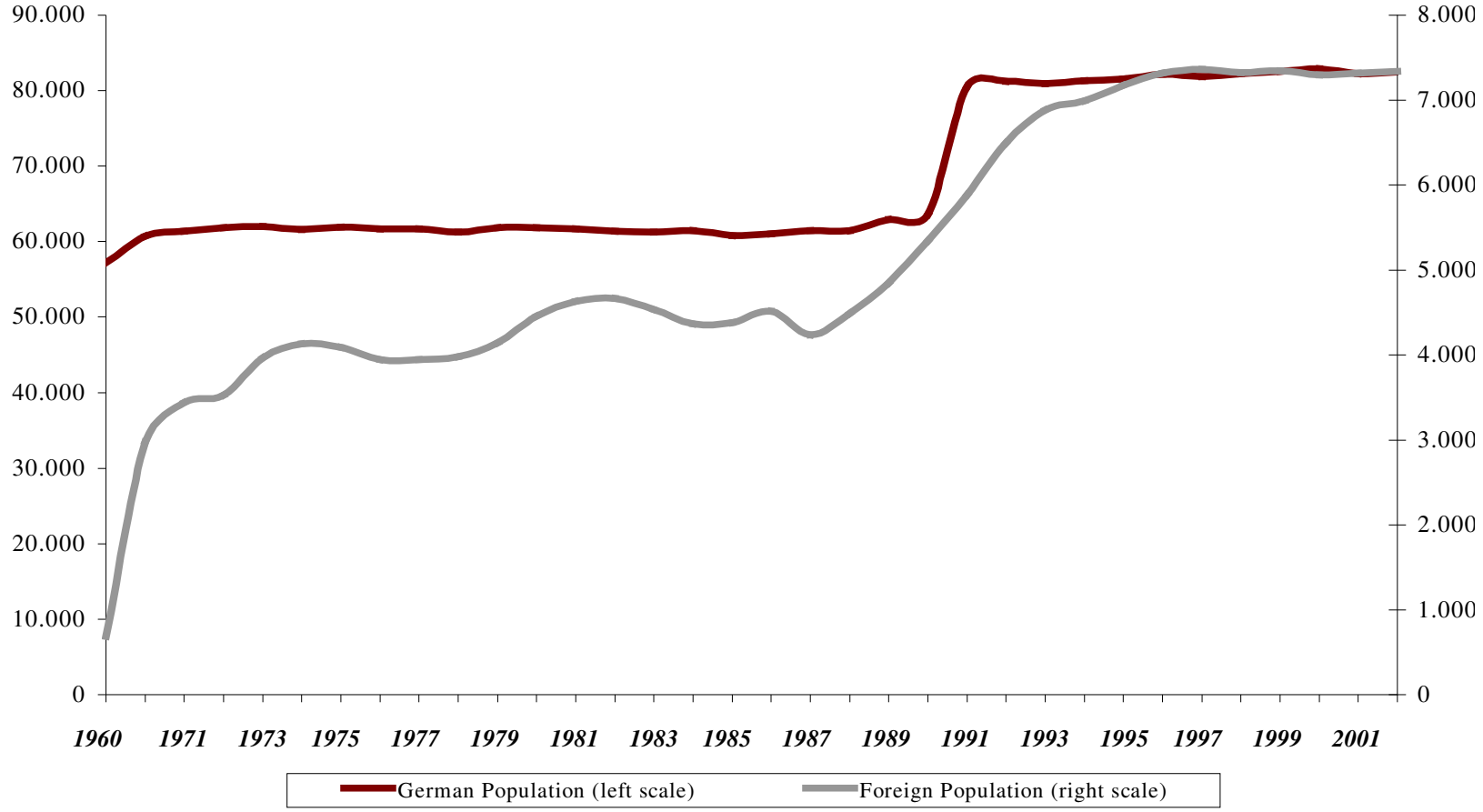
2.4.1 Trends among the immigrant population since 1960

During the first years after the founding of the Federal Republic of Germany, there were only a few immigrants resident in the country. In the 1950s, for instance, about 350,000 on average were registered in Germany, which accounted for less than 1.0 per cent of the total German population. Figure 2.1 depicts the resident population, foreign and domestic, in thousands for the period 1960-2002 to illustrate the basic demographic trends, which directly reflect the migration policy pursued by the German government.

I can identify two periods of rapid growth in the immigrant population. First, the demand for labour, as a consequence of the economic development process, exceeded the domestic labour force potential already by the end of the year 1950. Even though the steady upsurge itself called the attention of foreigners to immigrate to Germany, there had been systematic recruitment of foreign employees from particular South Eastern European countries as well. Hence, the immigrant population rose during the period 1960-1973 by 3,280 thousand immigrants or by 478.0 per cent, correspondingly.

The recruitment ban brought to an end the immigration of foreign labour as a result of the first oil price crisis at the start of the economic recession in Germany. The restrictive political measures with regard to the immigration process enforced their inclination to permanent residence, and consequently the reunification of their families. Therefore, in the following years the foreign population increased by virtue of family unifications and reached 7.6 per cent in 1982. Second, due to the political reforms in Europe, which led in the end to German reunification, a new immigration wave started in 1987 and the foreign population increased during the period 1987-1997 by 3,125,300 (73.7 per cent). Moreover, the majority of the immigrants resident in Germany originate from Turkey (26.1 per cent in 2002), followed by those from EU-countries (25.4 per cent in 2002).

Figure 2.1: Resident Population in the Federal Republic of Germany by Nationality in Thousand Inhabitants, 1960-2002



Note: Up to 1985, the cut-off day is September 30, while from 1985, December 31 of each and every year. From 1991 the population data concern the reunited Germany.

Source: Federal Statistical Office, various years.

Moreover, table 2.1 illustrates the distribution of immigrants by country of origin represented by more than 1.0 per cent for the period 1997-2002 to specify the main development trends towards nationality of the foreign population living in Germany. According to table 2.1, the foreign population resident in Germany stems predominantly either from a EU-country or from Turkey. Among the EU member states, immigrants from Italy account for 32.8 per cent, followed by Greece 19.3 per cent, and Austria 10.2 per cent in 2002, respectively. In this sense, the above-mentioned countries of origin represent almost two third of the foreigners coming to Germany from EU-member states.

Table 2.1: Distribution of Immigrants in Germany by Country of Origin in Percentage of the Total Foreign Population, 1997-2002

Nationality	1997	1998	1999	2000	2001	2002
Turkey	28.6	28.2	28.0	27.4	26.6	26.1
EU-Countries	25.1	25.2	25.3	25.7	25.6	25.4
Yugoslavia[1]	9.8	9.8	9.5	9.1	8.6	8.1
Italy	8.3	8.4	8.4	8.5	8.4	8.3
Greece	4.9	5.0	5.0	5.0	5.0	5.0
Poland	3.8	3.9	4.0	4.1	4.2	4.3
Croatia	2.8	2.9	2.9	3.0	3.1	3.2
Austria	2.5	2.5	2.5	2.6	2.6	2.6
Spain	1.8	1.8	1.8	1.8	1.8	1.7
Portugal	1.8	1.8	1.8	1.8	1.8	1.8
United States	1.5	1.5	1.5	1.6	1.6	1.5
United Kingdom	1.5	1.5	1.5	1.6	1.6	1.6
Netherlands	1.5	1.5	1.5	1.5	1.5	1.6
Iran	1.5	1.5	1.4	1.5	1.4	1.2
France	1.3	1.3	1.4	1.4	1.5	1.5
Romania	1.2	1.1	1.2	1.2	1.2	1.2
Vietnam	1.0	1.0	1.1	1.1	1.1	1.1
Morocco	1.0	1.0	1.1	1.1	1.1	1.1
Total Percentage	**99.9**	**99.8**	**99.9**	**100.0**	**98.7**	**97.3**

Note: [1]All individuals are verified that are administrated in the foreigner central register and which hold Yugoslavian nationality. Serbia and Montenegro are also included.

Source: Own calculations based on released data of the Federal Statistical Office, various years.

The immigrants registered in Germany are almost solely resident in the states of the 'old' Federal Republic. Table 2.2 depicts the distribution of foreign population by federal states as a percentage of the total German population for the period 1997-2002. Three fourth of the immigrants are concentrated in six federal states and account for 74.9 per cent of the foreigners living and working in Germany in year 2002. More precisely, 15.1 per cent are resident in Hamburg, followed by Berlin 13.0 per cent, Baden-Wuerttemberg 12.1 per cent, and Bavaria 9.4 per cent. Overall, the regional distribution of the foreign population is of importance for my dissertation as I investigate further the success of the immigrant entrepreneurs in Upper Bavaria and Hamburg city in Chapter four and six correspondingly, and this discussion aims to provide a general evidence on the population structure by regions in Germany.

Table 2.2: Distribution of Immigrants by Federal States in Percentage of the Total German Population, 1997-2002

Federal State	1997	1998	1999	2000	2001	2002
Baden-Wuerttemberg	12.6	12.5	12.5	12.2	12.2	12.1
Bavaria	9.3	9.2	9.2	9.2	9.4	9.4
Berlin	12.6	12.7	12.8	12.8	13.0	13.0
Brandenburg	2.2	2.3	2.4	2.4	2.5	2.5
Bremen	11.7	11.8	11.9	11.9	12.1	12.1
Hamburg	15.2	15.2	15.4	15.3	15.1	15.1
Hesse	11.4	12.2	12.1	11.9	11.6	11.6
Mecklenburg-Western Pomerania	1.3	1.6	1.8	1.9	2.0	2.0
Lower Saxony	6.5	6.6	6.7	6.6	6.7	6.7
North-Rhine-Westphalia	11.4	11.4	11.4	11.1	11.0	11.0
Rhineland-Palatinate	7.7	7.6	7.6	7.5	7.6	7.6
Saarland	8.1	8.1	8.2	8.2	8.3	8.3
Saxony	2.2	2.3	2.4	2.4	2.5	2.5
Saxony-Anhalt	1.7	1.6	1.7	1.7	1.8	1.8
Schleswig-Holstein	4.9	5.4	5.5	5.4	5.5	5.5
Thuringia	1.4	1.5	1.3	1.8	1.9	1.9
Total Percentage	**9.0**	**8.9**	**8.9**	**8.8**	**8.9**	**8.9**

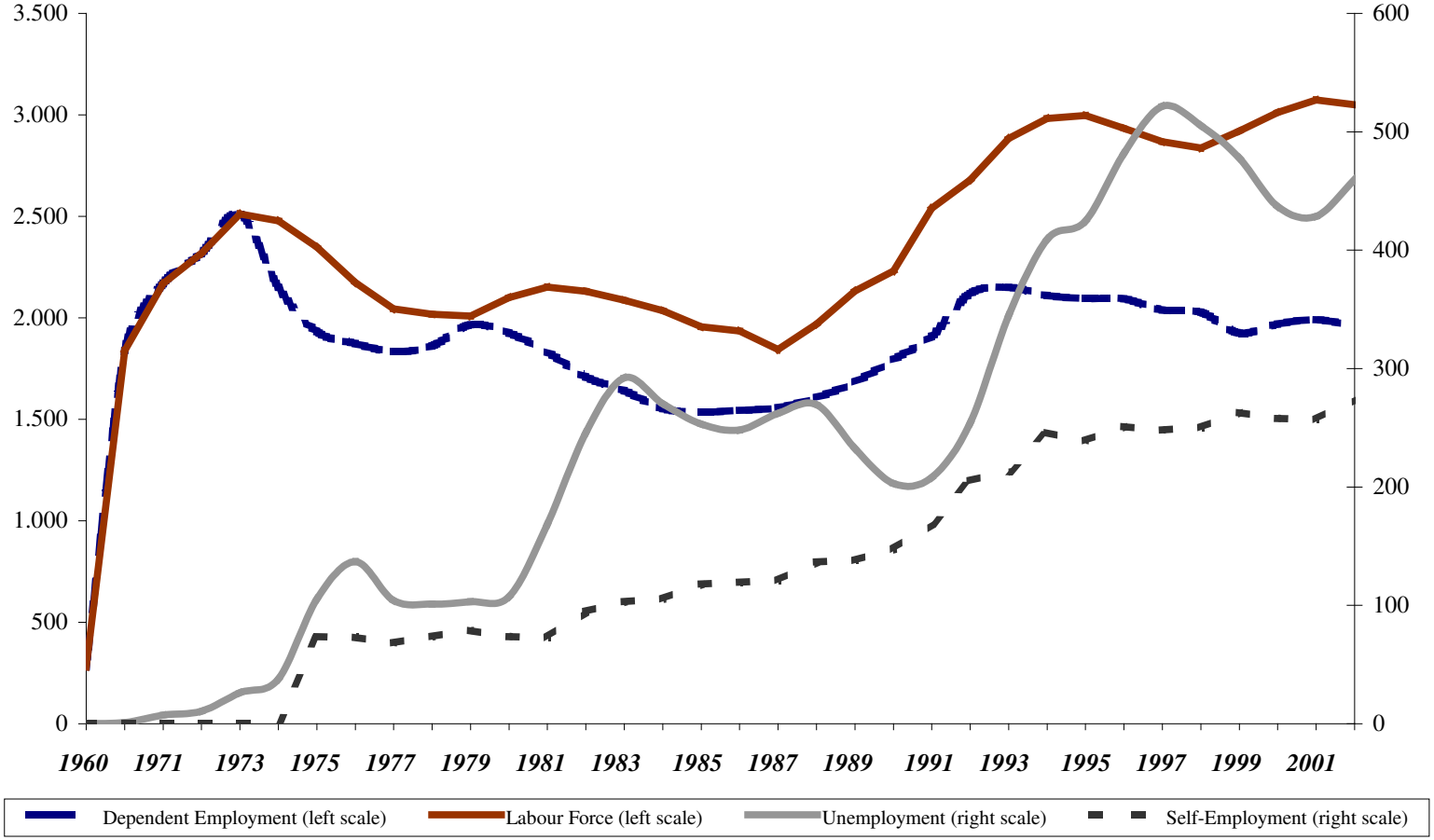
Note: The cut-off day is December 31 of each and every year.

Source: Own calculations based on released data of the Federal Statistical Office, various years.

2.4.2 Employments issues: A brief overview

The immigrant employment has increased rapidly in Germany since the late 1950s and has reached a short-term peak level of 2.5 million in 1972/73. Figure 2.2 shows the distributions of immigrant labour force, dependent employment, self-employment and unemployment for the period 1960-2002. The immigrant employees were for the most part unskilled or less qualified labour at that time recruited for jobs in the industrial sectors mining, manufacturing and construction. In 1972, for instance, 90.2 per cent of employed men worked in industry. Even for women the corresponding figure was as high as 74.2 per cent. By contrast, in the same year the share of goods employment was 60.2 per cent for German men and 36.5 per cent for German women. Additionally, as provided by the labour and social legal regulations, the immigrant employees were for the most part indeed on equal terms with their German colleagues.

Figure 2.2: Distributions of Immigrant Labour Force, Dependent Employment, Self-Employment and Unemployment in Thousand, 1960-2002



Note: Up to 1985, the cut-off day is September 30, while from 1985, December 31 of each and every year. From 1991 the population data concern the reunited Germany.

Source: Federal Statistical Office, various years.

Altogether, it seemed that immigrant labour force had to incline mainly towards activities subject to social insurance contribution until mid-1970s. The number of those who engaged in self-employment accounted for 70,000 immigrants due to restrictive general legal conditions.

The economic recession subsequent to the first oil shock in 1973 changed permanently the further development of the immigrant employment in Germany. As a response to the surplus domestic labour supply, the recruitment of immigrant employees carried out by the outpost of the Federal Employment Office was stopped. Additionally, the awarding procedure of work permits, which were required for taking-up a dependent employment, became extremely restrictive. This concerns immigrants from non-EU countries in the first instance since those from EU-countries are on equal terms with native employees since the beginning of 1970s by virtue of cross-national agreements. As a consequence, they possess unrestricted possibilities to take up either dependent employment or to incline towards self-employment activities. Conversely, all other immigrants are allowed to take employment only after obtaining the obligatory work permit. At the same time, the issuing of a 'general' work permit comes normally into consideration and is awarded only if for the target vacancy there is no available German nor an immigrant employee on equal terms with a German.

As a result, the number of immigrant employees subject to social insurance contribution declined from 2.5 to 1.8 millions (28 per cent) until 1978, and after a peak in 1979/80, it reached the level of 1.5 million in the mid-1980s. After reunification, the number of immigrant employees increased again and yielded a level of 2.0 million in the 1990s, but the trend is still downwards (see figure 2.2). On the contrary, there is a noticeable upward trend towards self-employed immigrants starting from 73.3 thousand in 1975 and reaching 274 thousand in 2002; that is an increase of 273.8 per cent for a period of 27 years. In my view, this figure explicitly indicates that the immigrants resident in Germany changed significantly their economic behaviour in favour of the self-employment. Therefore, there emerges a demand for comprehensive research in the field of immigrant entrepreneurship.

From the 1980s onwards though, immigrant employment shifted towards the tertiary sector in accordance with the overall structural change. Table 2.3 represents the distribution of the economically active immigrants by occupational status for the period 1987-2002. Accordingly, the share of the white-collar immigrant employees increased from 19.1 per cent in 1987 to 35.2 per cent in 2002, while that of the blue-collar

workers scaled down from 73.7 per cent to 54.5 per cent during the same period. More precisely, the decline of 25 per cent in the share of blue-collar workers is contrasted by an increase of 60 per cent in the share of the white-collar ones. This development, I suppose, could be explained by the fact that immigrants of the second generation graduated entirely or partially in Germany, and thus, contribute significantly to the shift observed during the last decade irrespective of other factors. Additionally, one might argue that with increasing years of residence in Germany, the acquired knowledge and skills of the first immigrants' generation also alter; hence, their occupational preferences changed in support of the tertiary sector.

Table 2.3: Distribution of Economically Active Immigrants by Occupational Status in Percentage of the Immigrant Labour Force[1], 1987-2002

Year	Labour Force, in Thousand	Self-Employed			Family Workers	White-Collar Employees[2]	Blue-Collar Workers[3]
		with Employees	without Employees	Total			
1987	1,844	3.2	3.4	6.5	0.7	19.1	73.7
1989	2,132	3.1	3.3	6.4	0.6	21.1	71.8
1991	2,539	3.2	3.4	6.7	0.5	23.2	69.6
1993	2,884	3.5	3.9	7.4	0.6	25.3	66.7
1994	2,982	3.8	4.3	8.2	0.8	27.1	63.7
1995	2,997	4.1	3.8	7.9	0.8	26.5	64.5
1996	2,934	4.5	4.0	8.5	0.9	25.5	64.7
1997	2,868	4.8	3.9	8.7	0.8	28.3	61.9
1998	2,837	4.6	4.2	8.8	1.0	29.0	60.8
1999	2,920	4.8	4.2	9.0	0.8	29.8	60.0
2000	3,012	4.9	3.7	8.6	0.9	29.6	60.7
2001	3,074	4.6	3.8	8.4	1.0	33.1	57.1
2002	3,050	4.8	4.2	9.0	1.0	35.2	54.5

Note: [1]Results based on the micro census, and from 1994 including the new Federal States; [2]Including apprentices in approved commercial and technical occupations requiring formal training; [3]Including apprentices in approved industrial occupation requiring formal training.

Source: Own calculations based on released data of the Federal Statistical Office, various years.

In total, the changing employment structure in favour of occupations that require higher initial levels of human capital endowment, demonstrates both the evolutional nature of the migration itself and the continuous modifying preferences among Germany's immigrants over the years. It is unrealistic to assume that immigrants recruited predominantly for temporary jobs in the industrial sectors mining, manufacturing and construction in the 1970s will start acquiring new knowledge and skills in the host country, and on the other hand will engage in self-employment. However, I have shown that the immigrants' employment situation has altered, and thus, wide-ranging research is needed to examine the factors determining their entrepreneurial activities in general as well as those leading to economic success.

2.5 Self-employment activities of immigrants to Germany

The Trade, Commerce and Industry Regulation Act (*Gewerbeordnung*, abbreviation *GewO*) normalises basically the taking up of self-employment activities as well as the establishing of own enterprises in the Federal Republic of Germany. Subject to § 1 *GewO,* everyone is allowed to conduct a trade as far as no exemptions or restrictions are either granted or regulated by law. The basic principle of economic freedom derives from Article 112 of the Germany's Constitution, which applies *expressis verbis* only to German nationals. Consequently, it is reasonable in my view to outline the general legal conditions for establishing enterprises by immigrants in Germany before I start with the analysis of their self-employment activities.

2.5.1 General legal conditions for immigrant's self-employment

It is often argued that the higher rate of job creation in the US compared to that in the Europe is likely linked to the relative easiness of new entry and expansion by an entrepreneurial firm (Krueger and Pischke, 1997). Entrepreneurship and self-employment, in particular, can be encumbered or empowered by the institutional settings of a country. Credit market imperfections, labour market rigidities, legal structures, and administrative red tape are the obvious culprits. In this context, Germany is characterised by a restrictive financial system whereby banks represent the major financial intermediary supplying capital to firms. Germany's labour market structure with respect to wage floors, union representation, anti-firing protections, and high payroll fringe costs is not very conducive to establishing a business (Constant and Shachmurove, 2003). Moreover, Germany's highly regulated system requires that most

workers have a special professional training, which is critical when it comes to founding an own company. Consequently, it has been argued that the segmented and regulated structure of the German labour market does not only restrict access to self-employment but it impedes immigrant earnings assimilation (Constant, 1998). Wage differentials between Germans and immigrants are affected by the segregation of immigrants into the low wage sector of the economy. Immigration laws as well as industrial or social barriers prevent mobility across sectors.

In the 1960s and 1970s there was hardly any self-employment as the guest workers migrated with guaranteed paid employment. With the exception of European Union (EU) nationals and immigrants with a residence permit, the Foreigner's Law of 1965 explicitly prohibited immigrants to engage in entrepreneurial activities (Kanein and Renner, 1988). However, the access to the labour market for immigrants, whether as an employee or self-employed, is subject to special regulations, which have been amended several times in the last decade.

Germany's Foreigners Act (*Ausländergesetz*, abbreviation *AuslG*), lastly revised in year 2002, stipulates the preconditions, which have to be fulfilled if a non-German is to work in self-employment. According to the Foreigners Act, we have to distinguish between EU nationals and foreigners from other countries when considering the legal provisions with regard to the commencement of an employment by foreigners. Citizens from a EU member state, one of the European Economic Area (EEA) states or Switzerland, have freedom of establishment and freedom of business closing within the EU member states. More precisely, EU nationals may establish a company in any member state of the EU, and on the other hand they possess a legal right to a residence permit. Since first of May 2004 (and also before that according to the Association Agreements concluded with the acceding countries), citizens from the new EU member states have the right to work on a self-employment basis, to set up or head a company. They may register a business like German nationals.

Conversely, citizens from a non-EU country of origin who enter Germany in order to work on a self-employed basis may obtain a residence permit that is issued for a certain period of time in general. If the foreigners only intend to stay in Germany for certain period, for instance, to establish an enterprise or to realise a project, the permit will be issued as a residence title for a specific purpose. Non-EU nationals, who are already in possession of a residence permit, are eligible to apply for altering the conditions of the permit in order to allow them to work on a self-employed basis. In the

case of work on a self-employment basis, an overriding economic interest or a particular local need have to exist prior to engaging in entrepreneurial activities. Before taking the decision, the foreigner's authority in charge is required in the praxis to contact usually the relevant trade authority, the chamber of industry and commerce, the chamber of crafts or other public-law professional bodies in Germany.

Moreover, foreign citizens staying in Germany for reasons other than self-employment are permitted to incline towards self-employment if, first, they possess an unlimited residence permit or the right of unlimited residence; or second, if they are married to a German national. An unlimited residence permit is issued to them after three years of marriage, which gives them the opportunity to work on a self-employed basis at any time. If they wish to found a business within the first three years of marriage, they have to submit an application to the foreigner's authority; and third they possess a residence permit as a stateless person.[18] Overall, immigrants from EU member states are on equal terms with German entrepreneurs, while those from non-EU countries are subject of treatment to the Foreigners Act, which poses restrictions among others on the right to freely choose occupational status and place of work. As a consequence, I expect the legal facilitations to be reflected noticeably in the development of the immigrants' self-employment activities in Germany, in particular, by nationality and industrial sector. Additionally, I assume that EU nationals show a higher propensity to engage in self-employment compared with non-EU nationals due to the above-stated constraints. I will prove my assumption while discussing immigrant self-employment by various indicators in the following subchapters.

2.5.2 Distribution of self-employed immigrants by nationality

I suppose that the above-described official divergences will affect the entrepreneurial activities of immigrants to Germany operationalised by the self-employment rate. Unsurprisingly, the propensity to incline towards entrepreneurial activities among immigrants from EU countries is higher compared to those from non-EU countries of origin as table 2.4 below illustrates.

[18] The exact legal provisions are formulated in paragraphs §§ 15-35 in the Foreigners Act (*AuslG*), and I derived the following summary therefrom.

Table 2.4: Self-Employment by Various Nationalities in Thousand and in Percentage, 1974-2002[1]

Nationality	1974	1977	1980	1985	1990	1995	2000	2001	2002
Austria	8	9	9	13	15	18	19	18	19
	8.4	*11.4*	*11.0*	*12.6*	*14.7*	*15.5*	*18.6*	*17.0*	*18.3*
Greece	6	7	11	15	16	27	23	22	25
	2.1	*3.2*	*6.4*	*10.3*	*9.3*	*13.5*	*12.5*	*11.7*	*13.3*
Italy	12	16	17	30	27	39	42	41	45
	3.3	*5.2*	*4.8*	*9.5*	*8.5*	*12.2*	*11.8*	*11.2*	*12.3*
Turkey	6	6	7	16	18	38	41	41	43
	1.0	*1.1*	*1.1*	*2.6*	*2.6*	*4.5*	*5.2*	*5.1*	*5.6*
EU Total	19	28	30	65	69	95	122	132	143
	6.7	*6.2*	*8.6*	*10.2*	*7.3*	*11.3*	*11.6*	*12.8*	*12.3*
Non-EU Total[2]	42	43	56	66	76	78	79	84	91
	2.7	*3.3*	*3.1*	*4.7*	*7.5*	*7.4*	*7.6*	*8.2*	*8.1*
Total	**61**	**71**	**86**	**131**	**145**	**239**	**258**	**257**	**273**
	2.5	***3.5***	***4.0***	***6.4***	***6.2***	***8.0***	***8.6***	***8.4***	***9.0***

Note: [1]The self-employed immigrants are given in thousand, and the share is computed as ratio between the absolute number of self-employed and all immigrants from a particular country of origin; [2]Countries such as Switzerland and the US are not included in this category, as they have freedom of business establishment and closing.

Source: Own calculations based on released data of the Federal Statistical Office, various years.

The different entrepreneurial behaviour among immigrants from EU and non-EU countries is largely due to the legal rights assigned to them as foreigners willing to engage in entrepreneurial activities. Immigrants from Austria account for the highest share of self-employed among the nationalities shown in table 2.4 over the entire period. One gets the impression that the majority of Austrian nationals come to Germany with the aim of establishing an own business, given the fact that the fraction of self-employment in Austria is comparatively rather low (10.55 per cent in year 2000). Additionally, the same language as in Germany and similar trade regulations regarding establishing an enterprise facilitate the entrepreneurial process. Moreover, the self-employment rates of Italians and Greeks are also above the EU-average. This tendency can be explained by the attitude towards self-employment and cultural behaviour in these countries. For instance, the self-employment rate in Italy accounted for 24.48 per cent and that in Greece for 32.36 per cent in year 2000, thus one might expect

immigrants from those countries of origin to have higher propensity of inclination towards self-employment. Finally, an upward tendency among immigrants originating from both EU- and non-EU-countries with respect to entrepreneurship does exist, but the self-employment behaviour of the non-EU nationals lags behind.

As the self-employment rates can only shed a light on the stock of immigrant's venturing activities, it is necessary to investigate their start-up behaviour, which I will undertake in the subsequent subchapter.

2.5.3 Distribution of start-ups: A comparative overview

Nascent immigrant entrepreneurs face various hindrances such as the ability to raise or secure seed capital, to acquire managerial talent, and to capture market opportunities in their decision to engage in self-employment. One of the most significant obstacles is the provision of finance for starting up their own business. The main part of newly established companies in Germany is financed by entrepreneur's savings in combination with means provided by credit institutions. Venture capital, private investors, or business angels do play a role in the start-up funding but not the central one. In the case of immigrant entrepreneurs, the family and friends assume the function of the business angels in Germany. Besides the initial constraints prior to enterprise establishment, immigrants do underwrite the risk of engaging into entrepreneurial activities. In this sense, I will discuss the entrepreneurial behaviour while comparing the start-up activities of immigrants and Germans based on the *Deutsche Ausgleichsbank-Gründungsmonitor 2002*[19] as the original data set has not been made accessible due to protection of data privacy.

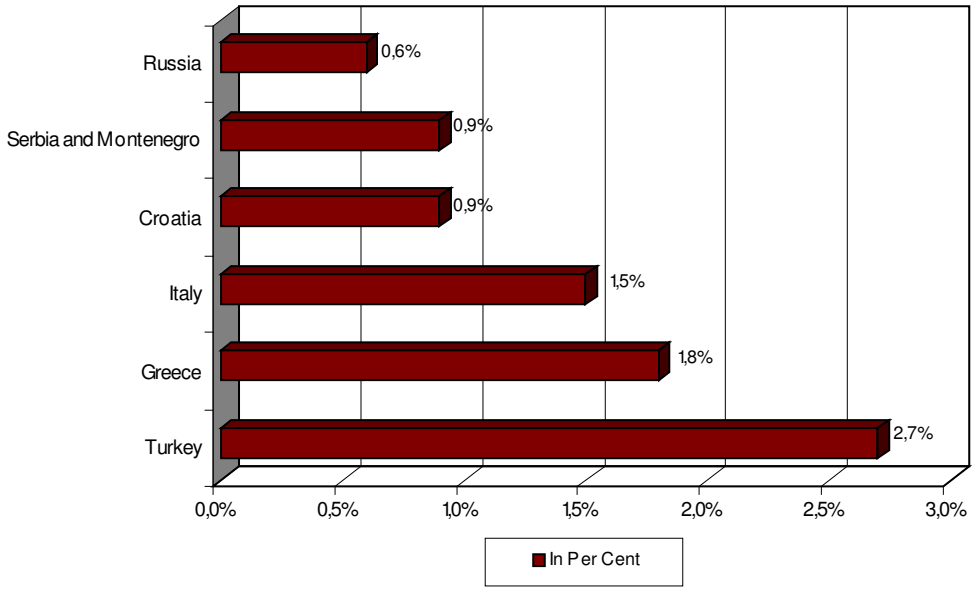
In addition, when interpreting the results for the immigrant founders, one should consider that they are only representative for those, who are willing to be interviewed telephonically; hence a certain distortion of the results is highly possible. For instance, the share of immigrants in the survey accounts for 5.6 per cent in year 2002 contrasted with 8.9 per cent disclosed by the Federal Statistical Office. The cause for the above-stated difference is the provision of information. The Federal Statistical Office reverts to data based on address registrations and micro census, and on the other hand, it defines

[19] The *Deutsche Ausgleichsbank-Gründungsmonitor 2002* (Lehnert, 2003) is a representative telephonic interview conducted by the *Deutsche Ausgleichsbank* since 2000. The main objective of this survey is to examine the entrepreneurial dynamics within the German economy with respect to native as well as immigrant founders.

immigrants by their nationality and not by country of origin as the *Deutsche Ausgleichsbank* does.

Conditional on the above-discussed differences, 40,190 Germans and immigrants were interviewed out of which 919 have established their own business.[20] According to the survey, the German founders account for 86.9 per cent while the immigrant ones for 13.1 per cent of the start-ups, respectively. Figure 2.3 shows the distribution of the immigrant establishments by various nationalities.

Figure 2.3: Distribution of Immigrants' Start-Ups by Nationality, 2002



Source: Based on released data of the *Deutsche Ausgleichsbank-Gründungsmonitor 2002*.

Among the various immigrant groups, the most entrepreneurial measured by number of founders in relative terms are Turks, followed by Greeks, and finally Italians. The remaining countries of origin are represented by less than one per cent. Additionally, the data confirm that entrepreneurship in Germany is likely to be a man's business. In that sense, only 24 per cent of the immigrant start-ups were by females in 2002, and the remaining 76 per cent by males, correspondingly.

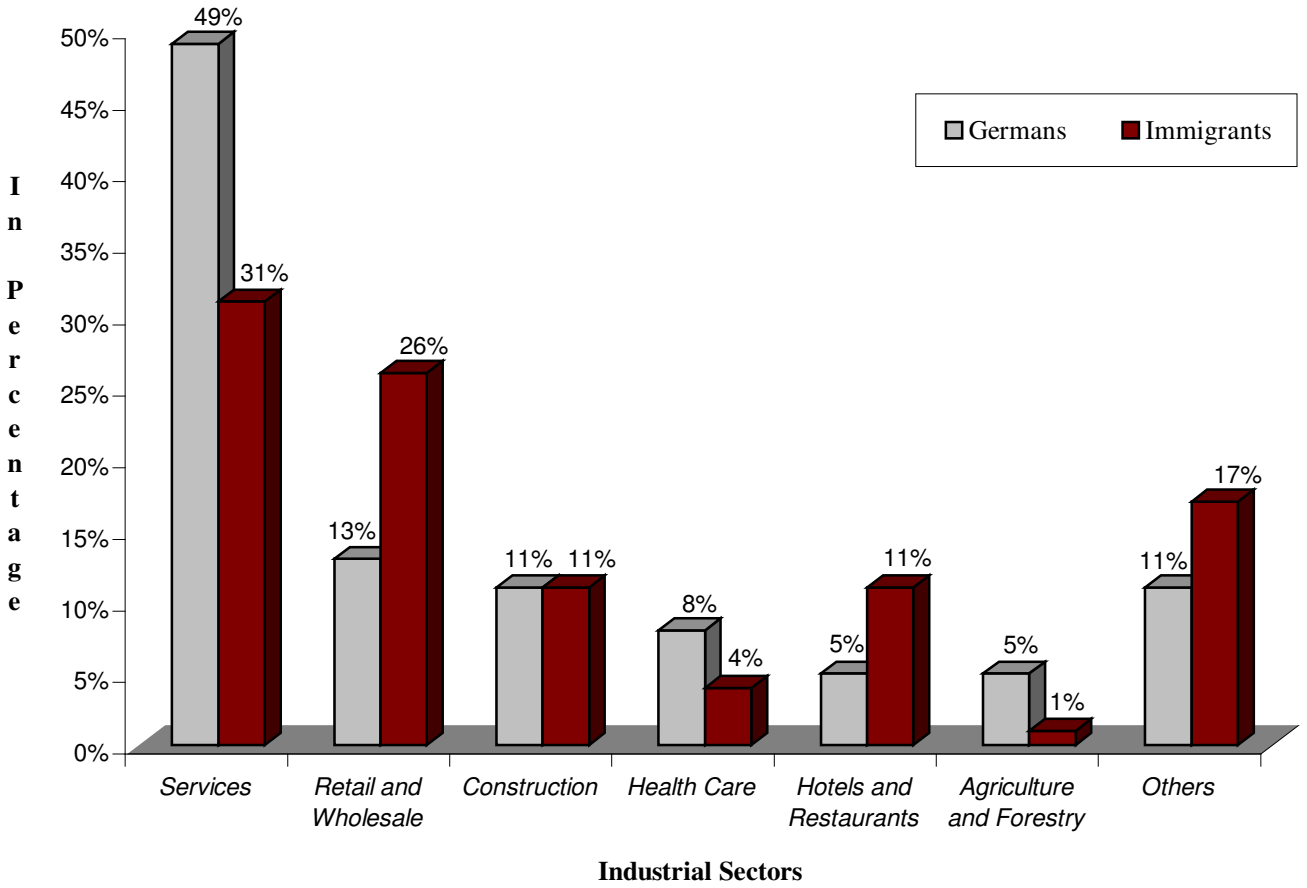
While considering the industrial sector and nationality of the founder, figure 2.4 illustrates that the most newly founded enterprises established by immigrants as well as

[20] The own business is defined here in the brother sense and includes four categories of enterprises, namely, only founder, two to five employees, 11 to 50 employees, and more than 50 employees.

natives operate in the service sector.[21] More precisely, 49 per cent of the start-ups deal in services and have a German founder contrasted with 31 per cent for immigrants. Overall, the German start-ups are more frequent than immigrant ones in services, health care and, agriculture and forestry. Immigrants give preferences to trade (retail and wholesale), construction, hotels and restaurants sector with large customer stock among both co-nationals and Germans.

[21] The service sector includes financial intermediation, real estate, renting and business activities, consulting, and education. The definitions of the above-mentioned industries are given by the NACE classification.

Figure 2.4: Distribution of Start-up Founders by Immigrants versus Germans Sector in Percentage, 2002



Note: The category other industrial sectors includes the remaining industries, in particular, such as manufacturing, transport and communications, and finally artistry.

Source: Based on released data of the *Deutsche Ausgleichsbank-Gründungsmonitor* 2002.

Moreover, the employment effects during the first twelve months after the establishment indicate that companies without employees are more frequent among Germans (26 per cent) compared with immigrant founders (16 per cent). The group of two to ten employees occurs most commonly with 54 per cent among immigrants and 52 per cent among natives, respectively (see table 2.5). In total, immigrant entrepreneurs engage on average five employees (measured by the sample median), while German ones only two.

Table 2.5: Distribution of Immigrant versus German Founders by Number of Employees Engaged in Percentage, 2002

Size of Company	Immigrant Founders, In Per Cent	German Founders, In Per Cent
Only Founder	16	26
2 – 10 Employees	54	52
11 – 50 Employees	22	15
More than 50 Employees	8	7

Note: The founder is also included in the number of employees.

Source: Based on released data of the *Deutsche Ausgleichsbank-Gründungsmonitor 2002*.

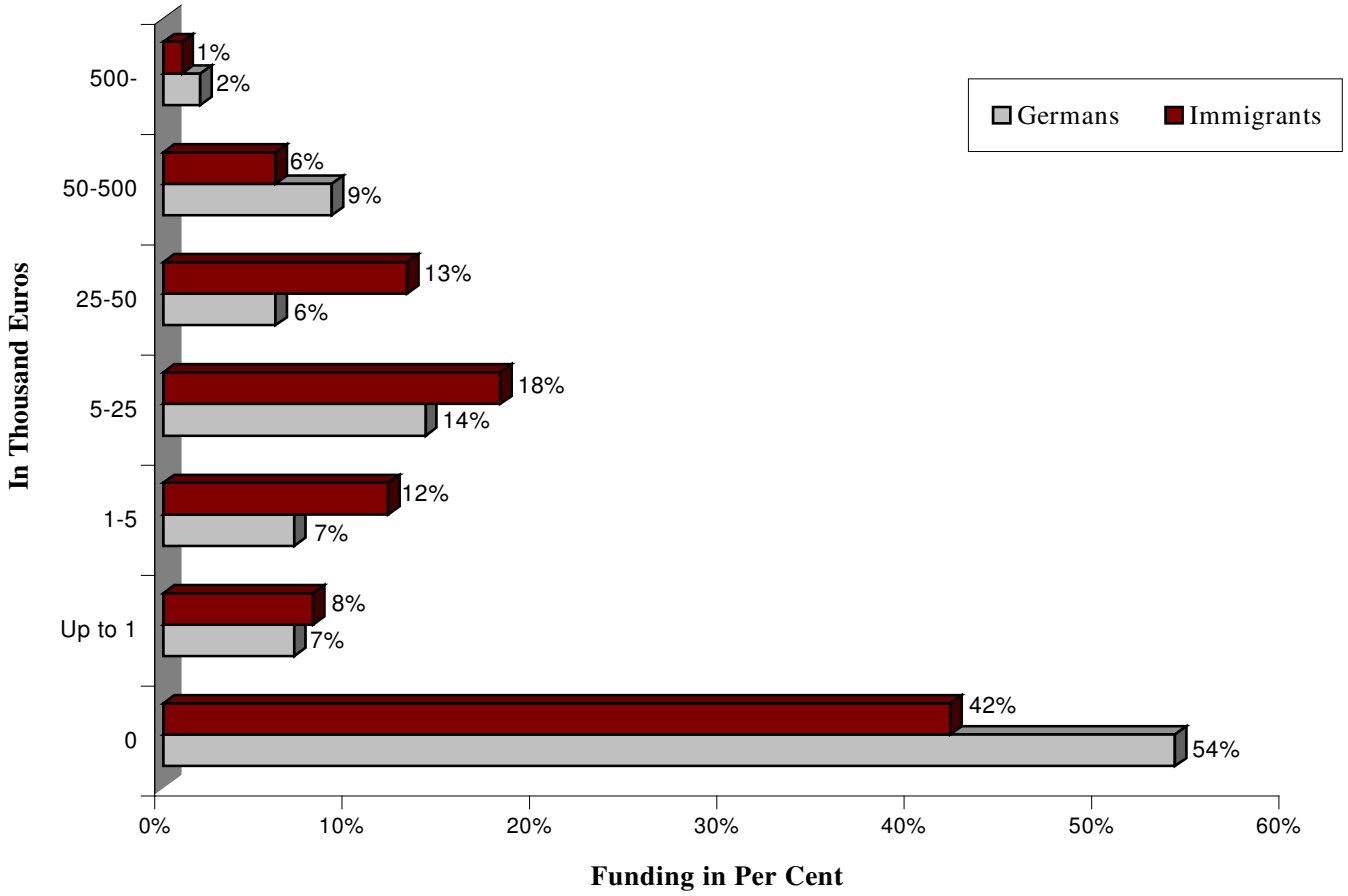
The funding of start-ups as indicated above results from a mixture of savings (presumably from family members and friends) and bank loans. The share of the nascent entrepreneurs who are in need for financial means and do not come across difficulties among Germans and immigrants is pretty much the same (43 per cent for natives and 46 per cent for immigrants). However, these numbers did not mirror my expectations, as I assumed the share of the immigrant founders to be considerable higher compared with Germans. In this sense, a difference of three percentage points is rather a small one. On the other hand, one might argue that the existence of banks such as the *Deutsche Ausgleichsbank* facilitates the start-up process. On the contrary, the share of native founders who do not acquire any funding is ten per cent greater than that of immigrants starting up their own business. For instance, immigrant entrepreneurs who seek financial means and experience obstacles account for 22 per cent, that is eight per cent higher in comparison to German founders in year 2002. In total, immigrant founders require more frequently seed capital for realising their entrepreneurial ideas on

average, and they have more often to expect fighting obstacles concerning the start-up process.

The funding structure of start-ups in Euros differs significantly among German and immigrant entrepreneurs (see figure 2.5). For instance, more Germans than immigrants indicate that there is no funding need at all.[22] Conversely, there exist more immigrant compared to native founders in the category 50 thousand Euros, while the Germans are more frequent represented in the last two categories, that is 50 to 500 thousand Euros and more than 500 thousand Euros, respectively. In this context, I can conclude that either group included in the survey operates predominantly in the area of micro lending (five to 25 thousand Euros).

[22] The funding need implicates absence of own financial means and loans provided by banks and other credit institutions.

Figure 2.5: Distribution of Start-Ups by Immigrant's versus German's Funding Structure in Percentage, 2002



Source: Based on released data of the *Deutsche Ausgleichsbank-Gründungsmonitor* 2002.

Besides the obstacles to financing the entrepreneurial idea, the rating of social and personal premises prior to establishing an enterprise plays also a crucial role. In particular, the survey records the interviewee's acceptance of diverse statements on a scale of one (truly applied) to five (not at all). The statements that have been questioned are the following:[23]

(1) To engage in self-employment is for me an attractive career alternative;
(2) The economic and political conditions in general provide me with a great opportunity to establish an own enterprise;
(3) An entrepreneur enjoys a high social esteem;
(4) I see good possibilities for me to accomplish the funding of an own enterprise;
(5) My current personal circumstances are well suited for establishing an own enterprise; and
(6) I have the personal qualifications that are required for a successful founding of an own enterprise.

The above-outlined questions enable us to obtain evidence on the driving motives prior to venturing an own business. However, I am deliberate of the fact that those are self-reported answers; hence, the results might be bias to a certain extent. Nevertheless, they allow me to shed light on the factors influencing the decision-making process.

In this context, when we differentiate the statements by native versus immigrant entrepreneurs, it is visible that either group does not vary tremendously with respect to societal acknowledgement and personal qualifications. For instance, 18 per cent (15 per cent) of the surveyed self-employed immigrants (Germans) are the opinion that entrepreneurs enjoy a high social esteem in Germany, and 13 per cent (11 per cent for Germans) possess the compulsory personal qualification for engaging in self-employment. For the remaining four statements, the immigrants' rating is much more positive than that of the German entrepreneurs. In particular, it varies from eight to 19 percentage points. In my view, the different cultural and social concepts to self-employment cause the notably high difference (19 percentage points) between natives and immigrants for the statement 'career alternative'. On the other hand, the diverse

[23] I compiled the six statements introduced below from the *Deutsche Ausgleichsbank-Gründungsmonitor* 2002.

occupational opportunities in the paid German labour market for natives and immigrants alike might also contribute significantly to that evidence.

In total, immigrants to Germany (5.4 per cent)[24] compared to natives (2.1 per cent) engage more frequently in self-employment. On average, more German than immigrant entrepreneurs dare to start up a business in the services and health care sector, while immigrants operate mainly in trade (retail and wholesale), and hotels and restaurants industry, respectively. Although immigrants face more commonly funding obstacles prior to establishing an own business, they employ more staff members on average.

2.6 Conclusion

As a main result, I should stress that the institutional characteristics of the German society, and particularly, its immigration policy, labour market structure and legal regulations, have channelled considerably the immigrants' labour market allocation process.

In the nineteenth century, for instance, Germany was primarily a country of net emigration, while since the 1950s, it has become one of the most important destinations for immigrants from all over the world. The bilateral agreements signed with seven non-EC countries for temporal employment after the Berlin Wall closed in 1961, provided the faster growing German economy with the necessary foreign labour force, the so-called 'guest workers'. Those immigrants were enrolled almost exclusively in the industrial sector or engaged in vacancies with few qualification requirements. The majority of them were ex-farmers between 18 and 35, although a large number of semi-skilled construction workers, miners, and schoolteachers migrated to Germany to work on assembly lines.

However, the decline in the demand for immigrant labour in 1973, the failure of the rotation principle, and the introduction of the family reunification legal framework led to increase in the foreign population resident in the country. Consequently, one might assume that their incentives towards permanent settlement increased, which in turn resulted in enormous change to the political and economic dedication of immigrants to Germany. The altered self-employment structure since the 1970s facilitates the aforementioned statement. More precisely, self-employment has come to

[24] The 5.4 per cent is the share of immigrant founders recorded in the survey. The 2.1 per cent is the corresponding number for German ones.

be viewed as a progressively more attractive option for economic and social mobility by the foreign population. They started establishing own businesses or are considering more often entrepreneurial activities as their main occupational choice.

Over the last decade, for instance, the absolute number of self-employed immigrants developed more dramatically than the number of self-employed Germans. The stock of self-employed immigrants rose by 23.6 per cent between 1992 and 2001, while the increase in self-employment was 17.0 per cent. Moreover, the self-employment rates show tremendous variations between nationals stemming from EU (12.3 per cent) and non-EU (8.1 per cent in 2002) countries, which could be explained to a great extent by the legal regulations. One might even assume that the different legal framework influences further the decision on the industrial sector, which the entrepreneur is operating in.

Besides the initial constraints prior to enterprise establishment, immigrants to Germany do undertake the risks of engaging in entrepreneurial activities. The start-up activities in year 2002 indicate that immigrants (5.4 per cent) compared to Germans (2.1 per cent) consider more often the self-employment as occupational choice. Although immigrants feature more commonly funding obstacles prior to venturing an own company, they employ more personnel on average.

Given this overall picture and the fact that immigrants have an increasing propensity towards self-employment, the local, state and federal governments in Germany will be required to provide the general conditions necessary to attract and simultaneously to encourage immigrants to engage in entrepreneurial activities, in particular, non-EU nationals.

Finally, policy makers and researchers in the area also need to gain a better understanding of this phenomenon, especially of its determinants leading to success, as entrepreneurship injects new dynamism into the economic development of a country.

3. Willingness to start as an immigrant entrepreneur

3.1 Extended abstract

My main objective in this chapter is to investigate the immigrants' propensity to self-employment, and in this sense to provide significant answers as to why immigrants in Germany establish own businesses and engage in entrepreneurial activities. Research in general suggests that it is a combination of individual attributes and opportunity structure with regards to the host country that facilitates or hinders the flourishing of immigrant entrepreneurship. For this purpose, I estimate a binomial logit model to capture the driving forces in the decision-making process in favour of the self-employment. Moreover, my findings suggest that higher propensity to self-employment is associated with higher levels of human capital endowment. The data on various cohorts over time show that immigrants with a longer duration of stay in Germany are more inclined towards venturing activities. EU nationals compared with CEEC nationals are much more willing to be self-employed.

3.2 Introduction

3.2.1 Former studies on the propensity to entrepreneurship

Regardless of accumulating literature on immigrant entrepreneurship and ethnic enclaves in general, research on entrepreneurship – and especially on immigrant entrepreneurship – in Europe and Germany in particular, has been somewhat scant. Recent surveys on immigrant self-employment in a comparative setting exploring research in Europe, the United States and other immigration destination identify the role of managerial and other individual abilities, family background, occupational status, financial constraints, the nature of work and ethnic enclave among significant determinants of engaging in self-employment.

More specifically, one of the major theoretical determinants of self-employment choice is the human capital endowment measured by educational attainment. Studies on immigrant entrepreneurship by Borjas (1986) and Li (2001), for instance, suggest that a more educated individual indicates a higher probability compared with a less-well educated one of choosing self-employment. In addition, Li (2001) finds based on the Longitudinal Immigration Data Base developed by Citizenship and Immigration Canada

and Statistics Canada that these selected for human capital as immigrants are even more likely to be self-employed.

On the contrary, Evans (1989) and Kidd (1993) report that a higher level of education deters entry into self-employment. Some of the variations between these studies may arise because of differences in the specification of the estimating equations. For instance, unlike other research, Evans (1989) controlled for occupational status, a variable that is positively correlated with both educational attainment and the propensity to be self-employed. This implies, however, that studies that do not account for occupational status generally report a positive (or weak negative) relationship between the self-employment and education whereas this relationship is negative and statistically significant when such a control is implemented.

The impacts of educational attainment on the propensity to be self-employed may vary across the immigrant groups in a particular country. Kidd (1993) finds for immigrants to Australia that different levels of education do not significantly influence their propensity to self-employment. In my view, there are several explanations for his result. If self-employment is the superior alternative, it implies that immigrant skills are transferable across countries, which would be contrary to the immigrant wage adjustment literature. However, if paid-employment is the superior option, the finding suggests that self-employment may be a refuge for better-educated immigrants whose foreign qualifications are not recognised in the destination labour market. The possibility that self-employment can be a refuge for individuals who experience employment difficulties in the wage/salary employment is emphasised in a number of studies (see, for instance, Rees and Shah, 1986; Evans and Leighton, 1989).

An alternative of the immigrant's accumulated lifetime learning is the age. For instance, Kidd (1993) argues that age is an index of accumulation of capital. On the other hand, age may be a proxy for an individual's attitude towards risk, with mature-age persons being unwilling to bear the stress and risk associated with self-employment, while those who are in their early working years might be more willing to take on that risk. All of the studies discussed above report a significant and non-linear relationship with the propensity to be self-employed, with rates of self-employment increasing, at least initially, with age.

The effect of years-since-migration on the employment choice is analysed by Borjas (1986), Kidd (1993), Evans (1998), and Li (2001). Period of residence could increase the probability of self-employment for various reasons. First, this effect may be

associated with knowledge of the local market and customs (Evans, 1998). A native-born individual would have an advantage over recently arrived immigrants with respect to labour market knowledge in the host country. This advantage would be expected to diminish the longer the immigrant has lived in the host country. Second, some immigrants might enter the destination country with limited capital, and duration of residence allows capital to be accumulated, thereby providing them with the resources to enter the self-employment (Borjas, 1986; Kidd, 1993). Third, the longer an immigrant resides in the host country, the greater the opportunity that individual would have had to access labour supplies and equipment.

All of the theoretical period of residence effects discussed above act in the same direction and it might therefore be expected that clear patterns would emerge from applied research. However, the empirical evidence on the relationship between period of residence and the self-employment probability is ambiguous. For instance, Kidd (1993) reports that period of residence is an important determinant of the propensity to be self-employed for male immigrants to Australia in general, but this influence differs across English and non-English speaking groups. In particular, he found that only the propensity to be self-employed of non-English speaking immigrants increases significantly at a decreasing rate with duration of residence. For the US labour force, Borjas and Bronars (1989) encountered that the relationship between period of residence and the probability to be self-employed is only significant for two (Asian and Hispanics) out of four immigrant groups. Consequently, it appears to me that the expected positive impact is offset by other factors. More precisely, paid-employment may be the immigrants' preferred occupational state and the barriers to entry into this state are reduced with length of residence in the host country. Such a pattern would be consistent with self-employment offering an alternative to unemployment for those facing difficulties in paid-employment.

Individual characteristics such as gender and marital status are also included when studying the immigrant's propensity to self-employment. Most of the empirical findings associated with these factors accord with intuition, but they confirm that there exists a positive relation between marital status and the propensity to be self-employed. Additionally, male immigrants are more likely than female ones to be self-employed (Li, 2001).

Finally, Zimmermann (1995) and Constant (1998) have studied the earning differences between immigrants and Germans, and those among various immigrant

groups insofar. Nevertheless, Germany is known to have a comparatively low rate of self-employment, but immigrants feature an even lower rate – this despite the fact that self-employed immigrants reach earnings parity of 30 per cent over immigrants engaged in the blue-collar category (Constant, 1998). A recent comparative study between Germany and Denmark illustrates that the self-employment of immigrants is male dominated and self-employed immigrants in Germany earn twice as much as the immigrants in paid-employment (Constant and Schultz-Nielsen, 2004). The difference in earnings is due to the narrower definition of immigrants applied by Constant (1998). She studied only the so-called 'guest worker' and compared their earnings with the blue-collar employees, while the second study accounted for all immigrants to Germany engaged in blue-collar as well as in while-collar category. Consequently, it is unclear why in a country with a relatively high unemployment rate and relatively institutionalised labour market entry one does not observe more self-employment among immigrants. The tendency towards self-employment activities among immigrants to Germany, however, is still increasing compared to natives. In this context, I investigate what factors drive self-employment among immigrants in Germany and raise their propensity to engage in entrepreneurial activities.

Recapitulating the foregoing discussion, given that self-employment is such a diverse and multi-faced form of economic activity, it is unlikely that one theory would be sufficient to encompass all the factors stated above to explain the entrepreneurial decision among immigrants in Germany. Economists have focused on the disadvantages immigrants face in the paid labour market as the primary cause for their higher rates of self-employment. But additional factors are also at work, because there are large variations in the self-employment rates across immigrant groups. In this sense, what makes my investigation special?

3.2.2 What makes my analysis special?

In contrast to all former studies on immigrants to Germany, I am not interested in the earnings differences between natives and migrants as well as among various immigrant groups residing in Germany, but in the factors influencing the propensity of a particular immigrant to be an entrepreneur. For instance, the *Deutsche Ausgleichsbank* (see Lehnert, 2003) is concerned only about the start-up behaviour of immigrants and Germans, and particularly in the employment and funding structure of newly founded companies. On this account, I apply the techniques of the discrete choice modelling on

individual data, which is in line with studies covering the decision-making process for countries such as the US, Canada, the UK, and the Netherlands.

In this vein, I shall contribute to the empirical research base in two ways. The first is to evaluate what observable variables affect the immigrant's propensity to self-employment in Germany. I will also discuss the unobservable factors that might have played a role. The observable characteristics (which will be explained in more detail later) consist of a set of human capital variables, individual and socio-economic characteristics. I include variables that measure economic, social, and psychological attachments to Germany (for instance, own a dwelling in the host country) as well. Following the literature that men are drawn into self-employment from the high earnings expectations, I account for the key conjecture that if the expected earnings from self-employment exceed the expected earnings from other types of employment, individual workers choose to be self-employed. Note that while Taylor (1996) finds strong statistical support for this hypothesis, others like Parker (2003) and Rees and Shah (1986) do not. Therefore, the second contribution pertains to providing significant evidence to the above-stated hypothesis using representative individual data on immigrants residing in Germany.

3.2.3 Models with qualitative dependent variables: A methodological review

This subchapter describes several econometric models with qualitative dependent variable that have become widely used for explaining individuals' decisions to participate in, to enter and to exit from, self-employment. It is necessary to outline them as the empirical analysis conducted later is based on this econometric framework.

Consider a cross-sectional data on n individuals, indexed by i: $i = 1,\ldots,n$. There are two occupational choices denoted by j: self-employment, S, and wage/salary employment, E. Each individual has a vector of observed characteristics W_i and derives utility $U_{ij} = U(W_i; j) + u_{ij}$ if they work in occupation j, where $U(\cdot;\cdot)$ is observable utility and u_{ij} is idiosyncratic unobserved utility. Then I can define the 'latent' variable, i.e. the relative advantage to S, as

$$I_i^* = U(W_i; S) - U(W_i; E) - u_{iE} + u_{iS} \tag{3.1}$$

If we assume that $U(\cdot;\cdot)$ is linear, taking the form $U(W_i; j) = \beta_j' W_i$, where β_j are vectors of coefficients, then I can write

$$I_i^* = \alpha + \beta' W_i + \nu_i \tag{3.2}$$

where $\beta' \coloneqq \beta_S' - \beta_E'$ is a vector of coefficients, $\alpha \coloneqq \mathrm{E}[u_{iS} - u_{iE}]$ is an intercept, and $\nu_i \coloneqq u_{iS} - u_{iE} - \alpha \sim IID(0, \sigma^2)$ is a disturbance term. Henceforth, I shall incorporate the intercept term in W_i as a set of ones, so β will be treated as the complete set of coefficients.

Individual i chooses self-employment over wage/salary employment if $I_i^* \geq 0$. Hence I can define the observable occupational indicator variable in the form

$$I_i \coloneqq \begin{cases} 1 \text{ if individual } i \text{ is observed in } S, \text{ i.e. if } \mathrm{I}_i^* \geq 0 \\ 0 \text{ if individual } i \text{ is observed in E, i.e. if } \mathrm{I}_i^* < 0 \end{cases}.$$

Therefore the probability that an individual with characteristic vector W_i is drawn from the population and appears in the sample is

$$\Pr(I_i = 1) = \Pr(I_i^* \geq 0). \tag{3.3}$$

In the above context, there are two major econometric specifications to estimate empirically the outlined model. The *probit* model, for instance, assumes that the distribution of the disturbance term ν_i is normal. Hence $\Pr(I_i = 1) = \Phi(\beta' W_i / \sigma)$ and $\Pr(I_i = 0) = 1 - \Phi(\beta' W_i / \sigma)$, where $\Phi(\cdot)$ is the cumulative distribution function of the normal distribution. The likelihood function is given by

$$L = \prod_{i=1}^{n} \Phi(\beta' W_i / \sigma)^{I_i} \left[1 - \Phi(\beta' W_i / \sigma)\right]^{1 - I_i}. \tag{3.4}$$

We need non-linear methods in order to maximise equation (3.4) and to estimate the β parameters up to a scalar transformation since σ is unknown. In addition, it is standard to normalise σ^2 to unity without loss of generality.

On the contrary, the *logit* model arises if the distribution function of ν_i is assumed to be that of the logistic distribution, in which case the equation (3.3) becomes

$$\Pr(I_i = 1) = \frac{\exp\{\beta' W_i\}}{1 + \exp\{\beta' W_i\}}. \tag{3.5}$$

The likelihood function can be formed in a similar way as above and β' estimated in a like manner.

In practice, estimates of β' tend to be insensitive to whether the probit or logit assumption is made. Both estimators are widely implemented and allow to obtain better results than ordinary least squares (OLS) estimation of $I_i = \beta' W_i + \nu_i$ (called the linear probability model), since OLS is an inefficient and heteroscedastic estimator in this context, and problematically can predict probabilities outside the unit interval (see, for instance, Maddala, 1983). Moreover, when we deal with a dichotomous dependent variable, as in this case, a question naturally arises as to which of the two described above non-linear models to choose. The best response to that question would be based on theoretical grounds, but well-developed theory to determine the exact functional form appears to be lacking. Many authors, however, tend to agree on the following two points.[25] First, the logistic and the cumulative normal functions are very close in the midrange, but the logistic function has slightly heavier tails than the cumulative normal. Hence, it does not matter much which function is applied except in cases when the data is heavily concentrated in the tails. And second, the logistic function is used due to the fact that it represents a close approximation to the cumulative normal and it is simpler to work with. The close similarity between the probit and logit models is confined to dichotomous dependent variables. When the dependent variable is polytomous, there exist major differences between the two models.

[25] See for further details on those arguments Maddala (1983: 9) and Schmidt and Witte (1984: 22).

Additionally, we are often interested in calculating the marginal effects of changes in the kth explanatory variable of W_i, i.e. W_{ik}, on the probability to engage in self-employment. These effects are given by

$$\frac{\partial \Pr(I_i = 1)}{\partial W_{ik}} := \begin{cases} \beta_k & \text{for the linear probability model} \\ \beta_k \Pr(I_i = 1)\left[1 - \Pr(I_i = 1)\right] & \text{for the logit model} \\ \beta_k \phi(\beta' W_i) & \text{for the probit model} \end{cases} \quad (3.6)$$

where $\phi(\cdot)$ is the density function of the standard normal distribution. In practice, these calculations are usually evaluated at sample means of the variables.

Finally, there are at least three distinct applications of the probit versus logit model to the occupational choice, which are of major interest for me from methodological standpoint. One (I) focuses on the probability that individuals are self-employed rather than employees. A second (II) asks the different question of what factors affect the decision to become self-employed, as opposed to remaining in wage/salary employment. A third (III) investigates the decision to leave the self-employment, in contrast to continuing in it. All of these applications can be handled by the probit versus logit model: they merely require a different definition of the dependent variable, I_i. However, it is important to define the relative advantages of each model. For instance, Evans and Leighton (1989) argue that (II) is preferable to (I), on the grounds that the latter confounds entry and survival effects. This is because the probability of being self-employed at time t depends on the probability of switching into self-employment at some previous time and then surviving until t. On the other hand, as Wellington (2001) points out, application (II) excludes people who are already successfully self-employed, which is evidently a group of some interest. Low annual switching rates from wage/salary employment into self-employment also means that (II) sometimes suffers from having small numbers of self-employed observations; and the characteristics of switchers may well be different from those of non-switchers. There is less disagreement about the importance of application (III). In total, all three applications generate useful information and play an important role in applied empirical research, but I will focus on the first one.

3.3 Data and hypotheses under estimation

In this subchapter, I describe the data source, discuss the creation of the major explanatory variables used in the empirical analysis, and outline the basic hypotheses in order to study the propensity to engage in entrepreneurial activities across the immigrant groups in Germany.

I provide also an overview about the basic characteristics of the self-employed immigrants and those working in the wage/salary employment in Germany. Even a decade after the unification, immigrants still predominantly cluster in West Germany and avoid the less-developed eastern part with much higher unemployment rates. The group of immigrants studied here contains the traditional former 'guest workers', namely those from Greece, Italy, Spain, former Yugoslavia, and Turkey, who (or their parents) were hired especially in the early sixties to meet the demand for blue-collar workers. However, I use also data on the 'new' immigrants from the eighties and nineties, who came mainly from Eastern Europe, among them mostly ethnic Germans from Poland, Romania, and states of the former Soviet Union. Special attention is paid to immigrants originating from EU and non-EU countries as the legal regulations with regards to the establishing process differ significantly between those two groups.

3.3.1 The German socio-economic panel as a data source

For the empirical analysis, my data is drawn from the German Socio-Economic Panel (GSOEP), which is a longitudinal survey with a yearly re-interview design conducted by the German Institute for Economic Research (DIW, Berlin) since 1984, and is largely patterned after the US Panel Study of Income Dynamics. The GSOEP provides data at household and individual level with specific information on various components of the household structure of both Germans and legal immigrants, but I will only analyse the immigrants and their employment behaviour. The immigrants to Germany are defined in the panel by country of origin and by nationality, which allow me to consider the foreigners that have already become naturalised.

Moreover, the GSOEP of the year 2000 is unique in comparison to the former waves as it permits a more detail analysis of the self-employed individuals. We can, thus, differentiate between self-employed in agriculture, in the three-lance or professional sectors, and in other self-employed categories incorporating those working for a family business.

For the purpose of my analysis, I utilise data from the GSOEP of the years 1984 and 2000. The sample I selected for the empirical study excludes those immigrants who are enrolled in school or enlisted in the military as military personnel follow different trajectories and may skew my estimates. Finally, I limit my investigation to males and females aged 18 to 64 – the prime age for self-employment endeavours – who are not born in Germany. Second-generation immigrants, however, I define by nationality.

I construct a binary variable for the self-employment status of immigrants from a self-reported answer in the GSOEP questionnaire. For all self-employed, this is their main employment, i.e. I do not consider self-employment as a secondary job. The wage/salary category includes blue-collar, white-collar, and civil servants. According to the selection criteria, I identify in the sample a total of 3,079 immigrants in 1984 and 1,966 immigrants in 2000, respectively.[26] Among them, 3.61 per cent were self-employed in 1984 and 3.62 per cent in 2000. I should emphasise here that the noticeable lower self-employment rates as opposed to these disclosed by the Federal Statistical Office are largely due to the fact that I consider only self-employment as a primary occupation.

3.3.2 Construction of explanatory variables and working hypotheses

The explanatory variables used in the analysis further include human capital variables (education and German language proficiency) and variables that show attachment to Germany and to the country of origin (years-since-migration, own a home in Germany), as well as other attitudinal and control indicators.

Human capital endowment proxied in general by variables such as age, formal education obtained either in the host or country of origin, occupational experience, or proficiency in German language are supposed to influence the decision to engage in entrepreneurial activities.

More precisely, one might expect older and/or more experienced immigrants to become entrepreneurs, for the following five reasons. First, human and physical capital requirements of entrepreneurship are often unavailable to younger employees. Older people are more likely to have received inheritances and to have accumulated capital, which can be used to establish an enterprise more straightforwardly, or to overcome financial constraints. There might also exist a particular type of human capital, which is

[26] The decline in the absolute number of immigrants is largely due to the longitudinal design of the GSOEP. Unemployed immigrants are also not included in these subsamples.

productive both in managing and in working for others, and which can be acquired most effectively by working initially as an employee (Lucas, 1978). Second, older individuals might choose self-employment to avoid mandatory retirement provisions sometimes found in paid-employment. Third, older people have had time to build better networks, and have identified valuable opportunities in entrepreneurship, possibly through learning about the business environment (Calvo and Wellisz, 1980). Fourth, as their own masters, entrepreneurs often possess greater control over the amount and place of their work, making it sometimes better suited to older people who have lost their physical stamina, or to workers in poor health or with skills that are obsolete in wage/salary employment. And five, older people might be less willing to work in a paid-employment.

Offsetting these factors, the old may be more risk averse in comparison with the young, and less capable of working long hours often undertaken by entrepreneurs. Also, Miller's (1984) 'job-shopping' theory predicts that workers try riskier occupations (like entrepreneurship) when they are younger, since these occupations provide the richest information about workers' personal job-matching opportunities. It is noteworthy, however, that this prediction does not rest on ad hoc assumptions such as the young having an innate taste for risk, or irrational expectations such as youthful over-optimism.

Descriptive studies tend to find that a switch to self-employment is concentrated among individuals in mid-career, i.e. between thirty-five and forty-five years of age including all self-employed.[27] Aronson (1991) demonstrated that self-employed Americans of both sexes were older on average than their employee counterparts throughout the entire post-second World War period. Numerous other descriptive studies from a variety of countries confirm these findings.

Before I turn to the econometric evidence, I mention two important caveats to the use of age as a measure of experience. Age and experience are not synonymous, yet a common practice (often dictated by data limitations) is to measure 'experience' as current age minus school-leaving age. This measure is imperfect because it takes no account of breaks from labour force participation in individuals' employment histories. This may be a particular salient consideration when analysing female entrepreneurship. Second, it is important to separate cohort effects from experience effects. To see this,

[27] See, for instance, Cowling (2000) and Reynolds et al. (2002) for international evidence.

consider using a cross-section of data to cross-tabulate self-employment rates by age. Suppose that there has been a secular decline in self-employment over time. Hence, older cohorts will be observed to have higher self-employment rates compared to younger cohorts, irrespective of any experience effects. To separate cohort effects from genuine experience effects accurate measures of years of actual working experience are required.

Despite the above-stated limitations, most econometric investigations have explored the effects of age on self-employment using cross-section data and have found a significant positive relationship between these two variables, while a minority reports insignificant or significant negative effect.[28] Consequently, I expect that the propensity to self-employment will increase with ageing discounted for non-linearity as older employees, and in particular immigrants, are more risk averse.

As with age, I can advance arguments to propose either a negative or a positive relationship between entrepreneurship and education. On the one hand, more educated workers select themselves into occupations in which entrepreneurship is more common such as managerial occupations for professionals (Evans and Leighton, 1989) and skilled craft jobs for manual workers (Form, 1985). As Keeble, Walker and Robson (1993) show, there are many opportunities for self-employment in knowledge-based industries. Also, greater level of education may promote entrepreneurship because more educated individuals are better informed about business activities.

On the other hand, the skills that make a good entrepreneur are unlikely to be the same as those embodied in formal education (Casson, 2003). In particular, one hesitates to suggest education as a proxy for managerial ability in entrepreneurship (Lucas, 1978). Entrepreneurs may also have fewer incentives to acquire formal educational qualifications than employees if education is an unproductive screening device used chiefly by employers to sort hidden worker types. As a result, the self-employed that does not feature this requirement can be expected to quit his education before his rate of return falls as low as that of employees'.

Additional grounds for doubting the impact of education on the decision to be an entrepreneur rest on the result that rates of return to education appear to be greater for employees than for the self-employed (Brown and Sessions, 1999). In my view, there

[28] Studies finding no significant effects of age on self-employment include Taylor (1996) and Robson (1998) for the UK; Blau (1987), Gill (1988), Evans and Leighton (1989) and Dunn and Holtz-Eakin (2000) for the US; and Bernhardt (1994) for Canada. Lin, Picot and Compton (2000) report significant negative effects for Canada. There is no evidence for Germany.

are at least three reasons why the self-employed earnings-age profile may be steeper than that of employees. First, the self-employed do not share the returns of their human capital investment with employers, who might smooth out their costs and returns over employees' lifetimes. Second, if the self-employed learn about their abilities over time with the best surviving, then one might expect to see any self-employed cohort's average returns increase over time. Third, if employees can shirk on the job, then employers may respond by steeping employees' earnings profiles in order to elicit appropriate worker effort. Naturally, no such agency problem arises in self-employment where the principal is the agent.[29] In this context, one might raise the question: are there indigent self-employed?

However, the majority of econometric investigations on the effects of education on self-employment are cross-sectional. In these studies, educational attainment is usually measured either as years of education completed, or as a set of dummy variables registering whether survey respondents hold particular qualifications. As with age, the evidence generally points to a positive relationship between educational attainment and the probability of being or becoming self-employed.[30] However, many other studies have found insignificant effects of education on self-employment[31]; and several have detected negative effect.[32] Interestingly, there is evidence that vocational qualifications and apprenticeship training rather than academic qualifications bear on self-employment choice (Knight and McKay, 2000; Cramer et al., 2002). Therefore, one might ask whether the informal education have become more important than the formal one over the time.

It is possible that the divergent results in this field of the literature can be attributed to the use of different econometric specifications, in particular, whether controls for financial variables (for instance, net family assets, income, inheritance) and occupational status are included (Le, 1999). One might expect an individual's specific occupation to be related to education, imparting possible upward bias to education

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[29] Flat self-employment earnings-age profiles can also emerge if the self-employed optimally do little investment in human capital on the job. This and other possible explanations of flat profiles are explored by Kawaguchi (2003).

[30] Studies finding a positive impact of education on immigrant self-employment in general include Clark and Drinkwater (1998) for UK; Flota and Mora (2001), and Lofstrom (2002) for the US; Li (2001) for Canada. The above list does not pretend to be complete, and evidence on Germany is lacking.

[31] Insignificant effects of educational attainment on the immigrant's propensity of becoming self-employed in general have been found by Clark and Drinkwater (2002) for the UK; Boyd (1990: for black and Asian self-employed) in the US.

[32] Negative effects of education on the immigrant's propensity to incline towards self-employment include Clark et al. (1998) for the UK.

coefficients in earnings function that omit detailed occupational control. Also, effects of education on self-employment appear to be sensitive to the industry, in which self-employment is performed. For instance, Bates (1997) reports positive and significant effects of education on the probability of entering self-employment in skilled services; negative and significant effects on the probability of entering self-employment in construction; and insignificant effects on the propensity of entering self-employment in manufacturing and wholesale. Bates concludes that the overall impact of education on self-employment is obscured by aggregation across dissimilar industries. However, I do not control for industrial sector due to the few cases, and on the other hand, industry-specific classification is provided only in the GSOEP 2000.

Given the above stated international evidence, I measure in my analysis the effects of years of schooling received in the home country and in Germany separately. In this manner, I control for differences in the initial stock of human capital (pre-migration education) and render immigrants' education received in Germany qualitatively similar to that of Germans and among the immigrants themselves. To the extent that education captures higher ability and allows individuals to know more and to have superior information set, we would expect that more years of schooling would push immigrants into self-employment. In Germany, I would assume an even stronger correlation between education and self-employment because, especially for certain occupations, there are educational requirements and qualifications deep-seated in the German Trade, Commerce and Industry Regulation Act.

In addition to age and years of schooling, I also incorporate the language information, in particular, the variable 'speak mostly German', which stems from a self-reported answer. Immigrants were asked whether they speak mostly German in their everyday life. While it does not necessarily reflect superior knowledge of the language, it nonetheless captures the easiness immigrants have with the German language, and the image they portray to others about being willing to integrate. Speaking the host country's language facilitates economic adaptation and improves economic performance. Self-employment is, in most cases, customer intensive and people-oriented; hence I expect that those who speak mostly German will have higher propensity to engage in entrepreneurial activities.

The key indicator for immigrant's integration in the host country is the years-since-migration variable (YSM). For those respondents with missing values in their year of arrival, I calculated the YSM variable following a simple algorithm: if the individual

was born in Germany, then YSM equals the age of the individual. If the individual was born elsewhere but went to school in Germany, I assigned YSM according to whether the individual went to elementary or secondary school in Germany. This variable measures the time and the quality of exposure to the German environment as well as earning-specific human capital. It is also more likely that high values indicate immigrants' familiarity with the legal regulations and the institutions. Accordingly, I assume that the longer the span of time since a particular person migrated to Germany, the higher will be its propensity to entrepreneurial activities.

Directly linked with the years-since-migration is the accumulation of immigrants' wealth. Therefore, I include the dummy variable 'own home in Germany' as a proxy for capital constraints and mobility. I suppose that more economic wealth will increase the probability of engaging in self-employment because it lessens the liquidity constraints (Taylor, 1996).

The marital status as an important personal characteristic enters the analysis as a dichotomous variable. It can play a significant role in the self-employment decision process from two diametrically opposite directions. One might expect a disproportionate number of married people to be entrepreneurs compared with single ones for the following five causes. First, a spouse can help provide start-up capital but also consume it. Once in business, second, a spouse can provide labour at below-market rates, or one can use her additional income as insurance against risky income in entrepreneurship.[33] Moreover, spouses may be more trustworthy workers, being less likely to shirk duties and responsibilities (Borjas, 1986). Third, having a spouse may offer tax advantages. These include income sharing to exploit personal tax allowances; introducing the spouses as a sleeping partner and allocating them a share of the enterprise's profits; and, if trading through a limited company, providing them with benefits, or making payments into the spouse's pension scheme. Fourth, a spouse might also act as an advisor. And lastly, entrepreneurs are older on average, and older people are more likely to be married.

Indeed, there is general but not unanimous agreement that self-employment is positively associated with marital status. But because most of the results reported above control for individual's age, these findings are probably capturing some kind of co-

[33] See, for instance, Scase and Goffee (1982) for case studies citing the importance to self-employed males of their wives' unpaid labour; self-employed tradesmen relying on their wives to take telephone bookings for work while they are out on jobs.

operative factor rather than indirect effects from age itself for endogeneity reason. My conclusion is consistent with direct evidence from Brüderl and Preisendörfer (1998) that emotional support from a spouse improves the survival and profitability prospects of business ventures newly founded by Germans.

In contrast, self-employment is considered a risky venture and as such married individuals might not opt for this occupational choice, given that their household depends on their income. Additionally, married couples with children may be unwilling to bear the risks associated with entrepreneurship; and to the extent that non-married people are 'displaced' or dissatisfied, they are arguably more likely to be entrepreneurs.

Cross-sectional econometric evidence from probit models provides consistent evidence: self-employed are significantly more likely to be, or to have been, married, with dependent children. This finding appears to hold quite generally, with possible exception of black Americans (Borjas, 1986) and all ethnic minority English (Clark and Drinkwater, 2000).

Numerous studies show that the self-employed consistently claim to enjoy greater job satisfaction than employees do, even after controlling for job and personal characteristics such as income gained and hours worked. For instance, using the British National Child Development Survey data from 1981 and 1991, Blanchflower and Oswald (1998) report that approximately 46 per cent of the self-employed claimed that they were 'very satisfied' with their job, compared with only 29 per cent of employees. It might be thought that job satisfaction would spill over into overall satisfaction with life, including work-family balance. Several authors have suggested that the flexibility of self-employment may make that occupation more conductive to balancing work and family role responsibilities, leading to enhanced psychological well-being (Loscocco, 1997). Set against this, however, is the fact that self-employed people work longer hours on average than employees do, while bearing direct responsibility for the success and survival of their business.

Nevertheless, the social context of work is likely to have a significant impact on the individual's attitude and behaviour. The finding that the self-employed reported higher levels of job satisfaction than employees is a rather robust across nations on which data are available. This result has been known for a long time in the psychology literature (see, for instance, Weaver and Franz, 1992; Katz, 1993) but is less known in economics. Recent example in economics is the Frey's and Benz's study (2002). The authors examine job satisfaction data for the UK, Germany and Switzerland and also

encounter evidence that the self-employed are more satisfied at work compared with employees. What is impressive about this research is that they utilise panel data over a number of years on the same individuals for both the UK (1991-1999) and Germany (1984-2000), and show that this result remains even in the presence of individual-specific fixed effects. In this sense, the direction of causality is clear – self-employment makes people happy. However, it is not the reverse direction of causality that happy individuals decide to become self-employed. Accordingly, I expect the self-employed immigrants to report higher 'job satisfaction' than these engaged in paid employment.

Finally, the country of origin affects the likelihood of engagement in self-employment due to the fact that legal requirements and regulations prior to establishing a business vary across the countries. Therefore, I include a dummy variable for immigrants stemming from EU- as well as for those from Central and Eastern European countries as opposed to the remaining countries of origin (see for details table 3.1) in order to examine how the start-up obstacles influence the decision-making process.

3.3.3 Characteristics of the sample populations

The differences and similarities between self-employed and salaried immigrants to Germany in my sample are highlighted in table 3.1. Between the both groups, self-employed immigrants earn, on average, significantly more in comparison to their wage/salary counterparts.

Table 3.1: Selected Characteristics of Self-Employed and Salaried Immigrants in Germany

Characteristics	GSOEP 1984		GSOEP 2000	
	Self-Employed	Salaried Employees	Self-Employed	Salaried Employees
Weekly Wages (in Euros)	831.05	473.15	1,008.96	570.28
Average Weekly Hours of Work	46.30	38.65	52.00	37.60
Length of Time with Business	5	7	9	9
Age in Years	38.17	37.07	41.25	40.63
Years of Schooling in Germany	3.78	2.14	7.83	6.68
Years of Schooling before Migration	8.64	6.28	3.82	4.17
Speak mostly German in per cent	22	26	23	29
Years-since-Migration	13.26	9.56	30.07	25.64
Male (in Per Cent)	65.77	53.96	77.46	50.03
Married (in Per Cent)	7.21	3.17	77.46	73.48
Own Dwelling in Germany (in Per Cent)	24.40	17.08	40.86	26.08
EU Nationals[1] (Numbers)	39	983	37	649
CEEC Nationals[2] (Numbers)	23	533	5	190
Number of Observations	111	2,968	71	1,895
Self-Employed as Percentage of the Total Group Observations	3.61	-	3.62	-

Note: [1]EU countries include Greece, France, Italy, Spain, the Netherlands and Great Britain.
[2]CEEC include Albania, Bulgaria, Czech Republic, Estonia, Former Yugoslavia and Republic of Macedonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

Source: Own calculations based on data from GSOEP 1984 and 2000.

The earnings disparity between self-employment and wage/salary employment remained almost constant. This statistical evidence shows, therefore, that self-employment is a lucrative choice for immigrants to Germany if they have the abilities; in particular, self-employment is a means of traversing and even annihilating the native-immigrant wage disparity. In a similar vein, this pattern applies to the weekly hours of

work. All immigrant entrepreneurs work more hours per week than salaried employees, even the average weekly hours increased from 46.30 in year 1984 to 52.00 in the year 2000. In other words, I can assume that immigrants willing to work longer and perform overtime would have a higher propensity to self-employment.

For the purpose of the study, the extensity of engagement in self-employment can be conceptualised as the extent to which members of groups incline towards any form of self-employment and it can be operationalised as the fraction of a particular immigrant group that reported self-employment income in a given year. Consequently, the larger the percentage of a group reporting self-employment income in a given year, the more extensive the self-employment activities can be inferred for that particular immigrant group. In this context, I found low self-employment rates for either year – GSOEP 1984 and 2000 – under investigation. Apart from the low percentage rates that I calculated based on the sample populations, a stable, increasing tendency exists towards immigrant entrepreneurship in Germany. Moreover, in 1984, 35.14 per cent of the self-employed immigrants are EU nationals (EU almost defined as the EU of 2000) and only 20.72 per cent come from CEEC. This pattern changed dramatically in the year 2000. Nationals from EU countries account for 52.11 per cent of the entrepreneurial activities among immigrants to Germany compared to 7.04 per cent of nationals from CEEC.

The human capital endowment measured as the number of years of schooling seems to play a major role in the decision-making process. All immigrants had some schooling before migrating to Germany; their educational attainment was higher when they are self-employed, i.e. self-employed immigrants spent four years longer in the education system than the wage/salary workers on average in 1984 while this gap shrunk to 0.8 years in 2000. Additionally, in 1984, immigrant entrepreneurs received 12.42 years of schooling on average while this number declined in year 2000 and reached 11.65 years of education. Nevertheless, the ratio between the years of schooling obtained in the country of origin and in Germany changed to the benefit of the German education. More precisely, in 1984, 30.43 per cent of the years of schooling were spent in the German education system while in 2000, this percentage reached 67.21. This tendency towards accumulating human capital in the host country is not surprising at all as more immigrants have been living longer in Germany.

Male and female immigrants to Germany differ in the likelihood to engage in venturing activities: the data depict that male immigrants have a higher tendency to be self-employed than female immigrants for the same year. For instance, the fraction of

the male self-employed immigrants was 65.77 per cent in 1984 and even 77.46 per cent in 2000, respectively. As a result, I can conclude that male immigrants still predominantly occupy the self-employment sector in Germany, while the females indicate higher propensity to the wage/salary sector.

Marital status affects the immigrant's propensity to self-employment as well. For instance, in 1984 a substantial proportion of immigrants were single (94.81 per cent on average for the total sample), while the share for the self-employed was slightly lower (92.79 per cent). This picture changed drastically in the year 2000. The majority of self-employed immigrants were married (77.46 per cent). Consequently, one might argue that married immigrants have higher probability to be entrepreneurial in Germany. With aging the probability to marry increases. This might be one possibility considering the longitudinal structure of the GSOEP. On the other hand, spouses contribute to the venture as voluntary family members in the regular case; in other words, they are source of labour at below-market rates.

Finally, table 3.1 shows that immigrants have been living in Germany for about a quarter of century, indicating a rather permanent migration. The average, self-employed immigrant has been in Germany for 30 years (GSOEP 2000). Even the percentage of the immigrants owning a dwelling in Germany compounds the conjecture towards permanent residence.

3.4 Predicting immigrants' propensity to be an entrepreneur

3.4.1 The self-employment decision

In my methodological framework, the unit of analysis is the immigrant to Germany. I model the choice behaviour as a binomial logit assuming that individual agents in the host country a facing two alternatives: the option of being self-employed versus working in the wage/salary sector. The decision, as discussed earlier, will depend on several factors that determine potential earnings in each sector. Assuming that individuals are risk neutral and maximise expected net earnings, an immigrant will choose the self-employment option if the expected financial rewards from self-employment, denoted by y_i^S, are greater than the market wages versus salaries from other types of employment, represented here by y_i^E. The utility function also indicates preferences for the characteristics of work in the two occupational choices that is denoted by z_i. The characteristics z_i are supposed to affect the utility but not the

earnings in each of the occupations. In addition, earnings in each sector will depend on a vector of observable characteristics X_i and idiosyncratic unobservable ones ε_i. Hence, an immigrant chooses self-employment if the expected utility from self-employment, depicted $E\left(U_i^S\right)$, is greater than the expected utility in the wage/salary sector, represented in the model by $E\left(U_i^E\right)$. Consequently, the utility functions in either sector can be defined in the form given by equations (3.1) and (3.2)

$$U_i^S = z_i^S \alpha^S + y_i^S = z_i^S \alpha^S + X_i \beta^S + \varepsilon_i^S \tag{3.1}$$

$$U_i^E = z_i^E \alpha^E + y_i^E = z_i^E \alpha^E + X_i \beta^E + \varepsilon_i^E \tag{3.2}$$

where ε_i^S and ε_i^E are jointly normally distributed with mean zero and variances σ_S^2 and σ_E^2. In this sense, an immigrant decides to become self-employed if

$$I_i^* = E\left(U_i^S\right) - E\left(U_i^E\right) > 0 \tag{3.3}$$

Clearly, the index function I_i^* is not directly evident since we do not observe the financial rewards for the option not chosen. In other words, we do not observe the wage/salary earning that a self-employed immigrant would earn if the wage/salary sector were chosen. From equations (3.1), (3.2) and (3.3), however, I_i^*, can be defined as:

$$\begin{aligned} I_i^* &= E\left(U_i^S\right) - E\left(U_i^E\right) \\ &= X_i \beta^S - X_i \beta^E + z_i^S \alpha^S - z_i^E \alpha^E + \varepsilon_i^S - \varepsilon_i^E \\ &= W_i \pi + e_i \end{aligned} \tag{3.4}$$

I set $I_i = 1$ if $I_i^* > 0$, if an immigrant is self-employed, and $I_i = 0$ if $I_i^* \leq 0$, if the paid-employment is selected. Consequently, equation (3.4) can be viewed as a binomial logit model of the occupational choice of self-employment.

Moreover, the choice probability, assuming a logistic distribution, is:

$$\Pr(I_i = 1) = F(W_i\pi + e_i) = 1/\left(1 + \exp\left[-(W_i\pi + e_i)\right]\right) \tag{3.5}$$

where F is the logistic density function. The probability an immigrant chooses the wage/salary sector is then simply: $\Pr(I_i = 0) = 1 - \Pr(I_i = 1)$. The parameters π reflect the impact of W_i on the probability that $I_i = 1$.[34]

The explanatory variables in W_i consist of a set of human capital, individual specific and socio-economic characteristics which I have discussed comprehensively earlier in this chapter. All these independent variables are expected to affect the immigrant's propensity of engaging in entrepreneurship.

3.4.2 Empirical results of the entrepreneurial decision

The occupational choice – self-employment or wage/salary employment – an immigrant to Germany makes will depend on several driving forces. As explained above, an immigrant is assumed to compare the expected utility from work as self-employed to the expected one from the paid-employment.

In this sense, I applied the binomial logit model outlined above to male and female immigrants as a group taking into account the years 1984 and 2000. For each of the respective years, I estimated two different econometric specifications, referred to as model 1 and model 2, which I will discuss below in greater detail.

The factors impacting the immigrants' propensity to self-employment are depicted in table 3.2 for 1984 and table 3.3 for 2000, respectively. Moreover, for each of the logit models computed, I present the coefficient estimates with p-values in parenthesis underneath. In the adjacent column, I show the odds ratios.

Among all immigrants, the probability of being self-employed increases significantly with age at a decreasing rate. As predicted, and in line with other empirical analysis (Blanchflower, Oswald and Stutzer, 2001), this signifies that self-employment is an effective choice later in life. Additionally, due to the fact that the aging effects in year 2000 are even stronger than in year 1984, these results show a stable age profile of immigrants to Germany with respect to entrepreneurial behaviour. I estimated, in particular, a rapid increase in the propensity to self-employment activities relative to the

[34] The parameters of the logit model are not necessarily the marginal effects, but they vary with the values of W_i. This is why the odds ratio is used. In essence, the estimated coefficient π represents the change in log odds for a unit increase in the independent variable.

paid-employment of 1.49 per cent (1984) and 10.06 per cent (2000) for model 1 based on the marginal effects.

As assumed, the impact of education (pre- and post-migration education) on the self-employment decision is positive. In fact, additional year of education obtained in Germany increases immigrant's probability to be self-employed. For instance, in 1984 each extra year of post-migration education raises the marginal effect on self-employment by 0.81 per cent while in 2000 by 1.31 per cent according to model 1. Even though the impact of years of education in the country of origin on immigrant's propensity to self-employment is positive, the marginal effect accounts only for 0.32 per cent (1984) and 0.07 per cent (2000) based on model 1.

When controlling for EU and CEEC, the influence of the factor EU-national is 13.77 per cent in 1984 and 11.79 in 2000, correspondingly (model 2).

Table 3.2: Estimation Results on the Propensity to Self-Employment: Immigrants in Germany, 1984 (Logit Models)

Explanatory Variables	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Intercept	-3.2012 (0.0000)	-	-3.3825 (0.0000)	-
Age	0.0596 (0.0436)	1.0614	0.0598 (0.0056)	1.0616
Age Squared	-0.0008 (0.0374)	0.9992	-0.0009 (0.0135)	0.9991
Years-since-Migration	-0.0452 (0.0265)	0.9558	-0.0306 (0.0386)	0.9699
Years-since-Migration Squared	0.0003 (0.0007)	1.0003	0.0004 (0.0012)	1.0004
Years of Schooling in Germany	0.0325 (0.0221)	1.0330	0.0441 (0.0286)	1.0451
Years of Schooling before Migration	0.0128 (0.0678)	1.0129	0.0086 (0.0561)	1.0086
Speaking mostly German	0.5670 (0.4512)	1.7630	0.5524 (0.4508)	1.7374
Overtime in Hours	0.0290 (0.0001)	1.0294	0.0290 (0.0000)	1.0294
Own Dwelling in Germany	0.3246 (0.5608)	1.3835	0.2214 (0.4531)	1.2478
Job Satisfaction	0.0186 (0.2653)	1.0188	0.0231 (0.1589)	1.0234
Male	0.3880 (0.0554)	1.4740	0.3965 (0.0532)	1.4866
Married	0.8429 (0.0282)	2.3231	0.7891 (0.0312)	2.2014
EU Nationals			0.6021 (0.0456)	1.8259
CEEC Nationals			-0.0006 (0.1208)	0.9994
Number of Observations	3,079		3,079	
McFadden R-Squared	0.2173		0.2170	
LR Statistic (p-value)	209.2165 (0.004)		210.8945 (0.0003)	

Note: P-values are set in parentheses. The shadowed area indicates significance at one, five and ten per cent level.

Table 3.3: Estimation Results on the Propensity to Self-Employment: Immigrants in Germany, 2000 (Logit Models)

Explanatory Variables	Model 1		Model 2	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Intercept	-6.6850 (0.0000)	-	-6.0598 (0.0000)	-
Age	0.4208 (0.0000)	1.5232	0.3898 (0.0011)	1.4767
Age Squared	-0.0048 (0.0009)	0.9952	-0.0046 (0.0016)	0.9954
Years-since-Migration	-0.0552 (0.0365)	0.9463	-0.0488 (0.0288)	0.9524
Years-since-Migration Squared	0.0056 (0.0023)	1.0056	0.0064 (0.0042)	1.0064
Years of Schooling in Germany	0.0525 (0.0021)	1.0539	0.0641 (0.0386)	1.0662
Years of Schooling before Migration	0.0028 (0.0178)	1.0028	0.0016 (0.0761)	1.0016
Speaking mostly German	0.6670 (0.5512)	1.9484	0.6524 (0.4878)	1.9201
Overtime in Hours	0.0086 (0.0000)	1.0086	0.0134 (0.0000)	1.0135
Own Dwelling in Germany	0.2210 (0.4608)	1.2473	0.2302 (0.5531)	1.2589
Job Satisfaction	0.3256 (0.0000)	1.3849	0.3356 (0.0000)	1.3988
Male	0.4439 (0.0129)	1.5588	0.4125 (0.0554)	1.5106
Married	0.0601 (0.6275)	1.0619	0.0421 (0.7312)	1.0430
EU Nationals			0.5021 (0.0306)	1.6522
CEEC Nationals			-0.0046 (0.0908)	0.9954
Number of Observations	1,966		1,966	
McFadden R-Squared	0.3273		0.3426	
LR Statistic (p-value)	214.7342 (0.0000)		215.1245 (0.0000)	

Note: P-values are set in parentheses. The shadowed area indicates significance at one, five and ten per cent level.

The odds of engaging in self-employment almost double for immigrants with good knowledge of the German language (GSOEP 2000). These results corroborate my hypothesis that self-employment is customer intensive, and on the other hand, one should be able to read and understand properly the official documents associated with the performing of entrepreneurial activities. Consequently, a certain proficiency in the German language is required. More interesting, language skills are here independent of schooling; hence they are significant endogenous.

Immigrants to Germany who are willing to work longer have a higher propensity to be entrepreneurs. In other words, the odds for 1984 are slightly smaller than those for the year 2000. Although the explanatory variable 'job satisfaction' is not statistically significant for 1984, its sign shows that self-employment among immigrants is associated with higher occupational satisfaction levels: estimates for the year 2000 confirm this result. One possible explanation for this finding could be that immigrants often experience social exclusion in their wage/salary working environment and entrepreneurship may be a means of cutting through it and being accepted as a full member of the German society.

As for socio-demographic factors, I found that marriage was associated with self-employment (GSOEP 1984). This impact remained positive for the year 2000 as well. More accurately, while for 1984 the odds doubled reaching values of 2.32 (model 1) and 2.20 (model 2), I obtained estimates of 1.06 (model 1) and 1.04 (model 2) in 2000. In this context, self-employment seems to be the occupational choice among the married population of immigrants to Germany. I am not surprised to uncover that married immigrants are often self-employed due to the fact that marriage offers flexibility in the allocation of time between family and work, and on the other hand trustful employees at lower wages versus salaries. But nevertheless, the marital status has become less important factor over the decades. Additionally, self-employment appears to be man's business among the immigrants. Being a male raises marginally the inclination towards self-employment by 9.53 per cent in 1984 (model 2) versus by 9.89 per cent in 2000 (model 2).

For immigrants, the self-employment propensity first decreases and then increases with years-since-migration (YSM). The marginal effects for the variables YSM and YSM-squared are –1.22 per cent and 0.16 per cent in 2000 (model 2), correspondingly. This U-shape finding means that when immigrants arrive to Germany, they have a lower likelihood to choose self-employment probably because of

institutional barriers and liquidity constraints. When immigrants have resided longer in the country, the probability to engage in self-employment increases again. This suggests that once immigrants have overcome the initial adjustment shock, they see self-employment as a means of taking advantage of the opportunities in the host country and achieving higher socio-economic standing.

In order to investigate the influence of institutional barriers and liquidity constraints, I included a dummy variable for immigrants stemming from EU- versus CEEC- country into the empirical analysis. Among all immigrants, I find that, *ceteris paribus*, the odds of becoming self-employed are almost double for those from EU countries in 1984 whereas CEEC nationals are giving preference to the wage/salary sectors. In other words, being a EU national increases the marginal effect in favour of the self-employment activity by 13.77 per cent in 1984, and by 11.79 per cent in 2000, respectively. Finally, the propensity of engaging in entrepreneurial activities for immigrants from CEECs decreases over time, i.e. the marginal effects are -0.01 per cent in 1984 and -0.11 per cent in 2000. Consequently, I can conclude, that institutional, legal and liquidity hindrances, irrespective of other factors that immigrants from different countries of origin might face, do affect their decision-making process. One could argue that the less the obstacles prior to becoming self-employed experienced by immigrants to Germany, the stronger the preferences for this occupational choice.

3.4.3 What has changed during the period 1984-2000?

During the investigated period 1984-2000, I did observe various changes in the factors considered to impact the immigrants' propensity to self-employment, which I should discuss in greater detail. More precisely, the positive marginal effect of age on the probability to be self-employed increased by 84.12 per cent given that the immigrant entrepreneurs were on average 3.08 years elder in 2000 compared with those in 1984. In a similar vein, the discounting impact of aging on being an entrepreneur rose by 81.82 per cent, i.e. the negative influence of the variable 'age-squared' on the propensity to self-employment increased tremendously. These alterations speak for the fact that self-employed immigrants reach faster the threshold value in 2000 where an additional life year does not lead to higher probability to engage in entrepreneurial activities. Overall, the positive marginal effect of lifetime experience measured by age did strengthen over the period.

In addition, the formal pre-migration education became less important while that received in Germany gained significance. For instance, the marginal impact of the years of schooling obtained in the host country rose by 31.25 per cent while that of schooling in the country of origin declined by 80.95 per cent during the period 1984-2000. These results are not surprising at all as, for instance, second generation migrants have graduated almost entirely from the German education system. Consequently, an additional year of formal education in Germany should be associated with higher propensity to self-employment in 2000 as opposed to 1984.

Even though the immigrants to Germany indicate on average 2.28 times longer period of residence in the country in 2000, the negative marginal impact on their propensity to be an entrepreneur increased by 37.70 per cent during 1984-2000. One might argue that the disadvantage of recently arrived immigrants in comparison with both natives and immigrants with some years of living in the destination country aggregated during the period under investigation. On the other hand, the longer period of residence (variable 'years-since-migration squared') drives by 93,75 per cent stronger the immigrants' propensity to self-employment.

Moreover, the self-employment among immigrants to Germany remained the preferred occupational choice of males. The marginal effect increased slightly (by 3.64 per cent) over the time. On the contrary, the individual characteristics 'being married' became less important while deciding to incline towards entrepreneurial activities.

Finally, the institutional and legal framework proxied by EU- and CEEC-nationals also indicates certain changes during 1984-2000. For instance, the positive marginal effect in favour of the self-employment activities diminished by 16.79 per cent for EU-nationals. Inversely, the negative impact on the probability to be an entrepreneur for immigrants from CEECs rose by 90.91 per cent. As a result, I can conclude that for EU- as well as for CEEC-immigrants the propensity to choose the self-employment as occupational choice declined during the period under study.

3.5 Conclusion

In this chapter I initiated the analysis of entrepreneurial behaviour of immigrants residing in Germany. In particular, I estimated the propensity of male and female immigrants aged 18 to 64 towards self-employment as an alternative to the wage/salary employment. Based on GSOEP data for the years 1984 and 2000, the obtained empirical

results by employing a binomial logit model suggest that immigrants are drawn into the world of business ownership by different factors.

As main result, I should stress the human capital endowment component studied by variables such as age, formal education received either in the country of origin or in Germany, and finally proficiency in German language. Overall, I uncover that the propensity to self-employment increases with immigrant's age at a declining rate. The age of individual can be viewed as a proxy for the accumulation of human capital in general. For instance, older people are more likely to have accrued working experience, to have established better networks, or to have developed valuable business ideas that can be successfully realised as self-employed. Formal education received either in Germany or in the country of origin propels the decision for self-employment. As assumed, the marginal effects of the schooling obtained in Germany are higher for both years under investigation.

Moreover, labour-intensive occupations and willingness to work overtime speak against the wage/salary employment as occupational choice. On the other hand, self-employed immigrants do indicate higher job satisfaction, which is in line with the previous research. The impact of the years-since-migration variable displays a U-shape. In other words, during the first years since migration, immigrants choose self-employment as a channel for entry into the labour market of the host country, while the likelihood decreases over time. However, when they have accumulated more years of residency in Germany, their likelihood of being self-employed is increasing again.

Contrasting two groups of immigrants – the EU and the CEEC nationals– I uncover that the odds of engaging in self-employment double for those stemming from EU countries. One might argue that this is due to lower institutional barriers to enter the self-employment activity and/or better funding opportunities aside from other prospective factors. On the other hand, it is difficult to provide evidence to the question why immigrants from certain countries of origin are more inclined towards self-employment than those from other countries. For instance, Li (2001) find for Canada that immigrants from West Europe have much higher propensity to engage in self-employment than those stemming from East Europe, and those from South Europe decide for the wage/salary employment given the equal entry conditions across all immigrant groups.

Finally, my analysis does not refute the conventional understanding that blocked mobility in the open market prompts some immigrants to enter entrepreneurial venture.

The findings are not inconsistent with the view that immigrants encounter various obstacles in the labour market, but they mainly imply that those who have the means to do so, more successful immigrants, manage to engage in self-employment to improve themselves financially, possibly as an avenue of upward mobility.

In summary, the self-employment sector in Germany is at the very early stage of development, but it has still the potential to grow. For the sake of entrepreneurship growth in Germany, it is imperative that individuals have unfettered access to the formal labour market. Especially for immigrants, it is important that they be given opportunities to implement their entrepreneurial endeavours and contribute to the wealth of the German economy by venturing into their own businesses.

4. The impact of human and social capital investments on survival in Upper Bavaria

4.1 Extended abstract

My objective is to analyse the impact of human, in particular general and industry-specific, and on the other hand social capital on the survival performance of immigrants as a significant determinant of entrepreneurial success. For this purpose, I develop a parametric hazard model to predict the survival chances of newly registered companies by immigrants in Upper Bavaria comparatively to Germans. Based on representative data from the Chamber of Industry and Commerce in Munich, I confirm the negative influence of either aforementioned type of capital on the hazard rate. Most notably, the inverted U-shape relation is not only evident between success and human capital endowment, but between social capital and survival duration as well. The latter result is unique in its nature, and has not been detected for the area of immigrant entrepreneurship in general.

4.2 Introduction

> *…the requisite capacity and talent limit the number of competitors for the business of entrepreneurs. Nor is this all: there is always a degree of risk attending such undertakings; however well they may be conducted, there is a chance of failure; the entrepreneur may, without any fault of his own, sink his fortune, and in some measure his character (Say, 1971: 33).*

Launching a new venture and being a successful immigrant entrepreneur in a new economic and social environment after overcoming the start-up stage are two considerably different subject matters. The economic performance, in particular the survival, of the newly established business can be influenced by factors such as human and social capital. Investments in human and social capital are widely believed to enhance employees' performance (Boselie, Paauwe and Jansen, 2001; Gelderblom and de Koning, 1996; McDuffie, 1995). Similarly, many authors advocate that this relationship should also exist in the case of entrepreneurial performance (Brüderl and Preisendörfer, 1998; Van Praag and Cramer, 2001; Van Praag, 2003). This is understandable, since entrepreneurship is, first, a fundamental characteristic of modern,

knowledge-based economic activity. And second, it is because the potential value of new business ideas and knowledge is inherently uncertain. This uncertainty, however, can be absorbed by a large number of individuals starting new enterprises to pursue, investigate and implement ideas (Audretsch and Thurik, 2001).

The links between entrepreneurship and survival have been investigated in a number of social science disciplines, including economics, sociology and regional studies. Numerous studies (see Geroski and Schwalbach, 1991) reported on the research related to the extent, causes and consequences of firm entry into the market. More recently, Geroski (1995) as well as Audretsch and Mata (1995) provided evidence that one of the major conclusions from entry studies is that the entry process does not end with the entry itself. The greatest obstacle in analysing the post-entry performance of firms is the lack of longitudinal databases that identify the actual start-up and closure dates of new firms.

Several studies, however, have investigated the post-entry performance of new enterprises and their determinants. Hall (1987) found, for instance, that the survival rate of new entrants is low, but their survival probability is positively correlated with firm size and age. Phillips and Kirchoff (1989) showed that the probability of survival increases with firm age. They also found that survival rates varied by industrial sectors, with manufacturing indicating the greatest survival rate on average. Dunne et al. (1989) uncovered for US manufacturing plants that the failure rates decline with size and age, as do the growth rates of surviving plants. The main conclusion of their post-entry performance analysis was that the entering plants most likely to survive and grow were plants that were diversifying into other industries.

Moreover, using historical data on companies with ten and more employees operating in the region of Baden, Germany, Baten (2001a) confirmed that the survival likelihood increases with firm size and age apart from other industry- and region-specific factors during the first phase of globalisation. As opposed to the Audretsch's and Mahmood's study (1995) on US manufacturing establishments, his empirical results showed that branches of a firm had lower mortality rates compared with the parent enterprise, which is well explained by the different legal regulation in either countries.

Finally, Audretsch (1995) used the theory of firm selection and industry evolution[35] to deduce hypotheses (initial start-up size and employment growth rate) about the factors shaping the post-entry performance of newly launched companies, and on the other hand the factors determining their employment growth and survival.

Almost all of the studies aforementioned focus their analysis on manufacturing industries merely. However, none of them investigate the post-entry performance of immigrant entrepreneurs, and more precisely of those venturing in Germany. Consequently, the objective of this chapter is to quantify, aside from other determining factors, the extent to which investments in human and social capital do enhance the immigrants' entrepreneurial success in Upper Bavaria, Germany, the only region for which the Camber of Industry and Commerce collects data on nationality. I do so by estimating a duration model, in particular, a Gompertz-Makeham hazard model. The extreme scarcity of the application of such techniques to understand business survival is astonishing. To the best of my knowledge, this is the first person-orientated duration analysis for business survival of enterprises established by immigrants in Germany, and on the other hand applying longitudinal data for the same.

The success in entrepreneurship has no unique definition or measure. It has been quantified in empirical economics by means of observed self-employment earnings[36], by firm size (according to Lucas' theory (1978)), by firm growth (Evans, 1987) as well as by means of the probability that one has remained an entrepreneur for a certain while. Brüderl, Preisendörfer and Ziegler (1992) define success as duration in business. However, I do believe that the duration of entrepreneurial venturing can be used as a measure of success in business, unless people generate a lower income than from the next best alternative. Consequently, my critical variable is the survival time (in months) of the business established by a particular immigrant in Upper Bavaria.

The remainder of this chapter is organised as follows. First, I specify the determinants human and social capital, which, it has been suggested, affect entrepreneurial performance at the individual level. Moreover, social capital, as a

[35] Jovanovic (1982) provides a theory of selection and industry evolution, i.e. firms learn about their efficiency as they operate in the industry. The firms may begin at a small – even suboptimal scale of output – and then, if they are merited by subsequent performance, they can expand. Those firms that are successful will grow whereas those that are not successful will remain small and may ultimately be forced to exit from the industry if they are operating at a suboptimal scale of output.

[36] Measurement errors are probably large when measuring self-employment earnings and not only because perceived definitions vary, but also because entrepreneurs tend to underreport their earnings due to tax shelter considerations, or to overreport as a consequence of feelings of pride or shame.

specific type of investment, is usually defined as an aggregate variable: the norms and networks of a particular community, for instance. As the decisions to invest in social capital are made by individuals and not by communities, I will put forward a definition of individual social capital that we can view as a counterpart to the community social capital. With this premise in mind, I test two kinds of hypotheses, which I specify in the following subchapter. Second, I provide details on the dataset applied to test the underlying hypotheses. Third, I outline the hazard model applied in the empirical analysis and close with an extensive discussion of the obtained results.

4.3 Determinants of survival in immigrant entrepreneurship

Several studies have been conducted on industrial dynamics or on the process by which newly established companies either survive and grow, or exit from the market. In the last few years, empirical research that has been undertaken by Fichman and Levinthal (1991) and Brüderl (1992), uses the arguments of organisational ecology, in which they modify the liability of newness argument. This suggests that organisational hazards[37] actually follow an inverted U-shaped pattern rather than continuously declining with age. This argument is associated with the 'liability of adolescence': during the first short period, the hazard (mortality) rate is rather low, but on the other hand, the end of adolescence (after six-nine months) is denoted by a mortality maximum. Moreover, they argue that newly founded enterprises often possess a stock of initial resources, such as human, social and financial capital, for instance. This stock helps them to survive for a specific period of time, during which they can establish their new structure. This early stage of a company life cycle is named 'adolescence'. During early adolescence one might expect lower mortality rates, whereas at the end of this phase, mortality should increase dramatically due to used up initial resources and final evaluation. In this context, it is essential to investigate further the relationship between the human and social capital endowment and the firm founder's performance after the adolescent stage. Do companies with more general and industry-specific human and social capital endowment perform better?

It is a well-known fact that the firm founder's performance is determined not only by talent, economic circumstances and good luck, but also by human, social and financial capital. In my view, firm performance can be used as a proxy for the

[37] The organizational hazard is defined as the mortality rate, which gives for every age the probability that the established enterprise will die in the next, short interval, conditional on still being alive.

performance of the firm's founder, because no other human capital is available during the first year of a start-up. The focus of my research, therefore, is the impact of human and social capital on the survival of newly established businesses by immigrants in Upper Bavaria. I am particularly interested in the general and industry-specific investments in these types of capital.

4.3.1 Human capital hypothesis

Human capital has long been acknowledged as an important factor for individual productivity (Becker, 1964; Schultz, 1961) and has been increasingly identified as a factor influencing the performance of firms (Bartel, 1989; Howell and Wolff, 1991; Prais, 1995). The development of modern ideas about human capital is largely due to the research of Theodore Schultz and Gary Becker because of their separation (and Becker's coining) of the terms 'general' (off-the-job training) and 'specific' (on-the-job training) human capital. The majority of social science researchers, who have adopted the human capital framework, use synonymously education, skills, and human capital. In particular, in the vast majority of human capital studies, education is the most important component of human capital. There is, however, an increasing number of scholars who point out that formal education is only one way to create skills. Howell and Wolff (1991), for instance, question the adequacy of years of education as a measure of workplace skills. They argue that most jobs require a multitude of different skills for adequate task performance, ranging from physical abilities to cognitive and interpersonal skills. Moreover, they consider that in some occupations, educational achievement may not be a direct measure of job-related skills *per se*, but a device used to screen for the ability to learn on the job, and for desirable social and personal characteristics.

Currently, human capital is a widely used concept with complex and varying definitions. In certain contexts, it might include only acquired formal education, whereas in other circumstances it can encompass a wider set of investments that potentially affect the well-being and productivity of individuals, firms and nations (Mincer, 1974). This might include investments in health and nutrition, as well as vocational training acquired outside the formal education system.

The positive impact of human capital on employee performance is widely accepted in social science research. Van Praag and Cramer (2001) made a first attempt to formulate this implication for the case of the business founder. Several authors,

including Pennigs, Lee and Van Witteloostuijn (1998), Van Praag (2003) and De Wit and Van Widen (1989), have put forth empirical support for the theoretical foundation. As referred to earlier, most of the studies concentrate on human capital-related issues; those associated with human capital theory implicitly assume that survival is not problematic. In fact, most of the existing empirical studies, whether they use statistical analysis (Bartel, 1991) or case studies (Blanchflower and Burgess, 1996; Mason and Wagner, 1999), neglect the issue of survival, focusing their investigation on firms that were in business at the time of the survey or study. A large proportion of firms, however, do not survive as identifiable units beyond their first few years, and only a small proportion achieves significant growth (Baldwin, 1995). Nevertheless, human capital does influence the survival performance of newly established enterprises.

Empirically, educational achievement or years of schooling as a proxy of human capital stock and skills is one of the most frequently employed measures when investigating the value of human capital for the economic performance. By using variables that only reflect formal education, these studies neglect the human capital accumulation that is obtained by on-the-job-training. Age structure could be a proxy for this learning-by-doing process. For instance, taking the age of the founder, Preisendörfer and Voss (1990) ascertained for German founders a negative effect of their age on the mortality rate, whereas the effect of the additional variable, age-squared, is positive. They interpreted this inverted U-shaped relationship as analogous to the well-known concave age-income profile in human capital research. Accordingly, the basic argument that high human capital endowment of the founder improves chances for enterprise survival seems plausible. In this sense, the existing literature in general gives support to my first hypothesis that

Hypothesis 1: Higher levels of human capital accumulation as measured by age of the immigrant entrepreneur are associated with higher survival rates of newly established enterprises in general.

This relationship, however, will have to be scrutinised while controlling for other influencing factors.

4.3.2 Social capital hypothesis

As far as I know, the impact of social capital on a business founder's performance has not yet been put in an appropriate theoretical perspective. In recent years, the concept of social capital has been associated with a number of characteristics vital to public policy making. Referring to features such as trust, norm and networks (Putman, 1993), it has been shown to be a causal factor of corruption (Uslaner, 2001), economic growth (Zak and Knack, 2001) and quality of government (Knack, 2002). Social capital can alternatively also be defined as people's ability to work together in groups and companies for a common purpose (Coleman, 1988). As such, the presence of social capital determines how easily transaction costs are reduced because informal self-enforcement of contracts is possible without third-party enforcement. Having social capital can thus help alleviate Prisoner's dilemma-type situations and in this way, social capital becomes 'the glue that holds societies together', lubricating voluntary collective actions, increasing income, dampening the effect of uncertainty on entrepreneurial performance, and accordingly, serving as an additional production factor.

Moreover, Glaeser, Laibson and Sacerdote (2000) developed a theory of investment in individual social capital. For the benefit of identifying determinants of social capital formation, the authors first seek to understand the social capital decision of individuals. Their understanding leads to seven propositions of which a subset is relevant for my analysis: (i) a rational individual's investment in social capital is higher in occupations with greater returns to social skills such as involving intensive contacts with other people, (ii) social capital effect declines with expected mobility, (iii) people who invest in human capital will invest in social capital as well. Since small business founders used to have more intensive contact with all the prospective stakeholders in their company, such as clients, investors, debtors and subcontractors, the expected benefits to social skills are high in this case. Furthermore, Blanchflower (2000) showed that business founders are less mobile in comparison with employees, but the immigrant entrepreneurs might be different in comparison with the native ones. However, this implies by proposition (ii) of Glaeser, Laibson and Sacerdote that the expected returns to social capital are higher than average for business founders, because they need otherwise to control everything. The third proposition of Glaeser, Laibson and Sacerdote assumes that individuals, for whom the net return to human capital is high, might also expect a relatively high net return to social capital. One could argue that the

process of acquiring human capital implies closer and more intensive contacts with different people, which might result in higher levels of social capital endowment.

For the purpose of my investigation, I focus on social capital related to the resources already acquired via the social network and on access to the resources of the network ties, which include both human and social capital of the ties. In this context, research on immigrant entrepreneurship reveals, for instance, that within the closely knit communities of Chinese and Korean immigrants, even distant family members are willing to fund a new business start-up (Bates, 1997).

Additionally, ethnic and linguistic homogeneity appears to be an important factor in creating social capital. The highest levels of human capital within the United States, for instance, are in the states of the Old Northwest[38], which are among the most homogeneous in the country (Glaeser, 2001). Many authors have identified the percentage Lutheran effect or the Scandinavian effect on social capital, which seems to be linked to the relative homogeneity of these areas. Indeed, out of the six countries with the most social capital, four are Scandinavian. At the bottom of the list is Brazil, which is an enormously heterogeneous area. Ethnic heterogeneity is often accompanied by education and income heterogeneity, both of which also appear to depress the acquisition of social capital. However, we could assume that impact of ethnic and linguistic homogeneity as proxy for social capital endowment on the survival performance of newly established enterprises would be positive, i.e. enterprises established in countries, regions and industrial sectors characterised by higher levels of homogeneity would have lower transaction costs, and thus, a better chance of survival at least in the first few years after enterprise establishment. Hence, hypothesis two implies that

Hypothesis 2: Higher levels of social capital endowment are associated with greater survival performance of the particular enterprise establishment.

4.3.3 Specificity of investment in human capital

The capital invested by the business founder can be differentiated with respect to the specificity of investment. In accordance with the human capital theory (Becker, 1964)

[38] The Old Northwest in the US refers to the area that became the states of Ohio, Indiana, Illinois, Michigan, Wisconsin and a portion of Minnesota.

and the Resource-Based theories of the firm (Montgomery, 1995), the more specific an investment to its current application, the higher should be the expected returns and its contribution to the firm survival performance, respectively. On the other hand, the returns on a deliberate specific investment in a current activity should be sufficiently sizeable to outweigh the cost associated with this investment. Contrarily, the returns on an investment in a more general asset might accrue to the investor over a long period of time while performing miscellaneous activities. Moreover, the Resource-Based theory of the firm assumes that success is determined by the extent to which Ricardian rents are earned by the accumulation and development of non-imitable resources. The likelihood of resources being non-imitable is higher when they are obtained through specific investment than through more general investments. Consequently, I should contrast general investment with industry-specific investment in human capital. The latter investment loses part of its value outside the industry, which the enterprise is operating in. My next hypothesis, therefore, is that

Hypothesis 3: Industry-specific investments in the entrepreneur's human capital have a stronger influence on the survival of a company than general investments.

4.3.4 Immigrant and native entrepreneurs

As the main objective of my analysis is to investigate to what extent the investments in human and social capital influence the survival performance of immigrant entrepreneurs, it is essential to discuss in general the differences between immigrants and natives. The tendency and/or ability to start one's own business will presumably differ between Germans and immigrants. More precisely, arriving at the decision to emigrate involves taking risks, which is also the case for entrepreneurial activities. Immigrants, could, therefore, be expected to have the right attitude necessary to establish their own enterprises. The above stated might not be true for second-generation immigrants, as they did not experience the migration process to the host country. In addition, certain immigrant groups (for instance, these from non-EU countries) are often at a disadvantage in the host society, because of difficulties with German behaviour, language and attitudes. They hold a weak position in the job market and, when they are employed, are often situated among the 'secondary' labour market occupations (SER, 1998). One way for immigrants to escape their lower class position

is to become entrepreneurs. Accordingly, there might be three types of immigrants who decide to start their own business: first, such immigrants who are forced to enter the self-employment sector due to the likelihood of better opportunities than in the wage/salary sector; second, immigrants whose decision to establish an enterprise has been considered in detail. In this sense, the survival performance of these two types of immigrant entrepreneurs might differ, i.e. the survival rate among the former may be lower than for the latter. And third, some are certainly a combination of those two types. Unfortunately, in my empirical analysis further, I cannot account for the aforementioned differences among these types of immigrant entrepreneurs in Germany, due to the specific structure of the data applied.

When adding the Germans into the framework, I should expect a better survival rate in comparison with the immigrants. Various factors account for the conclusion that Germans perform better than immigrants in general. In this context, it is noteworthy that immigrants, for instance, have to overcome more obstacles with respect to venturing activities. Accordingly, my next hypothesis states that

Hypothesis 4: Immigrant and German entrepreneurs differ as regards their survival performance. The survival rates of enterprises established by Germans may be higher than those of immigrants in general.

4.4 Patterns of survival performance in Upper Bavaria

4.4.1 Data set employed in the survival analysis

I base my survival analysis upon representative longitudinal data from the Chamber of Industry and Commerce in Munich, Germany. The initial data set consists of 122,195 companies that have either been founded or liquidated by immigrants and Germans in Upper Bavaria. The data on start-ups are available for the period 1990-1994, and on liquidation for 1990-1997. Due to the specific structure of the empirical data, the survival time is the only measurement of entrepreneurial performance, i.e. the hazard of business ownership. Additionally, I have constructed a variable measuring the number of years that a firm has been active, as the business registration and deregistration is specified by actual date. I applied a survival model when analysing this performance measure. Besides the survival period that I have computed, the data provide information on: (i) administrative district (‘*Landkreis*’) where the enterprise has been established;

(ii) cause and mode of liquidation; (iii) first name, date of birth and nationality of the entrepreneur, which provides me also the opportunity to ascertain the gender of the founder in 95 per cent of the cases; and finally (iv) industrial sector, which the enterprise is operating in.

The data set described above is fascinating, but there are some problems due to process-specific matters. In 173 start-ups, for instance, the year of liquidation was before 1990 or after 1997. Since it was impossible for me to reconstruct which point the company was actually liquidated at, these cases were treated as missing values. Additionally, in 7,000 cases, the date of liquidation was before that of establishment, therefore, these cases as well as those where the reason of liquidation was 'doubly documented' were excluded from the empirical analysis. As a result the further econometric analysis is based on 114,550 registrations and liquidations.

In addition to the fundamental variables stated above, I collected a series of context-specific parameters, in particular such as: (i) number of companies in various industrial sectors according to administrative district at different points in time; (ii) population at different points in time; (iii) unemployment rates; (iv) real gross domestic product; (v) immigrants dependent on wage/salary employment; and (vi) number of resident immigrants.

4.4.2 Dimension and likelihood of survival by immigrant's nationality

For the period of empirical investigation, immigrants in Upper Bavaria established 12,945 enterprises out of 114,550, whereas in 36 cases the entrepreneurs are stateless. Additionally, for 428 registrations, the nationality of the founders is not indicated; thus I excluded them from the further analysis.

However, table 4.1 shows the distribution of the fifteen most entrepreneurial immigrants by nationality. The companies listed in the table account for 90.64 per cent of all businesses established by immigrants to Upper Bavaria, as other nationalities that are represented in the data set by fewer than 100 members, i.e. less than one per cent, are not included here. Germans registered the remaining 101,177 enterprises. Hence, immigrants started 11.34 per cent of new ventures. Of all registered companies, 64,998, i.e. 56.74 per cent had been liquidated by the end of the period of this study.[39]

[39] Please follow the subchapter 4.4.5 entitled 'Causes of liquidation' for further details.

Table 4.1: Nationality of the First Fifteen Immigrant Founders in Upper Bavaria, 1990-1994

Nationality of the Founder	Number of Registered Enterprises	Fraction of Immigrant Enterprises in Percentage
Austria	2,855	22.12
Turkey	2,296	17.79
Italy	1,615	12.51
Yugoslavia	1,218	9.43
Greece	972	7.53
Great Britain and North Ireland	395	3.06
Czech and Slovak Republics	370	2.87
U.S.A.	365	2.83
Poland	337	2.61
France	290	2.25
Hungary	274	2.12
Netherlands	210	1.63
Iran	208	1.61
Switzerland	177	1.37
Romania	118	0.91
Total	**11,700**	**90.64**

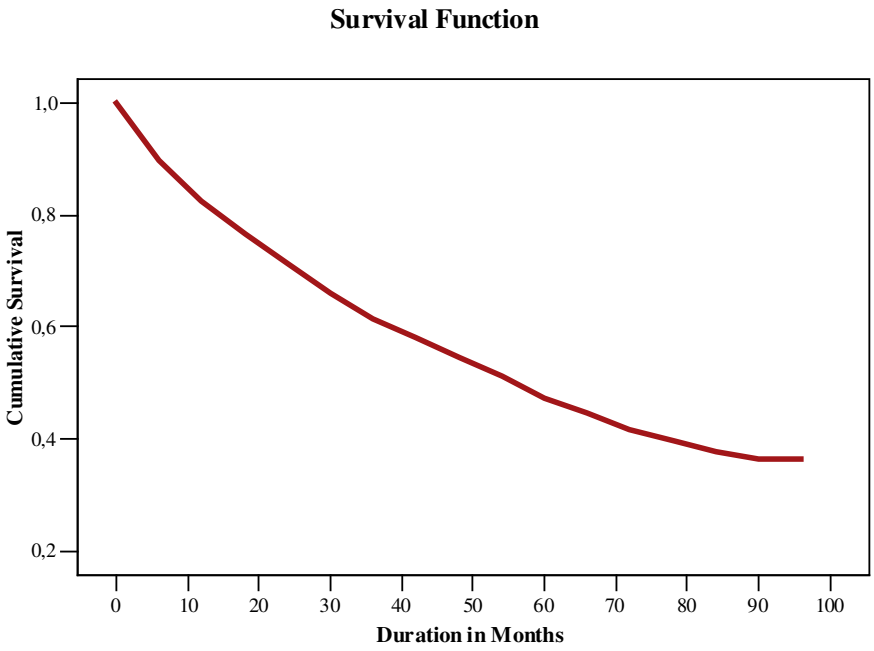
Source: Own calculations based on data provided by the Chamber of Industry and Commerce in Munich, Germany.

According to table 4.1, Austrians account for the most enterprise registrations in Upper Bavaria during the period under investigation, meaning that almost every fourth immigrant entrepreneur was holding Austrian nationality. Austria is a neighbouring country of Upper Bavaria, and both places have the German language in common, apart from similar institutional regulations pertaining to the registration procedure. Hence, one reason for this development may be due to lower transaction costs associated with the start-up process. Moreover, the percentage of enterprise registrations undertaken by nationals from Turkey, Italy, Yugoslavia, and Greece is rather high compared with the remaining immigrant entrepreneurs. These four countries account for 47.26 per cent of

the total registrations in Upper Bavaria. Their entrepreneurial behaviour can be explained by the migration policy of the German government during the 1950s and 1960s, when bilateral agreements for labour market reasons have been signed with the four countries mentioned above.

The enterprises' survival on average amounts to 4.41 years measured by the median during the whole period under investigation as depicted by figure 4.1.[40] Approximately eight years later, only 35.75 per cent of the registered companies in Upper Bavaria were still operating on the market.

Figure 4.1: Survival of Enterprises in Upper Bavaria, 1990-1997

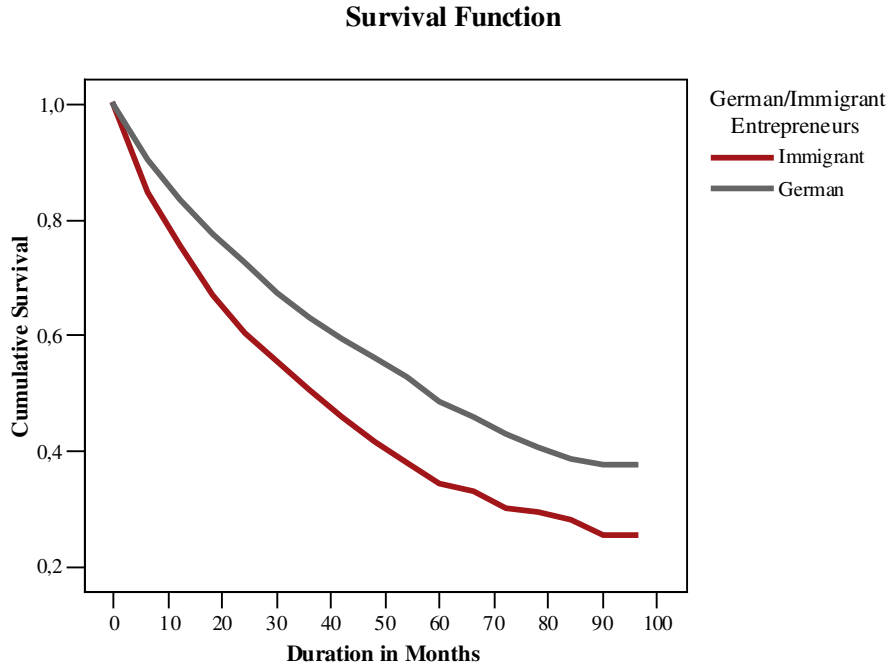


On the other hand, when considering the survival of immigrant and native founders (see figure 4.2), that of the companies launched by immigrants is noticeably shorter. The median of survival duration for German firms is four years, compared to three years of the immigrant firms, which is a difference of one year. The observed differences are statistically significant at the one per cent level. Additionally, 63.31 per cent of

[40] For accuracy reasons, I computed the survival time in days, firstly, and then I annualised it. For the conversion from days into month, I divided by 30.42 $\left(365/12 = 30.4167\right)$. I did not consider leap years.

enterprises established by immigrants to Upper Bavaria were deleted from the company register, as opposed to 54.82 per cent of those founded by Germans.

Figure 4.2: Survival of German and Immigrant Enterprises, 1990-1997



Moreover, the survival performance of immigrant entrepreneurs stemming from European countries is also of interest due to distance matter. We expect that the shorter the geographical distance between country of origin and Upper Bavaria is, the higher will be the propensity to register a company there. Countries more remote from Germany are associated with higher information and transaction costs; hence the likelihood to establish an enterprise is expected to decrease. The geographical distance increases the initial start-up costs that can be quickly paid off due to entrepreneur's ability, for instance, to recognise new market opportunities and be innovative. The survival performance, therefore, may or may not be impacted by the distance between the sending and receiving country. Table 4.2 depicts the survival of companies registered by European immigrants applying as measurements the mean as well as the median. Accordingly, entrepreneurs from Croatia account by far for the better survival (rank one measured by the median) among the European countries.

Table 4.2: Survival Performance of Companies Established by European Immigrants in Years, 1990-1994

Nationality of the Founder	Survival Time (Median)	Survival Time (Mean)	Number of Enterprises
Croatia	6.42	5.71	41
Romania	4.27	4.40	118
Bulgaria	4.06	3.65	28
Sweden	4.06	4.11	55
Hungary	4.01	4.33	274
Poland	3.99	4.25	336
Austria	3.88	4.31	2,848
Czech and Slovak Republics	3.81	4.20	369
Yugoslavia	3.72	4.11	1,218
Denmark	3.41	3.83	53
Switzerland	3.34	4.13	117
Norway	3.25	3.85	10
Italy	3.17	3.94	1,614
Luxemburg	3.07	4.11	25
Turkey	3.01	3.82	2,294
Spain	2.98	3.80	87
Belgium	2.96	3.29	41
France	2.90	3.90	289
Greece	2.66	3.67	969
Great Britain	2.62	3.48	394
Netherlands	2.57	3.65	209
Portugal	2.49	3.79	29
Soviet Union	2.09	2.75	47
Finland	1.44	3.18	18
Ireland	1.39	2.75	52

Source: Own calculations based on data provided by the Chamber of Industry and Commerce in Munich, Germany.

Given the smaller number of companies registered by Croatians in Upper Bavaria in general, one might assume that the entrepreneurial decision is well thought out. Finally, Ireland exhibits the worst survival performance computed both by the median and the mean.

Overall, the entrepreneurial activities decrease clearly over the period of my analysis. For instance, 26,406 enterprises were registered in 1990, whereas in 1991 this number sank to 22,313, and finally, in 1994, only 19,031 companies were set up. As for the immigrants, the percentage of enterprise registrations increases slightly over the years. Hence, in 1990 this fraction was 9.65, increasing to between 11.63 per cent and 11.69 per cent during the period 1991-1993, and finally accounting for 12.31 per cent by 1994. This proportion varies across administrative districts, which I will discuss in the following subchapter.

4.4.3 Regional location

It is not surprising that the most registrations (36.31 per cent) out of all enterprise establishments were carried out in the largest city, Munich. The Munich region (8.01 per cent) is ranked second, followed by the Rosenheim region (5.34 per cent), Fuerstenfeldbruck (5.41 per cent), Freising (3.64 per cent), Starnberg (3.51 per cent), and Traunstein (3.14 per cent). The remaining registrations are distributed among the other administrative districts in Upper Bavaria, which account for less than three per cent in each case. To study the differences in regional size, I computed an index that links the number of foundations to the average population resident in a particular district during the period 1990-1994. As a result of this indexing, I found that the least entrepreneurial activity featured Eichstaett with 1.70 registrations per 100 inhabitants, and the most active is the population of Starnberg with 3.47 registrations per 100 residents. The computed mean value amounts to 2.73 registrations and the median to 2.78, respectively.

The enterprise foundations by immigrants in Upper Bavaria are concentrated more strongly in Munich, i.e. 54.51 per cent of the immigrant founders are resident in the city of Munich in contrast to only 33.52 per cent of the Germans. Almost all other administrative districts feature a lower proportion of immigrant than German foundations. This is, however, less surprising when taking into consideration that 55.77 per cent of the resident population of Upper Bavaria lives in Munich. In summary, I can

conclude that the proportion of immigrants living in Upper Bavaria is obviously correlated with the proportion of companies created by those immigrants.

The survival performance of immigrant enterprises, and only for comparative purposes that of German ones, differs according to administrative district. Table 4.3 indicates the survival time for either group of founders in years as well as the differences in survival time during the period 1990-1997.

Table 4.3: Survival Performance of Immigrant and German Founders by Administrative Districts in Years, 1990-1997

Administrative District	Survival of Immigrant Firms (Median)		Survival of German Firms (Median)	German Minus Immigrant Firms
	Years	Number[1]	Years	Years
Miesbach	4.73	259	5.35	0.62
Ebersberg	4.47	143	5.07	0.60
Munich Region	4.32	1,035	4.61	0.29
Starnberg	4.30	376	5.25	0.95
Weilheim-Schongau	4.12	170	4.97	0.85
Bad Toelz	3.71	465	5.18	1.47
Berchtesgaden Region	3.67	466	5.48	1.81
Dachau	3.60	91	5.00	1.40
Fuerstenfeldbruck	3.43	472	4.55	1.12
Freising	3.38	337	4.39	1.01
Erding	3.36	168	4.90	1.54
Munich-City	3.28	7,056	4.12	0.84
Traunstein	3.20	118	5.63	2.43
Muehldorf	3.18	147	5.03	1.85
Rosenheim Region	3.09	236	5.34	2.25
Altoetting	2.73	118	4.44	1.71
Rosenheim-City	2.60	144	3.37	0.77
Pfaffenhofen	2.43	258	4.89	2.46
Garmisch-Partenkirchen	2.43	233	4.70	2.27
Landsberg am Lech	2.31	65	4.67	2.36
Ingolstadt	2.28	375	3.34	1.06
Eichstaett	2.05	93	5.15	3.10
Neuburg-Schrobenhausen	1.95	120	4.70	2.75

Note: [1]Number of companies established by immigrants in the particular administrative district.
The shadowed areas indicate the best and the worst performing administrative districts.

Source: Own calculations based on data provided by the Chamber of Industry and Commerce in Munich, Germany.

Accordingly, enterprises established in the administrative district ‘Miesbach’ indicate the longest survival measured by the median even though only 2.0 per cent of the companies founded by immigrants were registered there. The highest mortality rate can be expected in the district ‘Neuburg-Schrobenhausen’. Companies established in this particular region survive 1.95 years on average. Immigrant entrepreneurs operating in the city of Munich exhibit worse chances of survival irrespective of the higher proportion of firms set up there. In this context, the data do not support the theory of what many have referred to as ‘enclave economy’ (Razin and Langlois, 1996).

Overall, two conclusions can be drawn in general: first, the survival performance shows a relatively large range, and second, the survival duration of the enterprises founded by immigrants is below that of the German companies in all administrative districts. Hence, the different chances of success cannot be explained by the immigrant entrepreneurs’ choice of location.

Finally, the difference between the survival of enterprises established by Germans and that of the total is relatively minor, and the sequence is approximately the same. Pertaining to the immigrants, the sequence is not in accordance with that of the German founders. For instance, companies registered by immigrants in Traunstein, where the total survival time is comparatively high, have a poorer chance of being successful than those in Munich region. However, not only the region, where the company is located, but also the industrial sector can impact the entrepreneurial success, which in turn might explain the above stated differences.

4.4.4 Industrial sectors

The data include the industrial sectors following the five-and six-digit classification by the German Federal Statistic Office. I pooled this information into ten groups and my further analysis is based predominantly on this. However, table 4.4 shows the distribution of companies in percentage of each group, immigrant versus German founders, operating in the particular industrial sector.

Accordingly, the ‘other services’ sector accounts for by far the largest group (34.87 per cent) in Upper Bavaria, followed by companies from the retail industry (26.99 per cent). There are major differences between immigrant and native founders with respect to the distribution of enterprises by industrial sector. In this context, the industrial sectors ‘other services’ and ‘catering and hotels’ are the most interesting. While 36.25 per cent of the companies founded by Germans are operating in the ‘other

services' sector, this only holds true for 24.90 per cent of those established by immigrants to Upper Bavaria. Hence, the German entrepreneurs are over-represented in this industrial sector: although they make up 88.33 per cent of all founders considered, 99.92 per cent of all companies in the 'other services' sector were registered by German nationals. The immigrant entrepreneurs, on the other hand, are operating in the 'catering and hotels' sector, namely 16.19 per cent in contrast to 5.61 per cent of the Germans. Moreover, immigrant entrepreneurs are more likely than the German founders to register a company in the sector 'communication and transport'. Within the sector 'communication and transport', immigrant founders are operating in 'other country transportations' (61.2 per cent), followed by 'travel business' (34.8 per cent), 'freight forwarding' (2.1 per cent), and 'telecommunication and private courier services' (1.9 per cent). The aforementioned differences between the two groups of entrepreneurs are statistically highly significant.[41]

Table 4.4: Composition of Data According to Industrial Sector, 1990-1994

Industrial Sector	Immigrant Companies		German Companies	Total Companies
	In Percentage	In Number	In Percentage	In Percentage
Animal Husbandry and Agriculture	1.00	129	1.20	1.18
Paper, Print and Publishing	0.80	104	1.20	1.11
Manufacturing	2.19	283	2.50	2.48
Catering and Hotels	16.19	2,096	5.61	6.84
Communication and Transport	9.01	1,166	7.11	7.34
Insurance Industry and Finance	4.10	531	6.40	6.16
Sales Agency	4.30	557	4.90	4.83
Retail	24.33	3,149	27.33	26.99
Wholesale	13.19	1,707	7.50	8.18
Other Services	24.90	3,223	36.25	34.87

Source: Own calculations based on data provided by the Chamber of Industry and Commerce in Munich, Germany.

[41] The computed χ^2 – statistics accounts for 2,967.47 with nine degrees of freedom and is statistically significant at the one per cent level.

Additionally, the survival performance between immigrant and native entrepreneurs varies across industrial sectors. Table 4.5 represents the median of the survival duration by the ten industrial sectors regrouped for the purposes of my analysis. The highest chance of survival for immigrants is in the 'paper, print and publishing' sector, whereas for Germans this is the second best. Within this industrial sector, 62.5 per cent of the companies established by immigrant founders venture in the 'print business', followed by 'publishing' (25.0 per cent), and 'paper-, cardboard- and paperboard processing' (12.5 per cent).

Moreover, the sector 'animal husbandry and agriculture' offers Germans the best chance of survival, and immigrants the least. This tendency may be due to differences in cultural habits and agricultural methods. The ranking of the 'retail' sector is for immigrant and native founders nearly identical: ranking three for Germans and four for immigrants according to survival in years.

Table 4.5: Survival Performance of Immigrant and German Founders by Industrial Sectors in Years, 1990-1997

Industrial Sector	Survival of Immigrant Companies (Median)	Survival of German Companies (Median)	Total Survival (Median)
Animal Husbandry and Agriculture	2.05	5.64	5.14
Paper, Print and Publishing	4.49	5.19	5.18
Manufacturing	2.50	4.02	3.84
Catering and Hotels	3.17	4.14	3.79
Communication and Transport	3.40	3.45	3.43
Insurance Industry and Finance	2.83	4.35	4.22
Sales Agency	4.02	4.70	4.58
Retail	3.44	5.07	4.86
Wholesale	3.27	4.43	4.18
Other Services	3.51	4.53	4.45

Note: The shadowed areas indicate the best and the worst performing industrial sectors.

Source: Own calculations based on data provided by the Chamber of Industry and Commerce in Munich, Germany.

In total, immigrants venturing in Upper Bavaria have a poorer chance of survival compared with Germans in all industrial sectors. Such variations in survival performance across industrial sectors can be explained, on the one hand, by the existence of scale economies and capital intensity.[42] Higher capital-labour ratios tend to be associated with greater scale economies (White, 1982). This is partially because capital equipment tends to be 'lumpy' in nature. Also, by enabling companies to take advantage of increased specialisation and greater rates of utilisation, the use of larger machines is likely to reduce costs per unit of output, and to decrease the mortality rates. Depending on the industrial sector, Brüderl et al. (1992) found evidence that a certain minimum start-up size operationalised by the amount of financial capital invested in the business is required. Accordingly, it does not make much sense to found an enterprise below this level as the changes to survival decrease.

On the other hand, entries differ across industrial sectors due to variations in expected profitability. Although expected profitability is virtually impossible to measure, it has been associated with industries experiencing higher growth rates in general, and as a result of, the likelihood to survive increase (Audretsch, 1995).

4.4.5 Causes for liquidation

When analysing the enterprise's survival, the causes for liquidation should be taken into consideration. Pertaining to the mode of liquidation, I distinguish between whether the liquidation results from the entrepreneur himself or *ex officio*. More precisely, a voluntary liquidation after a period of time, on the one hand, is due to a lack of willingness or motivation to continue in business. A better outside option is encountered on the labour market, evidently before the entrepreneur is forced to exit. A compulsory liquidation, on the other hand, is cause by lack of sufficient (financial) opportunity to continue in business. In this context, 64,998 out of 114,550 companies were liquidated by the end of the observation period and 22.01 per cent of those took place officially.

In the case of immigrant founders, this number is notably higher, i.e. 29.08 per cent or 2,410 companies, whereas only 21.36 per cent of German enterprises were liquidated *ex officio*. Table 4.6 depicts the five most frequent reasons for liquidation in absolute and relative numbers for either group of founders in Upper Bavaria although the remaining reasons (for instance, transfer of enterprise, death of the founder, personal

[42] For recent examples, see the individual country studies contained in Geroski and Schwalbach (1991) as well as Audretsch and Mahmood (1994, 1995).

reasons, unprofitable enterprise, and trade not carried on) not specified in the table were very rarely found, i.e. in less than one per cent of the liquidations.

According to table 4.6, there exist differences between immigrant and native founders, which are statistically highly significant, but on the other hand, complex for interpretation due to the specific structure of the data. Definitely, I am not surprised that the fraction of enterprises liquidated because of the owner's address being unknown is higher for immigrant (20.56 per cent) than for German (15.26 per cent) entrepreneurs in Upper Bavaria. To a certain extent, this might concern returns to the country of origin, and thus a voluntary exit, which cannot be associated with failure but rather with better employment alternative.

Table 4.6: Causes for Liquidation in Absolute Numbers and in Percentage of Total Liquidations, 1990-1997

Causes for Liquidation	Immigrant Companies	German Companies	Total Companies
Cancellation of Business	6,011	41,763	47,774
	72.70	***77.00***	***73.82***
Address Unknown	1,707	8,613	10,320
	20.56	***15.26***	***16.00***
Alteration of the Legal Form	60	861	921
	0.70	***1.54***	***1.44***
Dissolution	61	649	710
	0.70	***1.13***	***1.13***
Other Reasons	370	3,732	4,102
	4.50	***6.61***	***6.32***

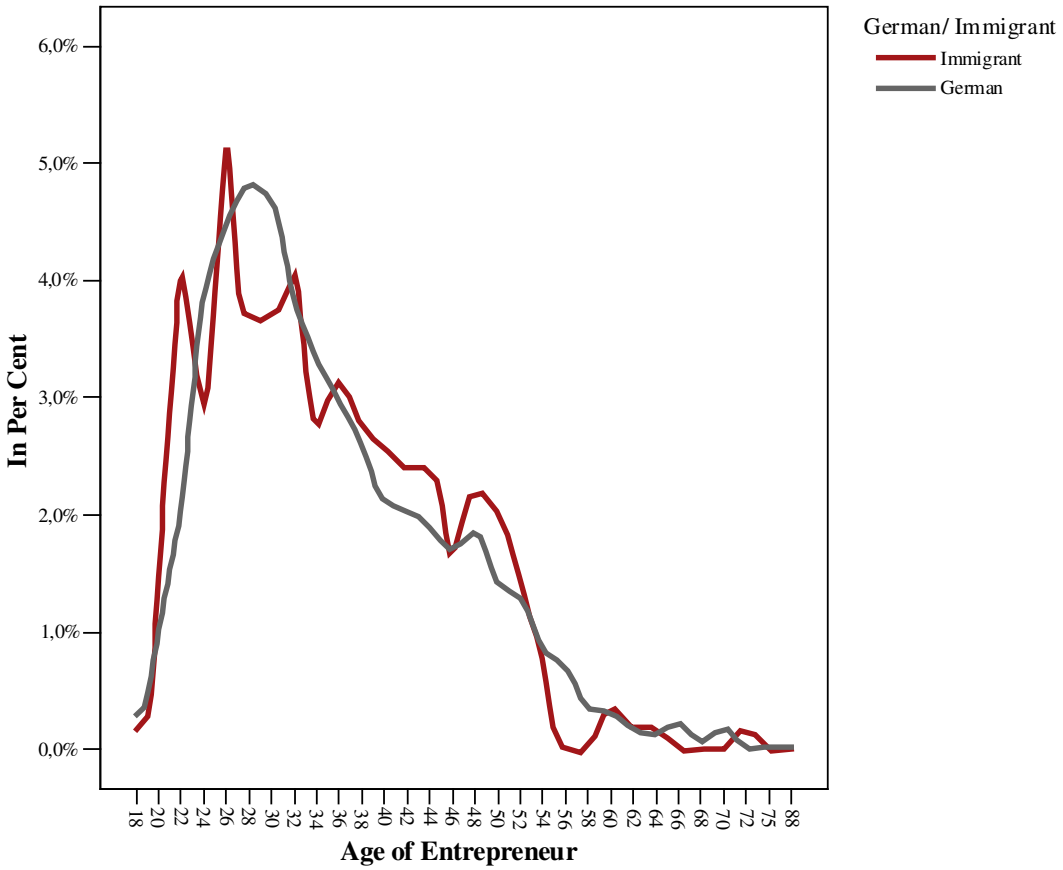
Source: Own calculations based on data provided by the Chamber of Industry and Commerce in Munich, Germany.

Alterations of the legal form as well as dissolutions were seldom the reason for enterprise liquidations, while the category summarised by the Chamber of Industry and Commerce in Munich, as 'other reasons' cannot be interpreted at all. For the further analysis, however, the cancellations of business are treated as no longer existent, i.e. as right-censored observations.

4.4.6 Individual characteristics of the immigrant entrepreneur

In this subchapter, I will discuss how the entrepreneur's age and gender influence the venturing process and the survival performance in Upper Bavaria. The founder's age at the time of enterprise establishment I computed as the difference between year of birth and the year of business registration. Accordingly, the minimum age at registration is 17 years and the maximum 93 years. The mean according to age amounts to 34.79 years, whereas the median is 32 years. Figure 4.3 illustrates the age composition of immigrant and native entrepreneurs.

Figure 4.3: Distribution of Immigrant and German Entrepreneurs at Enterprise Establishment by Age



Immigrants registered more companies in the age groups 20 – 23, 25 – 27, and 36 – 54 compared with Germans in Upper Bavaria. One could speculate that after finishing the secondary and tertiary education immigrants choose to establish an own business due to obstacles prior to facilitating their first employment. The third age group speaks for period of wage/salary employment and well thought out decision. For the remaining foundations by age, German registrations outnumbered those of immigrants.

I constructed an age-group variable while regrouping the entrepreneurs at registration by age to study the impact of working experience on the business success in general. Table 4.7 outlines the age groups and their frequencies of occurrence. The majority of the founders, immigrant and native, included in the data are between 26 and 35 years old, followed by those in the age group 36 – 45. The age-specific differences among the immigrant entrepreneurs I will stress when analysing the results of the estimation.

Table 4.7: Composition of Immigrant and German Founders at Enterprise Establishment by Various Age-Groups, 1990-1994

Age Groups	Frequencies of Occurrence	Fraction in Percentage[1]
17 – 25	21,188	18.50
26 – 35	47,787	41.17
36 – 45	26,528	23.16
46 – 55	14,589	12.74
56 – 65	3,391	2.96
66 – and older	906	0.79
Total Observations	114,389	99.86
Missing Values	161	0.14
Total Data Set	**114,550**	**100.00**

Note: [1]The missing values are also included while computing the fractions of each age-group.

Source: Own calculations based on data provided by the Chamber of Industry and Commerce in Munich, Germany.

The female share amounts to 21.43 per cent for immigrant and 38.04 per cent for German founders, respectively. Admittedly, I have to mention here that according to the immigrant entrepreneurs, in 28.78 per cent of the cases the gender could not have been identified in such a way as to enable me to state with a reasonable certainty how reliable is the above-indicated value. This value accounts for 1.86 per cent with respect to Germans.

Immigrant as well as German female entrepreneurs establish their companies in the sector ‘other services’, i.e. 33.51 per cent of the immigrants and 46.28 per cent of the natives are operating in the above-stated sector. Overall, the immigrant female share is below this of the Germans in all-industrial sectors except for the sector ‘paper, print

and publishing'. The female share, for instance, amounts to 32.73 per cent for immigrants and 32.42 per cent for Germans, respectively.

The chances of survival for female entrepreneurs are noticeably lower than for males. Taking all founders into consideration, the median for the males amounts to 4.71 years (56.54 months), and for females, 4.05 years (48.58 months) respectively. This difference is much less among the immigrant entrepreneurs in Upper Bavaria. The survival duration for companies established by males is 3.34 years (40.11 months), and for those by females, 3.31 years (39.74 months). The median for the German males and females accounts for 4.87 years (58.48 months) and 4.11 years (49.34 months) correspondingly. In sum, the difference is 11 days for the benefit of male immigrant entrepreneurs and 278 days for the German male founders.

Finally, the sector 'other services' accounts for the third best survival performance among the immigrant female entrepreneurs even though its share is the highest.

4.5 Models for duration data

The analysis of duration data comes rather recently to the economic literature, while the investigation of the length of time until failure has interested engineers for decades. For instance, duration models were applied to the durability of electric and electronical components long before economists discovered their usefulness. In a similar vein, the analysis of survival time – for instance, the length of survival after the diagnosis of a particular disease or after an operation such as a heart transplant – has long been a basic technique of biomedical research. Social scientists have recently applied the same framework of techniques to strike duration, time until business failure, length of unemployment spells, intervals between conception measures, and so on.

In this subchapter, I will summarise briefly the econometric analysis of duration data while restricting myself to a few straightforward techniques and applications, primarily to introduce the terms and concepts. Thereafter, I will outline the model specification that I applied to my data on business failure of immigrant entrepreneurs in Upper Bavaria.

4.5.1 Theoretical background: A brief overview

The appropriate method to study durations of any kind is to estimate a survival model. The variable of interest is, therefore, the length of time that elapses from the beginning

of a particular event (enterprise establishment) either until its end (enterprise liquidation) or until the measurement is taken into consideration (end of the period under investigation), which may precede termination. The process under observation may have started at different points in time; hence, censoring is a pervasive and generally unavoidable problem in the analysis of duration data. The common cause is that the measurement is made while the process is still ongoing. For instance, although the time of enterprise establishment in Upper Bavaria is known with precision, at the time of measurement, observations of any entrepreneurs who are still in business are necessarily censored. For these entrepreneurs, survival is at least the observed time, but not equal to it. Estimation has to account for the censored nature of the duration data, even if the consequences of ignoring censoring are not those that arise in the regression analysis.

In a standard regression model that specifies the conditional mean and variance of a distribution, the explanatory variables can be considered as fixed characteristics at the point in time (time-series data) or for the individual (cross-sectional data) for which the measurement is taken. When we measure duration, the observation is implicitly on a process that has been ongoing for a spell of time, $\lfloor 0,t \rangle$. The analysis is conditional on a set of covariates (the counterparts of explanatory variables) x_t, the duration is implicitly a function of the entire time path of the variable $x(t)$, $t = \lfloor 0,t \rangle$, which may have changed during the interval. Consequently, incorporating time varying covariates into the duration analysis will be a considerable solution of this problem.

In my survival analysis, for instance, the spell length is represented by T, which is defined as a continuous random variable denoting the number of months an immigrant entrepreneur remains in business.[43] Time as it elapses is denoted by t in the model, irrespective of calendar time. Hence, all entrepreneurs start their business at $t = 0$. The probability density function of T is $f(t)$, its distribution function $F(t)$ is defined in the form

$$F(t) = \int_0^t f(s)ds = \Pr(T \le t).$$

[43] As far as I know, no other transition has taken place within any month due to the computing way of obtaining these durations. Therefore, observations are complete and a continuous model in months is appropriate.

We will generally be more interested in the probability that the spell is of length at least t, which is given by the survival function, $S(t)$,

$$S(t) = 1 - F(t) = \Pr(T \geq t).$$

In modelling the survival of enterprise establishment, the quantity of fundamental interest is known as the hazard rate, which specifies the conditional probability that an entrepreneur, who has remained in business for a period from 0 to t, exits in the short interval $(t, t+\Delta t)$, and is defined (Greene, 2003) as

$$h(t) = \lim_{\Delta t \to 0} \frac{\Pr(T \leq t + \Delta t \,|\, T \geq t)}{\Delta t} = \frac{f(t)}{1 - F(t)} = \frac{f(t)}{S(t)} \tag{4.1}$$

Note that because $f(t)$ and $S(t)$ are nonnegative quantities, $h(t)$ is also nonnegative that can assume any value between 0 and ∞. Additionally, the quantity $\Pr(T \leq t + \Delta t \,|\, T \geq t)$ in equation (4.1) gives the probability of the event (enterprise establishment), between time t and Δt, conditional on the event of interest not yet having occurred; hence conditional on the population at risk. For events occurring in continuous time, it is desirable to define $\Pr(T \leq t + \Delta t \,|\, T \geq t)$ over all possible positive t; this is done by introducing the limit in the equation (4.1), with the limit restricted to positive values of t so as to confine intervals to those in the future. Combining these two parts – the limit and the conditional probability – yields the hazard rate, which is typically interpreted as the 'risk' of an event, where risk refers to the 'instantaneous' conditional probability that the event of significance arises at time t. In this sense, it is more interesting to model the hazard rate in comparison to the survival rate or the density.

4.5.2 Parametric models of the hazard rate

Various econometric specifications can be applied to model the hazard rate. As I am interested in the question to what extent investments in human and social capital

influence the success measured by the duration of survival of a particular immigrant entrepreneur, only parametric models can be considered as appropriate.

The most common parametric specification is the so-called proportional hazard model (Cox and Oakes, 1984) given by

$$h\{(t),(x_1,x_2,\ldots,x_n)\} = h_0(t).\exp(\beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n) \tag{4.2}$$

where $h(t,\ldots)$ denotes the resultant hazard rate, given the values of the n covariates for the relevant case $(x_1,x_2,\ldots,x_n)$ and the respective survival time (t). The term $h_0(t)$ indicates the baseline hazard rate; it is the hazard rate for the respective enterprise when all independent variable values are equal to zero. $\beta_1,\beta_2,\ldots,\beta_n$ are the coefficients to be estimated. We can linearise the model by dividing both side of equation (4.2) by $h_0(t)$, and then take the natural logarithm of both sides:

$$\begin{aligned} h\{(t),(x_1,x_2,\ldots,x_n)\}/h_0(t) &= \exp(\beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n) \\ \log\left[h\{(t),(x_1,x_2,\ldots,x_n)\}/h_0(t)\right] &= \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n \end{aligned}. \tag{4.3}$$

While no assumptions are made explicitly about the shape of the underlying hazard function, the model equations shown above do imply two assumptions. First, they specify a multiplicative relationship between the underlying hazard function and the log-linear function of the covariates. In practical terms, it is assumed that, given two observations with different values for the covariates, the ratio of the hazard functions for those two observations does not depend on time t. Second, there is a log-linear relationship between the independent variables and the underlying hazard function.

The popularity of the proportional hazard model stems from both practical and theoretical considerations. The asymptotic properties of these models are well understood under a variety of conditions (Cox and Oakes, 1984; Fleming and Harrington, 1991), including quite general on the distribution of censoring times. Moreover, under proportionality, covariates have linear effects on the logarithm of $h(t)$; hence intuitions from ordinary and logistic regression carry over in a straightforward manner to the proportional hazard model. Empirically, proportionality is often adequate

in that the estimated coefficients under the proportionality assumption are similar to those when proportionality is relaxed; this can often hold when the observation period is short relatively to the mechanisms generating variation over time in the effects of a covariate.

Proportionality is nevertheless a strong assumption and violations can occur empirically. When the assumption is violated, the effect of a covariate on the logarithm of the hazard rate will not be an additive constant, but rather will vary with time t. Consequently, one way to relax the proportionality is to code a set of time-varying dummy variables that represent an exhaustive and mutually exclusive partition of the observed period. Interacting these dummy variables with a covariate x hypothesised to have non-proportional effect then yields a specification that models the effect of x as a step function of time.

In practice, and in particular for my further survival analysis, assumptions with regard to the baseline hazard $h_0(t)$ are typically of greater concern than possible non-proportional effects. This often occurs when the baseline hazard accounts for a greater proportion of the observed variation in $h(t)$ than do the covariates $x(t)$; hence the baseline hazard rate needs to be parameterised.

Various parameterisations for $h_0(t)$ can be considered, including exponential, Weibull, log-logistic, log-Gaussian, Gompertz, Makeham, and Gompertz-Makeham models (Blossfeld et al., 1989). In many cases, theory does provide grounds to lean toward a particular choice, but more often practical considerations underlie these choices. Unfortunately, estimated effects of covariates can sometimes vary markedly across different functional forms, complicating matters for the analysis.

More precisely, one reason for this sensitivity is that the models differ noticeably in their specification of the time variation in the baseline hazard. For instance, some models assume that the baseline hazard increases or decreases monotonically (the Weibull, Gompertz, and Makeham models), while other models presume a unimodal shape for the baseline hazard, with the rate rising and then declining (the log-logistic, and log-Gaussian models). In addition, some specifications yield a distribution of event times that integrate to unity, implying all entrepreneurs will experience the event of interest if observed for a sufficiently long period of time (the exponential, Weibull, Makeham, log-logistic, and log-Gaussian models), while other models, in some cases, yield a so-called defective distribution in which some

individuals will never experience the event of interest, even if they are observed for an arbitrarily long time. Note that a defective distribution of event time is often substantively plausible. Residential moves, for instance, where some entrepreneurs may live all their life in the locality in which they were born. In a similar vein, there are other instances in which a non-defective distribution of event times is desirable, with a classic example being human mortality. As a result, the questions arise: how should I model the hazard rate and where should the covariates be attached?

4.5.3 Why should I choose the Gompertz-Makeham model?

As already discussed above, the hazard rate can be modelled in such way that it stays either constant or varies over time t. The assumption of a constant rate seems to be rather unrealistic as it implies that the risk for a particular enterprise to fail at any time of its existence is identically high. Hence, the question about the lapse of the hazard rate arises. The existing literature, however, gives support to different concepts, which I will briefly state below, in order to explain why I should favour the Gompertz-Makeham model over the other parametric models.

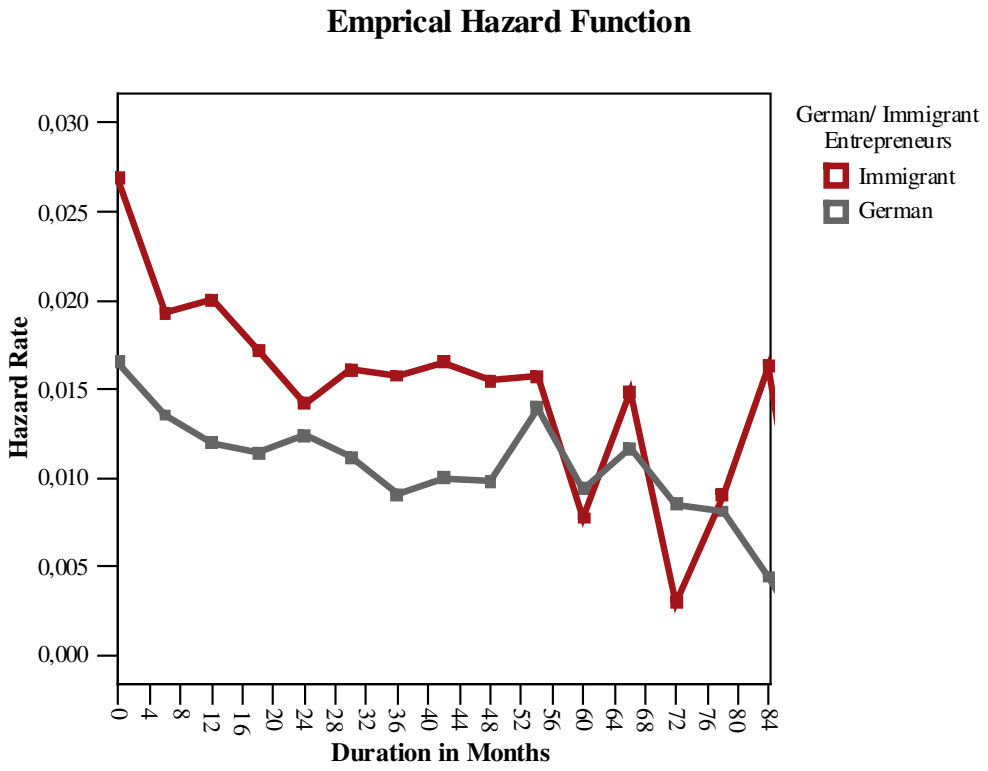
More precisely, according to 'the liability of newness' preposition traces back to Stinchcombe (1965), and it describes the different risks of dying of an enterprise during its life course. This phenomenon states that at the time of founding of a company the risk of dying is the highest and decreases with growing age of the company. There are basically three reasons why this might be the case. First, new enterprises, which are operating in new areas demand for new tasks to be performed by their members. The learning process takes time and leads to economic inefficiencies. Second, trust among the enterprise members has yet to be developed since in most of the cases the new employees of a firm do not know each other when the enterprise is launched. And third, new companies have not yet built stable portfolios of clients, which do not hold true for age-old companies. A recent wave of studies has emerged consistently showing that the likelihood of firms to survive tends to increase along with the age of the firm (Fichman and Levinthal, 1991, Brüderl, 1992; Audretsch and Mahmood, 1994). This finding holds across different industrial sectors, time periods and even countries (Audretsch, 1991). Overall, the empirical findings of the entrepreneurial literature confirm 'the liability of newness' preposition.

Additionally, Brüderl (1992) used the arguments of organisational ecology, in which he modified 'the liability of newness' proposition. He suggested that the

company's hazard rate actually follows rather an inverted U-shape pattern than continuously declining with increasing age. This argument is associated with 'the liability of adolescence' proposition. The reasons for this are cognitive, emotional, and financial. First, it will only become clear after some period of time that the firm, or the firm's performance, is not reaching expectations. It takes the entrepreneur time to acquire insight into the financial figures. A second reason why a firm is only closed down after a few years is the presence of an emotional barrier. It is often difficult to admit to oneself and one's immediate circle that establishing the new enterprise was not really a success. A third factor is that it can take some time to use up the seed capital.

Several hazard rate models can represent the aforementioned theoretical arguments. The 'liability of newness' hypothesis, for instance, can be modelled applying the Gompertz-Makeham model, whereas the 'liability of adolescence' using the log-logistic hazard model. According to my data, an 'adolescence'-phase employing the log-logistic model can be found, but this is too short (less than month), and thus, can be regarded as negligible. Additionally, the empirical hazard rate over the time t, which is depicted by figure 4.4, strengthens my argumentation in favour of the Gompertz-Makeham model.

Figure 4.4: Empirical Hazard Rate of Immigrant and German Enterprises, 1990-1997



According to figure 4.4, the hazard rate is relatively high at the time of enterprise establishment, thereafter it falls off immediately, and then it continues to drop down over the entire period under consideration. Consequently, this speaks once again for the application of the Gompertz-Makeham model as already argued above. In total, for reasons pertaining to the theory on the one hand, and due to the data set used in my analysis on the other, the Gompertz-Makeham hazard model significantly represents the empiric evidence on registrations and liquidations in Upper Bavaria during the period 1990-1997.

In the single transition case, the Gompertz-Makeham model is based on the assumption that the baseline hazard rate increases or decreases monotonically. The hazard rate is defined (Blossfeld and Rohwer, 1995) as

$$h(t) = \alpha + \beta \exp(\gamma t),\ \gamma < 0.^{44} \tag{4.4}$$

The parameters in the model specified by equation (4.4) can be interpreted as follows. Setting $t = 0$ gives the hazard rate at enterprise establishment:

$$h(0) = \alpha + \beta .$$

Setting $t = \infty$ gives the asymptotic hazard rate, the rate that applies to age-old firms:

$$h(\infty) = \lim_{t \to \infty} \left[\alpha + \beta \exp(\gamma t) \right] = \lim_{t \to \infty} (\alpha) + \beta \lim_{t \to \infty} \left[\exp(\gamma t) \right] = \alpha .$$

Thus β determines the amount by which the initial hazard rate exceeds the asymptotic rate α. Finally, γ governs the speed at which the hazard rate falls with company's age, the rate at which the liability of newness wears off. Accordingly, large negative values of γ will imply that the liability of newness diminishes rapidly.

4.5.4 Where should I attach the covariates?

As my objective is to estimate the impact of human and social capital investment on the survival performance, the hazard rate denoted by equation (4.4) has to be modelled as a function of a set of exogenous entrepreneur-specific covariates. The covariates entered into the Gompertz-Makeham function must be introduced to the specific vectors α, β, and γ, each of which has a different substantive interpretation. I specify, however, that

$$\begin{aligned} \alpha_i &= \exp(a'x) \\ \beta_i &= \exp(b'x) \\ \gamma_i &= c'x \end{aligned} \tag{4.5}$$

---

[44] The survival function is denoted as $S(t) = \exp\left\{-\alpha t - \beta / \gamma \left[\exp(\gamma t) - 1 \right]\right\}$, whereas the density is specified by $f(t) = \exp\left\{-\alpha t - \beta / \gamma \left[\exp(\gamma t) - 1 \right]\right\} \cdot \left\{ \beta \exp[\gamma t] \right\}$.

where a', b', and c' are transposed vectors of parameters, and x is a matrix of covariates. Substituting these specifications into equation (4.4) yields the following model of hazard rates:

$$h_i(t) = \exp(a'x) + \exp(b'x)\exp\left[c'x(t)\right].$$

Note that the hazard rate at the enterprise establishment equals

$$h_i(0) = \exp(a'x) + \exp(b'x),$$

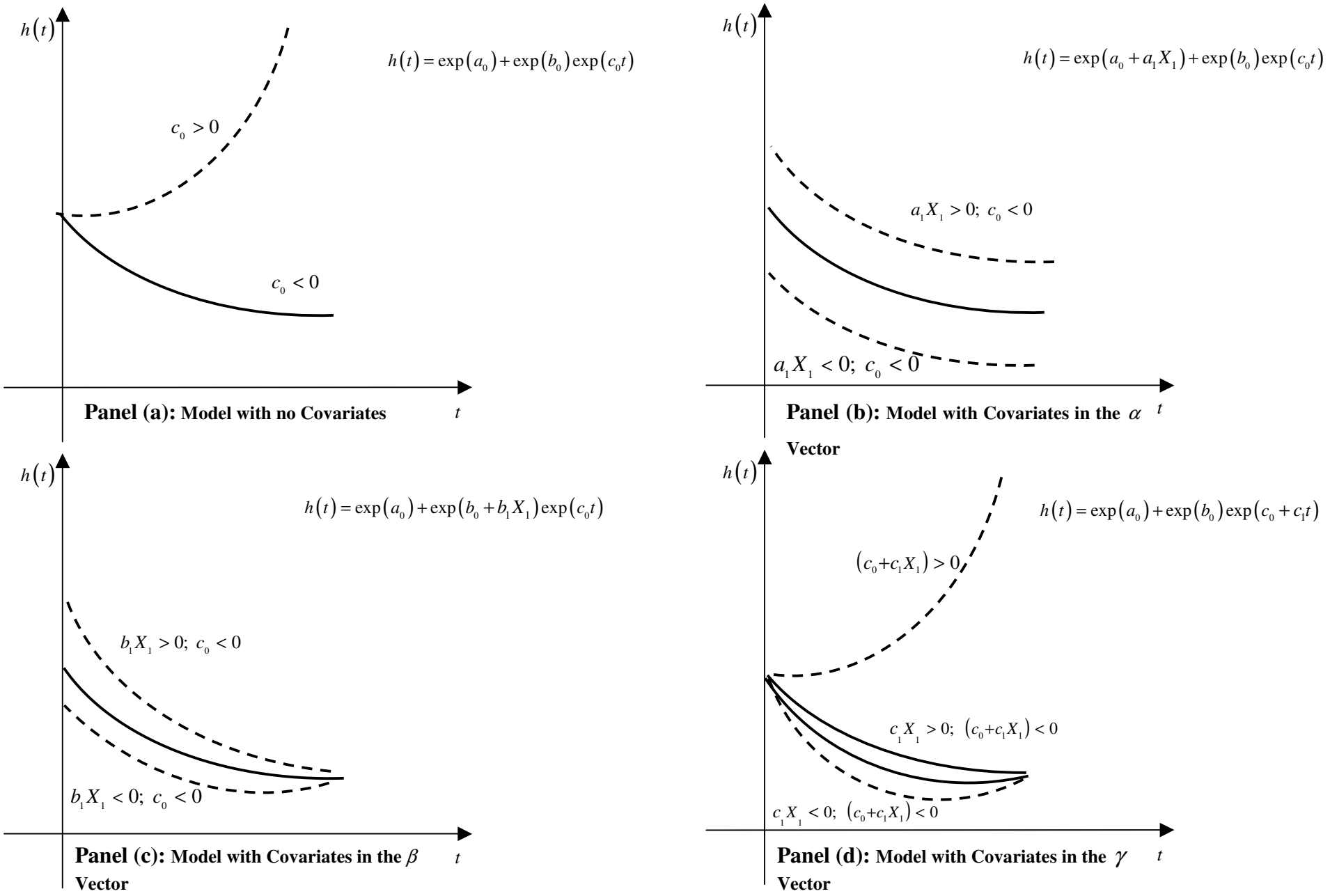
and the asymptotic rate is

$$h_i(\infty) = \exp(a'x).$$

Thus, I have to specify in advance not only which exogenous variables influence the survival performance of the immigrant entrepreneurs, but also which component of the hazard rate will be affected. Attempts at disentangling the relevant components empirically by entering covariates into all vectors simultaneously are usually unsuccessful due to multi-collinearity problems in estimation. I took my decision based on the following argumentation.

Recalling, the Gompertz-Makeham model contains three vectors: α, β, and γ. Provided that the γ vector is negative, the β is related to the initial mortality rate, the α is associated with the asymptotic death rate, and the γ vector determines the speed with which the asymptotic rate is approached. Figure 4.5 illustrates the effects of a covariate when entered into each of the aforementioned vectors.

Figure 4.5: Illustrations of the Gompertz-Makeham Model for Covariates Attached to the Three Vectors



Panel (a) shows the baseline hazard function model without covariates. The solid line depicts the model with declining firm's age dependence and the dashed line represents the model with increasing age dependence. Since my estimations of the model consistently yield negative values of the constant term c[45], I use the model with decreasing firm's age dependence as the baseline in the other panels of the figure.

Panel (b) illustrates the effect of a covariate X_{i1} in the β vector of the model. When the value of the $b_1 X_{i1}$ is positive, positive values of this covariate shift the early rate of death upward. When $b_1 X_{i1}$ is negative, the early death rate is lower than the baseline. In both instances, however, the effect of the covariate is greatest at the founding and declines with aging of the company. The asymptotical death rate and the age, at which it is approached, are not influenced by elements incorporated in the β vector.

The impact of a covariate entered into the α vector is depicted in panel (c). If the value of $a_1 X_{i1}$ is positive, the asymptotic rate increases with X_{i1}; and if $a_1 X_{i1}$ is negative, its hazard rate moves downward. Additionally, covariates in this vector also shift the absolute values of the initial rates, but not the relative values. In general, this vector plays a role analogous to that of an intercept in a standard regression equation. Its value does not, however, influence the speed, at which the rate moves from the initial value to the asymptotic one.

Specifying the γ vector is potentially the most complicated part of the Gompertz-Makeham model because minor differences in the value of a covariate can have drastically different implications. Panel (d) illustrates this potential problem. As the top dashed line shows, whenever the value of the γ vector becomes positive, the model shifts from one that predicts decreasing age dependence to one that predicts increasing dependence. This might appear across substantively insignificant increases in X_{i1} if c_0 is negative and c_1 positive. If, however, the γ vector remains negative across the range of values for X_{i1} (as in my case), then the interpretation of the effects is straightforward: a positive $c_1 X_{i1}$ value increases the speed of approaching the

[45] The hazard rate estimated based on the Gompertz-Makeham model for the immigrant entrepreneurs is $\hat{h}(t) = 0.0094 + 0.0138 \exp(-0.0303t)$, whereas for the German entrepreneurs it is $\hat{h}(t) = 0.0021 + 0.0139 \exp(-0.0102t)$.

asymptotic rate, while a negative $c_1 X_{i1}$ decreases the speed. These effects might also be interpreted as prolonging and shortening the liability of newness.

In my survival analysis, I inserted the covariates of interest into the β vector. This decision reflects partly the substantive problems I have chosen to study, but it also mirrors my view of selection processes among companies. Moreover, I argue that since most enterprises die at early ages, selection processes are most intense as they operate on the initial rate of firm's death. Early selection processes also probably account for the greatest variation in hazard rates across populations of firms. By this reasoning, the β vector of the Gompertz-Makeham model should reflect selection processes most clearly. In addition, previous empirical research as discussed above also gives support to this assertion.

In total, I model the survival performance of the immigrant entrepreneurs in Upper Bavaria based on the Gompertz-Makeham hazard model. The hazard rate is represented as a function of a set of exogenous covariates, which entered the model into the β vector, so that

$$h_i(t) = \alpha_i + \exp(b'x)\exp(\gamma_i t) \tag{4.6}$$

where b' is a vector of parameters, x is a matrix of entrepreneur-specific covariates such as age of entrepreneur, industrial sector, nationality, and $\beta_i = \exp(b'x)$. I estimate the so specified model by applying the maximum-likelihood-method, and I discuss the obtained results comprehensively in the following subchapter.

4.6 Empirical results

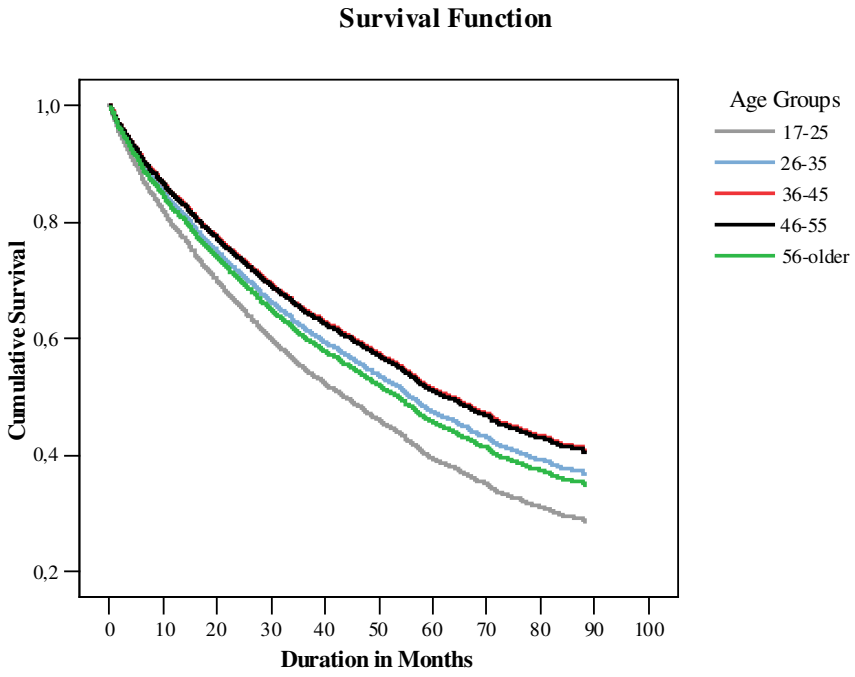
I applied the techniques of survival analysis, and in particular, the Gompertz-Makeham hazard model outlined above to the data set on registrations and liquidations in Upper Bavaria during the period 1990-1997. The obtained empirical results are subject to further discussion below.

4.6.1 Results for the human capital endowment

Human capital, proxied by age in my study, appears to influence the survival performance of immigrant and native entrepreneurs in Upper Bavaria during the period

under investigation. Figure 4.6 illustrates the cumulative survival in years for all founders included in the data set. Accordingly, the 17-25 age-group features the least survival prospects, followed by the 56-older and the 26-35 age-groups. The 36-45 age-group shows the best survival performance: initially, the curve runs identically to that of the 46-55 age-group, but at the end of the period it is clearly above it, indicating higher survival rate. The 46-55 age-group accounts for the second best likelihood of survival. The medians behave accordingly: 3.53 years for the youngest group, 4.28 years for the second, 5.13 for the third, 4.99 years for the fourth and 3.80 years of survival for the eldest age-group. Statistically speaking, the estimated differences among the age-groups are highly significant (99 per cent confidence interval). Consequently, I can conclude that the hazard function estimated for all age-groups corroborates the hypothesis of the inverted U-shape relationship between human capital, proxied by entrepreneur's age, and economic performance.

Figure 4.6: Survival Performance of Enterprises by Various Founders' Age Groups, 1990-1997



Note: The rank of the survival functions from top to bottom is as follows: 36-45 age-group (rank one); 46-55 age-group (rank two); 26-35 age-group (rank three); 56-older age-group (rank four); and 17-25 age-group (rank five).

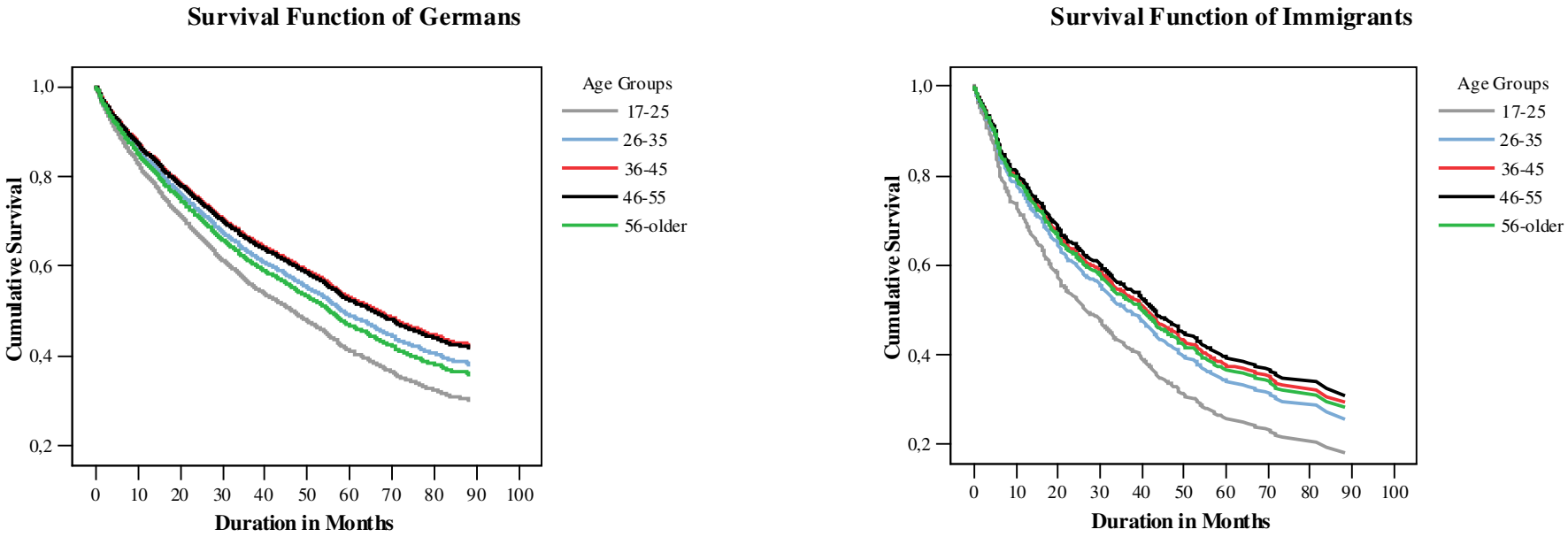
Preisendörfer and Voss (1990) also found this inverted U-shape relation between founder's age-groups and survival of enterprises registered by Germans in the area of Munich and Upper Bavaria using archival data for the period 1980-1984.[46]

The results obtained hold true for both immigrant and German entrepreneurs venturing in Upper Bavaria as well. Figure 4.7 depicts the cumulative survival in years for both groups of founders.

For all age-groups the survival performance of the immigrant founders is poorer in comparison with the Germans. The survival chance of even the most successful 46-55 age-group among the immigrants is lower than that of the least successful German group. It should be mentioned, however, that the medians lead to similar results. With respect to the immigrant entrepreneurs, the values are: 1.94 years for the 17-25 age-group, 2.57 years for the 26-35 age-group, 3.76 years for the 36-45 age-group, 3.91 years for the 46-55 age-group, and 2.84 years for the 56-older age-group. In other words, the human capital endowment as proxied by age influences the survival performance of immigrant founders in Upper Bavaria, but this first result could not explain why immigrant founders from the same class have a different probability of being successful.

[46] Their empirical analysis includes industrial sectors such as manufacturing, construction, trade and services.

Figure 4.7: Survival Performance of Immigrant and German Enterprises by Various Age-Groups, 1990-1997



Additionally, I estimated a Gompertz-Makeham attaching as covariates the entrepreneur's age and age-squared. The hazard rate is given by the equation below, that is

$$h_i^{immigrant}(t) = \alpha_i^{immigrant} + \exp\left[b_0' + b_1' Age_i^{immigrant} + b_2' \left(Age_i^{immigrant}\right)^2\right] \exp\left(\gamma_i^{immigrant} t\right) \tag{4.7}$$

where $Age_i^{immigrant}$ represents the age in years of immigrant entrepreneur i, and b_0', b_1', and b_2' are vectors of parameter. The estimates received with the corresponding p-values, the –2 log likelihood and χ^2 – statistics are represented in table 4.8.

According to the estimates, the impact of age on the hazard rate is statistically highly significant and as expected negative. In other words, being one year older when establishing the own company will prolong the survival by 2.22 per cent. Nevertheless, the positive impact of the covariate 'age-squared' corroborates the assumption of the inverted U-shape correlation between age of immigrant entrepreneur and survival duration as measure of success; hence it is almost impossible to predict at what entrepreneur's age the negative effect on the hazard will shade off into positive one. Unfortunately, I have to stress that founder's age is the only indicator that can be used as a proxy for the human capital endowment due to the structure of the data set provided by the Chamber of Industry and Commerce in Munich, Germany.

Table 4.8: Impact of Human Capital on the Survival Performance of Immigrant Entrepreneurs in Upper Bavaria

Covariates	Coefficient	P-Value
Constant Term, $\alpha_i^{immigrant}$	-4.6438	0.0953
B Terms of the Hazard Rate		
Constant Term, b_0	-3.5673	0.0428
Age of Entrepreneur, $Age_i^{immigrant}$	-0.0225	0.0656
Age-Squared of Entrepreneur, $\left(Age_i^{immigrant}\right)^2$	0.0022	0.0247
Constant Term, $\gamma_i^{immigrant}$	-0.0308	0.0319
Number of Observations	11,523	
-2 Log-Likelihood	39,038.470	
χ – Square (P-Value)	51.427 (0.000)	

Note: The shadowed area indicates the statistical significance of the estimated coefficients at one, five, and ten per cent level.

The distribution of the survival (median) by age and industrial sector allows analysing the impact of the industry-specific human capital on the firm performance. For comparative purposes, I illustrate the survival of German entrepreneurs operating in Upper Bavaria by industrial sector and age as well. Figures 4.9 and 4.10 outline the distribution of the survival performance in months. In accordance with the data, I can confirm the inverted U-shaped curve for almost all industrial sectors. This relation is particularly true for the German entrepreneurs when excluding the slightly dubious age-group of 66 and older. Moreover, the curves concerning the immigrant founders run below those of the German entrepreneurs in general. When considering the retail industry, which is associated with less specific human capital requirements, I can ascertain that the survival performance of immigrants from even the most successful age-group 46-55 is poorer that that of the least performing German age-group. In other words, the German entrepreneurs in Upper Bavaria manage with less than 20 years' human capital. Even taking into account that human capital accumulated in the country of origin is less valuable in the host country due to problems of diploma's equality between countries, this result is remarkable.

Figure 4.8: Survival Performance of Immigrant Enterprises by Age-Groups and Industrial Sectors, 1990-1997

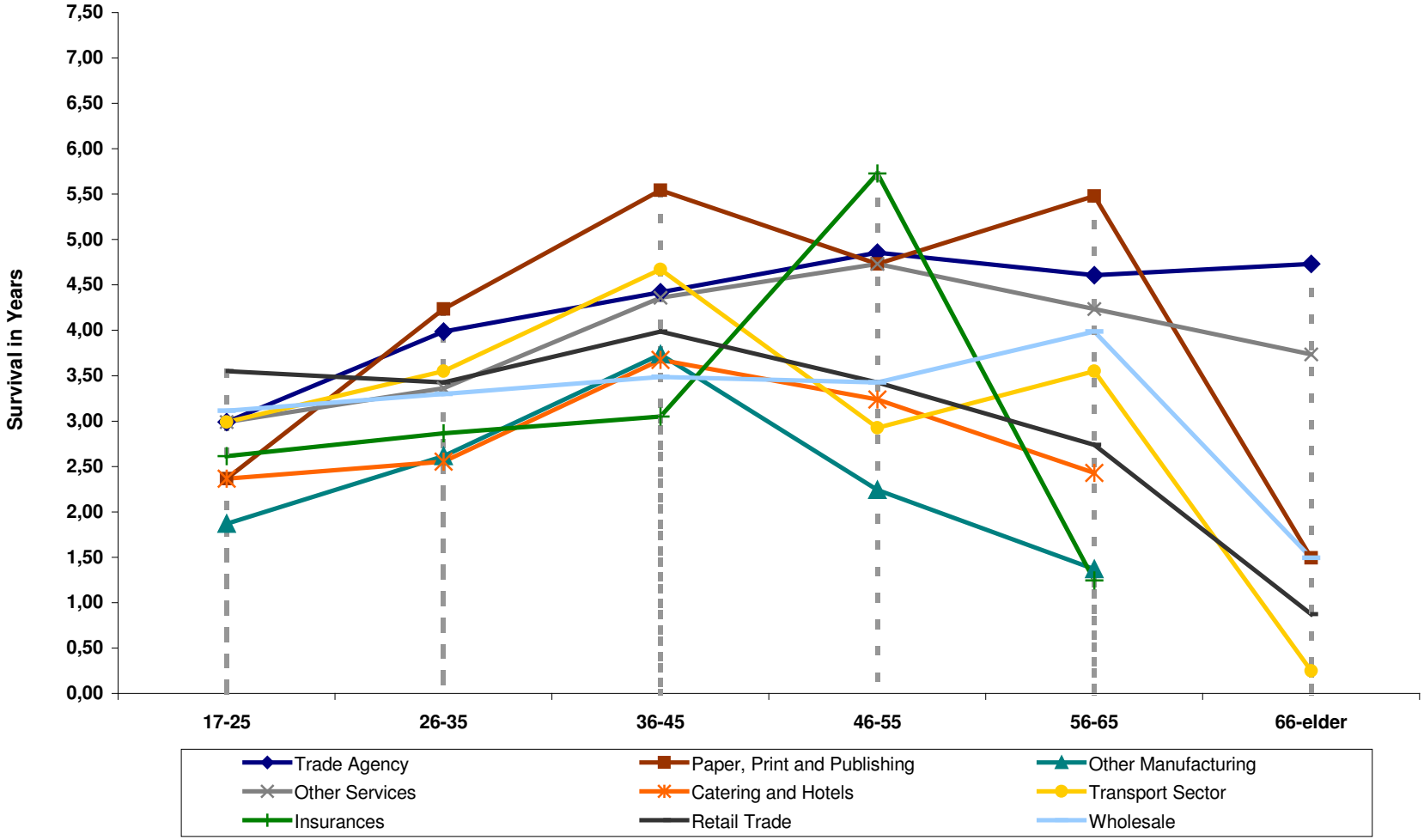
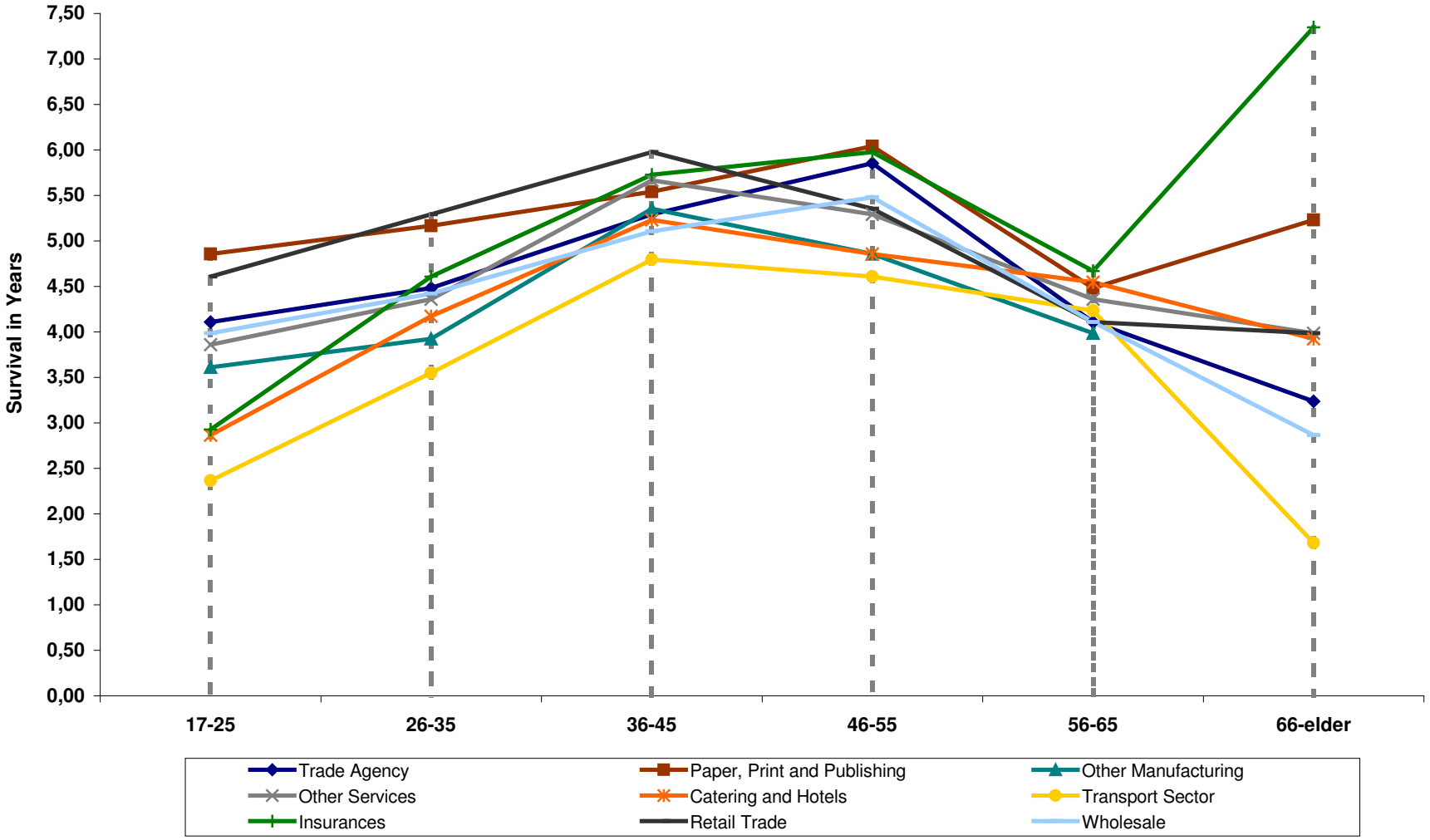


Figure 4.9: Survival Performance of German Enterprises by Age-Groups and Industrial Sectors, 1990-1997



The empirical evidence for the catering and hotels sector is not as clear as for the retail industry. On the grounds of flat survival curve with respect to immigrant entrepreneurs, I can assume that immigrants are more likely to establish companies such as lunch and snack bars than Germans, for instance, those that require general human capital.

The manufacturing sector is characterised by the greater demand for specific human capital, though its influence is clearly stronger. This relationship is true for the service sector and the paper, print and publishing industry. In the paper, print and publishing sector, the best survival performance indicate the age-groups of 36-45 and 56-65-years old. Surprisingly, the manufacturing industry, given the higher levels of industry-specific human capital required, accounts for the shortest survival among the immigrant founders in Upper Bavaria. One possibility to explain this result is provided by the trade regulations in Germany. Accordingly, it is demanded from the immigrant entrepreneur who does not accomplish the contemplated requirements to employ a business manager. In this vein, the founder is given the opportunity to overcome the formal obstacles related to the specific human capital endowment.

In addition, I estimated the Gompertz-Makeham model incorporating covariates for the industrial sectors as proxies for the industry-specific human capital investments. In this case, the hazard rate is represented by the equation below, that is

$$h_i^{immigrant}(t) = \alpha_i^{immigrant} + \exp\begin{bmatrix} b_0' + b_1' Age_i^{immigrant} + b_2' \left(Age_i^{immigrant}\right)^2 + b_3' Agricult_i + \\ b_4' Paper_i + b_5' Manufact_i + b_6' Catering_i + b_7' Transp_i + \\ b_8' Insur_i + b_9' SaleAgen_i + b_{10}' Retail_i + b_{11}' Wholesale_i \end{bmatrix} \exp\left(\gamma_i^{immigrant} t\right) \quad (4.8)$$

where: $Agricult_i$ … Dummy that takes value one if the enterprise i belongs to the animal husbandry and agricultural sector

$Paper_i$ … Dummy that takes value one if the enterprise i belongs to the paper, print, and publishing sector

$Manufact_i$ … Dummy that takes value one if the enterprise i belongs to the manufacturing sector

$Catering_i$ … Dummy that takes value one if the enterprise i belongs to the catering and hotels sector

$Transp_i$ … Dummy that takes value one if the enterprise i belongs to the communication and transport sector

$Insur_i$ … Dummy that takes value one if the enterprise i belongs to the insurance industry and finance

$SaleAgen_i$ … Dummy that takes value one if the enterprise i belongs to the sales agency sector

$Retail_i$ … Dummy that takes value one if the enterprise i belongs to the retail sector

$Wholesale_i$ … Dummy that takes value one if the enterprise i belongs to the retail sector.

Carrying out the maximum likelihood estimation of equation (4.8), I received the results that are depicted in table 4.9. Additionally, table 4.9 contains the p-values, the values of the –2 log likelihood and the $\chi^2 -$ statistics.

Table 4.9: Impact of Industry-Specific Human Capital on the Survival Performance of Immigrant Entrepreneurs in Upper Bavaria

Covariates	Coefficient	P-Value
Constant Term, $\alpha_i^{immigrant}$	-4.7352	0.0084
B Terms of the Hazard Rate		
Constant Term, b_0	-3.8194	0.0025
Agricultural Sector, $Agricult_i$	-0.0979	0.1643
Paper, Print and Publishing, $Paper_i$	-0.4440	0.0401
Manufacturing, $Manufact_i$	0.3792	0.0064
Catering and Hotels, $Catering_i$	0.5651	0.0037
Communication and Transport, $Transp_i$	0.6045	0.0018
Insurance Industry and Finance, $Insur_i$	0.2152	0.0389
Sales Agency, $SaleAgen_i$	0.0776	0.2304
Retail Industry, $Retail_i$	-0.1360	0.0021
Wholesale, $Wholesale_i$	0.1100	0.0824
Age of Entrepreneur, $Age_i^{immigrant}$	-0.0369	0.0406
Age-Squared of Entrepreneur, $\left(Age_i^{immigrant}\right)^2$	0.0036	0.0054
Constant Term, $\gamma_i^{immigrant}$	-0.3000	0.0086
Number of Observations	11,523	
-2 Log-Likelihood	40,696.794	
χ – Square (P-Value)	89.128 (0.000)	

Note: The reference group regarding the industrial sectors is 'other services'. The shadowed area indicates the statistical significance of the estimated coefficients at one, five, and ten per cent level.

According to the obtained estimates, immigrant entrepreneurs venturing in the industrial sector 'paper, print and publishing' have the highest likelihood to stay longer in business given the fact that the reference group 'other services' belongs to the industries accounting for good survival performance. More precisely, establishing a company in aforementioned sector will decrease the hazard rate by 35.85 per cent compared to the

'other services'. Surprisingly, the retail sector also impacts the hazard rate negatively. Deciding to launch a business in this particular industry will prolong the survival performance by 12.72 per cent. The estimated influence of the agricultural sector on the hazard rate is negative as well, but because of its statistical insignificance, it should be taken into consideration cautiously. Finally, the remaining industrial sectors incorporated in the survival analysis increase the hazard rate compared to the sector 'other services'. The worst survival performance can be expected in communication and transport sector, followed by the catering and hotels. This can be explained in turn by the less industry-specific human capital required there.

In total, the shape of the survival curve by industrial sector shows more fluctuations among the immigrant than German founders in Upper Bavaria. Better survival performance can only be yielded through more industry-specific human capital investments. I conclude, therefore, that hypothesis one – human capital influences the survival performance of immigrant entrepreneurs in this particular region –, and hypothesis three – industry-specific capital impacts even stronger the survival – are confirmed by the data.

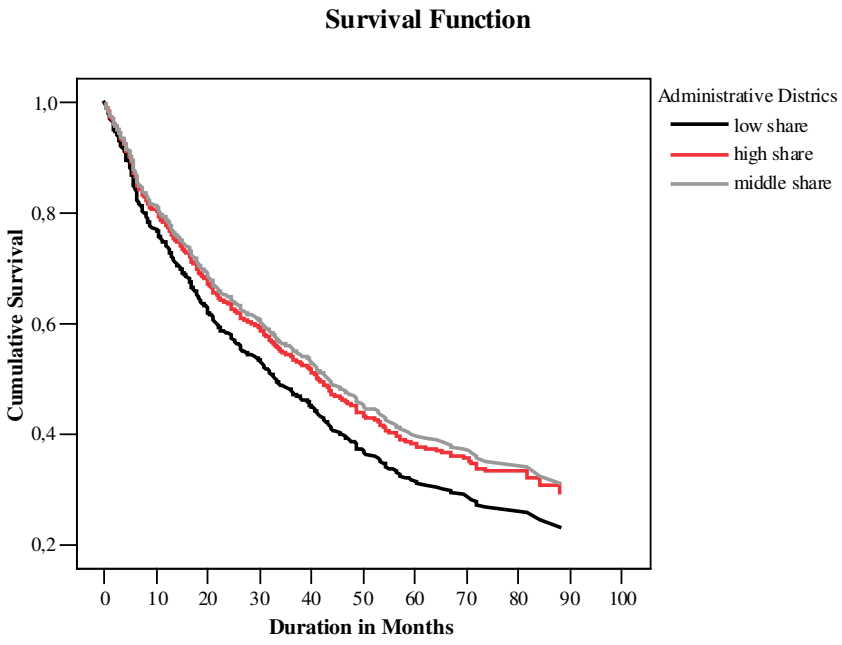
4.6.2 Results for the social capital endowment

Social capital also appears to influence the survival of immigrant entrepreneurs. If business owners plan to gather their information using commercial and non-commercial relationships, this improves several performance measures. Moreover, information gathering via general channels extends the survival time and the employment generated. Contacts with other entrepreneurs of the same nationality, for instance, have a positive effect on the economic performance of a business founder (Fertala, 2004). In other words, I can expect that in regions with a relatively high proportion of immigrants, the probability of social networking and survival will both be higher. To test my second hypothesis, I use as a proxy for the social capital endowment the proportion of resident foreign population by administrative district in Upper Bavaria. The city of Munich, for instance, accounts by far for the highest share of immigrants among the regions under consideration, and therefore requires separate examination. On the other hand, the heterogeneity among immigrants in regions where they are more highly represented may be greater than in regions with a smaller proportion of foreign population. In this context, the social networking in smaller administrative districts and with a smaller proportion of immigrants may be intensive. However, I regard the percentage of

immigrants as small when it averages below seven per cent, as medium-range when it is between seven and 12 per cent, and high when it exceed 12 per cent for the period 1990-1997. Accordingly, administrative districts such as Ingolstadt, Munich city and Rosenheim city have a high proportion; the Berchtesgaden region, Bad Toelz, Dachau, Ebersberg, Freising, Fuerstenfeldbruck, Garmisch-Partenkirchen, Miesbach, Munich region and Starnberg have a medium-range proportion; and the regions of Altoetting, Eichstaett, Erding, Landsberg am Lech, Muehldorf, Neuburg-Schrobenhausen, Pfaffenhofen, Rosenheim region, Traunstein and Weilheim-Schongau have the smallest proportion of foreign population. In my view, it would be more precise to incorporate into the analysis the share of each particular nationality when investigating the impact of social capital on survival, but unfortunately these data are not available.

When I consider the survival performance of immigrant entrepreneurs by percentage of foreign population resident in a certain administrative district, I have found that it is notably greater in districts with a medium or high percentage of immigrant living there. Figure 4.10 shows the survival duration of immigrant enterprises by proportion of foreigners in the region.

Figure 4.10: Survival of Immigrant Enterprises by Foreign Population in the Region, 1990-1997



In view of that, immigrant founders are the most successful in districts with a medium share of resident immigrants. The worst economic performance is seen in regions with a relatively low percentage of immigrants, and the likelihood of these companies being liquidated is extremely high in the period between one and five years after foundation. These first results point to an inverted U-shape relationship between survival and proportion of immigrants in a particular region, which to my best knowledge have not been found yet by other scholars studying the immigrant entrepreneurship.

Before investigating the aforementioned relationship in detail, the industrial structure pertaining to the administrative districts in Upper Bavaria needs to be assessed. For this purpose, I carried out a cluster analysis[47] including variables such as unemployment rate, GDP per capita, trade tax collection rate, population density (proxy for urban and rural area), and share of industrial sectors out of the total number of firms as a reference to whether it concerns rather an agricultural, an industrial or a service region. I used average values over the observed time period, and the K-mean algorithm clustered the established enterprises into four groups.[48] The main characteristics of each cluster are depicted in table 4.10.

Table 4.10: Main Characteristics of the Generated Clusters in Upper Bavaria

Characteristics	Generated Clusters			
	1	**2**	**3**	**4**
Share of Tertiary Sector	90.54	92.19	91.53	89.57
Share of Secondary Sector	8.12	7.26	7.33	8.88
Share of Primary Sector	1.34	0.54	1.15	1.54
Population Density (Persons pro Square Meters)	155.10	2,197.21	667.13	146.46
Trade Tax Collection Rate	312.08	394.51	352.98	326.42
GDP per Capita in Euros	23,827.21	61,061.30	44,381.38	29,658.44
Unemployment Rate in Per Cent	7.61	4.25	7.35	6.64
Number of Districts	12	2	4	5

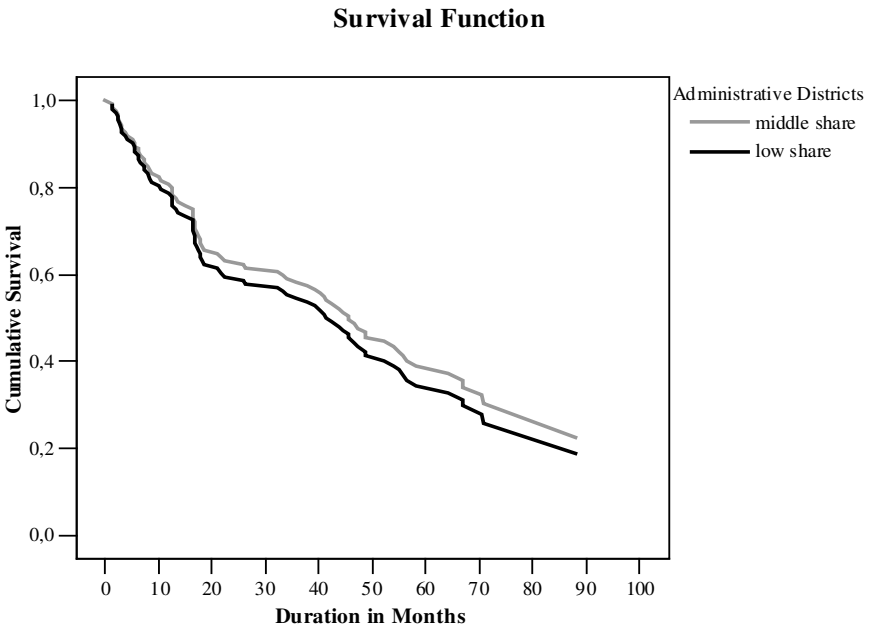
[47] Cluster analysis is an exploratory data analysis tool for solving classification problems. Its object is to sort cases into clusters, so that the degree of association is strong between members of the same cluster and weak between members of different clusters. Each cluster thus describes, in terms of the data collected, the class to which its members belong; and this description may be abstracted through use from the particular to the general class or type.

[48] Cluster 1: Berchtesgaden Region, Bad Toelz, Dachau, Ebersberg, Erding, Fuerstenfeldbruck, Garmisch-Partenkirchen, Landsberg am Lech, Miesback, Muehldorf, Neuburg-Schrobenhausen and Rosenheim Region; Cluster 2: Munich City and Munich Region; Cluster 3: Ingolstadt, Rosenheim City, Altoetting and Pfaffenhofen, and Cluster 4: Eichstatt, Freising, Starnberg, Traunstein and Weilheim-Schongau.

Additionally, I consider cluster two to be an outliner due to its size, though, it is not taken into account in the following analysis.

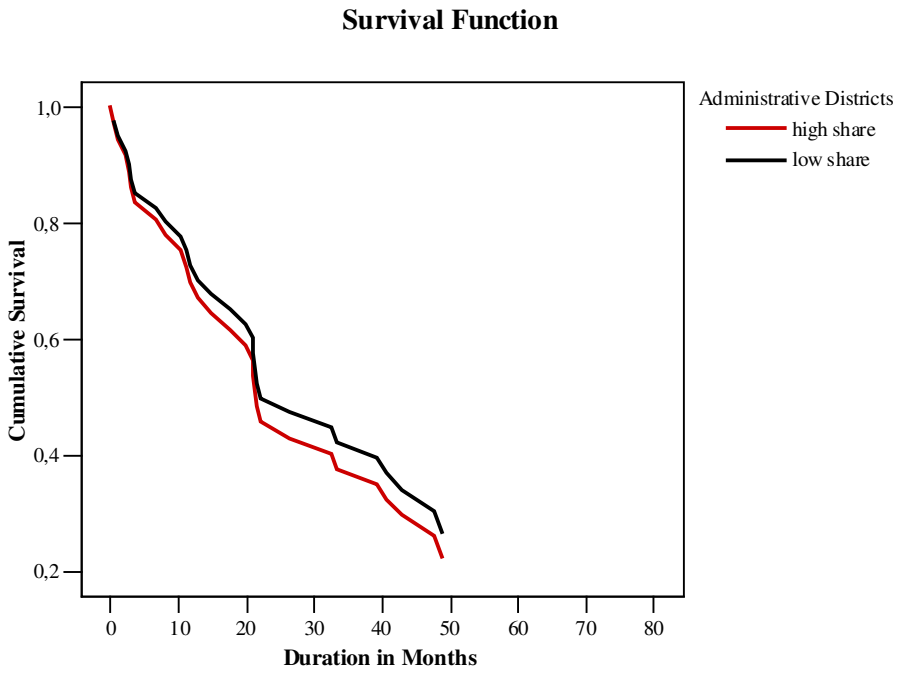
Hypothesis two is fully confirmed for cluster one. In other words, companies founded in a region with a medium proportion of immigrants show better survival performance, whose median amounts to 3.74 years (1,863 companies). In contrast, the survival performance of companies established in districts with a lower percentage of foreign population is 2.89 years (989 companies). These differences are statistically significant at the one per cent level (see figure 4.11).

Figure 4.11: Survival of Immigrant Enterprises in Cluster One by Share of Foreign Population



In cluster three, the firms founded in districts with a low proportion of immigrants survive longer. More precisely, the median for the higher proportion amounts to 2.43 (498 enterprises) years, as apposed to 2.54 years (338 enterprises) for the low proportion (see figure 4.12). The estimates are not statistically significant and therefore should be handled with caution in this particular cluster.[49]

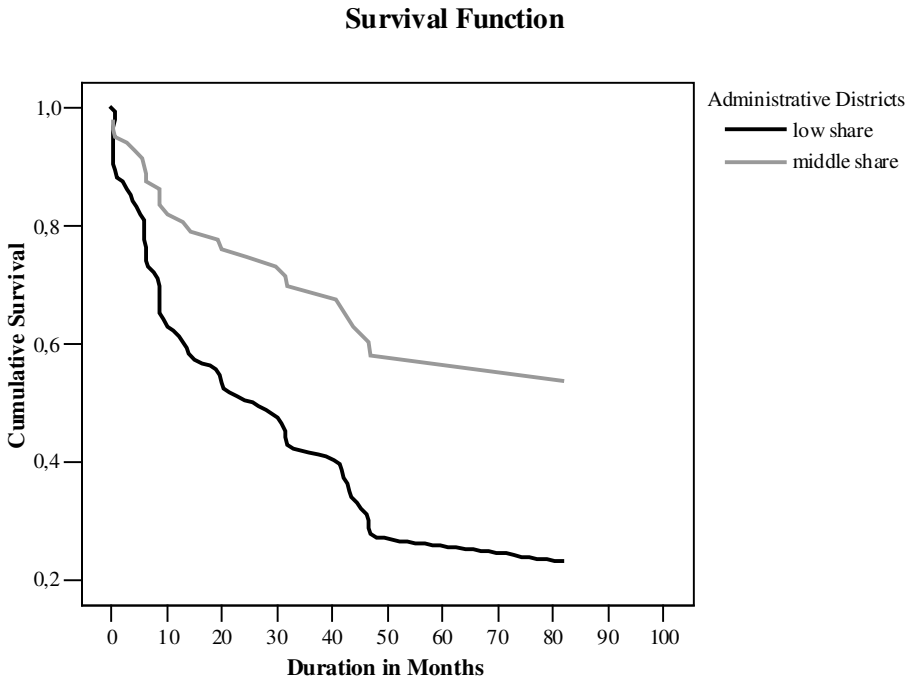
Figure 4.12: Survival of Immigrant Enterprises in Cluster Three by Share of Foreign Population



[49] The obtained significance levels applying various tests are: Log-Rang (Savage) 0.2561; Wilcoxon (Breslow) 0.4602; Wilcoxon (Prentice) 0.4087.

Cluster four confirmed my hypothesis pertaining to the social capital endowment. Moreover, the median computed is 3.75 years (610 enterprises) for firms founded in regions with a medium share of foreign population in comparison to a median survival performance of 2.92 years (517 enterprises). The differences are statistically significant at the five per cent level (see figure 4.13).

Figure 4.13: Survival of Immigrant Enterprises in Cluster Four by Share of Foreign Population



How does the share of immigrant population in Upper Bavaria influence the hazard rate? I assume that the impact of the share will be stronger for newly founded companies at the beginning whereas this may not be the case for those companies already in operation. Therefore, I estimated three different specifications of the Gompertz-Makeham model: in the first, I excluded the share of the foreign population, while in the second the population is included, and in the third specification, I tested for the inverted U-shape relationship. I also incorporated into the hazard model the covariates: tax trade collection rate, unemployment rate, and population density. Applying the maximum likelihood procedure, I received the results that are depicted in

table 4.11. Additionally, table 4.11 contains the p-values, the values of the –2 log likelihood and the $\chi^2 -$ statistics.

Table 4.11: Impact of Share of Foreign Population on the Survival Performance of Immigrant Entrepreneurs in Upper Bavaria

Covariates	Model 1	Model 2	Model 3
Constant Term, $\alpha_i^{immigrant}$	-4.6825***	-4.6409***	-4.5663***
B Terms of the Hazard Rate			
Constant Term, b_0	-8.9223***	-9.2383***	-7.8102***
Trade Tax Rate	0.0121***	0.0146***	0.0119***
Unemployment Rate	0.1148***	0.0950***	0.0688**
Population Density	-0.0004***	-0.0004***	-0.0003***
Share of Foreign Population		-0.0441*	-0.0542*
Share of Foreign Population Squared			0.0021**
Constant Term, $\gamma_i^{immigrant}$	-0.0290***	-0.0311***	-0.0355***
Number of Observations	11,523	11,523	11,523
-2 Log-Likelihood	24,803.321	27,303.143	27,304.705
$\chi -$ Square (P-Value)	65.820 (0.000)	88.775 (0.000)	87.150 (0.000)

Note: The number of stars indicates significances of the estimates. One star represents ten per cent, two five per cent, and three one per cent level of significance.

The estimated hazard model two suggests that a one-percentage point increase in the foreign population share yields a 4.31 per cent decrease in the hazard rate. While including the squared share of the foreign population into the model three in order to account for the inverted U-shape relation between social capital and survival, the effect of the foreigners even strengthens. In other words, a one-percentage point increase in the share leads to a 5.28 per cent decline of the hazard rate whereas the squared share causes a 0.21 per cent increase of the same. However, it is extremely difficult to estimate the level at which the still positive effect of the increasing share reverses the impact on the hazard rate. On the whole, I can conclude that there is sufficient support

for hypothesis two that social capital positively affects entrepreneurial performance of immigrants in Upper Bavaria but at a declining rate.

4.6.3 Differences in survival among the immigrant entrepreneurs

I have already shown that German entrepreneurs account for the best survival compared with immigrant founders in general. In this subchapter, I am interested in the impact of the nationality, in particular continent of origin, with respect to immigrants taking the Germans as reference group. For this purpose, I group the immigrant entrepreneurs in such stemming from Europe (11,161), Africa (112), South and North America (495), Asia (633), and lastly from Australia (25).

Among the four groups, Asian founders indicate the longest period of survival, for instance, the median amounts to 3.69 years while the mean is 4.20 years. The European entrepreneurs show the second best performance among the immigrants venturing in Upper Bavaria. Their survival measured by the median is 3.32 years, while the mean value accounts for 4.01 years. The remaining continents are ranked measured by the median in the following manner: American (3.18 years), African (2.90 years), and finally Australian enterprises, which due to the few cases perhaps are not of significant relevance.

Moreover, the relatively good performance of the Asian companies cannot be explained neither by the choice of location nor by industrial sector. The entrepreneurs from Asia concentrate in the city of Munich as all other groups of immigrant entrepreneurs do, but they favour industrial sectors such as catering and hotels, and retail industry, which belong to the medium tercile considering the survival of all companies and to the middle with respect to Munich city, respectively. But the clustering can be viewed as an indication for intensive networking. The American founders are clustered in sectors such as ‘other services’, ‘retail’ and ‘wholesale’. Additionally, 79 per cent of all firms established by Americans operate in the aforementioned industrial sectors and are located in Munich city. The same holds true for the African entrepreneurs whose venturing activities favour the service sector, communication and transport, retail, and wholesale.

In order to shed light on the factors leading to the different survival performance of immigrant entrepreneurs, I estimated two econometric specifications of the Gompertz-Makeham hazard model incorporating in the second one dummy covariates for each of the four continents discussed above. I also included in either model

industrial dummies, age, and age-squared of the founder. The industrial dummies allow investigating to what extent the variation in the survival is due to the sectors, which the company is operating in. Additionally, I included a dummy for Munich city in order to capture the impact of the firm collation. The obtained results are given in table 4.12. Accordingly, all continent dummies have a positive impact on the hazard rate (see model 2), i.e. the survival performance compared with the one of the German founders is worse. The Asian hazard rate is 22.04 per cent, the 'other' European 51.10 per cent, the African 86.13 per cent, and finally the American 92.21 per cent higher than the German entrepreneurs' hazard rate.

Additionally, the industrial sectors agriculture, paper, print and publishing, and retail offer the better survival compared to the services. Operating in the aforementioned industries decreases the hazard rate significantly. Finally, being located in Munich city leads to 31.05 per cent increase in the hazard rate.

In total, the empirical analysis has explicitly showed that there do exist diverse survival chances for the different nationalities, which cannot only be explained by the human capital endowment, the industrial sector, or the location of the company. According to continent of origin, the immigrants from Asia indicate the longest survival duration followed by these from Europe. Particularly bad chances face American and African entrepreneurs venturing in Upper Bavaria.

Table 4.12: Impact of Nationality on the Survival Performance of Immigrant Entrepreneurs in Upper Bavaria

Covariates	Model 1	Model 2
Constant Term, $\alpha_i^{immigrant}$	-4.7436***	-4.8119***
B Terms of the Hazard Rate		
Constant Term, b_0	-3.8583***	-3.9568***
Agricultural Sector, $Agricult_i$	-0.0944	-0.0884
Paper, Print and Publishing, $Paper_i$	-0.4449***	-0.3901***
Manufacturing, $Manufact_i$	0.3832***	0.3325***
Catering and Hotels, $Catering_i$	0.5592***	0.3932***
Communication and Transport, $Transp_i$	0.5931***	0.4924***
Insurance Industry and Finance, $Insur_i$	0.2096***	0.1797***
Sales Agency, $SaleAgen_i$	0.0921	0.0512
Retail Industry, $Retail_i$	-0.1216***	-0.1215***
Wholesale, $Wholesale_i$	0.1175***	0.0704*
Age of Entrepreneur, $Age_i^{immigrant}$	-0.0354***	-0.0301***
Age-Squared of Entrepreneur, $\left(Age_i^{immigrant}\right)^2$	0.0035***	0.0029***
Munich City	0.3496***	0.2704***
Europe		0.4128***
Africa		0.6213***
America		0.6529***
Asia		0.1992*
Australia		0.6054
Constant Term, $\gamma_i^{immigrant}$	-0.0292***	-0.0255***
Number of Observations	11,523	11,523
-2 Log-Likelihood	27,303.355	27,303.364
$\chi-$ Square (P-Value)	88.414 (0.000)	88.599 (0.000)

Note: The reference category for the nationalities is Germany, while for industries the sector 'other services'. The number of stars indicates significance of the estimates. One star represents ten per cent, two five per cent, and three one per cent level of significance.

4.6.4 Limitation of the study on Upper Bavaria

Any investigation of the impact of human and social capital endowment on the economic performance of immigrant entrepreneurs to Germany encounters numerous challenges. First, because of institutional reasons, it is quite seldom that data on economic performance of immigrants at the company level see the light of the day. Moreover, after we contacted all Chambers of Industry and Commerce in Germany, this in Munich was the only one collecting data on the nationality of the founder, which allows us to study their venturing activities.

Second, indicators measuring the accumulation of human capital such as years of schooling, the highest obtained degree, working experience, or experience as entrepreneurs are lacking in the data. Consequently, the only available is the age of entrepreneurs with its advantages and disadvantages, which I used as a proxy for the general human capital. Additionally, the influence of the industry-specific human capital on the survival I studied by including industry dummies, assuming that establishing a company in a sector characterised by greater demand for specific capital will lead to longer survival. Nevertheless, I am aware of the fact that these dummies are not the best measures, but they can still provide first significant insights into the immigrant entrepreneurship analysis.

Finally, even though I obtained sound results concerning the social capital influence, the measurement of this type of capital is not complete yet. In most studies, the social capital is proxied by presence of spouse, number of family member working as employees in the company, and rarely by contacts with entrepreneurs in networks, and way of information gathering, respectively. Consequently, there is both theoretical and empirical need in this area of research, in order to understand how this particular indicator functions, and in which way it impacts the entrepreneurial success.

4.7 Conclusion

Combining human and social capital theory with ideas from organisational ecology, I investigated a broad range of factors influencing the mortality process of newly founded enterprises by immigrants and Germans in Upper Bavaria during the period 1990-1997.

The main finding of my empirical analysis suggests that survival chances vary between the two main groups subject to investigation. I uncovered that the endowed level of human capital of a business founder shows an inverted U-shaped pattern. More precisely, the 17-25 age-group indicates the highest mortality rate among the immigrant

entrepreneurs while the 46-55 age-group is the most successful. The results obtained for the founder's age confirm the empirical evidence found by Preisendörfer and Voss (1990) employing data on registrations and deregistrations in the area of Munich and Upper Bavaria for the period 1980-1984. The authors also grouped the age of German founders and used it as a proxy for general human capital as I did. Human capital alone, measured by the entrepreneur's age, influences the hazard rate negatively, but it could not explain the different chances of survival across the immigrants as peer founders do not necessarily have the same level of human capital endowment. Hence, I can conclude that the general human capital does impact the entrepreneurial success, but is not the unique determinant of survival performance.

Rather investments in industry-specific human capital contribute significantly to explaining the cross-sectional variance of the survival performance of entrepreneurs. Generally, this type of human capital is measured by variables such as industry-specific, self-employment, and leadership working experience (Brüderl et al., 1992), and on the other hands, by industrial sector dummies (Preisendörfer and Voss, 1990). As the Chamber of Industry and Commerce in Upper Bavaria does not collect such data, I tested the impact of the specific human capital on survival by applying industry dummies. This approach, however, is well accepted in the existing literature. Accordingly, I found that the industries- agriculture, paper, print and publishing, and retail- offer immigrant founders better survival relative to the sector 'other services'. The communication and transport sector show the highest mortality rate. Even in the Brüderl's et al. study, the transportation sector accounted for the worst survival performance, but in comparison to the manufacturing.

The social capital in terms of social homogeneity of a particular region in Upper Bavaria affects positively the survival likelihood of businesses founded by immigrants. I also uncovered empirical evidence for an inverted U-shape relationship between social capital and survival, which to best of my knowledge, is unique in the immigrant entrepreneurship research, and has to be confirmed by other studies in the field.

Finally, immigrants to Upper Bavaria established fewer companies compared with their population share, but the creation rate was rising since then (Lehnert, 2003). The highest preference is given to the catering and hotels industry associated with less industry-specific human capital requirements, and here the firms are small-scale enterprises compared to those of the German entrepreneurs. The survival performance of immigrants is poorer than of German founders for all age-groups, industrial sectors

and administrative districts. However, it would be incorrect to assign the credit for better performance by German entrepreneurs solely to investments in human and social capital.

In total, the conducted empirical analysis did confirm the positive impact of human and social capital investments in generating higher survival rates among the immigrant founders venturing in Upper Bavaria.

5. A dynamic model of behaviour change: how fast do immigrant entrepreneurs adjust their beliefs?

5.1 Extended Abstract

The scope of this chapter is to capture the extent to which immigrant entrepreneurs adjust their beliefs with respect to effort in the light of new information, rather than relying on past experience to guide their decision making and entrepreneurial success. To detect the awareness of the immigrant entrepreneurs in Germany, I develop a model in which they constantly receive valuable noisy market signals about their accurate but unobserved productivity. Correspondingly, a dynamic iterative formulation of this process is integrated into the model of optimal effort, and an econometric specification is derived that enables to investigate the behaviour change of entrepreneurs.

5.2 Introduction

In the previous chapter I have shown that enterprises established by immigrants in Upper Bavaria are less successful in comparison to native entrepreneurs by applying a parametric hazard model to predict their survival chances. The investments in human and social capital do improve the economic performance, but the explanation for the differences is complex in view of the many influences on entrepreneur's success. One of the essential factors frequently referred to is the use of adequate information and a sound information system. Faced with dynamically changing competitive markets and shifting demands through firm's life cycle transitions, the sustainable success of immigrant entrepreneurs also relies on their ability to utilise new information rather than relying on past experience to learn about their true (but unknown) abilities and economic environment as the interface between the firm and the market alters. In this context, learning theory presents a compelling framework through which successful immigrant entrepreneurship may be examined and understood. Learning theory explicates a dynamic process that in its simplest form serves to generate new information. This process can occur at the individual, firm, or industry level. In this chapter I will address only the individual dimension of the dynamic learning and its impact on entrepreneur's success.

5.2.1 How important is behaviour change for entrepreneurial success?

To what extent do immigrant entrepreneurs rely on past experience when taking decisions about their business ventures? And to what extent do they utilise new information about their business performance to learn about their true (but unknown) abilities and trading environment? The answers of the above-addressed questions imply an answer to the underlying composite question: 'How important is behaviour change for entrepreneurial success?' that I seek to examine theoretically in this chapter. I do so by building a model in which entrepreneurs continually receive valuable noisy market signals, which they use to update their expectations as new information comes in. Additionally, I imbed a dynamic iterative formulation of this process into a model of optimal effort.

Knowing the extent to which immigrant entrepreneurs adjust their beliefs and so engage actively in behaviour change is desirable for several reasons. First, such knowledge might help us to gauge how 'alert' entrepreneurs are, in the sense of Kirzner's (1973, 1979) conception of an entrepreneur who observes the market and responds attentively to opportunities he perceives. Second, if immigrant entrepreneurs ignore or react sluggishly to new information then that might hinder their business performance and ultimately the vitality of the economy as a whole (Berry, 1996; Lybaert, 1998). Third, a belief that entrepreneurs are unresponsive to market signals might encourage governments to devise policy interventions such as entrepreneur education and awareness programmes (Sexton et al., 1997). Nevertheless, the suitability of such programmes presumably depends on the extent to which entrepreneurs actually do adjust their beliefs in practice - a parameter that needs to be measured. And fourth, academics, practitioners and policy-makers might be interested in finding out whether particular entrepreneurial groups are more responsive than others are. That might be valuable for targeting support programmes more effectively.

If entrepreneurs learn, and in consequence of, change their behaviour, *what* do they learn about? According to Minniti and Bygrave (2001), entrepreneurial decisions are a function of two types of knowledge. The first relates to market conditions, opportunities, technologies and/or new business ideas. The second relates to 'how to be entrepreneurial', or to the ability in entrepreneurship. In practice, entrepreneurs are rarely perfectly informed about either. For brevity, I refer to their joint impact on the entrepreneur's venture as 'unobserved productivity' as several authors (see, for instance, Jovanovic, 1982; Frank, 1988) argue that, in practice, entrepreneurs obtain noisy signals

about unobserved productivity, the noise deriving from stochastic variations such as macroeconomic or sector-specific shocks, or idiosyncratic luck. These entrepreneurs can update their beliefs about the unobserved productivity using both the most recent noisy signal and the past history of previous signals. Researchers following this approach tend to make strong assumption about the unobserved productivity, such as being fixed at some constant level for all time, to which expectations are expected to converge. However, such an assumption will be unrealistic if the underlying market conditions and entrepreneurial abilities change over time.

It is also important to be clear about *why* immigrant entrepreneurs adjust their beliefs and so engage in learning. In my view, a satisfactory model of this phenomenon should not only shed light on how entrepreneurs adjust their beliefs, but should also endogenise the incentives for doing so. It is, for instance, empirically well established that entrepreneurial learning can add considerable value to business ventures: see, for instance, Abetti (1997), Arrighetti and Vivarelli (1999) and Wesson and de Figueiredo (2001). There exists, therefore, a need for a model that specifies how adjustments to entrepreneurs' beliefs affect their decisions and improve their subsequent performance. Entrepreneurs, for instance, might only be willing to increase their input of costly effort to their venture if they have just perceived that more favourable market conditions are emerging. In this sense, a better understanding of immigrant entrepreneurial learning and expectations formation also implies a better understanding of what determines their success (see also Cressy, 1992).[50]

5.2.2 Former studies on the learning context in entrepreneurial ventures

A latest review of past studies on learning among entrepreneurs concludes, that despite the importance of the issues, research is still at a preliminary stage (Agndal, 1999). In a recent theoretical contribution, commenting on the insightful observation of Kirzner (1973) that the purposeful search of information that follows the discovery of an opportunity is essential to entrepreneurial activity, Minniti and Bygrave (2001) conclude that 'entrepreneurship is a process of learning, and a theory of entrepreneurship requires a theory of learning'. Nevertheless, with some exceptions (Bailey, 1986; Guth et al., 1991), researchers in the field of entrepreneurship have

[50] Like Cressy (1992), Minniti and Bygrave (2001) and others, I treat the entrepreneurial venture as a single homogeneous unit. This is not to deny the influence of organisations on individual knowledge and learning, the implications of learning for organisational design, or social learning, which can of course all be very important in a range of different contexts.

devoted little attention to investigate how entrepreneurs learn and change accordingly their behaviour.

Traditionally, research on the psychology of entrepreneurs focused on the cognitive traits, such as risk propensity, need for achievement, and self-confidence, that differentiate entrepreneurs from non-entrepreneurs (Begley and Boyd, 1987; Forlani and Mullins, 2000). Empirical studies aimed at demonstrating the peculiarity of entrepreneurs' traits, however, seem to have failed to produce conclusive results (Low and MacMillan, 1988). More recently, some studies shifted attention to the cognitive processes and mechanisms, according to which entrepreneurs select and process information, to make sense of the external environment (Nicholls-Nixon et al., 2000; Shane and Venkataraman, 2000). Drawing on cognitive schema theory, Palich and Bagby (1995) observed that entrepreneurs tend to frame opportunities in more favourable way than non-entrepreneurs do. When facing an uncertain business situation, entrepreneurs seem to lay emphasis on strengths and potentials for gain, whereas non-entrepreneurs tend to stress weaknesses and potentials for loss. Busenitz and Barney (1997) compared the way entrepreneurs and managers make decisions, and found that entrepreneurs are inclined to use heuristics – simple decision rules that reduce the complexity of decision processes – more extensively than mangers do. The two authors speculate that these cognitive biases may be beneficial, insofar as they let entrepreneurs catch windows of opportunities even when time constraints do not allow a thorough and rational analysis. Finally, Shane's study (2000) on different market applications of the same invention supports the argument that opportunity recognition is driven more by the distinctive knowledge possessed by individuals, rather than by their personality characteristics. This idiosyncratic information allows individuals to discover opportunities that others cannot see, even if they are not actively searching for them (Kirzner, 1997).

A distinctive feature of numerous studies on entrepreneurial cognition – be it related to opportunity recognition, risk taking or other – appears to be the assumption that what makes entrepreneurs different is either a set of psychological characteristics or the way they collect, select and process information. Recent theoretical modelling of entrepreneurial learning seems to follow the same approach. Agndal's research agenda for studying learning among entrepreneurs, for instance, concentrates on individual learning styles (Bailey, 1986), implicitly assuming the existence of a fundamental difference between entrepreneurs and non-entrepreneurs. The dynamic model of Minniti

and Bygrave (2001) of entrepreneurial learning proposes a representation of the way entrepreneurs modify their courses of action over time, on the basis of their experience. In other words, studying entrepreneurial learning has generally been conceived as investigating the unique and distinctive way in which entrepreneurs acquire, store and use knowledge (Agndal, 1999; Minniti and Bygrave, 2001). In this sense, what makes my theoretical formulation unique?

5.2.3 What makes my theoretical formulation unique?

Several previous researchers have suggested that the establishment and development of enterprises involves ongoing adjustment of original plans and beliefs, possibly through an iterative process of trial and error (e.g., Nicholls-Nixon et al., 2000). I conceptualise how immigrant entrepreneurs adjust their beliefs by imagining them comparing the latest noisy signals about their unobserved productivity with their prior expectation. Any divergence between the two conveys potentially valuable information that the entrepreneur can exploit. Like Minniti and Bygrave (2001), I contend that a learning approach based on ongoing adjustment is likely to describe entrepreneurs' actual behaviour change better than an assumption of 'rational expectations'. Rational expectations imply that agents learn all there is to know immediately, making only unsystematic and unpredictable forecasting errors. I argue that this presumes a level of knowledge and awareness that few immigrant entrepreneurs are likely to possess in practice.

For these reasons, adaptive expectation adjustment forms the basis of my approach. Additionally, I propose a framework that is theoretically and empirically tractable, and that avoids having to make strong assumptions about unobserved productivity, such as it being fixed at some constant level for all time, to which expectations converge.[51] An assumption of this type will be unrealistic if underlying market conditions and entrepreneurial abilities change over time. An entrepreneur's ability might improve as he gains experience from managing his venture; and new innovations might impact on an entrepreneur's venture in a profound and ongoing manner that he, nevertheless, does not fully comprehend at the time.

The analytical framework analysis described here makes three contributions, which to the best of my knowledge are new additions to the literature. First, I propose a

[51] See Jovanovic (1982), and Frank (1988), for models with this assumption.

joint model of entrepreneurial adjustment of beliefs, effort, and performance, which links all of these phenomena together in a unified way. Second, I provide an econometric formulation of the model that enables me to estimate the extent to which immigrant entrepreneurs exploit new information when adjusting their expectations. A key aspect of the formulation is its simplicity and ease of application, placing relatively few demands on the researcher in terms of data requirements, and being amenable to estimation by regression analysis.[52]

5.2.4 Structure of this chapter

The reminder of this chapter is organised as follows. First, I introduce the theoretical specification of my model of dynamic behaviour change in an entrepreneurial context. Second, I discuss thoroughly the robustness of the so derived model. More precisely, while investigating the theoretical robustness of the model, I provide an answer to the questions whether there are alternative interpretations of the autoregressive effort, and on the other side, how observable individual- and venture-specific characteristics might change the so specified model. And finally, I go on to discuss what can be learnt about the entrepreneurial success from the beliefs' adjustment process.

5.3 The theoretical model of entrepreneur's behaviour change

I commence with a verbal outline of the model about the entrepreneurial adjustment of beliefs, effort and performance. Then I write down a formal model that permits econometric estimation of the extent to which self-employed immigrants adjust their beliefs rather than relying on past experience while receiving new information.

The story starts with an entrepreneur supplying a level of costly effort to his enterprise. The total costs and benefits of effort take time to emerge, and are only fully realised by the end of the period. Entrepreneur's effort impacts on the venture's revenues via his productivity. This productivity depends on the combined effect of market conditions and entrepreneurial ability, and evolves with an unpredictable stochastic (and possibly also an unknown deterministic) component. Because its true

[52] If unobserved productivity was in fact observable to the researcher, then one might measure entrepreneurs' expectations adjustment by interrogating a sample of them directly. But by its very nature the phenomenon is unobserved, ruling out that approach. It might seem that an alternative would be to set up an experimental design, in which the researcher supplies market information sequentially to entrepreneurs who make decisions that also receive feedback from the researcher. Such experiments, however, are unlikely to replicate the real world business environment, learning about which is the topic of central interest in this chapter.

underlying value is unknown, I refer to as 'unobserved productivity'. Only noisy signals about unobserved productivity are received in any period; hence the entrepreneur does not know what the unobserved productivity of his effort will be in the next period. Nevertheless, he can form an expectation about it. His incentive to do so is that this helps him choose the correct new effort input, where effort generates both benefits and costs.

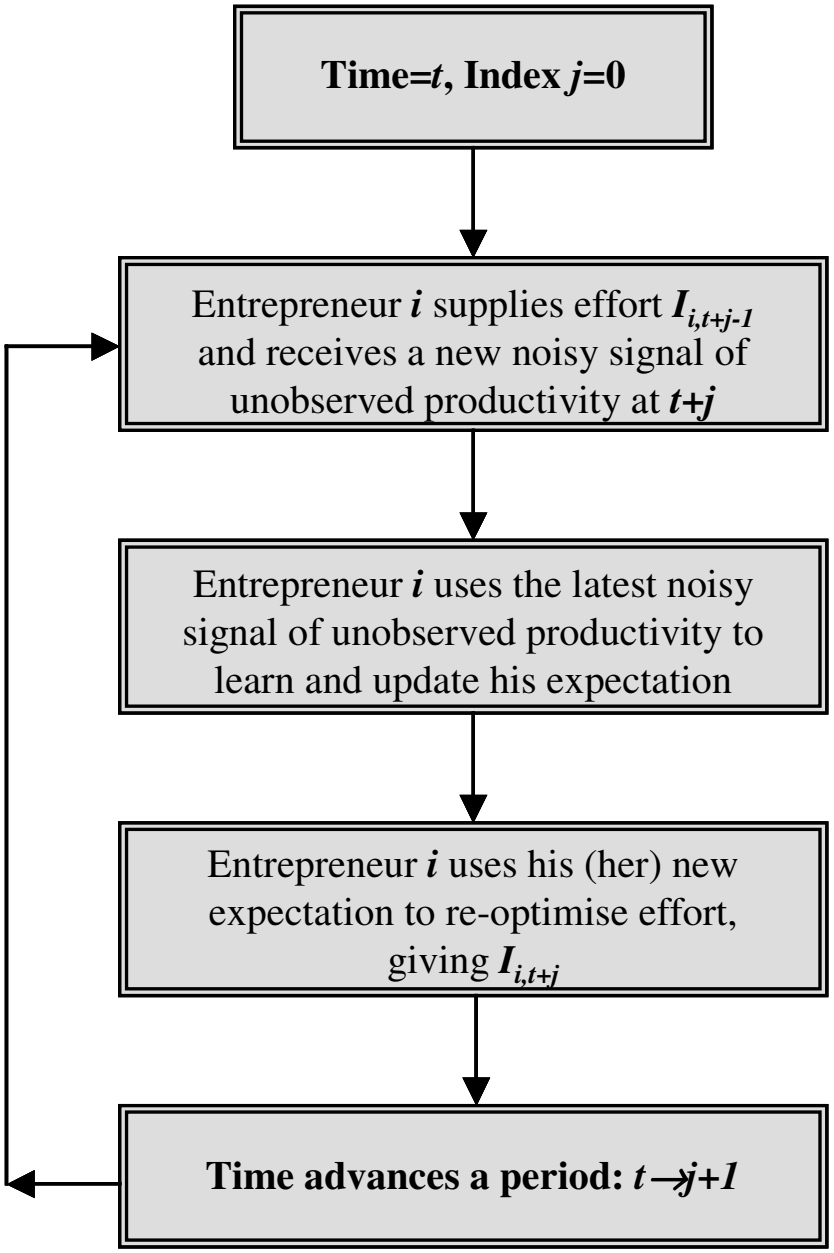
How does the entrepreneur form and change his expectations about the unobserved productivity? I assume that the entrepreneur updates his previous estimate of unobserved productivity by comparing the deviation between the last noisy signal and his previous estimate. If the former is greater that the latter, the entrepreneur has grounds for increasing his estimate; and if the former is less than the latter, he has grounds for decreasing it. The key parameter of interest is the extent to which entrepreneurs adjust their expectations in the light of new information.

The model is fully dynamic, because the entrepreneur's new expectation of unobserved productivity helps determine his optimal choice of effort, which in turn affects revenues and operating profit next period when a new noisy signal of unobserved productivity is received. Then the entrepreneur once again updates his estimate in the manner described above. This process continues over time as entrepreneurs obtain more and more information as they continue in the venture. Consequently, my main focus of interest centres on the responsiveness of entrepreneurs to new information, rather than the path of the expectations themselves.[53]

Figure 5.1 illustrates the learning model that I outlined verbally above. The effort is denoted by I; the subscript i refers to an individual entrepreneur i, and a second subscript refers to a time period t.

[53] For a commanding analysis of the latter, see Minniti and Bygrave (2001), who analyse the quality of entrepreneurial choices in an iterative learning model, and derive the interesting result that entrepreneurs can make decisions that are self-reinforcing rather than optimal.

Figure 5.1: The Dynamic Model of Entrepreneur's Behaviour Change



According to figure 5.1, the entrepreneur, first, infers a noisy signal of unobserved productivity from his performance, measured by profit and denoted by π. The performance by i at t depends in part on previous-period effort, I_{it-1}. Second, the signal is compared with the previous expectation of unobserved productivity according to an adaptive expectations scheme, whose behaviour changing parameter is denoted by λ, with $0 \leq \lambda \leq 1$. The entrepreneur updates his belief at this stage. Third, the entrepreneur uses the new belief to re-optimise the effort. This affects the entrepreneurial performance in the subsequent period, when a new signal of

productivity is observed. The process continues in this manner, iterating forwards over time as indicated by the 'loop-like' structure of figure 5.1.

5.3.1 Specification of the theoretical model

I now present the formal model, a diagrammatic representation of which was summarised in figure 5.1. I commence by deliberately writing down the most straightforward model that makes my point. The robustness of the model to more complicated specifications is treated separately in the next subchapter.

We consider an entrepreneur i at time t, who seeks to maximise his utility function

$$U = U\left(\pi_{it}, c_{it}\right) = \pi_{it} - c_{it} \tag{5.1}$$

where π_{it} is the operating profit and c_{it} is the non-pecuniary cost of supplying effort to the enterprise. I imply a separable linear utility function, and this assumption is motivated primarily by a wish to simplify the exposition. Later, I will test the robustness of the results obtained from this first model specification.

The entrepreneur observes his operating profit π_{it} at time t, which equals revenues minus operating cost. For the purpose of this model, productivity is defined in the usual way as the ratio of output to labour input. Normalising the output price to unity, productivity is, therefore, equal to revenues divided by effort. Rearranging, the entrepreneur's signal about revenue is therefore $\hat{p}_{it} I_{it-1}$, where $\hat{p}_{it}$ is the signal of unobserved productivity and I_{it-1} is the effort the entrepreneur invested in the enterprise in the previous period, $t-1$. Operating costs are given by $\theta_{it} I_{it-1}$, where $\theta_{it} = \theta_i + \varepsilon_t > 0$ is the marginal operating cost of effort of entrepreneur i at time t. Here θ_i is an individual-specific component of marginal operating cost; time variation of this cost enters through the stochastic component ε_t, which is a white-noise process. It is assumed that θ_i is known to i with certainty.

In this context, the observed operating profits are given by[54]

$$\pi_{it} = \hat{p}_{it} I_{it-1} - \theta_{it} I_{it-1} . \tag{5.2}$$

So at any time t, $\hat{p}_{it}$ can be deduced from (5.2) as

$$\hat{p}_{it} = \left[\frac{\pi_{it}}{I_{it-1}} \right] + \theta_{it} . \tag{5.3}$$

It is implicitly assumed in the foregoing that effort is supplied before the noisy productivity signal is received. This is an important, and I argue, a realistic formulation because it motivates entrepreneurs to form expectations and modify their beliefs and behaviour in a dynamic and iterative manner.

Additionally, I assume that the entrepreneur's non-pecuniary cost of effort is given by

$$c_{it} = \gamma I_{it-1} \ln\left(I_{it-1} / \underline{I} \right), \tag{5.4}$$

where $\gamma > 0$ and $\underline{I} \geq 1$ are parameters. This convex cost function implies that entrepreneurs dislike working beyond a certain point, denoted by $\underline{I}$. The full impact of effort expended at $t-1$ also takes a period of time to be fully realised in terms of non-pecuniary costs.

The entrepreneur uses the noisy signal $\hat{p}_{it}$ from (5.3) to change his expectation of true underlying unobserved productivity, p_{it}, in a manner that will be now described. Note that the expectation of p_{it} can be thought of as the entrepreneur's best guess of future productivity realisation. In this sense, letting $\mathrm{E}\left(. \mid \Omega_{it}\right)$ denote the entrepreneur's expectation conditional on his information set at time t, which I denote by Ω_{it},

[54] Note the distinction between operating cost, which enters profit function, and non-pecuniary cost, which together with profits enter the utility function given by (5.1). In fact, (5.2) implies constant returns to scale from the entrepreneur's effort investment. Constant returns to scale is a common assumption about production technologies.

$$E\left(\hat{p}_{it+1} \mid \Omega_{it}\right) = E\left(p_{it} \mid \Omega_{it}\right). \tag{5.5}$$

The entrepreneur's information set evolves according to the following dynamic process:

$$\Omega_{it} = \Omega_{it-1} \cup \hat{p}_{it}, \tag{5.6}$$

where Ω_{it-1} is the entrepreneur's information set in the previous period, $t-1$, and '$\cup$' denotes the union of sets.

To envisage how the entrepreneur updates his estimate of true underlying productivity, I propose the following flexible 'adaptive' adjustment scheme:

$$E\left(p_{it} \mid \Omega_{it}\right) = E\left(p_{it-1} \mid \Omega_{it-1}\right) + \lambda E\left[\hat{p}_{it} - E\left(p_{it-1} \mid \Omega_{it-1}\right)\right], \tag{5.7}$$

where $0 \leq \lambda \leq 1$ is a parameter measuring the extent to which entrepreneurs exploit new information when updating their expectations.

To see the rationale, observe that the square bracketed term on the right hand side of (5.7) measures the difference between the noisy signal of unobserved productivity at time t and the entrepreneur's previous expectation of it. In general, these will not be the same, a difference that provides a valuable learning opportunity for the entrepreneur. By inspection of (5.7), if $\lambda = 0$ the entrepreneur does not learn from this difference at all, i.e. $E\left(p_{it} \mid \Omega_{it}\right) = E\left(p_{it-1} \mid \Omega_{it-1}\right)$. The entrepreneur fixes his expectations forever and never does any behaviour change. At the other extreme, if $\lambda = 1$ the entrepreneur gives maximum weight to the latest noisy signal and discounts all previous history in forming the new expectation as equal to the latest noisy signal, i.e. $E\left(p_{it} \mid \Omega_{it}\right) = \hat{p}_{it}$. Intermediate λ values imply that entrepreneurs give some weight to their previous expectation but also use the latest data to some extent, adjusting their expectation upwards (downwards) if the latest noisy signal exceeds (falls below) their previous expectation. The greater is λ, the more alert they are to new information and the less they rely on their previous beliefs.

The entrepreneur's new expectation affects the subsequent behaviour, which in turn generates new behaviour changing opportunities. To see this, note that in the next period, $t+1$, optimising entrepreneurs will want to adjust their effort if the expected

costs and benefits from expending it have changed. For instance, if they revise downwards the expectation of their unobserved productivity then it might not pay them to exert as much costly effort as before. This set-up ensures that expectation adjustment is of non-trivial value to the entrepreneur and so is worth doing.

To see this formally, note that at time t the entrepreneur chooses I_{it} given his information set Ω_{it}. Hence, he expects his $(t+1)$-dated operating profit less his non-pecuniary cost of supplying effort I_{it} at t to be

$$\begin{aligned} E(\pi_{it+1} - c_{it+1} \mid \Omega_{it}) &= E(\pi_{it+1} \mid \Omega_{it}) - E(c_{it+1} \mid \Omega_{it}) \\ &= E\{I_{it}[\hat{p}_{it+1} - \theta_{it+1}] \mid \Omega_{it}\} - [\gamma I_{it} \ln(I_{it}/\underline{I}) \mid \Omega_{it}] \\ &= E\{[I_{it}\hat{p}_{it+1} - I_{it}\theta_{it+1}] \mid \Omega_{it}\} - [\gamma I_{it} \ln(I_{it}/\underline{I}) \mid \Omega_{it}] \\ &= I_{it}[E(p_{it} \mid \Omega_{it}) - \theta_i] - \gamma I_{it} \ln(I_{it}/\underline{I}) \end{aligned} \tag{5.8}$$

using (5.5) and noting that $E(\theta_{it+1} \mid \Omega_{it}) = \theta_i$ since $E(\varepsilon_{t+1} \mid \Omega_{it}) = 0$. In the mathematical appendix (see subchapter 8.1.1) I show that the entrepreneur's optimal effort that maximises (5.8), is determined as

$$\ln(I_{it}) = \gamma^{-1} E(p_{it} \mid \Omega_{it}) - \gamma^{-1}\theta_i + [\ln(\underline{I}) - 1]. \tag{5.9}$$

The final step is to backwards iterate on (5.7) and substitute into (5.9). After some simple but essentially uninteresting algebra (which is also relegated to the mathematical appendix), I finally obtain the regression equation

$$\begin{aligned} \ln(I_{it}) &= \alpha + (1-\lambda)\ln(I_{it-1}) + \gamma^{-1}\lambda\hat{p}_{it} - \gamma^{-1}\lambda\theta_i + \lambda[\ln(\underline{I}) - 1] \\ &= \alpha + (1-\lambda)\ln(I_{it-1}) + \gamma^{-1}\lambda\left(\frac{\pi_{it}}{I_{it-1}}\right) + u_{it}, \end{aligned} \tag{5.10}$$

using (5.3), where $\alpha = \lambda[\ln(\underline{I}) - 1] \geq 0$ or $\alpha = \lambda[\ln(\underline{I}) - 1] \leq 0$ is a constant term, and u_{it} is a mean-zero disturbance term recognising the possibility in a random sample of measurement error in I_{it}.

Note that (5.10) has a single intuitive explanation in terms of behaviour change and the expenditure of effort. If $\lambda = 0$, then (5.10) collapses into $E\left[\ln\left(I_{it}\right)\right] = \ln\left(I_{it-1}\right)$, i.e., the entrepreneur does not systematically adjust his effort from period to period. This is what would be expected from an entrepreneur who never updates his beliefs. On the other hand, if $\lambda = 1$, then (5.10) becomes $E\left[\ln\left(I_{it}\right)\right] = \gamma^{-1}\left(\pi_{it} / I_{it-1}\right) + \left[\ln\left(\underline{I}\right) - 1\right]$. That is, the entrepreneur adjusts his effort purely on the basis of what he has just learned, taking no account at all of the past history of noisy productivity signals, which are embodied in I_{it-1}. The practical importance of (5.10) to the research on entrepreneurship is that it enables λ, i.e. the extent to which entrepreneurs exploit new information when updating their expectations and behaviour change, to be estimated.[55] To do so, all we need is a sample of data on immigrant entrepreneur's effort in two contiguous years, and operating profit in the most recent of them.

Finally, two important questions arise at this point. First, can the theoretical model given by equation (5.10) also sustain alternative explanations based not on learning but on some extraneous model of work effort? And second, how robust is (5.10) to the possibility that productivity and non-pecuniary costs vary systematically with observable characteristics?

5.3.2 Theoretical robustness of the model

5.3.1.1 Are there alternative interpretations of autoregressive effort?

Can the derived model, not based on behaviour change also generate a regression specification like (5.10)? If it can, then the autoregressive coefficient on lagged effort, $\left(1-\lambda\right)$, might sustain alternative interpretations to the one that I suggest, based on adjusting beliefs. In which case, the above-proposed interpretation of λ might be thrown into doubt. Below, I consider this possibility by reviewing other studies from the literature. Further, I show that other dynamic work effort models do not in fact possess the autoregressive structure of equation (5.10). Consequently, I contend that this finding makes my proposed interpretation more secure.

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[55] In fact, all of the structural coefficients λ, γ, and $\underline{I}$ are exactly identified in equation (5.10): hence, for my purposes only the first is of direct interest.

It should be stressed at the outset that static models of work effort in the labour supply literature – which, like (5.10), condition work effort on returns to that effort[56] - cannot provide alternative interpretations of the coefficient on lagged effort. This is because static empirical models do not include lagged effort as an explanatory variable – that is the variable to which the (identified) behaviour change parameter is attached (Blundell and MaCurdy, 1999). In contrast, there do exist dynamic models of work effort that include a lagged effort variable – but only in a rather specialised way, as I describe below.

Before considering these dynamic models, I mention for completeness how my effort model relates to others in the entrepreneurship literature. Several previous studies have explored how entrepreneurs allocate their time between various different tasks involved in running a business (see, for instance, McCarthy et al., 1990; and Cooper et al., 1997). Conversely, I do not analyse the set of specific tasks on which observed effort is expended. On a different tack, Lévesque and MacCrimmon (1997) analysed the conditions under which it is optimal for an entrepreneur to apportion time between developing his own business and engaging in wage/salary employment.

Becker (1965), and on the other hand, Greenwood and Hercowitz (1991) studied the optimal allocation of time between market and household production. This problem is related to one of optimal choice between participation in self-employment or wage/salary employment (Campbell, 1992; Parker, 1996; Douglas and Shepherd, 2000; and Lévesque et al., 2002). None of these studies posit a dynamic work effort relation as an autoregression, as in equation (5.10).

I now discuss dynamic econometric models of work effort. Existing models of this type are all variants of one proposed originally by MaCurdy (1981). MaCurdy assumed rational expectations and optimising behaviour. Individuals choose how much to work and consume each period, taking into account the effects of their decisions on the evolution of assets in subsequent periods. The method of stochastic dynamic programming is used to generate first order conditions for optimal effort, which under assumptions of separable utility (like in my case) and rational expectation (unlike me) give rise to the following econometric specification (MaCurdy, 1981, equation (24): 1076):

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[56] Note that the term π_{it}/I_{it} on the right hand side (RHS) of (5.10) is effectively the entrepreneur's 'wage'. This variable is therefore directly comparable to the corresponding wage variable in static 'employee' labour supply models.

$$\Delta \ln I_{it} = \Upsilon_0 + \Upsilon_1 \Delta \ln \omega_{it} + u_{it}, \tag{5.11}$$

where Υ_0 and $\Upsilon_1 > 0$ are parameters, ω is the wage rate, and Δ is the first difference operator.

What is notable about (5.11) is that, unlike (5.10), it is not in fact an autoregression, but rather, it is a first difference specification. This, jointly with its logarithmic structure, means that it cannot provide an observationally equivalent alternative explanation for the coefficient $(1-\lambda)$ in equation (5.10). The only exception is the special case of $\lambda = 0$. It might be interesting, however, to note that two previous studies using data on self-employed individuals have rejected a key prediction of MaCurdy's dynamic model, namely of a positive intertemporal substitution of effort, i.e. $\Upsilon_1 > 0$ (see Rees and Shah, 1994; and Camerer et al., 1997). While the reasons for this are not clear at present, one possibility is an inappropriate assumption of rational expectations.

To summarise, the autoregressive work effort specification that emerges from my dynamic model of behaviour change is markedly different from other specifications developed in the entrepreneurship and economics labour supply literature even though alternative interpretation can never be definitely ruled out.

5.3.1.2 Incorporating observable characteristics

I will provide now answer to the question: how robust is equation (5.10) to alternative model assumption? More precisely, I test the robustness of the model to two different extensions, which I discuss below in turn.

First, I allow observable individual- and venture-specific characteristics to affect the productivity at time t, alongside the unobserved productivity. Denote the vector of observable characteristics by X. Thus, the operating profit given originally by equation (5.2) is extended to become

$$\pi_{it} = I_{it-1}\left[\beta' X_{it} + \hat{p}_{it} - \theta_{it}\right],$$

where β is a vector of coefficients. Notice that values of X are dated at time t, because this is the date when the productivity realisations occur. Hence equation (5.3) becomes

$$\hat{p}_{it} = [\pi_{it} / I_{it-1}] + \theta_{it} - \beta' X_{it}.$$

Second, I allow a (potentially different) set of individual- and venture-specific characteristics to affect the non-pecuniary costs of entrepreneurship, through a vector denoted by Z. Thus the cost function (5.4) is extended to become

$$c_{it} = \gamma\left(I_{it-1} + \delta' Z_{it-1}\right) \ln\left[\left(I_{it-1} + \delta' Z_{it-1}\right) / \underline{I}\right], \tag{5.13}$$

where δ is a vector of coefficients. Notice that values of Z are dated at time $(t-1)$, because this is the date when the effort is supplied. Thus, for instance, if entrepreneurial effort I_{it-1} is measured in terms of work hours, then a component of Z_{it-1} might be family responsibilities, which could be expected to map on to c_{it} with a positive δ coefficient.

For brevity, I will just state the main result, confining the derivations to the mathematical appendix (see subchapter 8.1.2). It turns out that the two extensions above change the estimating equation given originally by (5.10) to become

$$\begin{aligned} \ln\left(I_{it} + \delta' Z_{it}\right) = {} & \alpha + (1-\lambda) \ln\left(I_{it-1} + \delta' Z_{it-1}\right) + \\ & \gamma^{-1} \lambda \left(\frac{\pi_{it}}{I_{it-1}}\right) + \gamma^{-1} \beta' (1-\lambda) \Delta X_{it} + u_{it}. \end{aligned} \tag{5.14}$$

It is readily seen that (5.14) collapses into (5.10) only as a special case. One way that this special case can arise is if (i) no person-specific factors affect the cost function (i.e., $\delta = 0$), and (ii) only time-invariant variables enter X_{it} (which can therefore be written as X_i). As a consequence, $\Delta X_{it} = 0$, and we arrive back to equation (5.10). This case is interesting because even if venture productivities are affected by factors such as family background, nationality (measured by country of origin), and gender – which are all

presumably time-invariant – then no information about these variables can possibly improve empirical estimates obtained from equation (5.10) of the key parameter of interest, λ.

Finally, the full-blown specification (5.14) places greater demands than (5.10) does, if we are to estimate it empirically, for two reasons. First, we need data on additional covariates, X and Z, in two contiguous periods. Second, the presence of $\lambda \ln\left(I_{it-1} + \delta' Z_{it-1}\right)$ on the RHS of equation (5.14) generally implies a non-linear restriction in the parameter space, necessitating the use of a non-linear estimator.

To summarise, I have now discussed several ways that the basic framework can be extended to control for robustness of the model specification given by equation (5.10). This is an important and necessary task because I want to be confident that any estimate of λ based on this dynamical model will be reliable.

5.4 What can we learn from belief adjusting?

Empirical investigations of the developed model of behaviour change for the immigrant entrepreneurs operating in Germany cannot be carried out as suitable data are lacking. Nevertheless, there exit benchmarks that I discuss briefly below. According to the classical work by Friedman (1957), consumer adjust their expectations of unobserved 'permanent income' in the light of new information by about one third; hence any estimates of λ smaller than this value speak for relatively slow expectation adjustment and behaviour change.

Aggregate estimates of how individual adjust their occupational choice between entrepreneurship and non-entrepreneurship under uncertainty might also be pertinent. If individuals hold erroneous expectations about the relative attractiveness of occupations, they can learn from these mistakes and change their behaviour in the next period. Parker (1996), for instance, estimated that the rate of this kind of error correction is about 20 per cent per annum for natives in Great Britain. The computed error correction is certainly not on the high side, though, it is a subtle issue, and judgement is difficult, because it partially depends on the nature of the new information that arrives each period, and on the other hand, on the entrepreneurial alertness.

Consider, for instance, an immigrant entrepreneur who has traded for many years in a relatively static market, in which unobserved productivity is quite stable. Under these circumstances, an older entrepreneur might have built up very reliable

expectations about his unobserved productivity, and therefore might be not justified in discounting further signals (implying that their λ is close to zero). This, in principle, might help explain why immigrant entrepreneurs of the 56-older age-group have significantly shorter survival performance in Upper Bavaria compared with their younger counterparts as I have shown in Chapter four. If older entrepreneurs are not justified in discounting new information so heavily, there might be scope for governments to intervene to raise awareness among these particular entrepreneurs who are most at risk from being swept by changing market conditions.

On the other hand, should we care if immigrant entrepreneurs discount new information and are consequently forced out of business? A neo-classical economist would have a simple answer to this question. If an entrepreneur is well informed and generates no externalities or market failures, and if entry and exit are free, then their displacement due to a lack of entrepreneurial awareness has no adverse implication for economic efficiency. For instance, an older immigrant entrepreneur might be contemplating retirement anyway, so the prospect of loosing the market might not trouble him to sufficiently compensate for exerting greater effort. However, a limitation of the neo-classical analysis is that entrepreneurs are typically far from perfectly informed, an assumption on which that analysis, but not mine, is predicated. If entrepreneurs do not know what they do not know, then programmes designed to raise their awareness can enable them to make superior decisions.

In this contest, I suggest that the desirable features of any programme designed to enhance immigrant entrepreneurs' sensitivity to new information are likely to include the following. First, they should be open to all entrepreneurs, given the scarce empirical evidence above about the ubiquity of relatively low adjustment of entrepreneurial expectations. Second, programmes should emphasise the need for continuous awareness and learning, and the importance of flexibility. Arguably, this kind of pedagogy can be expected to be more successful when delivered in programmes that embody as well as teach strategic awareness and iterative feedback, and that are grounded in an owner-manager environment (Hartshorn, 2002). What is likely to be less useful are prescriptive 'top-down' programmes – which might explain why smaller businesses often report finding programmes derived from applications to larger companies non-beneficial (Gibb and Scott, 1985). Third, a suitable programme might also usefully emphasis the need to understand and follow changing market conditions, sector-specific innovations, and best

practices.[57] That might usefully complement the more conventional content of many existing entrepreneurship programmes.

Finally, the implications for government are that provision of information, training and education along the lines described above are more likely to be effective at improving entrepreneur's responsiveness directly, and if anything might permit business managers to persist with their beliefs rather than exposing them to the salutary practice of having them changed by the market.

5.5 Conclusion

This chapter of my dissertation attempted to make two contributions to the understanding of entrepreneurs' use of information in learning and shaping their business decisions. First, I proposed a joint model of entrepreneurial adjustment of beliefs, effort, and performance, which links all of these phenomena together in a unified way. Second, I provided an econometric formulation of the model that enables (if empirical data are available) to estimate the extent to which immigrant entrepreneurs in Germany exploit new information when adjusting their expectations.

As main result, I should stress here that the autoregressive work effort specification that emerges from my model of behaviour change is markedly different from other specifications developed in the entrepreneurship literature.

In addition, there are several ways that future research might take forward some of the issues addressed in this chapter. For instance, one might seek to enrich the model by allowing entrepreneurs to perform only partial (and possibly costly) observation of noisy signals. Another possibility is to try to model the true underlying process of unobserved productivity, to see whether one can measure how closely entrepreneurs' expectations track the true values. However, this approach would be prone to the criticism that the results will only be as good as the model of unobserved productivity, which by its nature is difficult to verify empirically. A similar problem might bedevil attempts to disaggregate unobserved productivity into separate market conditions and entrepreneurial ability components.

Alternatively, it might be fruitful to extend the empirical side of the model. A particularly interesting line of enquiry might attempt to cross-validate the findings obtained here using methods from experimental economics. For instance, an

[57] For case study evidence of the value of information about market conditions, and the benefits of training and information assistance, see Gibbs and Scott (1985).

experimenter could in principle monitor a sample of entrepreneurs who are given a controlled steam of data whose underlying data generation process is unknown to the entrepreneur and is also possibly time varying. Then the experimenter could attempt to infer entrepreneurs' learning behaviour from their responses. This approach has proven fruitful in the context of price expectations data (Williams, 1987). It is less clear, however, whether the approach would prove to be as useful in the context of learning about unobserved productivity. It is likely to be difficult for a researcher to simulate or replicate real-world data on unobserved productivity, which by its very nature cannot be measured directly. And, there is now considerable evidence from the experimental economics literature that inferences about learning depend heavily upon the nature of the experiment, and the extent to which subjects learn about the design to the experiment itself (Ledyard, 1995). Arguably, entrepreneurs face an unusually complex and challenging task in interpreting their trading environment, which makes the framing of any experiment liable to the charge that it is estimating the degree of learning about something other than true productivity. Still, this does not rule out the value of using experimental methods in future research on entrepreneurial learning more generally. The flexibility of the experimental approach endows researchers with ample opportunities to explore a variety of pertinent issues. That might open up new and presently unforeseen avenues in entrepreneurial learning, which could stimulate an exciting and productive new branch of theory development.

Within the methodology of my current study, one could also consider forms of costly investment other then personal effort, about which entrepreneurs might also make decisions and form expectations. For example, data on capital investments might reveal whether entrepreneurs adjust their expectations differently when the decision variable changes. A more general empirical framework might also allow entrepreneurs to choose effort and capital investment simultaneously. Second, one might sample entrepreneurs graduating from various entrepreneurship programmes and estimate whether they differ systematically with respect to how they subsequently exploit new information in their ventures. It would then be interesting to ask whether there is any relationship between those differences and the nature of the programmes themselves. Finally, it would be appealing to test empirically the derived theoretical model using data on immigrant entrepreneurs in Germany and other countries, where immigrant entrepreneurship is flourishing. Identifying cross-national patterns in expectation formation behaviour might highlight cultural differences that can shed further light on this phenomenon.

6. The impact of homophily on entrepreneurial performance: case study of Hamburg city

6.1 Extended Abstract

Who gains from homogenous working teams and economic environment? The scope of this chapter is to test the effect of the 'similar-to-me' hypothesis on the success of immigrant entrepreneurs operating in the city of Hamburg. A survey including 427 immigrant entrepreneurs has been conducted by the University of Hamburg, and the tools of the regression analysis are applied to the data collected by the means of face-to-face interviews. To study the factors that affect the immigrant entrepreneurial success, I use the volume of sales per employee as a dependent variable in a cross-sectional case study. Controlling for various determinants pertaining either to the founder or to the company, I uncover that the nationality-based homophily exhibits remarkably negative impact on sales in comparison with the other measures of similarity. Consequently, I refer to this finding as a homophily paradox.

6.2 Introduction

'Birds of a feather flock together' is the phrase that summarises the phenomenon recognised as homophily, the tendency of individuals to search for people of similar characteristics, such as nationality, demographic variables, beliefs and values. In other words, the contact between similar economic agents occurs at a higher rate than among dissimilar ones. The existence of homophily has been repeatedly confirmed in psychological research, but was hardly incorporated into behavioural economics or management studies. One of the first to systematically analyse this phenomenon was the social psychologist Byrne. He proposed a 'similar-to-me' hypothesis (Byrne, 1971) according to which, individuals rate other people more positively the more similar they are to themselves, or the more similar the rating expert believes they are. Similarities between individuals along specific dimensions have often been utilised to predict structures, like dyads and triads, in various kinds of groups (see for instance, McPherson and Smith-Lovin, 1987; Marsden, 1988).

The literature of this phenomenon is spread through the studies of social networks, voluntary associations, social capital (at the individual and community levels), social movements, culture, organisations, and a variety of substantive subject

matters that are affected directly or indirectly by network processes. Because the principle of homophily is so central to the operation of these systems (see, for instance, Aldrich and Waldinger, 1990; DiMaggio, 1992; Reskin et al., 1999), and in particular to the business venture (Ibarra, 1997; Lazear, 2000; Lee, 2001), I will use it as an organising concept in this chapter.

Given the existence of the above-addressed phenomenon, I explore whether homophily as an organising principle impacts the entrepreneurial performance of immigrants in Germany. More precisely, the objectives of this chapter are to investigate how the structure of the working team in a particular venture is composed, and on the other hand, how the existing structure influences the economic performance measured by the indicator volume of sales per employee. I argue that the composing process follows the principle of homophily and the latter leads to stable work teams over a specific period of time, whose members communicate efficiently. Individuals are inclined towards communication with those who are close to them in physical distance, and who are relatively homophilious in social features. They tend to develop networks that require the least effort or provide the most rewards, whether social, emotional or commercial (Rogers and Kincaid, 1981). In this regards, does efficient communication due to the 'similar-to-me' hypothesis cause better economic performance among the immigrant entrepreneurs in Germany? If this is not the case, I refer to the observed phenomenon as a homophily paradox. In other words, do homophily and entrepreneurial success of immigrants breed together?

I provide answer to the questions stated above by structuring my chapter as follows. First, I briefly review in an interdisciplinary context the present status of the literature in this field of research, and provide an operational definition of the phenomenon homophily for the purposes of my dissertation. Second, I propose a new model of understanding how homophily as an organising principle interacts with economic performance in general. Third, the method of sampling is presented followed by a brief discussion of its representativeness for the immigrant entrepreneurs under investigation. Fourth, I examine in a descriptive manner the characteristics of the overall random sample. Fifth, I discuss the empirical findings whether similarity leads to redistribution of entrepreneurial efficiency gains due to the mergers from less to relatively homophilious working teams within the ventures established by immigrants. And sixth, I conclude the chapter stressing the limitations of the analysis conducted, and the need for further research in this field of immigrant entrepreneurship.

6.3 Homophily as a basic organising principle

A pattern as powerful and pervasive as the relationship between association and similarity did not go unnoticed in classical Western thought. In Aristotle's *Rhetoric* and *Nicomachean Ethics*, he noted that people 'love those who are like themselves' (Aristotle, 1934: 1371). Plato observed in *Phaedrus* that 'similarity begets friendship' (Plato, 1968: 837).[58] The positive relationship between the similarity of two nodes[59] in a network and the probability of a tie between them was one of the first features noted by early structural analysts (see a historical review in Freeman, 1996). Social scientists who began systematic observations of team formations and network ties in the 1920s and 1930s (for instance, Hubbard, 1929) indicated that children formed friendships and played groups at higher rates if they were similar on demographic characteristics.

The classical citation in the literature seems to be Lazarsfeld and Merton's (1954) study of friendship process in Hilltown and Craftown. Lazarsfeld and Merton drew on the theoretical work of Simmel (1971) and Park and Burgess (1921). Their use of the term 'homophily' coalesced the observations of the early network researchers and linked it to classical anthropological homogamy (homophily in marriage formation). They also quoted the proverbial expression of homophily, 'birds of a feather flock together', which has been used to summarise the empirical pattern ever since.[60]

6.3.1 Studies of homophily across the twentieth century

The earliest study of homophily concentrated on small social groups, in which an ethnographic observer could straightforwardly ascertain all of the ties between members whether those ties were behavioural or reported. Therefore, the first systematic evidence of homophily in an informal network relation context stemmed from school children, college students, and small urban neighbourhoods. The initial network studies showed substantial homophily by demographic characteristics such as age, gender, education, and ethnicity (see, for instance, Loomis, 1946), and by psychological characteristics such as intelligence, attitudes, and aspirations (for instance, Richardson, 1940).

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[58] Both Aristotle and Plato stated in other locations (Aristotle, 1934: 1155; Plato, 1968: 837) that opposites might attract, so it would be inappropriate to think of them as unambiguously anticipating later social scientific observations.

[59] A 'node' is any element (person, organisation or other entity) that can be connected (or not) to other nodes through relational ties in a network.

[60] Lazarsfeld and Merton attributed the proverb to Robert Burton (1927[1651]: 622). Like Lazarsfeld and Merton, Burton acknowledged his own conceptual predecessors in classical Western thought. The closest to the modern proverb is Diogeniasnus' observation that 'Jackdaw perched beside Jackdaw' (quoted in Burton, 1927[1651]: 622).

By mid-century a vigorous research tradition has grown concentrating on two main themes. As issues of ethnicity and school desegregation dominated in the US political arena, many researchers focused on the extent of informal segregation in newly desegregated schools, buses, and other public places (see review in Schofeld, 1995). While observation of relationships eventually lagged behind the study of prejudice and other attitudinal measures, researchers found strongly homophilious association patterns by race and ethnicity although these behavioural patterns were in some cases weaker compared to the attitudinal prejudice. A second tradition started with the strong assumption that peer groups were an important source of influence on individuals' behaviour especially among adolescents. Regardless of whether the focus was positive (for instance, of college aspirations) or negative (of deviant subcultures) impact, cross-sectional association between some individual characteristics and the corresponding features of that individual's friends were employed as evidence for the potency of the peer context.

The 1970s and 1980s produced an alteration in scale of the evidence on homophily, as researchers in the field applied the technology of modern sample survey to the study of social network for the first time.[61] Whether in large-scale studies of schools (Shrum et al. 1988), communities (Fischer, 1982), or the US population as a whole (Marsden, 1987), adequate information about the networks in large system with the ability to generalise to a known population has been provided. These large-scale studies allowed measuring simultaneously the impact of homophily on multiple characteristics, just as theoretical developments about cross-cutting social circles (Blau, 1977) made aware of the significance of a multidimensional view for the integration of the general public.

And finally, recent work has comprehensively contemplated the organisational contexts of networks and, to a lesser extent, the networks connecting social entities above the level of individual. An interest in the effects of networks on both individual careers and organisational success fostered a lot of research on connections in work organisations (Ibarra, 1997; Burt, 2000), on employees of an organisation more generally (Ibarra and Smith-Lovin, 1997), or on interconnected resources necessary to accomplish tasks in the business world (for example, Aldrich et al., 1996). However, none of the studies mentioned above investigated the impact of the network, in sense of

[61] A brief review on this issue is provided in Marsden (1987: 122-124).

work-teams' composition, on the organisational success, and additionally they did not include simultaneously the multiple characteristics of the silent phenomenon homophily, which I consider to be the objective of this chapter.

6.3.2 Types of relationships among individuals

Researchers have studied homophily in relationships that range from the closest ties of marriage (see review in Kalmijin, 1998) and the strong relationship of 'discussing important matters' (Marsden, 1987) and friendship (Verbrugge, 1983) to the more circumscribed relationships of career support at work (Ibarra, 1992, 1995) to mere contact (Wellman, 1996), 'knowing about' someone (Hampton and Wellman, 2000) or appearing with them in a public place (Mayhew et al., 1995). There are some subtle differences that I mention below, but in general the patterns of homophily are remarkably robust over these widely varying types of relations. In addition, the few studies that measured multiple forms of relationship (notably Fischer, 1982, and others who have analysed these data) demonstrate that the patterns of homophily tend to aggregate the more types of relationships exist between two individuals, and thus, indicating that homophily on each type of relation cumulates to generate greater homophily for multiplex compared with simplex ties.[62]

The methodical strategies of analysing homophily have varied almost as widely as the types of relationships. Some researchers, guided by Blau's (1977) theoretical framework, have concentrated on the relative frequency of in-category and out-category relations (Blau et al., 1982; McPherson and Smith-Lovin, 1987). The fact that these patterns are powerfully affected by the relative size of groups in the pool of potential contacts is one of the central insights of this approach. Others discuss homophily as a deviation from what a baseline model of random assortment would predict. In this sense, the concept represents a bias that leads similar people to associate more often than they would be expected to do, given their relative numbers in the opportunity pool (Marsden, 1988; Mayhew et al., 1995).[63] Many other researchers simply use the homogeneity of a network or the similarity of a dyad, measured on some characteristics as a source or outcome of social processes, without being clear whether this

[62] The term *tie* is used in the social network literature to denote a connection between two individuals in a network, whether that is a single or multi-threaded connection. One or more relations may connect a pair of individuals. A tie that is based on multiple relations is said to be *multiplex* otherwise *simplex*.

[63] Fararo and Skvoretz (1987) called this feature *tau bias* in their theoretical formulation, while Marsden (1988) entitled it *inbreeding* or *social distance*, depending on whether the dimension was two category, ordered category, or continuous in nature.

homogeneity is created by demographic opportunity or selection within that opportunity framework (for instance, Fischer, 1982). Perhaps surprisingly, full network measures of heterogeneity and measures of dyad similarity often are not strongly related; Marsden (1990) finds correlations of diversity- and difference-based personal network measures range between 0.47 and 0.63.

In total, the mechanism of homophily explains groups' compositions by similarity of member's characteristics. More precisely, these characteristics may refer to social identities that are attached to individuals, for instance, the so-called ascribed characteristics such as age, gender, and nationality, or to internal circumstances regarding beliefs, norms and values (Lazarsfeld and Merton, 1954). In either case, the similarity of individuals disposes them towards a greater level of interpersonal magnetism, trust and understanding – and as a consequence to greater level of social affiliation – than would be supposed among dissimilar ones. This tendency towards homophily should be especially visible in groups such as organisational founding teams, which require substantial investments of time and other resources considered (Bird, 1989).

Although homophily may be analysed in terms of ascribed characteristics, achieved characteristics, or internal psychological states, I limit my operational definition of homophily to ascribed characteristics for several reasons. First, by excluding achieved characteristics such as education, occupation and income we avoid arguments with respect to homophily from slipping into functional arguments about the efficacy of a particular group of individuals. This is especially relevant for groups that are task-oriented, such as entrepreneurs. Second, the similarity of group members by psychological states is often endogenous to the group-formation process itself. In this context, the homophily may result as much from the misattribution of shared as from actual stared understandings among affiliated individuals. This is caused by the fact that individuals tend to assume that others with whom they have structural bonds think as they do (McPherson et al., 2001). As a consequence, I discuss the gender and nationality as the characteristics most fostering the homophily to a greater extent in the following subchapter. Additionally, these two variables are of major importance for the empirical analysis of the homophily impact on the economic performance of immigrant entrepreneurs.

6.3.3 The salient dimensions of gender and nationality

One of the most extensive investigated ascribed characteristics encouraging homophilious relationships is gender. Although the general population is almost perfectly gender heterogeneous with men and women being approximately equally distributed, the most organisational settings, where networks have been studied, are not. Work establishments, for instance, are highly gender segregated (Kalleberg et al., 1996) in comparison to voluntary associations (McPherson and Smith-Lovin, 1987). Therefore, it is not surprising that the networks formed in these settings display a significant amount of baseline as of inbreeding homophily on gender. The gender specific composition of the venture, group, and occupational level creates powerful sex differences in homophily of networks, with the minority sex having much more heterophilous networks[64] than the majority category members (McPherson and Smith-Lovin, 1987).

Researchers have studied this baseline phenomenon most intensively among upper-level managers and entrepreneurs, and the findings are very consistent. Men tend to have more sex homophilious networks than women do, especially in businesses where they represent a strong majority (Ibarra, 1997). This pattern is especially strong when taking into consideration instrumental or status-loaded relationships of advice, respect, and mentoring, in spite of skewed environment. Across many cultures and work establishments, both men and women use men as network routes to accomplish tasks and to connect to information in more distant domains (Aldrich et al., 1996). Moreover, women businesses support groups, often formed as a reaction to male dominance in entrepreneurial activities (Aldrich, 1989), may further enhance homophily. As all the above-stated results are based on case studies, and might be not universally valid, their relevance, in my view, should be considered with certain caution. Nevertheless, they show that gender is a significant driving force towards homophilious networks.

Insofar as gender is a highly visible ascribed characteristic that drives attributions of similarity and differences in established companies, I propose that

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[64] The two basic diffusion networks are termed *homophilous* and *heterophilous* (see Rogers, 2003). Homophilous networks include members who are similar with regard to certain attributes such as nationality, demographical variables, beliefs and values. Heterophilous networks involve members who are dissimilar with regard to these attributes. Homophilous networks arise frequently because they tend to foster more effective communication than heterophilous ones.

Hypothesis 1: Company's teams with male or female dominance of greater than 70 per cent will be more common than will mixed gender teams. A significant impact on the entrepreneurial performance is expected.

The second ascriptive dimension of interest for my research that generates strong network homophily is nationality (as well as ethnicity) defined by place of birth and not by citizenship, as the latter might change over time. Studies of many task-group settings such as work places (Reskin et al., 1999) reveal substantial homogeneity in composition with respect to nationality, especially among white ethnic majorities. Reskin et al. (1999) report that almost one in four business ventures employ no minorities, while slightly more than one quarter employ fewer than ten per cent minority (as the immigrants are); it shall be understood in a particular country framework. Similarly, the National Organizational Study found that 34 per cent of all enterprises are all white; the median establishment is 80 per cent white (Kalleberg et al., 1999). For completeness, I should stress that the employment of immigrants or minorities cannot be entirely assigned to the 'similar-to-hypothesis'. Factors such as social networking, regional location, and finally, human capital requirements also matter for the decision-making process.

For entrepreneurial founding teams the literature also tends to emphasise solidarity within ethnicities, but primarily among minority and immigrant groups (Aldrich and Waldinger, 1990). Variation of in-group preferences across ethnicities may result from a number of factors, including environmental constraints on the availability of other entrepreneurs sharing a common ethnicity, discriminatory status expectations, and finally unmeasured network effects.

Additionally, nationality has been found to be a key personal attribute that shapes interactions among managers in a multinational enterprise. A common nationality, much like gender in any organisation, generates shared perspectives and potential conversational content (DiMaggio, 1992). Such shared attributes often lead to homophily due to the fact that managers would be more likely to establish either business or non-business relations with those who have similar beliefs, values, and perceptions. Under circumstances of conflict, nationality is a highly salient attribute which may signal managers to bypass the hierarchy and to contact a compatriot directly, which leads in turn to reduction of communication costs and relatively fast problem solution. Hence, in case of emergency this could impact significantly the economic

performance of the business venture at last. Hence, the existing literature gives support to my next hypothesis that

Hypothesis 2: Nationally as well as ethnically homogenous work teams[65] will be more common than will mixed-nationality versus -ethnicity ones. The impact on the entrepreneurial performance is expected to be positive.

To summarise, the literature is remarkably consistent with respect to the 'similar-to-me' hypothesis across various different relationships and many dimensions of similarity. Homophily does characterise network systems, and homogeneity does embody personal networks. Even though several divergences exist the patterns of homophily are noticeable robust over these broadly varying types of relations. Baseline patterns, for instance, strongly shape networks by influencing opportunity structures of contacts, both within large populations and within smaller groups. Inbreeding homophily often complements baseline, such that smaller categories of individuals who would otherwise have networks dominated by the majority group actually have contacts that are much more similar to them than we would predict from the opportunity structure. Consequently, I can conclude that the principle of homophily does shape the structure of the work teams in a company, which remains stable in a dynamic perspective. How does this particular work team structure impact the entrepreneurial performance?

6.4 The impact of homophily on entrepreneurial performance

In opposition to the principle of homophily, many functionalist theories of task-group composition argue for the importance of diversity among members, especially with respect to achieved characteristics such as leadership skills and task expertise. This may be true for founders and founding teams. For instance, subsequent research and theorising on organisational founding teams has explored the extent to which entrepreneurs draw on diverse, complementary skills that may lie beyond the abilities of any individual founder, especially in high technology industries (Vesper, 1990). Moreover, Eisenhardt and Schoonhoven (1990) linked team diversity to functional performance, noting that organisational growth among semiconductor firms was higher

[65] A work team is considered to be nationally or ethnically homogenous if more than 70 per cent of its members belong to the same nationality or ethnicity, respectively.

for organisations with heterogeneous founding teams. At a more micro level, Ancona and Caldwell (1992) reported benefits of functional diversity for communication and innovation in their study of product teams.

However, I am not concerned about how the founding team will affect the economic performance of the firm in the future but about how the composition of the work teams will do. Accordingly, my objective is to investigate in immigrant entrepreneurship context how members of staff within an established company, in particular their structural composition by ascribed characteristics (demographics such as nationality and gender), will influence the firm's outcome. On the other hand, I search for empirical evidence on whether employee-customer versus employee-supplier homophily will lead to improved economic performance measured by volume of sales per employee.

6.4.1 Employee – customer homophily

Most research of the employee-customer relation is based on the importance of homophily. Various related theories suggest that the similarity between employee and customer with respect to ascribed characteristics can improve the economic performance of the business venture. In this context, social identity theory (Tajfel and Turner, 1986), similarity-attraction theory (Tsui, Egan and O'Reilly, 1992), social-categorisation theory (Tajfel and Turner, 1986) and Becker's theory of customer discrimination (1957) require special attention. In these studies, familiarity – the desire to consider similar individuals as holding worthwhile characteristics – and preferences to be close to those who consider the in-group lead to preferences for doing business with similar others.

A higher level of homophily caused by ascribed characteristics may also improve the employees' understanding of costumers' preferences and how the latter vary in dynamic perspective. Additionally, members of staff can also attract customers using their social network within the community (Cox, 1993; Ibarra 1995). As a result, an employee's social relationships often provide support in bringing customers to the workplace and thus lead to increasing volume of sales.

Moreover, Jennifer Lee (2001) has identified, for instance, two additional motives for storeowners to hire employees possessing characteristics similar to customer' demographics in her study of retail stores in predominant black neighbourhoods. She found that white and Korean shopkeepers face disputes that can

quickly escalate and gain a racial tinge. Consequently, storeowners in her inner-city sample prefer to hire at least one black as a member of staff who is competent to resolve a tense situation without overtones of race. In addition, owners prefer that at least one black employee is visible all the time, so that customers feel the store returns to the community where it is located.

The employee-customer homophily with respect to ascribed features may also lead to declining communication costs. Speech pattern, slang and jargon all vary by demographic groups. Even among native speakers, diverse nationalities and gender differences often make communication among them difficult. These communication costs' objections grow in importance when a large number of potential customers do not speak the language of the host country well. Although most immigrants learn English rapidly (Friedman and DiTomaso, 1996), for instance, in many cities large immigrant enclaves contain a substantial number of people who cannot or prefer not to speak English.

All these motivations can encourage profit-maximising employers to desire a labour force that is demographically similar to its customers. In spite of the many theories supporting this idea, the evidence for this effect is weak in general and documents two essential issues. First, previous research in this area provides only little, and what we have is mixed, evidence as to whether customers prefer to be served by similar others in retail and service occupations, although the evidence is more consistent in other spheres. Second, employers often act as if customers have this preference.

Besides the lack of consistent conformation, proponents of diversity routinely advocate that employers have to hire a dissimilar labour in order to attract diverse customers. Empirical proof can be found in trade publications including those serving marketing departments (Bertagnoli, 2001), stock brokerages (Lee, 2000), voluntary associations (Baker, 1999), restaurants (Lieberman, 1998), real estate (Liparulo, 1998), healthcare providers (Chyna, 2001) and numerous others. With respect to baseline expectations, however, the existing literature supports the hypothesis that

Hypothesis 3: Employee-customer homophily with respect to ascribed characteristics is supposed to impact positively the economic performance of a business venture.

6.4.2 Workplace homophily

Even if diversity does not affect entrepreneurial performance through customer preferences, I need to investigate whether it still has direct productivity effects by affecting how employees work with each other in groups or teams. In this subchapter, I document that both the theory and the empirical evidence on how employees' similarity with each other affects performance show mixed results.[66]

First, theories of diversity emphasise that heterophily can have both positive and negative influence on enterprise's economic performance. Studies indicate that diverse teams can improve performance because they are more likely to have the information needed to solve any given problem (Lazear, 2000), come up with more creative solutions than do homogeneous groups (Thomas and Ely, 1996; Nemeth, 1985), and are more likely to have employees with insights into the consumer needs of customers (Thomas and Ely, 1996). At the same time, heterophily can increase the costs of communication within the personnel (Lang, 1986; Zenger and Lawrence, 1989), lower group cohesiveness (Pfeffer, 1983), increase employee turnover (O'Reilly et al., 1989; Jackson et al., 1991), and reduce incentives for cooperation (Greif, 1993).

Given the contradictory theories and the mixed evidence surrounding diversity's effects, it is crucial to examine directly how homophily affects the economic performance of immigrant entrepreneurs in Germany. Insofar I propose that

Hypothesis 4: Workplace homophily with respect to nationality affects significantly the economic performance of a business venture. The expected impact is rather positive than negative.

6.4.3 Entrepreneur – supplier homophily

Nationality as stressed above is a key personal attribute that shapes interaction among members of personnel as well as between employees and customers. However, evidence about the entrepreneur-supplier or employee-supplier networks, and to what extent homogenous ties impact company's success, to best of my knowledge, is lacking. An important aspect of this framework is, for instance, the understanding that in a network, relationships can be multiple. More precisely, the social network theory distinguishes between instrumental and expressive ties (Ibarra and Andrews, 1993). Instrumental ties

[66] Williams and O'Reilly (1998) and Reskin et al. (1999) provide excellent recent reviews of demographic research in organisations.

arise in the performance of work and facilitate the transfer of physical, informational, or financial resources. Expressive ties provide friendship and social support. Most of the interactions among entrepreneurs and suppliers as well as among employees and suppliers have both instrumental and expressive aspects; hence it is usually hard to disentangle the two.

Nevertheless, shared nationality often leads to homophily because entrepreneurs would be more likely to deal intensively with those who feature similar attributes, values, and perceptions (Marsden, 1988). Under circumstances of threat and conflict, nationality is a highly salient characteristic, which may signal entrepreneurs and/or employees within the company to contact a co-national supplier directly. People from the same nationality create a cultural group with its own routines transmitted through communication channels across geographical boundaries that are often closed to non-members (Kilduff, 1992).

In this context, a shared nationality is a basis for both, entrepreneurs and employees, to establish and maintain strong network ties while negotiating and closing deals with different suppliers. Therefore, I propose that

Hypothesis 5: Entrepreneurs versus company's employees are more likely to develop business connections with suppliers of the same nationality. The expected effect on the entrepreneurial performance is rather positive than negative.

6.5 Research design of the case study Hamburg city

6.5.1 Design of the random sample

The analysis is based on a detailed questionnaire of 427[67] observations on entrepreneurs from six different countries of origin – Afghanistan, China, Former-Yugoslavia, Iran, Poland, and Turkey- operating in the city of Hamburg. The decision to include only the above-addressed countries is due to the empirical evidence provided by the Central Register of Trade, Commerce and Industry (*GZR*, German abbreviation) that they are the most frequently non-EU entrepreneurs represented in the city of Hamburg, and on the other hand, as non-EU nationals, they have to overcome additional barriers prior to establishing an enterprise in Germany.

[67] Additionally, 23 German small- and medium-sized enterprises have been surveyed.

The survey was conducted during the period September-October 2002 by means of face-to-face interviews to study different aspects of immigrant entrepreneurship in Germany. The questionnaire consists of 40 questions divided in the categories of (i) general, (ii) consulting prior to enterprise foundation, (iii) capital and investment, (iv) obstacles with regards to the German authority, (v) problems subsequent to the foundation, (vi) employment issues, (vii) country of origin as well as (viii) a rich set of background variables attached to the immigrant entrepreneur.[68]

Students of the University of Hamburg both graduating in economics and political sciences, and speaking one of the foreign languages of interest, were appointed as interviewers. In addition to the country of origin, the only constraint was the industrial sector, which the entrepreneur is operating in. Accordingly, the aim was to collect data on industries such as handicraft (construction in particular), retail, wholesale, transportation, manufacturing, catering, and services, if possible equally distributed. The research design specifies two phases of data collection. In the first phase we telephoned immigrant entrepreneurs based on the yellow pages for each of the six countries of origin by means of alphabetical order. When an immigrant entrepreneur agreed to respond to the survey, a face-to-face interview was arranged. In the second phase, a detailed interview was conducted employing the above-specified questionnaire. Finally, a 69.3 per cent rate of respondence was achieved. In this vein, how representative is the drawn sample of immigrant entrepreneurs?

6.5.2 How representative is the drawn sample?

For Germany as well as for the city of Hamburg, there are only sparsely stated numbers available considering the immigrant entrepreneurs. The Centre for Studies of Turkey in Essen (*ZfT*, German abbreviation), for instance, has reported the most differentiated research, but just for this country of origin admittedly. The micro census provides only aggregate data on the immigrant self-employment rates at federal and Hamburg level, respectively. In addition, the *GZR*, which could have been accessed in this case, takes account of detailed information on business registrations inclusive of nationality, but serves administrative and not statistical objectives, which in turn can lead to problems of actuality. However, in the following subchapter, I will compile some accessible information on enterprise size-classes, industrial sectors and country of origin, and

[68] The complete questionnaire design employed to collect the data is included in the technical appendix of the dissertation.

compare it with the overall sample. And as a consequence, I will provide answer to the question how representative is the sample of immigrant entrepreneurs?

In a study conducted in year 2000, and considered as representative, the *ZfT* ascertained the distribution of Turkish business ventures operating in Germany by employment size-classes. Table 6. 1 depicts the obtained results, and they are contrasted with the sample drawn for the city of Hamburg and with the statistics provided by the Institute for Medium-Sized Business Research (*IfM*, German abbreviation) in Bonn, Germany.

Table 6.1: Distribution of the Employment Structure by Size-Classes in Percentage

Size-Classes of Employment	Data Sources		
	ZfT Sample 2000	**Overall Sample 2002**	**IfM Statistics[1] 2001/2002**
No employees (Business owner)	11.6	10.1	-
1-3 employees	41.7	41.2	87.1
4-9 employees	37.3	31.6	
10 and more employees	9.4	17.1	12.9
Total Absolute Number	**1,054**	**427**	**3,048,532**

Note: [1]The data on employment size-classes reported by the *IfM* start by the class of 1-9 employees. Therefore, the number 87.1 per cent has to be interpreted as cumulative number for the classes 1-3 and 4-9 employees, correspondingly.

Source: Own calculations based on the overall sample, the released *IfM* and *ZfT* statistics.

According to table 6.1, we can observe a satisfying compliance with respect to distribution of the employment size-classes, given that the employment structure of the investigated non-German nationalities does not diverge considerably from the distribution of the business ventures established by Turks. Moreover, due to the census conducted by the occupational co-operative society, 87.1 per cent of all enterprises functioning in Germany are located in the class below ten employees.[69] Subsequently, there is no evidence for larger bias, but small medium business ventures are represented strongly in the overall sample.

The distribution of the immigrant enterprises established by industrial sectors shown in table 6.2 can provide further impression on the representativeness of the sample employed in the empirical analysis later in this chapter. In table 6.2, I compare

[69] The *IfM* releases the census data conducted by the occupational co-operative society in Germany.

the random sample with the data obtained from the Central Register of Trade, Commerce and Industry in Hamburg, taking into consideration all ventures registered by immigrants as well as those by the six different nationalities subject of matter in the conducted study.

Table 6.2: Distribution of the Established Immigrant Enterprises by Industrial Sector

Industrial Sectors	ZfT Sample 2000	Immigrant Enterprises in Hamburg, Total	Immigrant Enterprises, Selected Nationalities[2]	Overall Sample 2002
	1	2	3	4
Handicraft	9.8	6.5	9.0	15.4
Trade	44.0	35.9	39.6	33.5
Manufacturing	2.2	0.4	0.1	3.3
Services	44.0	57.1	51.3	47.8
Total Absolute Number	**1,054**	**17,199**	**7,117[1]**	**427**

Note: [1]This number includes additional 600 business ventures registered by immigrants in Hamburg, which reported multiplex fields of business activities; [2]The data depicted in this column refer only to the six countries of origin – Afghanistan, China, Former-Yugoslavia, Iran, Poland, and Turkey – represented in the city of Hamburg.

Source: Own calculations based on the overall sample, the released *ZfT* and *GZR* statistics.

Table 6.2 uncovers not only evidence about the reliability of the sample, but it provides additionally information on the industrial sectors. First, immigrant entrepreneurs focus generally on industrial sectors such as trade and services. Second, the manufacturing compared with a share of ten per cent in the total company's stock in Germany is weakly represented in the overall sample.[70] This tendency becomes even stronger if we consider only the business ventures registered in Hamburg by the six nationalities of interest (follow column 3 of table 6.2). Companies founded by immigrants from Turkey diverge slightly from the above-stated tendency; hence the higher proportion in the overall sample can be explained. Third, the industrial sector handicraft is

[70] The ten per cent share is taken from the tax figures with respect to the volume of sales for the year 2000, and considering only companies above the tax limitation of 16,600 Euros annual sales (*IfM* Bonn, 2002: 55 et seqq.).

overrepresented in the overall sample compared with the total group of immigrant entrepreneurs. And finally, industrial sectors such as handicraft and manufacturing are as a result of our sectoral choice higher-than-average. The same trends, however, appear for the rest as in the case of the other data sources.

Some limitations have to be considered when analysing the degree of *GZR* data reliability, basically because the enterprise registration is mandatory indeed, but the deregistration is optional in the case when the business venture is shut down either temporary or permanent, therefore, the number of the inactive business ventures is unknown insofar. In addition, a small number of pseudo-registrations could be present in the *GZR* data set. However, the non-deregistration is penalty-free, and this applies to the data file of the corresponding Chambers of Commerce supplied by the *GZR*, as long as for small businesses no contribution is charged, which in turn would provide an incentive for deregistration. According to the information given by the chamber, this holds for about 110,000 registered members of the Hamburg Chamber of Commerce, while for the Chamber of Craft the contribution free membership includes only a few cases out of 12,900 enterprises. It is not likely to assume that missing deregistrations focus on both, industrial sectors and nationalities. Therefore, I consider the evidence based on the *GZR* data below in order to estimate the reliability of the overall sample.

The *GZR* provided 18,582 business registrations with a non-German nationality indication, while the Hamburg micro census estimated only 11,3000 immigrant entrepreneurs in year 2001. In this context, to compare the stock of self-employed with the stock of business registrations (in total 32,000 in Hamburg) we have either to exclude the free-lance professionals or to add them to the registrations; hence the undertaken correction will just aggravate this difference. The number of free-lance professionals among the immigrants might be low due to legal concession obstacles prior to the enterprise establishment. However, even in the overall sample there are not many represented, and thus the divergence remains considerably high.

Moreover, the legal structure of a company has a certain impact on the economic performance; therefore, it should be taken into consideration. As per the *GZR* data, 26 per cent of the immigrant enterprises are organised as limited liability companies (Ltd.), a legal form that is favoured to a greater extent by small business owners-entrepreneurs. An owner/managing director of a Ltd., for instance, does not fall in the category ‘self-

employed', which in turn will reduce the divergence, but on the other hand, he might refer to his occupational status as self-employed in the regular case when surveyed.[71]

To summarise, the data provided by the *GZR* could overestimate the business venture stock by 30 per cent at maximum. Deregistration numbers are likely to be undervalued. This has to be considered when analysing the *IfM* statistics on start-ups' dynamics as the latter relies mainly on the difference between business registrations and deregistrations.

The last issues when studying the representativeness of the overall sample that has to be comprised is the country of origin versus nationality of entrepreneur. The nationalities represented in my sample account for 42 per cent of the foreign companies recorded by the *GZR* data. An additional third accounts for entrepreneurs form EU-countries. The comparison between the overall sample and the *GZR* data is illustrated in table 6.3.

Table 6.3: Distribution of the Established Immigrant Enterprises by Nationality

Entrepreneur's Nationality	GZR Data 2001	Overall Sample 2002
Afghanistan	5.6	6.8
China	5.8	10.8
Former-Yugoslavia	12.6	21.0
Iran	24.5	11.2
Poland	7.3	5.4
Turkey	44.2	44.7
Total Absolute Number (= 100 Percent)	**7,753**	**427**

Source: Own calculations based on the drawn sample, and the statistics provided by the Hamburg *GZR*.

Provided the already discussed limitations of the Hamburg *GZR* data sets, table 6.3 shows, on one hand, that entrepreneurs form China and Former-Yugoslavia are above-average represented, and on the other hand, these from Iran are undervalued. In this sense, there could not be given significant evidence at the nationality level, which is in

[71] The Hamburg micro census defines the self-employed either as a business owner or a co-owner. Consequently, an owner/managing director of a Ltd. who draws income revenues from self-employed and non-self-employed activities will be considered as dependent labour.

fact not the objective of this chapter. As far as countries of origin are compared in the following subchapters, however, they act mainly as illustration of potential characteristics, and in addition, to make the further explanations feasible. On the contrary, the group of the Turkish entrepreneurs will affect all indicators, on average, to a high degree included in the overall sample as a result of its weighting.

In conclusion, the drawn sample of immigrant entrepreneurs venturing in the city of Hamburg represents significantly the employment structure by size-classes of the total foreign self-employed population, which is of interest for my empirical analysis. For instance, 82.9 per cent of the enterprises included in the overall sample engage less than 10 employees contrasted with 87.1 per cent estimated by the *IfM*. The country of origin can be considered only as indicator for prospective features due to the fact that some of the nationalities are above average, and others included in the conducted survey are overrated. To a certain extent, I can provide realistic evidence only for the Turkish entrepreneurs given their weighting in the sample.

6.5.3 Patterns of immigrant entrepreneurship: descriptive analysis

To obtain a first impression on the data set, I derive various basic characteristics in a descriptive manner. More precisely, I present, first, the propensity to incline towards entrepreneurial activities among the six different groups taking into account certain human and social capital indicators. Subsequently, I address the company's characteristics such as volume of sale in general, by industrial sector and by country of origin. Finally, I conclude the subchapter with the team structure at the workplace, with respect to the venture's employees, customers and suppliers, respectively.

6.5.3.1 Year of enterprise establishment and age of entrepreneur

The surveyed companies in the overall sample are of age no older than 12 years. Table 6.4 depicts the distribution by year of establishment, country of origin, and age of entrepreneur, respectively. Accordingly, the mean values concerning the year of establishment by country of origin are close to each other; hence the immigrant entrepreneurship in the city of Hamburg is a phenomenon that appears since the 1990s. These developments can be explained by political migration reasons, in particular, this proposition holds true for immigrant entrepreneurs from Afghanistan, Former-Yugoslavia, and Iran.

Enterprise establishments by Polish immigrants have been carried out in earlier times, which could have been motivated by the privatisation of former state-owned enterprises. It applies, however, to children of former white-collar employees. The aforementioned is in contrast to the venturing activities of Turkish entrepreneurs who started recently their activities in the city of Hamburg. One significant cause for the fact that Turks are younger in comparison with the remaining immigrant entrepreneurs in the sample is rather the change in the migration generation than the entrepreneur's age. The *ZfT* (2000) has made the above-addressed observations as well.

Table 6.4: Year of Enterprise Establishment and Age of Entrepreneur by Country of Origin

Entrepreneur's Nationality	Year of Enterprise Establishment, Mean	Age of Enterprise, Mean	Age of Entrepreneur, Mean	Percentage with Former Dependent Employment in Germany[1]
Afghanistan	1992	10	43	58.6
China	1995	7	48	32.6
Former-Yugoslavia	1992	10	42	50.0
Iran	1991	11	46	43.8
Poland	1990	12	42	26.1
Turkey	1996	6	38	58.1
Total Sample	**1994**	**8**	**41**	**50.4**

Note: [1]The professional experience is comprised as percentage of the total for the particular country, for instance, 58.6 per cent of all Afghanistan entrepreneurs revealed having former work experience in Germany.

Source: Own calculations based on the overall sample.

In half of the cases, the enterprise formation proceeded after a phase of dependent employment in Germany except for the Chinese, Polish, and partially, for the Iranian entrepreneurs. It is a matter, therefore, of rather original establishments in the latter three cases even though the residence regulations imply a longer stay in Germany prior to inclining towards entrepreneurial activities.[72] Additionally, one should consider that the personal career development also impacts the entrepreneur's qualification, and on

[72] The legal regulations have been discussed comprehensively in subchapter 2.5.1.

the other hand, the professional knowledge acquired either by formal education or by vocational training as well.

Based on other immigrant entrepreneurship studies in Germany, which I have discussed comprehensively in Chapter three, the age of entrepreneurs included in the sample is noticeable higher but the empirical evidence in this field of research is rather mixed. In this context, the results obtained for the city of Hamburg are not surprising at all.

6.5.3.2 Education and German language skills

The formal education, both general and vocational, as a proxy for the human capital endowment, and the German language skill can provide further insight concerning the overall sample, as the human capital is known to influence the economic performance of a firm noteworthy.

Table 6.5: Received Education in Germany by Country of Origin in Percentage

Entrepreneur's Nationality	Received Education in Germany[1]
Afghanistan	3.6
China	4.3
Former-Yugoslavia	29.2
Iran	18.8
Poland	39.1
Turkey	51.1
Total Sample	**33.9**

Note: [1]The education obtained abroad or in Germany is computed in per cent of the total for the particular country, for instance, 96.4 per cent of surveyed Afghanistan entrepreneurs have received their education in the country of origin, and only 3.6 per cent in Germany.

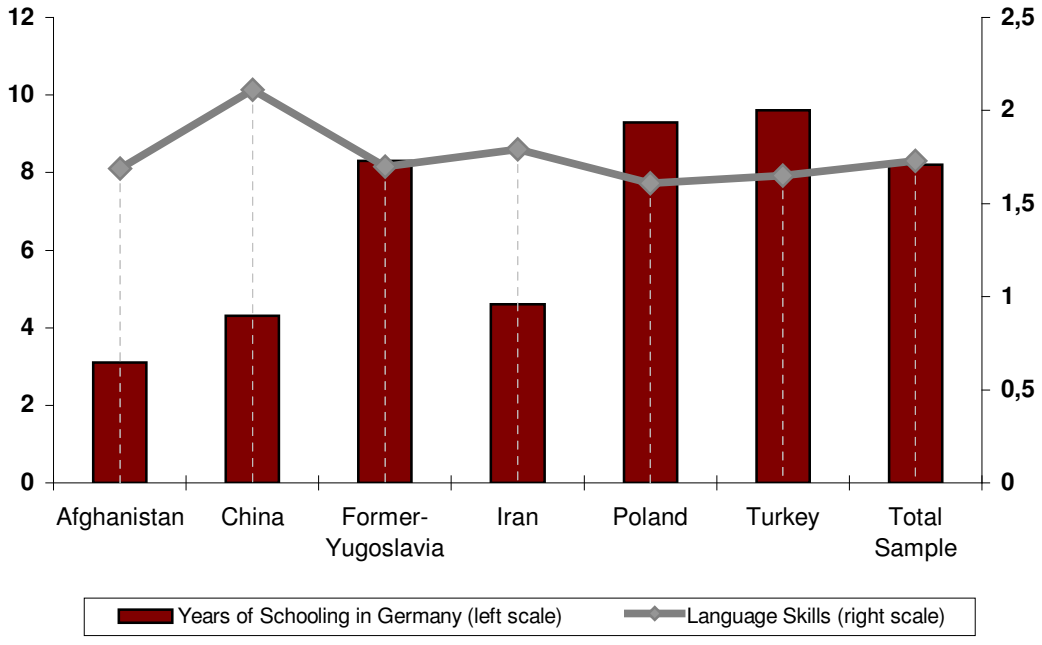
Source: Own calculations based on the overall sample.

The education is regarded as received in Germany if the surveyed immigrant entrepreneur has either visited the school solely in Germany, or the years of schooling obtained in the country of origin are less than these in Germany. In this sense, table 6.5 uncovers that receiving education in Germany is atypical for entrepreneurs stemming

from China and Afghanistan, due to the so-called original establishments or engaging into entrepreneurial activities after a period of dependent employment in Germany. A second group including Iran, Former-Yugoslavia, and Poland shows a mixed picture, while half of the Turkish entrepreneurs have obtained their education mostly in Germany, which in turn signifies firm foundations in the second generation to a greater extent.

In addition, the average years of schooling received in Germany and the level of German language skills are supposed to be positively correlated. The surveyed immigrant entrepreneurs ought to evaluate their language skills by considering the alternatives 'fluent' (1), 'sufficient professionally' (2), and 'could be better' (3). The results are presented in figure 6.1. Accordingly, 45 per cent indicated fluent language skills, 37 per cent sufficient, and the remaining 18 per cent pointed out demand for improvement. This uncovers already the frequently stressed obstacles reported by the consulting services in Germany, which have to deal rather with different language fields compared with the occupation ones. Moreover, the Turkish entrepreneurs account for the highest level of German language skills, i.e. the ratios are 49 per cent for 'fluent', 37 per cent for 'sufficient', and 14 per cent 'could be better', respectively.

Figure 6.1: Average Years of Schooling Received in Germany and Language Skills



It is not surprising at all given the result on formal education that entrepreneurs of Polish and Turkish origin account for the highest level of German language skills, while the Chinese ones show the lowest level due to less formal education obtained, and the immediate commencement of the business in Germany. In total, the language skills of the questioned immigrants tend towards the category of sufficient to perform the activity.

Finally, I discuss the vocational education by country of origin and industrial sector as indicators for the specific human capital endowment; hence tables 6.6 and 6.7 depict the distribution within the overall sample.

Table 6.6: Vocational Education by Country of Origin in Percentage

Entrepreneur's Nationality	Industrial Education[1]	Tertiary Education	Semi-Skilled Education
Afghanistan	39	23	38
China	17	63	20
Former-Yugoslavia	60	5	35
Iran	24	48	28
Poland	67	9	24
Turkey	45	21	34
Total Sample	**44**	**25**	**31**

Note: [1]The relationship between technical education and master craftsman is 33 to 10.

Source: Own calculations based on the overall sample.

In the field of industrial education the significance of table 6.6 may be biased due to the absence of comparability of domestic and foreign certificates. Nevertheless, we can observe greater concentration (shadowed area in table 6.6) only with respect to entrepreneurs from Former-Yugoslavia, and Poland, correspondingly, which refers to their preferences for the industrial sectors 'handicraft' and 'services' (see table 6.7). For Chinese and Iranian founders, however, the typical vocational education is holding university[73] certificate.

[73] To illustrate, a share of 2.3 per cent of foreign students based on the total foreign population is the result for year 1998 compared with the university degree ratio of 25 per cent regarding the immigrant entrepreneurs in the overall sample (Schnitzer et al., 2001: 424).

The handicraft sector is characterised by industrial education, and both the wholesale and the services by tertiary education (university degree). Quintessentially, the semi-skilled qualifications focus on the industrial sectors ‘transportation’ and ‘catering’; hence the lines of business that are associated with immigrant entrepreneurship based on the everyday life view. Finally, I can rank understated the polar pattern of the retail sector among them.

Table 6.7: Vocational Education by Industrial Sectors in Percentage

Industrial Sectors	Industrial Education	Tertiary Degree	Semi-Skilled Education
Handicraft	73	11	16
Retail	45	14	41
Wholesale	31	52	17
Transportation	42	8	50
Manufacturing	38	31	31
Catering	34	18	48
Other Services	35	44	21

Source: Own calculations based on the overall sample.

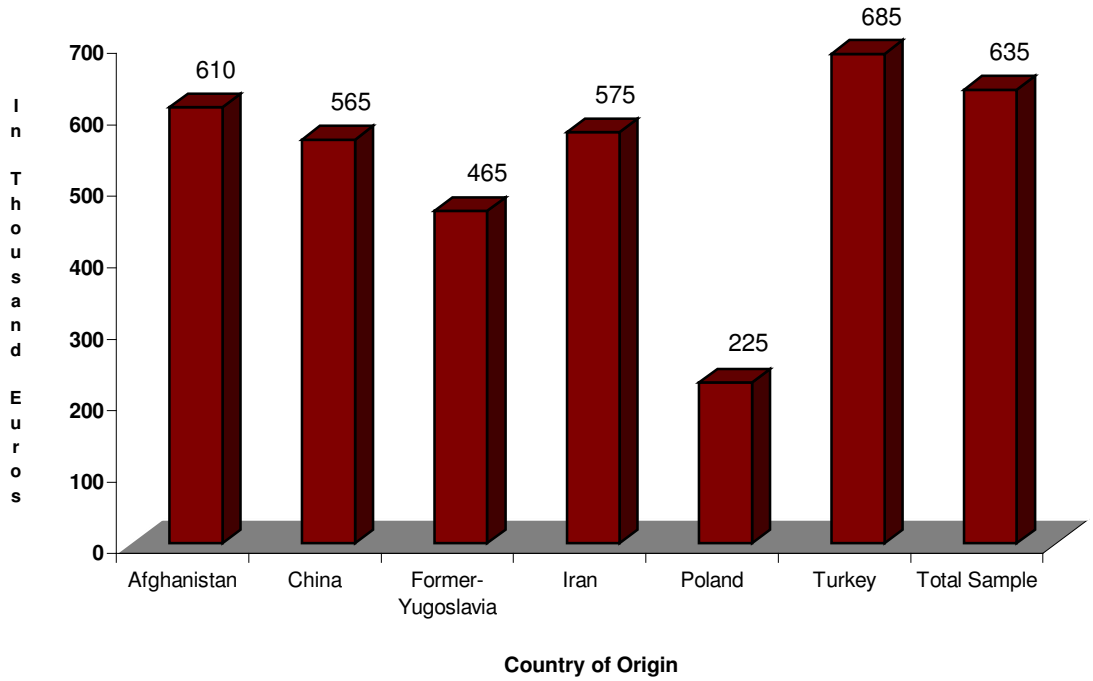
6.5.3.3 Volume of sales by country of origin and industrial sector

Numerical data on lump or capital sums were practically impossible to obtain. However, the overall sample does contain figures on the realised volume of sales, which in turn can illustrate the dimension of the entrepreneurial activities performed by immigrants in the city of Hamburg. The information (mean values) obtained is pooled by country of origin and industrial sector, and the results are presented in figure 6.2 and 6.3.

Figure 6.2 shows that entrepreneurs from Former-Yugoslavia realise nearly sales volume of 500,000 Euros and feature besides the Polish entrepreneurs the smallest revenues. Despite the fact that Chinese enterprises deal predominantly at retail, they have only comparatively narrow markets. As opposed to, the Turkish enterprises (on average the youngest) account for the highest volume of sales. However, it is not much stated when considering the realised sales, but it depicts one of the economic indicators for entrepreneurial dynamics. Multifarious motives and factors might account for those divergences among the groups of immigrant entrepreneurs. For instance, the volume of

sales is strongly related to the vocational education, and on the other hand, it is for technicians and university diploma holders notably higher than for skilled and semi-skilled labourers. Another reason to be taken into consideration is the number of employees and their productivity. And finally, the business revenues depend on the industrial sector, which the enterprise is performing in.

Figure 6.2: Volume of Sales Structure by Country of Origin in Thousand Euros

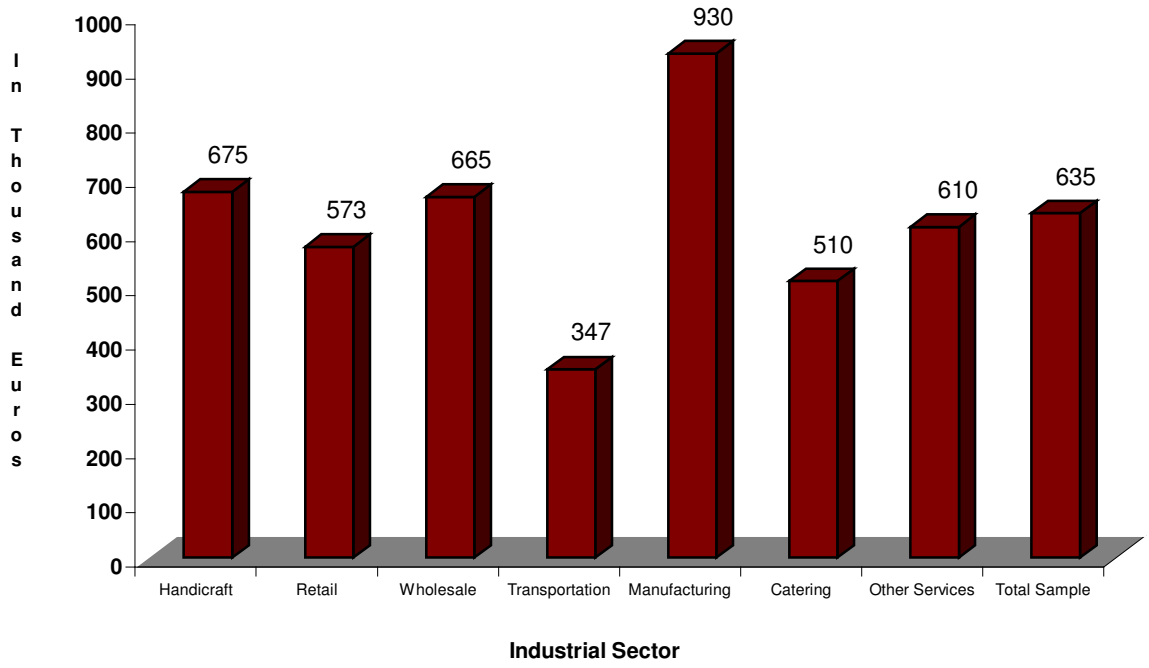


Note: The volume of sales realised by the immigrant entrepreneurs are rounded to nearest 500 Euros.

In addition, figure 6.3 shows that manufacturing (930,000 Euros) accounts for the highest sales followed by handicraft (675,000 Euros) and wholesale (665,000 Euros). The volume of sales with respect to handicraft seems to be overrated in the sample due to the fact that entrepreneurs who hold both commercial degree and are members of the Chamber of Handicraft are classified as handcrafter. Among the sectors retail and wholesale, a few enterprises conduct vertical integration with correspondingly high business revenues. Moreover, the transportation sector including largely taxicabs and couriers reports the lowest volume of sales in the overall sample. Lastly, retail and other services are each represented by nearly one fifth in the sample. While retail as a rather traditional activity accounts for lower sales among the immigrant entrepreneurs in Hamburg, the situation within the sector other services starting with cleaning companies

over Internet services, and ending with finance service providers and freelancers appears significantly sustainable.

Figure 6.3: Volume of Sales Structure by Industrial Sector in Thousand Euros



Note: The volume of sales realised by the immigrant entrepreneurs are rounded to nearest 500 Euros.

In conclusion, table 6.8 confirms under all reserves, when the reliability of such classification is considered, that in the area of small enterprises there do not exist any differences in regard to the particle size distribution of all companies (2,9 millions) based on the German value added tax statistics.[74] The immigrant entrepreneurs realise lower volumes of sales due to few numbers of companies operating in the manufacturing sector; therefore, the distribution is informative in this case.

[74] See *IfM* Bonn (2002: 55).

Table 6.8: Volume of Sales Structure in Percentage[1]

Source of Information	Up to 50,000 Euros	Up to 500,000 Euros	Up to 1,0 Million Euros	Above 1,0 Millions Euros
Overall Sample	27.6	54.4	9.1	8.9
Value Added Tax Statistics 2000	26.6	54.6	8.2	10.6

Note: [1]Table 6.8 summarises the fraction of enterprise in per cent of the respective volume of sales category to the whole number of enterprises.

Source: Own calculations based on the overall sample, and *IfM* released statistics.

6.5.3.4 Employment structure at the workplace

The employment structure in a particular company should be taken into consideration when investigating the success of immigrant entrepreneurship. For instance, 85 per cent of the companies included in the overall sample have only one plant location while the remaining do have one or several branches. Accordingly, table 6.9 shows the employment on average (excluding the business owner) by country of origin and by industrial sector.

Table 6.9: Number of Employees by Country of Origin and Industrial Sector

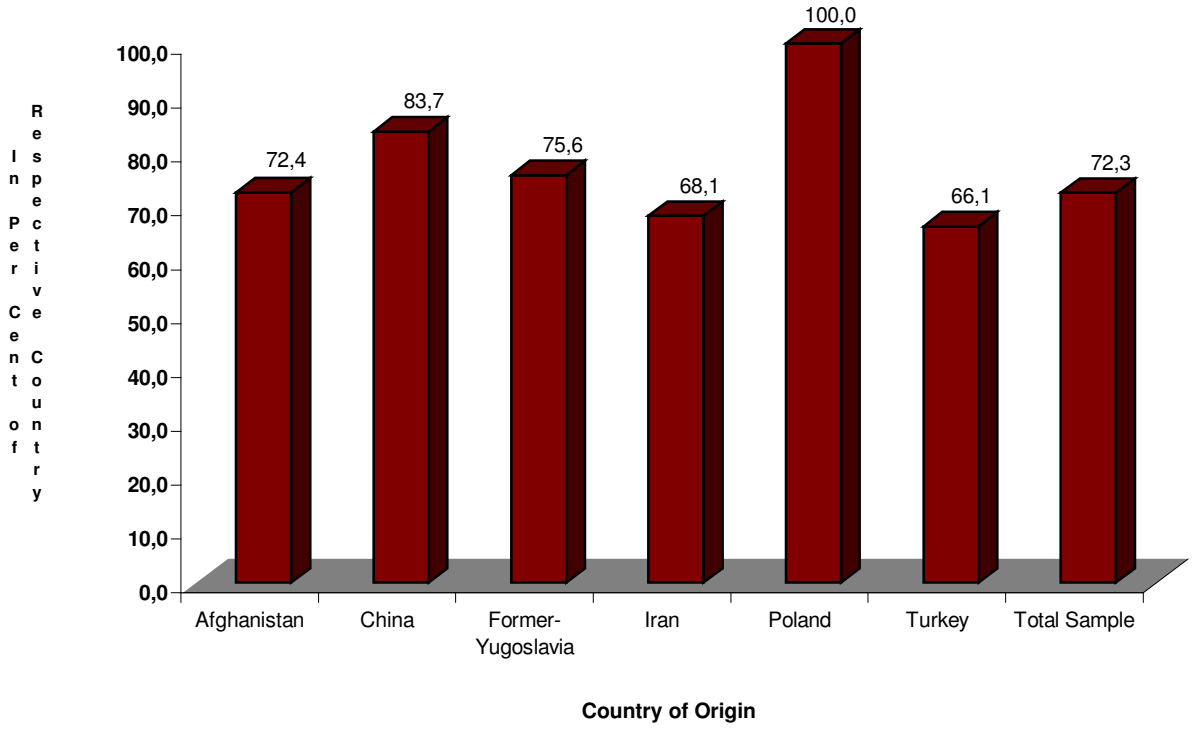
Employees by Country of Origin	Mean	Employees by Industrial Sector	Mean
Afghanistan	10.3	Handicraft	5.9
China	2.2	Retail	3.6
Former-Yugoslavia	6.0	Wholesale	5.7
Iran	5.0	Transportation	5.4
Poland	2.1	Manufacturing	10.4
Turkey	6.8	Catering	6.8
		Other Services	5.6
Total Sample		**5.9**	

Source: Own calculations based on the overall sample.

Given the evidence that Chinese and Polish entrepreneurs realise the lowest volumes of sales, it is not unexpected at all that they employ on average only two employees. Entrepreneurs of Afghan and Turkish origin indicate the highest employment in the sample. In addition, industrial sectors such as transportation and catering are labour intensive even at lower sales figures compared with the remaining sectors. However, immigrant entrepreneurs engage 5.9 employees on average.

To what extent does a preference exist for co-national employees, more precisely, for immigrants from the same country of origin? For this purpose, it was surveyed whether the employees are solely or mostly compatriots, and whether they stem mainly from Germany or other countries. The answer to the above-addressed issues will provide first evidence to the 'similar-to-me' hypothesis. Because the team compositions by nationality are of primary interest for my further empirical analysis, figure 6.4 presents some descriptive statistics.

Figure 6.4: Predominant Employment of Co-Nationals in Percentage of the Respective Country of Origin



According to figure 6.4, nearly three fourth of the immigrant entrepreneurs engage entirely or primarily individuals of the own country of origin. This tendency varies significant differently among the interviewed immigrant entrepreneurs. For instance, Chinese and Polish entrepreneurs are considerably above the average sample. Preferring predominantly compatriots as employees might relate especially to language ability, specific trust, and lastly to size of the enterprises established. The latter applies, in particular, to the both above-mentioned immigrant groups. Chinese trade companies are founded usually by married couples and are administrated often from the dwelling place according to the survey. The same holds true for the smallest companies providing

services in the case of Polish origin. Moreover, the language ability argument is only of relevance for the Chinese entrepreneurs in the city of Hamburg. On the contrary, the Turkish entrepreneurs themselves (followed closely by the Iranian ones) disengaged from the solely co-national employment the most compared with the other immigrant groups. The question considering the origin of customers and suppliers, the so-called national economic relationships, I discuss comprehensively in the next subchapter.

I should stress that the rather co-national employment – according to the overall sample quite high – has to be measured not only by subject headings such as 'remote integration'. Contributions to the decline of the above-average foreign unemployment should also be considered as a figure. If I go further into the aspect of foreign employment, I can link the survey data to the micro census at Hamburg level, and in this vein, I can obtain a significant extrapolation. For instance, in 2001 there were 11,300 foreign enterprises and 109,000 foreign employees, respectively. Based on the sample average number of 5.9 employees, this results in 66,670 employees engaged in foreign companies. In this sense, 72.3 per cent out of 66,670 lead to 48,202 foreign employees, which in turn account for 44.2 per cent of the foreign labour force in the city of Hamburg. Consequently, roughly ten per cent of the immigrant entrepreneurs employ nearly the half of the foreign labour.

6.5.3.5 Co-national economic relationships

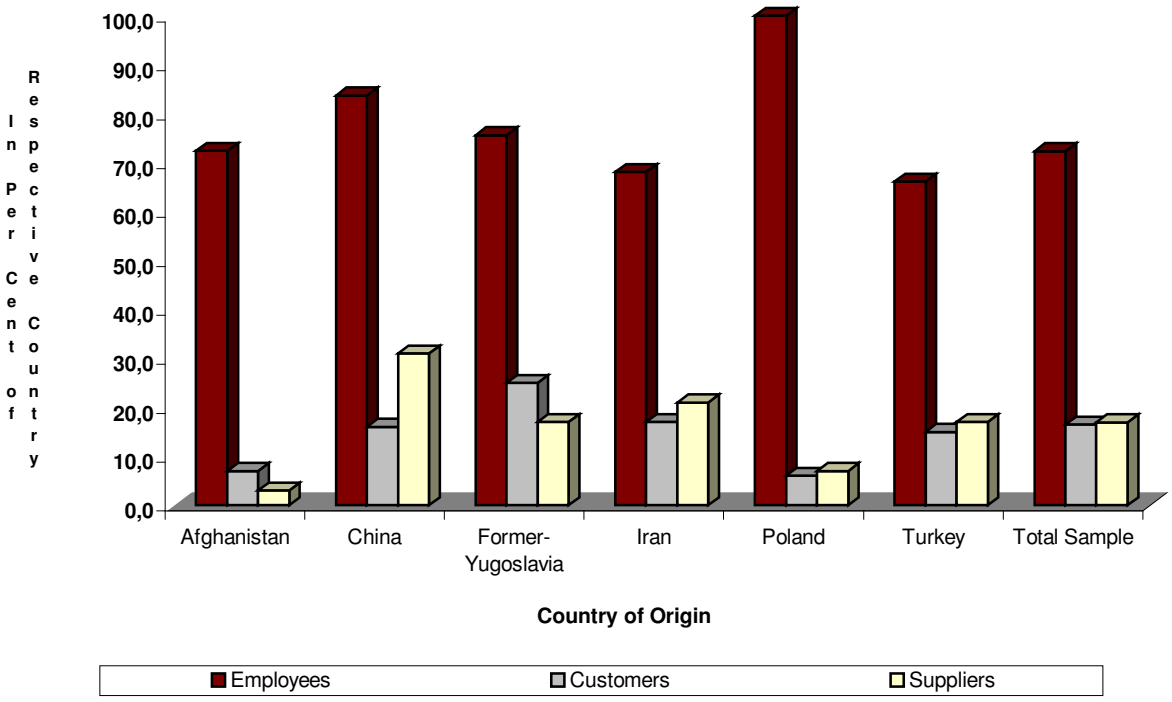
To what extent do business founders work in an ethnic niche, in particular, offer economic output to one and the same origin, is among the conventional issues of the research on immigrant entrepreneurship (Goldberg, 1997). I have mirrored above data on the employment structure by country of origin; hence I will consider them once more in conjunction with the relationship to customers and suppliers in the following subchapter.

The immigrant entrepreneurs have been asked to indicate whether employees, customers and suppliers are solely or mainly fellow countrymen, and whether they belong predominantly to Germany or other countries of origin. Figure 6.5 depicts the origin of employees, customers and suppliers in per cent of the respective immigrant group.

Accordingly, it seems that the origin tie is of importance only for employees, and it hardly plays a significant role for customers and suppliers. Nevertheless, there exist differences at the country level that I should stress more in depth. For instance, the

high fraction of co-national suppliers among the Chinese entrepreneurs is related to the commercial firms, which either import various products such as parts of ships, textiles or comestible goods from China to Germany, or export producer goods.

Figure 6.5: Origin of Employees, Customers, and Suppliers



Moreover, the opposed figure is evident for the Afghan and Iranian entrepreneurs, which has to do with their diverse activities in the retail and service sector. For instance, Afghan entrepreneurs deal more at retail and less at services, and vice versa in the case of Iranian entrepreneurs. The differences in localisation of national customers correspond to this development. It can be assumed, therefore, that the national orientation concerning customers in the service sector tends to be still the strongest, which can be explained itself by the experience, and respectively, by the confidence character of the goods traded in this sector.

Finally, the share of the so-called national customers scores one-third for the service sector and is twice as higher as the sample average. A comparison is most possible for the wholesale due to imports from and exports to the country of origin. In sum, it remains, however, correct that stage of maturity, duration and scale of immigrant entrepreneurial activities cannot tolerate a predominant focus on compatriot customers and suppliers.

6.6 Empirical results for the homophily impact on the entrepreneurial performance

Prior to presenting the empirical results and responding to the question how the homophily impacts the performance of immigrant entrepreneurs in the city of Hamburg, I introduce the specification of the variables. More precisely, based on the overall sample I derive potential explanatory variables of entrepreneurial success concerning immigrants to Germany, I outline their construction, and lastly, I specify the measure for the entrepreneurial performance. Then I go on to discuss the empirical findings in depth.

6.6.1 Determinants of entrepreneurial performance: construction of variables

Working on a firm specific level, I can shed some light on the driving factors of successful immigrant entrepreneurship by controlling for various prospective determinants with a special emphasis on homophily, which are set out in table 6.10. Variables measuring the degree of homophily with respect to gender, nationality, employees, customers and suppliers related to the venture under investigation are also incorporated in the analysis.

Table 6.10: Definition of Variables Selected

Variables	Definition Based on the Sample
Human Capital Variables	
Age of Entrepreneur	Respondent's age in years
Years of Education	Number of years of education received in both country of origin and Germany
Working Experience in Germany	Years of labour experience in Germany
Working Experience in Country of Origin	Years of labour experience in the country of origin
Family Capital Variables	
Number of Family Members as Employees	Number of employees, which are family members
Motives Prior to Establishment	
Image Improvement	Dummy variable equal to one if respondent wanted to improve his image
Income Improvement	Dummy variable equal to one if respondent wanted to improve his income
Dissatisfaction with Previous Occupation	Dummy variable equal to one if respondent was not satisfied with the previous occupation
Unemployment	Dummy variable equal to one if respondent was unemployed prior to enterprise establishment
Homophily Variables	
Employees, Mainly Co-Nationals	Dummy variable equal to one if mainly compatriots are employed in the venture
Customers, Mainly Co-Nationals	Dummy variable equal to one if mainly compatriots are the venture's customers

Variables	Definition Based on the Sample
Homophily Variables (Continuation)	
Suppliers, Mainly Co-Nationals	Dummy variable equal to one if mainly compatriots are the venture's suppliers
Customers, Mainly Germans	Dummy variable equal to one if mainly Germans are the venture's customers
Suppliers, Mainly Germans	Dummy variable equal to one if mainly Germans are the venture's suppliers
Gender, Male	Dummy variable equal to one if the employees are mainly male
Industrial Sectors	
Handicraft	Dummy variable equal to one if respondent operates in the handicraft sector
Retail	Dummy variable equal to one if respondent operates in the retail sector
Wholesale	Dummy variable equal to one if respondent operates in the wholesale sector
Transportation	Dummy variable equal to one if respondent operates in the transportation sector
Manufacturing	Dummy variable equal to one if respondent operates in the manufacturing sector
Catering	Dummy variable equal to one if respondent operates in the catering sector
Other Services	Dummy variable equal to one if respondent operates in the other services
Control Variables	
Firm Size	Total number of employees
Legal Form	Dummy variable equal to one if legal form is limited company (Ltd.)
Economic Performance	
Volume of Sales per Employee	Annual sales per employee in 1,000 Euros

Before discussing the two model structures, I should comment on the construction of the variables, and on the theoretical justification to include these characteristics into the further empirical analysis, in order to investigate the hypotheses verbalised above.

Human capital is one of the main intangible assets that affect the path of economic performance in local industrial areas (Hand and Baruch, 2003). The taxonomies suggested by the literature mostly focused on the difference between general and specific human capital, transferable and non-transferable knowledge (Becker, 1993). Accordingly, I included three major human capital explanatory variables, both general and specific, in my empirical analysis. First, the age of entrepreneur can be seen as a proxy for the accumulation of general human capital. The inclusion of age and age squared enables us to control for the conventional inverted U-shaped relation between age of entrepreneur and economic performance as they impact entrepreneur's abilities. Second, the educational attainment measured by years of

schooling received in both, country of origin and in Germany, should shed light on the influence of the human capital stock on entrepreneurial success. Third, the specific human capital endowment is represented by two variables computed as working experience in years accumulated in Germany as well as in the country of origin. In addition, I argue that this experience obtained outside Germany might be less valuable; thus their effect on the economic performance should be of miner relevance for my explorations.

I also control for the impact of the social capital by including the variable family members employed in the business venture. This is the only characteristic derived from the sample that can be considered in the further empirical analysis.

When investigating the entrepreneurial success of immigrants to Germany, the willingness to establish an own enterprise should be taken into account apart from the other factors fostering the economic performance. However, the willingness to start as an entrepreneur is defined as the valuation of work in self-employment versus remaining (un)employed, in otherwise identical situations (Van Praag and Van Ophem, 1995). Moreover, it is positive whenever entrepreneurship is seen as the best available option. Consequently, the willingness is dependent on both individual preferences for the special features of entrepreneurship as well as on the alternative available options and their perceived attractiveness. In other words, pull factors are expected to influence rather positively the entrepreneurial performance in comparison to the push ones. In this context, I include four dummy variables such as image and income improvement that are related to the attractiveness of being self-employed, and on the other side dissatisfaction with the previous work and unemployment as alternative preferences.

In order to measure the homophily, the main characteristic of interest, I incorporate two groups of variables. The first one is linked to the business venture itself, and consists of ‘predominantly males as employees’ and ‘mainly compatriots as employees’, respectively. The second group of variables is related to the company’s environment considering customer- and supplier-based homophily that comprises either dealing mostly with co-nationals versus German customers or suppliers. The motivation to take into account mainly customers and suppliers of the same nationality relies on the basic assumption that ‘birds of a feather flock together’.

The line of business, which the immigrant entrepreneur is operating in, indicates industry specific factors that could also influence his success. Therefore, I include six

industry dummies while the transportation sector serves as a reference group in the econometric analysis.

In addition, two control indicators such as firm size and legal form (limited company dummy) are believed to directly influence the entrepreneurial performance. There are several reasons, why one should control for firm size. For instance, larger companies realised higher volumes of sales, but on the other side they provide work for more personnel. As a result, the sales per employee can be lower compared with smaller enterprises *ceteris paribus*. Additionally, size might also serve as a weak proxy for economies of scale in an industry (Kumar et al., 2001). In this context, the number of employees can be seen as an appropriate proxy for the size, which I transform into natural logarithm due to statistical reasons.

Finally, the realised volume of sales per employee in year 2001 measures the economic performance of immigrant entrepreneurs in Hamburg city, which enter the empirical analysis as natural logarithm. It represents the only indicator of economic performance derived from the overall sample.

6.6.2 Entrepreneur's capital endowment and economic performance

I first model the immigrant entrepreneurial performance in dependence of his human capital endowment, and then I enrich the econometric specification to account for the homophily impact with respect to gender, employees, customers, and lastly suppliers. I use, therefore, the following regression equation, which is considered as my basic model.

$$\begin{aligned}\log(Sale_i) = {} & \beta_0 + \beta_1(Age_i) + \beta_2 \log(FamCap_i) + \beta_3 \log(YearEduc_i) + \\ & \beta_4 ExpGer_i + \beta_5 ExpOrg_i + \beta_6 Image_i + \beta_7 Income_i + \beta_8 Dissat_i + \\ & \beta_9 Unempl_i + \beta_{10} \log(Empl_i) + \beta_{11} Ltd_i + \beta_{12} \mathrm{Re}tail_i + \beta_{13} Wholesale_i + \\ & \beta_{14} Catering_i + \beta_{15} Handcraft_i + \beta_{16} Manufact_i + \beta_{17} Services_i + u_i\end{aligned} \tag{6.1}$$

where: $\log(Sale_i)\ldots$ Natural logarithm of the volume of sales per employee in enterprise i

$\beta_0\ldots$ Intercept

$Age_i\ldots$ Age of immigrant entrepreneur i

$\log(FamCap_i)\ldots$ Natural logarithm of the number of family members employed in company i

$\log(YearEduc_i)\ldots$ Natural logarithm of years of education received either in Germany or in the host country by entrepreneur i

$ExpGer_i\ldots$ Years of labour experience obtained in Germany by entrepreneur i

$ExpOrg_i\ldots$ Years of labour experience obtained in the country of origin by entrepreneur i

$Image_i\ldots$ Dummy that takes value one if the entrepreneur i wished to improve his image prior to enterprise foundation

$Income_i\ldots$ Dummy that takes value one if the entrepreneur i wished to improve his income as result of the enterprise foundation

$Dissat_i\ldots$ Dummy that takes value one if the entrepreneur i was not satisfied with the previous occupational choice

$Unempl_i\ldots$ Dummy that takes value one if the entrepreneur i was unemployed prior to enterprise foundation

$\log(Empl_i)\ldots$ Natural logarithm of number of employees engaged by enterprise i

$Ltd_i\ldots$ Dummy that takes value one if the legal form of the enterprise i is limited company

$Retail_i\ldots$ Dummy that takes value one if the enterprise i belongs to the retail sector

$Wholesale_i\ldots$ Dummy that takes value one if the enterprise i belongs to the wholesale sector

$Catering_i\ldots$ Dummy that takes value one if the enterprise i belongs to the catering and restaurant sector

$Handcraft_i\ldots$ Dummy that takes value one if the enterprise i belongs to the handicraft sector

$Manufact_i \ldots$	Dummy that takes value one if the enterprise i belongs to the manufacturing sector
$Services_i \ldots$	Dummy that takes value one if the enterprise i belongs to the service sector
$u_i \ldots$	Disturbance term

Carrying out the regression (6.1), I receive the results that are depicted in table 6.5. Additionally, table 6.5 contains the p-values of a White- and F-test, which test for heteroscedasticity and the explanatory power of the entire estimated model.

Table 6.11: OLS Estimation of the Regression Equation (6.1)

Explanatory Variables	Coefficient	P-Value
Intercept	9.6239	0.000
Entrepreneur's Characteristics		
Age of the Entrepreneur, Age_i	0.0059	0.4968
Years of Education, $\log(YearEduc_i)$	0.4494	0.0261
Working Experience in Germany, $ExpGer_i$	0.4278	0.0059
Working Experience in Country of Origin, $ExpOrg_i$	-0.0845	0.6217
Family Capital, $\log(FamCap_i)$	0.3486	0.1552
Motives Prior to Enterprise Establishment		
Image Improvement, $Image_i$	0.5786	0.0014
Income Improvement, $Income_i$	-0.4186	0.0143
Dissatisfaction with Previous Occupation, $Dissat_i$	-0.3857	0.0262
Unemployment, $Unempl_i$	-0.0738	0.7175
Control Variables		
Firm Size, $\log(Empl_i)$	-0.5129	0.0000
Legal Form, Limited Company, Ltd_i	0.3896	0.0399
Industrial Sectors		
Retail, $Retail_i$	0.1793	0.5625
Wholesale, $Wholesale_i$	0.5484	0.0990
Restaurants and Catering, $Catering_i$	0.4826	0.1101
Handicraft, $Handcraft_i$	0.9423	0.0023
Manufacturing, $Manufact_i$	1.0942	0.0194
Other Services, $Services_i$	0.6713	0.0314
Number of Observations N	427	-
Adjusted R^2	0.2304	-
F-Test (p-value)	4.1209	0.0000
White-Test NR^2 (p-value)	25.3978	0.2303

Note: The transportation sector serves as reference group within the industrial sector dummies. The shadowed area indicates significance of the obtained estimates at one, five and ten per cent level.

The results presented in table 6.5 confirm the findings of the previous literature on entrepreneurship that the level of human capital endowment influences positively the economic performance in general. The main determinants of sales per employee within

this category are occupational experience and years of education. Having worked in Germany prior to venturing an own business increases significantly the volume of sales per employee by 53.39 per cent *ceteris paribus*. This effect is negative for the labour experience cumulated in the country of origin but on the other hand, it is statistically insignificant. The estimated coefficient for years of education obtained either in Germany or abroad depicts that the sales per employee increase by 4.38 per cent while increasing the years by ten per cent.

The entrepreneur's age appears to enhance the volume of sales positively, as assumed, but the estimated coefficient is not statistically significant, thus, should be taken into consideration cautiously. Additionally, several empirical studies as discussed in Chapter three and four, have found evidence for the conventional inverted U-shaped relation between economic performance and age of entrepreneur. I tested, therefore, that hypothesis by adding a squared term, but I did not find significant support for the assumption stated above. Moreover, I carried out Ramsey's regression specification error test including one versus two fitted terms in order to detect misspecification error. Either test specification rejected the hypothesis that the coefficients on the powers of fitted values are zero.

Interestingly, image and income improvements account for the strongest positive versus negative impact on volume of sales among the objectives prior to enterprise establishment. The obtained estimates are 0.78 for image and -0.34 for income improvement, respectively. Dissatisfaction with the previous occupational status is associated with decrease in the volume of sales per employee.

Moreover, the firm size proxied by the number of employees plays a crucial role for the entrepreneurial performance. The size effect is negative and, on the other hand, it indicates a decrease in the sales by 4.77 per cent while increasing the number of employees by ten per cent. As a result, I can conclude that given the small size of companies included in the overall sample, the highest output is realised by rather small companies.

Finally, the entrepreneurial performance varies significantly among the industrial sectors included in the econometric analysis. Apart from other industrial sectors, the order of magnitude is manufacturing (1.89), followed by handicraft (1.57) and other services (0.96) relative to the reference group. These three sectors account for the strongest effects on sales per employee realised by the immigrant entrepreneurs.

6.6.3 Homophily and entrepreneurial performance

Conditional on the human capital endowment of the immigrant entrepreneur, I extended the basic model in order to explore the impact of homophily on the venture's performance. However, I consider in the extended econometric specification four types of similarities accounting either for the working team structure within the enterprise or for the economic environment represented by customers and suppliers, which I refer to further in this subchapter as model one to four. More precisely, with respect to the working team I contemplate gender and nationality of employees, and the same holds true for the customers and suppliers of the company under investigation.

In this sense, the first modification of the basic model is of the form given by equation (6.2).

$$\begin{aligned}\log(Sale_i) = {} & \beta_0 + \beta_1(Age_i) + \beta_2 \log(FamCap_i) + \beta_3 \log(YearEduc_i) + \\ & \beta_4 ExpGer_i + \beta_5 ExpOrg_i + \beta_6 Image_i + \beta_7 Income_i + \beta_8 Dissat_i + \\ & \beta_9 Unempl_i + \beta_{10} \log(Empl_i) + \beta_{11} Ltd_i + \beta_{12} \mathrm{Re}tail_i + \beta_{13} Wholesale_i + \\ & \beta_{14} Catering_i + \beta_{15} Handcraft_i + \beta_{16} Manufact_i + \beta_{17} Services_i + \\ & \beta_{18} Gender_i + \beta_{19} CoNat_i + u_i\end{aligned} \tag{6.2}$$

where: $Gender_i$ … Dummy that takes value one if the employees in company i are predominantly males

$CoNat_i$ … Dummy that takes value one if the employees in company i are mainly co-nationals,

and the remaining variables are as in equation (6.1).

Additionally, I enriched equation (6.2) by including those companies into the regression analysis whose customers and suppliers are mainly compatriots. This modification of the basic model is motivated by the theoretical argument that communication costs are expected to decline, and as a consequence of, the entrepreneurial performance to improve. Offering country-specific goods and services according to the ethnic 'niche' or 'enclave' theory as a decision-making factor for engaging in entrepreneurship, should guarantee a certain enterprise performance.

$$\begin{aligned}\log(Sale_i) &= \beta_0 + \beta_1(Age_i) + \beta_2 \log(FamCap_i) + \beta_3 \log(YearEduc_i) + \\ &\beta_4 ExpGer_i + \beta_5 ExpOrg_i + \beta_6 Image_i + \beta_7 Income_i + \beta_8 Dissat_i + \\ &\beta_9 Unempl_i + \beta_{10} \log(Empl_i) + \beta_{11} Ltd_i + \beta_{12} \mathrm{Re}tail_i + \beta_{13} Wholesale_i + \\ &\beta_{14} Catering_i + \beta_{15} Handcraft_i + \beta_{16} Manufact_i + \beta_{17} Services_i + \\ &\beta_{18} Gender_i + \beta_{19} CoNat_i + \beta_{20} CusNat_i + \beta_{21} SupNat_i + u_i\end{aligned} \tag{6.3}$$

where: $CusNat_i \ldots$ Dummy that takes value one if the customers of company i are predominantly co-nationals

$SupNat_i \ldots$ Dummy that takes value one if the suppliers of company i are predominantly co-nationals

and the remaining variables are as in equation (6.2).

Models one and two in table 6.12 show the results of this procedure. What do those estimates tell us?

Table 6.12: OLS Estimation of the Regression Equations (6.2) and (6.3)

Explanatory Variables	Model 1	Model 2
	Coefficient	Coefficient
Intercept	9.9067 (0.0000)	9.8867 (0.0000)
Entrepreneur's Characteristics		
Age of the Entrepreneur, Age_i	0.0050 (0.5613)	0.0041 (0.6351)
Years of Education, $\log(YearEduc_i)$	0.3848 (0.0560)	0.3862 (0.0548)
Working Experience in Germany, $ExpGer_i$	0.4019 (0.0091)	0.3636 (0.0189)
Working Experience in Country of Origin, $ExpOrg_i$	-0.1198 (0.4816)	-0.1204 (0.4778)
Family Capital, $\log(FamCap_i)$	0.3585 (0.1475)	0.3387 (0.1704)
Motives Prior to Enterprise Establishment		
Image Improvement, $Image_i$	0.5599 (0.0018)	0.5590 (0.0018)
Income Improvement, $Income_i$	-0.4358 (0.0104)	-0.4213 (0.0130)
Dissatisfaction with Previous Occupation, $Dissat_i$	-0.3656 (0.0357)	-0.3211 (0.0640)
Unemployment, $Unempl_i$	-0.0689 (0.7336)	-0.0897 (0.6574)
Control Variables		
Firm Size, $\log(Empl_i)$	-0.5488 (0.0000)	-0.5235 (0.0000)
Legal Form, Limited Company, Ltd_i	0.4014 (0.0332)	0.3690 (0.0504)
Industrial Sectors		
Retail, $Retail_i$	0.2532 (0.4112)	0.2595 (0.3989)
Wholesale, $Wholesale_i$	0.5781 (0.0793)	0.5328 (0.1059)
Restaurants and Catering, $Catering_i$	0.5769 (0.0559)	0.5529 (0.0675)
Handicraft, $Handcraft_i$	0.9377 (0.0022)	0.9682 (0.0015)
Manufacturing, $Manufact_i$	1.1799 (0.0112)	1.2364 (0.0079)
Other Services, $Services_i$	0.8033 (0.0108)	0.7849 (0.0135)
Homophily Indicators		
Employees, Co-Nationals, $CoNat_i$	-0.6660 (0.0173)	-0.7343 (0.0094)
Gender, Male, $Gender_i$	0.6045 (0.0151)	0.6533 (0.0089)
Customers, Co-Nationals, $CusNat_i$		0.0463 (0.8318)
Suppliers, Co-Nationals, $SupNat_i$		0.3909 (0.0682)
Number of Observations N	427	427
Adjusted R^2	0.2523	0.2641
F-Test (p-value)	4.1193 (0.0000)	3.9301 (0.0000)
White-Test NR^2 (p-value)	22.2713 (0.5038)	23.1608 (0.5682)

Note: The transportation sector serves as reference group within the industrial sector dummies.

Given that homophily translates generally dissimilarity with respect to the above-mentioned characteristics into network distance, but on the other hand, it leads to stable working teams, which communicated effectively, the impact on entrepreneurial performance should be positive. Surprisingly, not all variables measuring the homophily phenomenon have a positive influence on the volume of sale per employee, therefore, I refer to this phenomenon as homophily paradox. Hiring predominantly labour from the same country of origin as the entrepreneur accounts for a statistically significant decrease of 48.62 per cent in the volume of sales. Moreover, working teams dominated by males are the regular case in my study. In 84.31 per cent of the surveyed companies, the founder and the majority of the employed personnel are males. The effect of the calculated gender-based homophily on the volume of sales is positive and rather stronger compared to that based on nationality, i.e. the gender homophily impacts by 41.44 per cent stronger the venture's revenues per employee than the nationality one.

While incorporating the customer and supplier homophily based on predominantly co-nationals into analysis, the effect of the gender-specific similarity raises by 9.93 per cent and that of the nationality-specific one by 6.52 per cent (but negative) on the volume of sales per employee in comparison to the results obtained by equation (6.2). As a result, I can conclude that the gap between the impact of gender and nationality homophily increases for the benefit of gender while considering the enterprise's environment, and thus, the total effect on entrepreneurial performance improves. However, acquiring customers as well as collaborating with suppliers mainly from the same country of origin enhances the sales opportunities positively. The obtained estimates for customer and supplier homophily are 0.05 and 0.48, respectively. Nevertheless, the customer impact is not statistically significant, which in turn does not allow me to make clear statement. The insignificance of this estimate provides, first, additional support to the mixed evidence concerning the importance of the co-national customers to the entrepreneurial performance, and second, it speaks against the ethnic market niche theory.

I also investigated the economic performance of immigrant entrepreneurs in Hamburg city while accounting for German customers and co-national suppliers. The regression equation is given below.

$$\begin{aligned}\log(Sale_i) &= \beta_0 + \beta_1(Age_i) + \beta_2 \log(FamCap_i) + \beta_3 \log(YearEduc_i) + \\ &\beta_4 ExpGer_i + \beta_5 ExpOrg_i + \beta_6 Image_i + \beta_7 Income_i + \beta_8 Dissat_i + \\ &\beta_9 Unempl_i + \beta_{10} \log(Empl_i) + \beta_{11} Ltd_i + \beta_{12} \text{Re}tail_i + \beta_{13} Wholesale_i + \\ &\beta_{14} Catering_i + \beta_{15} Handcraft_i + \beta_{16} Manufact_i + \beta_{17} Services_i + \\ &\beta_{18} Gender_i + \beta_{19} CoNat_i + \beta_{20} CusGer_i + \beta_{21} SupGer_i + u_i\end{aligned} \tag{6.4}$$

where: $CusGer_i \ldots$ Dummy that takes value one if the customers of company i are predominantly Germans

$SupGer_i \ldots$ Dummy that takes value one if the suppliers of company i are predominantly Germans

and the remaining variables are as in equation (6.2).

Given the fact that for the immigrant entrepreneurs in Hamburg city, the ethnic 'niche' or 'enclave' theory is not of relevance, I modified equation (6.4) in order to gain further insight into the factors determining the entrepreneurial success.

$$\begin{aligned}\log(Sale_i) &= \beta_0 + \beta_1(Age_i) + \beta_2 \log(FamCap_i) + \beta_3 \log(YearEduc_i) + \\ &\beta_4 ExpGer_i + \beta_5 ExpOrg_i + \beta_6 Image_i + \beta_7 Income_i + \beta_8 Dissat_i + \\ &\beta_9 Unempl_i + \beta_{10} \log(Empl_i) + \beta_{11} Ltd_i + \beta_{12} \text{Re}tail_i + \beta_{13} Wholesale_i + \\ &\beta_{14} Catering_i + \beta_{15} Handcraft_i + \beta_{16} Manufact_i + \beta_{17} Services_i + \\ &\beta_{18} Gender_i + \beta_{19} CoNat_i + \beta_{20} CusGer_i + \beta_{21} SupNat_i + u_i\end{aligned} \tag{6.5}$$

The empirical evidence based on equations (6.4) and (6.5) is depicted in table 6.13, and it is referred to as model three and four.

Table 6.13: OLS Estimation of the Regression Equations (6.4) and (6.5)

Explanatory Variables	Model 3	Model 4
	Coefficient	Coefficient
Intercept	9.8507 (0.0000)	9.7169 (0.0000)
Entrepreneur's Characteristics		
Age of the Entrepreneur, Age_i	0.0044 (0.6056)	0.0037 (0.6658)
Years of Education, $\log(YearEduc_i)$	0.3908 (0.0517)	0.4056 (0.0419)
Working Experience in Germany, $ExpGer_i$	0.4470 (0.0039)	0.3908 (0.0110)
Working Experience in Country of Origin, $ExpOrg_i$	-0.0956 (0.5744)	-0.0839 (0.6196)
Family Capital, $\log(FamCap_i)$	0.3205 (0.1932)	0.3056 (0.2124)
Motives Prior to Enterprise Establishment		
Image Improvement, $Image_i$	0.6015 (0.0008)	0.6052 (0.0007)
Income Improvement, $Income_i$	-0.3837 (0.0252)	-0.3614 (0.0340)
Dissatisfaction with Previous Occupation, $Dissat_i$	-0.3527 (0.0398)	-0.3220 (0.0606)
Unemployment, $Unempl_i$	-0.0393 (0.8453)	-0.0548 (0.7847)
Control Variables		
Firm Size, $\log(Empl_i)$	-0.5364 (0.0000)	-0.5040 (0.0001)
Legal Form, Limited Company, Ltd_i	0.3261 (0.0863)	0.3005 (0.1130)
Industrial Sectors		
Retail, $Retail_i$	0.2675 (0.3825)	0.2762 (0.3646)
Wholesale, $Wholesale_i$	0.5328 (0.1040)	0.5099 (0.1180)
Restaurants and Catering, $Catering_i$	0.4821 (0.1132)	0.5076 (0.0895)
Handicraft, $Handcraft_i$	0.9059 (0.0030)	0.9274 (0.0022)
Manufacturing, $Manufact_i$	1.2281 (0.0082)	1.3025 (0.0049)
Other Services, $Services_i$	0.8910 (0.0048)	0.8527 (0.0064)
Homophily Indicators		
Employees, Co-Nationals, $CoNat_i$	-0.7296 (0.0091)	-0.7805 (0.0053)
Gender, Male, $Gender_i$	0.6996 (0.0054)	0.7286 (0.0037)
Customers, Germans, $CusGer_i$	0.4417 (0.0278)	0.3834 (0.0449)
Suppliers, Co-Nationals, $SupNat_i$		0.4052 (0.0521)
Suppliers, Germans, $SupGer_i$	-0.1855 (0.0678)	
Number of Observations N	427	427
Adjusted R^2	0.2686	0.2767
F-Test (p-value)	4.0331 (0.0000)	4.1901 (0.0000)
White-Test NR^2 (p-value)	21.5736 (0.6602)	22.2801 (0.6195)

Note: The transportation sector serves as reference group within the industrial sector dummies. P-values are set in parentheses.

Serving mostly German customers increases the volume of sales realised per employee in a particular company by 55.53 per cent. In contrast, dealing mainly with German suppliers deteriorates the entrepreneurial success of immigrants in Hamburg by 16.93 per cent. Moreover, while accounting for mostly German customers and suppliers, the effect of the nationality homophily on sales even strengthens. The strongest negative impact of the nationality is reached in model four, i.e. ten per cent increase in the co-national employment leads to 5.42 per cent decline in the sales per employed. The contemplated paradox can be explained, first, by the fact that diverse working teams are more likely to come up with creative solutions of a given problem, as they dispose over better insights into the consumer needs of customers than do homogeneous personnel. Second, one could hypothesise that an immigrant entrepreneur who employs only his own co-nationals might be a more risk averse entrepreneur. Third, a mixed working team might occur in companies that hire stronger according to skill and qualification, rather than to nationality.

In total, the most relevant factors influencing the success of immigrant entrepreneurs in Hamburg city with respect to homophily are, male dominance within the working team, avoiding too many compatriots as employees and suppliers, and German customers in the main. One could argue that the positive influence of the male dominance is caused by the fact that the majority of the immigrant entrepreneurs in the overall sample are male; hence the communication costs are expected to decline, and thus, the performance indicator to improve.

In this context, I could confirm the hypothesis one that mixed gender teams would be not the regular case. Besides, the gender-based homophily accounts for the strongest positive impact on business sales estimated for the overall sample. Additionally, nationally homogeneous personnel are the regular case in my study; hence I also found empirical support for hypothesis two and partially for hypothesis four. Unexpectedly, the nationality affects the company's sales realised per employee negatively, and accounts insofar for the strongest negative impact. And finally, I failed to corroborate hypothesis three that employee-customer homophily based on nationality was supposed to improve the success of immigrant entrepreneurs in the city of Hamburg.

6.7 Limitation of the case study

Any study of how homophily affects the economic success of immigrant entrepreneurs in Germany faces a number of challenges. First, because of potential legal challenges, it is rare that similarity and performance data at the company level with respect to immigrants see the light of the day. To the best of my knowledge, this sample is the only one conducted within Germany.

Second, homophily versus heterophily exists as a concept along infinite dimensions. However, I focused in the current research on the socially salient dimensions of gender and nationality, although many other dimensions such as age, religion, education, occupation, social status, are expected to matter. Third, in practice similarity is often confused with the main effects of demographic differences. And fourth, the impacts of homophily are often confounded with other differences across occupations, employers, or economies.

Studies on homophily can mistake not just employer similarity but also special similarity for homogenous effects. In my model specification, I could not control for special characteristics that might affect the realised sales per employee.

Finally, a particular special unit can experience an employment shock that might influence both the demographic mix of employees and demand for company's products and services. In the analysis, I did not account for the effect of regional shocks to sales or workplace demographics due to the cross-sectional structure of the data set applied.

6.8 Conclusion

In many cities of advanced economies such as Hamburg, we find significant number of immigrants who have set businesses themselves. The founding process as such, and on the other hand, the entrepreneurial performance are influenced by various factors. In this context, I aimed to answer the question whether "birds of a feather flock together" and perform economically better in the current study? In other words, does effective communication due to "similar-to-me" hypothesis cause better economic performance among immigrant entrepreneurs in Hamburg?

For this purpose, a unique data set was collected by the University of Hamburg and analysed economically here for the first time. The cross-sectional data consist of 427 immigrant entrepreneurs from Afghanistan, China, Former-Yugoslavia, Iran, Poland and Turkey operating in the city of Hamburg. They were surveyed during the

period September-October 2002 by means of face-to-face interviews using a detailed questionnaire to study different aspects of immigrant entrepreneurship in Germany.

My main finding suggests that the process of fielding a work team within a venture is likely to follow the principle of homophily. Working teams with male dominance among the immigrant entrepreneurs in Hamburg city are more common than mixed gender teams. In 84.31 per cent of the surveyed companies the founder and the greater part of the employees are males. Moreover, the gender-based homophily raises significantly the volume of sales by 10.72 per cent (model four) while increasing the male dominance by ten per cent.

The nationally homogenous working teams are the regular case in the study. In 72.3 per cent of the companies, the working team is composed of mainly employees of the same country of origin as the entrepreneur. Surprisingly, the so formed team structure causes decline in the sales per employee by 5.42 per cent while raising the dominance of co-nationals by ten per cent. We should have expected that similarity did lead to effective communication and did reduce communication cost. But we speculated about the explanation of our opposite finding: it might mute the innovativeness of the working team in the long run as I analysed companies beyond the start-up stage. It is highly possible that the effect of innovativeness dominates this of effective communication, and cause in this vein, a negative total impact on the immigrant entrepreneurial success.

Finally, cooperating mostly with co-nationals as suppliers improves the economic performance of immigrant entrepreneurs in the city of Hamburg by 49.96 per cent. In contrast, serving mostly German customers improves significantly the volume of sales per employee by 46.73 per cent.

In sum, the patterns of homophily among the immigrant entrepreneurs are remarkably robust over those varying types of relations investigated in the case study. As a consequence, I can conclude that the principle of homophily does lead to stable working teams within a company with respect to gender and nationality but does not always improve the entrepreneurial performance.

7. Concluding Remarks

Self-employment and entrepreneurship are economic phenomena of significant importance, which are increasingly addressed in the social science research and, on the other hand, in the mass media. Governments all over the world extol its benefits and implement policies designed to promote the venturing activities in their respective countries. There are several reasons for this interest in, and enthusiasm for, entrepreneurship. Owner-managers of small enterprises, for instance, run the majority of businesses in most countries. These enterprises are credited with providing specialised goods and services that are ignored by the largest companies. In addition, they intensify competition, thereby growing economic efficiency.

Some entrepreneurs pioneer new markets for innovative products and services, creating job opportunities and enhancing economic growth. But only in a few cases, today's small owner-managed enterprises do grow to become tomorrow's industrial giants. Even those that do not may create positive externalities, like the development of supply chain that help attract inward investments, or greater social inclusion. It is often claimed that the decentralisation of economic production into a large number of small firms is good for society and democracy, as is the fostering of a self-reliant and hardy entrepreneurial spirit.

When we add to the aforementioned migration as an essential component of the ongoing globalisation process, the entrepreneurship as a subject of research becomes even more complex. The increase in numbers of immigrants in most advanced economies, including Germany, in the last decade of the twentieth century, has also led to an increase in the immigrant entrepreneurship. More precisely, the self-employment structure of immigrants to Germany changed tremendously since the 1970s. For instance, in the early 1970s only 40,000 immigrants were registered performing self-employment activities, and their businesses were tied to restaurant or to cater to the need of their compatriots. Overall, the absolute number of self-employed foreigners developed more dramatically than the number of the self-employed Germans. The stock of self-employed foreigners rose by 23.6 per cent between 1992 and 2001, while the increase in total self-employment was 17.0 per cent.

Providing these matters of fact, it is unclear to me why immigrant entrepreneurship in Germany has been investigated so little yet, both empirically and theoretically. Brüderl and Preisendörfer (1998), for instance, studied the factors

improving the survival performance of enterprises established by Germans in the Upper Bavaria excluding the immigrant entrepreneurial activities in the region. Sen and Goldberg (1996) analysed the entrepreneurial activities of immigrants from Turkey in a descriptive manner without considering the factors leading to economic success. Therefore, the objective of my dissertation was to fill this scholarly gap, and to answer the underlying composite question: 'What are the determinants of successful immigrant entrepreneurship in Germany?'

7.1 The determinants of inclining towards entrepreneurship

I started approaching the answer of the complex question stated above by investigating the factors that impact the immigrant's propensity to self-employment in Germany. In other words, which socio-economic characteristics accelerate the decision-making process in favour of the self-employment contrasted against the wage/salary employment? In this context, I estimated a binomial logit model of the likelihood of male and female immigrants towards self-employment based on the GSOEP data for the years 1984 and 2000.

As main result, I should stress that the propensity to entrepreneurial activities is affected by certain human capital variables. Overall, I uncovered that the likelihood to incline towards self-employment increases with immigrant's age but at a declining rate. Formal education obtained either in Germany or in the country of origin propels the decision in benefit of the self-employment as occupational choice.

Moreover, labour-intensive activities and willingness to work overtime speak against the paid-employment. On the other hand, self-employed immigrants do have higher job satisfaction, which provides additional support to the existent scarce research findings. The impact of the years since migration displays an U-shape. In other words, during the first years since migration, immigrants to Germany select self-employment as a channel to enter the labour market, while the likelihood decreases over time.

While contrasting two major groups of immigrants – EU and CEEC nationals – for legal regulation reasons prior to establishing a business, I found that the odds of becoming self-employed double for those stemming from EU-countries may be due to lower transaction costs and entry barriers associated with the venturing procedure.

Finally, my empirical analysis does not lend support to the perception of impoverished immigrants coming to Germany and establishing own businesses to overcome restricted occupational opportunities in consequence of limited human capital

endowment and labour market regulation. Most noteworthy, they mainly imply that immigrants who have the means to do so, more successful immigrants, manage to engage in entrepreneurial activities possibly as an avenue of upward economic mobility.

7.2 The success of immigrant entrepreneurs to Germany

Establishing a new enterprise and being successful as an immigrant entrepreneur in a new economic and social environment after a certain period of time are two significantly diverse matters. Unfortunately, a large proportion of newly founded companies does not survive as identifiable units beyond their first few years, and only a small proportion achieves significant growth. Consequently, I studied in Chapter Four, Five and Six the determinants that lead to successful entrepreneurship across immigrants to Germany, after investigating their propensity to engage in self-employment. For this purpose, I derived different measures of success, which were partially motivated by the availability of empirical data.

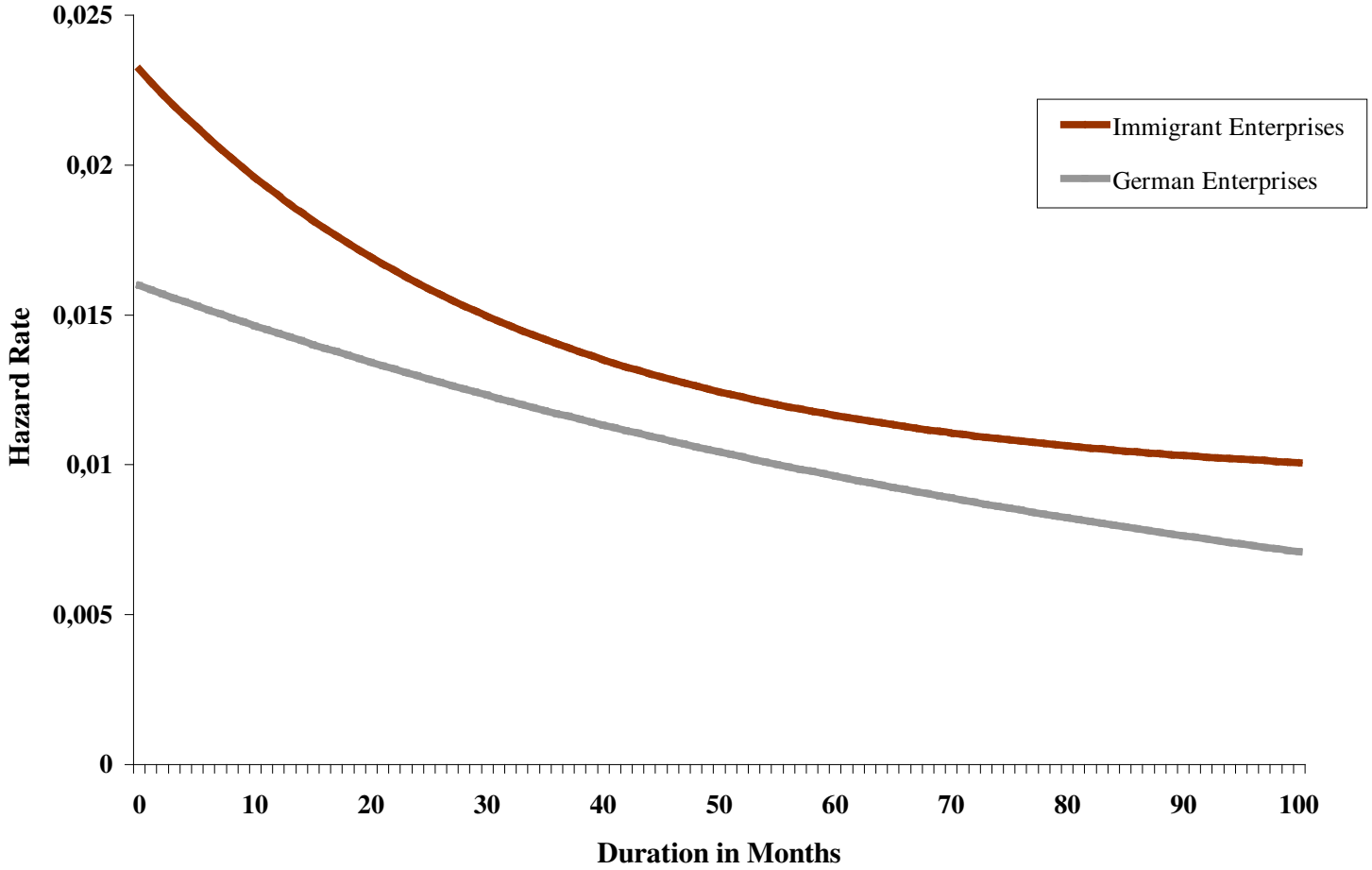
7.2.1 Which factors extend the survival of enterprises?

To the best of my knowledge, Chapter Four provides the first empirical evidence for immigrant survival of newly founded enterprises in Germany. Defining success as the time span of survival before an immigrant exists the entrepreneurial state, I performed a duration analysis based on 114,550 firm registrations and liquidations in Upper Bavaria, Germany, applying a Gompertz-Makeham parametric hazard model.

There is little theory or empirical evidence about person-oriented determinants of immigrant business survival. Therefore, I derived potential survival indicators from empirical evidence concerning related issues by means of statistical relationship development for the purpose. This also resulted in hypotheses about the qualitative effects of covariates on the self-employment duration.

My main result suggests that the success of newly founded companies varies between immigrant and German entrepreneurs in Upper Bavaria. Figure 7.1 plots the estimated baseline Gompertz-Makeham hazard rate for either group. Accordingly, the hazard for exit out of entrepreneurship is a decreasing function of calendar time elapsed. Companies established by Germans survive on average 1.24 years longer compared with immigrants in Upper Bavaria. The initial difference between native and immigrant founders is even larger.

Figure 7.1: Estimated Gompertz-Makeham Hazard Rate of Immigrant and German Enterprises in Upper Bavaria, 1990-1997



I included a broad range of determinants that can be taken into consideration to explain the above-stated differences. Survival duration is positively affected by entrepreneur's age at start, while the negative impact of the age-squared corroborated the assumption of the inverted U-shape. Moreover, the group of 46 to 55-years old accounted for the longest survival duration among immigrants, whereas the group of 17 to 25-years old for the shortest.

However, the endowed human capital level of an immigrant founder measured by his age is not the unique determinant of success. Rather investments in industry-specific human capital contribute significantly to explaining the cross-sectional variance of survival among immigrant entrepreneurs. For instance, immigrant entrepreneurs venturing in the paper, print and publishing industry have the highest likelihood to stay longer in business compared to the 'other services' sector, which belongs to the industrial sectors accounting for good survival performance. Registering a company in the aforementioned industry will decrease the hazard rate by 35.85 per cent than in services. Surprisingly, deciding to launch a business in the retail sector will prolong the survival duration by 12.72 per cent. Finally, the shortest business duration can be expected in communication and transport sector, followed by the catering and hotels. This is well explained by the less industry-specific human capital required there.

Additionally, the social capital quantified as share of immigrant population resident in a particular administrative district in Upper Bavaria influences the survival chances of enterprises established by immigrants. The best survival performance indicated regions with middle, followed by high and low share of resident foreign population. I also uncovered that the industrial structure and economic power of a particular region impact on the business duration. The most unique result is the found empirical evidence for the inverted U-shape relationship between social capital and survival duration, which has to be confirmed by further research on immigrant entrepreneurship.

7.2.2 How fast do immigrant entrepreneurs adjust their beliefs?

In Chapter Four, I have shown that enterprises established by immigrants are less successful with respect to survival duration in comparison with German entrepreneurs. Accordingly, the investments in human and social capital do improve the survival chances, but the explanations for these differences are complex, as many factors impact

on the entrepreneurial success. One of the essential determinants frequently referred to is the use of adequate information.

The sustainable success of immigrant entrepreneurs will also rely on their ability to utilise new adequate information when confronted with dynamically changing competitive markets and shifting demand through company's life cycle transitions. In other words, I aimed to answer theoretically the question: How important is behaviour change for the entrepreneurial success of immigrants to Germany?

In this context, Chapter Five of my dissertation made two contributions to the understanding of entrepreneur's use of information in shaping business decisions and alerting one's behaviour. First, I proposed a joint theoretical model of entrepreneurial adjustment of beliefs, effort, and performance, which links all of these phenomena in a unified way. Second, I provided an econometric formulation of the so derived model that enables to estimate the extent to which immigrant entrepreneurs in Germany exploit new information when adjusting their business behaviour.

7.2.3 Do birds of a feather flock together and perform better?

'Bird of a feather flock together' is the phrase that summaries the phenomenon recognised as homophily, the tendency of individuals to be similar to each other in various characteristics, for instance nationality and gender. In other words, the contact between similar economic agents will occur at a higher rate than among dissimilar one. The existence of the above-addressed phenomenon has been repeatedly confirmed to the psychology and hardly incorporated into behavioural economics or management studies. Consequently, my objection was to investigate the composition of the work team in a particular company established by immigrants in Hamburg city, and to study how the existing structure influences the economic performance measured by the volume of sales per employee.

Most noticeably, I found that the process of fielding a work team within a particular company is likely to follow the principle of homophily. For instance, working teams with male dominance among the immigrant entrepreneurs are the common case. In 84.31 per cent of the surveyed enterprises the founder and the majority of the employees are male. Additionally, the gender-based homophily increases significantly the volume of sales by 10.72 per cent while raising the male dominance by ten per cent.

Nationally homogenous working teams are the regular case in my study. More precisely, in 72.3 per cent of the companies, the working team is composed of mainly

employees of the same country of origin as the entrepreneur stems from. Most surprisingly, the so formed team structure causes decline in the sales per employee by 5.42 per cent while increasing the dominance of co-national employees by ten per cent. This finding is empirically robust over all econometric specifications being estimated, thus I refer to as a 'homophily paradox'. One possible cause for this result might be the fact that similarity does lead to effective communication and does reduce communication cost, but it might mute the innovativeness of the working team in the long run.

As a consequence, I can conclude that the principle of homophily according to nationality and gender does lead to stable teams but not necessary improve the economic performance of immigrant entrepreneurs.

7.3 Contribution of my research

Corresponding with Chambers of Industry and Competence in the entire territory of Germany, restructuring GSOEP data from various waves beginning with year 1984 and ended by 2001, and outlining questionnaire for conducting face-to-face interviews in order to gather individual data on immigrant entrepreneurs is only the preparatory part of my dissertation.

Definitely, many new results were obtained by my research, as it is the first work to best of my knowledge, investigating the determinants of successful immigrant entrepreneurship in the Federal Republic of Germany. Consequently, I contributed in various respects to this field of research, which I outline briefly below.

As already mentioned above, I uncovered that legal regulations with respect to the founding process do impact considerably the immigrant's propensity to engage in entrepreneurial activities besides other significant factors taken into account. Therefore, for the sake of entrepreneurship growth in Germany, it is imperative that immigrants, in particular the non-EU nationals, have unfettered access to the formal labour market, and they be given the opportunities to implement their venturing endeavours.

Moreover, I shed light on the survival of immigrant entrepreneurs in Upper Bavaria. Although the survival performance of immigrant entrepreneurs is by 1.24 years shorter compared with Germans, I found based on the estimated Gompertz-Makeham hazard model that Asians account for the highest survival (4.20 years on average) among all immigrants venturing in Upper Bavaria.

In addition, I uncovered the so-called ‘homophily paradox’, which existence has to be proven by other scholars and for other countries with flourishing immigrant entrepreneurship.

Finally, every study is by nature limited. Although I provided considerable insights regarding the determinants leading to successful immigrant entrepreneurship in Germany, there is still enough space for future investigations in this area. A concluding research issue is that there are few German academics working and exploring the phenomenon of immigrant entrepreneurship, although immigrants establish more companies and employ more co-workers on average than Germans do. For instance, the start-up activities in year 2002 (Lehnert, 2003) indicate that immigrants (5.4 per cent) compared with Germans (2.1 per cent) consider more often self-employment as occupational choice. Although immigrants feature more commonly funding obstacles prior to establishing an own company, they hire twice and a half more staff members on average. If the concerns identified above were to be conquered, then it would be appropriate for more German scholars to get involved, and to help understand the significance of that phenomenon, as Germany was and is among the countries attracting immigrants since the 1950s.

8. Mathematical and technical appendix

8.1 Mathematical appendix

8.1.1 Derivation of optimal effort and equation (5.10)

From equation (5.8), the objective function of the entrepreneur is

$$\max_{I_{it}} \left\{ E\left(\pi_{it+1} - c_{it+1} \mid \Omega_{it}\right) = I_{it}\left[E\left(p_{it} \mid \Omega_{it}\right) - \theta_i\right] - \gamma I_{it} \ln\left(I_{it}/\underline{I}\right) \right\}$$

Maximise by setting the first derivative with respect to I_{it} equal to zero:[75]

$$\frac{\partial E\left(\pi_{it+1} - c_{it+1} \mid \Omega_{it}\right)}{\partial I_{it}} = E\left(p_{it} \mid \Omega_{it}\right) - \theta_i - \gamma \ln\left(I_{it}/\underline{I}\right) - \gamma = 0$$

This expression can be re-arranged to yield (5.9) in Chapter five:

$$\begin{aligned}
\gamma \ln\left(I_{it}/\underline{I}\right) &= E\left(p_{it} \mid \Omega_{it}\right) - \theta_i - \gamma \\
\gamma \ln\left(I_{it}\right) &= E\left(p_{it} \mid \Omega_{it}\right) - \theta_i + \gamma\left[\ln\left(\underline{I}\right) - 1\right] \\
\ln\left(I_{it}\right) &= \gamma^{-1} E\left(p_{it} \mid \Omega_{it}\right) - \gamma^{-1}\theta_i + \left[\ln\left(\underline{I}\right) - 1\right]
\end{aligned}$$

To derive (5.10), I lag (5.9) a period and multiply both sides by $(1-\lambda)$ to obtain

$$(1-\lambda)\ln\left(I_{it-1}\right) = (1-\lambda)\gamma^{-1} E\left(p_{it-1} \mid \Omega_{it-1}\right) - (1-\lambda)\gamma^{-1}\theta_i + (1-\lambda)\left[\ln\left(\underline{I}\right) - 1\right].$$

Taking the difference of the equations (5.9) and $(1-\lambda)\ln\left(I_{it-1}\right)$ yields

$$\begin{aligned}
\ln\left(I_{it}\right) - (1-\lambda)\ln\left(I_{it-1}\right) = \gamma^{-1}\left[E\left(p_{it} \mid \Omega_{it}\right) - (1-\lambda)E\left(p_{it-1} \mid \Omega_{it-1}\right)\right] \\
- \gamma^{-1}\lambda\theta_i + \lambda\left[\ln\left(\underline{I}\right) - 1\right]
\end{aligned}$$

[75] The second order condition guarantees a maximum, since the second order derivative equals $-\gamma\left(I_{it}\right)^{-1} < 0$.

Substituting for $E(p_{it} \mid \Omega_{it}) - (1-\lambda) E(p_{it-1} \mid \Omega_{it-1})$ after re-arranging (5.7) into the equation $\ln(I_{it}) - (1-\lambda)\ln(I_{it-1})$ yields

$$\ln(I_{it}) - (1-\lambda)\ln(I_{it-1}) = \gamma^{-1}\lambda\hat{p}_{it} - \gamma^{-1}\lambda\theta_i + \lambda\left[\ln(\underline{I}) - 1\right]$$
$$\ln(I_{it}) - (1-\lambda)\ln(I_{it-1}) = \gamma^{-1}\lambda\left[\hat{p}_{it} - \theta_i\right] + \lambda\left[\ln(\underline{I}) - 1\right]$$

Finally, I substitute in (5.3) for $\hat{p}_{it}$ and arrange, then add the disturbance u_{it} to obtain (5.10) as follows:

$$\ln(I_{it}) - (1-\lambda)\ln(I_{it-1}) = \gamma^{-1}\lambda\left(\frac{\pi_{it}}{I_{it-1}}\right) + \gamma^{-1}\lambda(\theta_{it} - \theta_i) + \lambda\left[\ln(\underline{I}) - 1\right]$$

$$\ln(I_{it}) = (1-\lambda)\ln(I_{it-1}) + \gamma^{-1}\lambda\left(\frac{\pi_{it}}{I_{it-1}}\right) + \gamma^{-1}\lambda\underbrace{(\theta_{it} - \theta_i)}_{\varepsilon_i} + \underbrace{\lambda\left[\ln(\underline{I}) - 1\right]}_{\alpha}$$

$$\ln(I_{it}) = \alpha + (1-\lambda)\ln(I_{it-1}) + \gamma^{-1}\lambda\left(\frac{\pi_{it}}{I_{it-1}}\right) + u_{it}$$

8.1.2 Proof of equation (5.14)

Given the extensions discussed in Chapter five, I amend (5.6) to become

$$\Omega_{it} = \Omega_{it-1} \cup \{\hat{p}_{it} \cup X_{it} \cup Z_{it}\}. \tag{8.5}$$

Also, the RHS of the objective function (5.8) of the entrepreneur becomes

$$I_{it}\left[\mathrm{E}(p_{it} \mid \Omega_{it}) - \theta_i + \beta' X\right] - \gamma(I_{it} + \delta' Z)\left[\ln(I_{it} + \delta' Z)/\underline{I}\right],$$

noting from (8.5) that the entrepreneur does not know X_{it+1} at t, so his best estimate is X_{it}. Analogous to the proof in Subchapter 8.1.1, we can show that the entrepreneur's objective function is

$$\max_{I_{it}} \left\{ \mathrm{E}\left(\pi_{it+1} - c_{it+1}\right) = I_{it}\left[\mathrm{E}\left(p_{it} \mid \Omega_{it}\right) - \theta_i + \beta' X_{it}\right] - \gamma\left(I_{it} + \delta' Z_{it}\right)\ln\left[\left(I_{it} + \delta' Z_{it}\right)/\underline{I}\right]\right.$$

s. t. $\quad \gamma > 0,\ \underline{I} \geq 1$

The first order condition is

$$\frac{\partial \mathrm{E}\left(\pi_{it+1} - c_{it+1}\right)}{\partial I_{it}} = \mathrm{E}\left(p_{it} \mid \Omega_{it}\right) - \theta_i + \beta' X_{it} - \left[\gamma \ln\left(\left(I_{it} + \delta' Z_{it}\right)/\underline{I}\right) + \gamma\right]$$

$$\frac{\partial \mathrm{E}\left(\pi_{it+1} - c_{it+1}\right)}{\partial I_{it}} = \mathrm{E}\left(p_{it} \mid \Omega_{it}\right) - \theta_i + \beta' X_{it} - \gamma \ln\left(I_{it} + \delta' Z_{it}\right) + \gamma\left[\ln\left(\underline{I}\right) - 1\right] = 0$$

Therefore

$$\ln\left(I_{it} + \delta' Z_{it}\right) = \gamma^{-1}\mathrm{E}\left(p_{it} \mid \Omega_{it}\right) + \gamma^{-1}\beta' X_{it} - \gamma^{-1}\theta_i + \left[\ln\left(\underline{I}\right) - 1\right]. \tag{8.6}$$

To derive (5.14), I lag (8.6) a period and multiply both sides by $\left(1-\lambda\right)$ to obtain

$$\begin{aligned}\left(1-\lambda\right)\ln\left(I_{it-1} + \delta' Z_{it-1}\right) = {} & \left(1-\lambda\right)\gamma^{-1}\mathrm{E}\left(p_{it-1} \mid \Omega_{it-1}\right) + \left(1-\lambda\right)\gamma^{-1}\beta' X_{it-1} \\ & - \left(1-\lambda\right)\gamma^{-1}\theta_i + \left(1-\lambda\right)\left[\ln\left(\underline{I}\right) - 1\right]\end{aligned} \tag{8.7}$$

Then taking the differences of the equations (8.6) and (8.7) yields

$$\begin{aligned}\ln\left(I_{it} + \delta' Z_{it}\right) - \left(1-\lambda\right)\ln\left(I_{it-1} + + \delta' Z_{it-1}\right) = {} & \gamma^{-1}\left[E\left(p_{it} \mid \Omega_{it}\right) - \left(1-\lambda\right)E\left(p_{it-1} \mid \Omega_{it-1}\right)\right] + \\ & \gamma^{-1}\beta'\left[X_{it} - \left(1-\lambda\right)X_{it-1}\right] - \gamma^{-1}\lambda\theta_i + \\ & \lambda\left[\ln\left(\underline{I}\right) - 1\right].\end{aligned}$$

Substituting for $E\left(p_{it} \mid \Omega_{it}\right) - \left(1-\lambda\right)E\left(p_{it-1} \mid \Omega_{it-1}\right)$ after re-arranging (5.7) into the equation $\ln\left(I_{it} + \delta' Z_{it}\right) - \left(1-\lambda\right)\ln\left(I_{it-1} + \delta' Z_{it}\right)$ yields

$$\ln\left(I_{it}+\delta' Z_{it}\right)-(1-\lambda)\ln\left(I_{it-1}+\delta' Z_{it-1}\right)=\gamma^{-1}\lambda\left(\hat{p}_{it}-\theta_i\right)+\gamma^{-1}\beta'\left[X_{it}-(1-\lambda)X_{it-1}\right]+\lambda\left[\ln\left(\underline{I}\right)-1\right].$$

Next substitute in $\left(\pi_{it}/I_{it-1}\right)+\theta_{it}-\beta' X_{it}$ for $\hat{p}_{it}$, where. Then collecting the X terms together as $\gamma\beta'(1-\lambda)\Delta X_{it}$, and adding the disturbance term u_{it}, lead directly to equation (5.14) as follows

$$\ln\left(I_{it}+\delta' Z_{it}\right)-(1-\lambda)\ln\left(I_{it-1}+\delta' Z_{it-1}\right)=\gamma^{-1}\lambda\left[\left(\pi_{it}/I_{it-1}\right)-\beta' X_{it}+\varepsilon_t\right]+\gamma^{-1}\beta'\left[X_{it}+\lambda X_{it-1}\right]+\lambda\left[\ln\left(\underline{I}\right)-1\right]$$

$$\ln\left(I_{it}+\delta' Z_{it}\right)-(1-\lambda)\ln\left(I_{it-1}+\delta' Z_{it-1}\right)=\gamma^{-1}\lambda\left[\left(\pi_{it}/I_{it-1}\right)-\beta' X_{it}+\varepsilon_t\right]+\gamma^{-1}\beta'\left[\Delta X_{it}+\lambda\left(X_{it}-\Delta X_{it}\right)\right]+\lambda\left[\ln\left(\underline{I}\right)-1\right]$$

$$\ln\left(I_{it}+\delta' Z_{it}\right)-(1-\lambda)\ln\left(I_{it-1}+\delta' Z_{it-1}\right)=\gamma^{-1}\lambda\left[\left(\pi_{it}/I_{it-1}\right)+\varepsilon_t\right]+\gamma^{-1}\beta'(1-\lambda)\Delta X_{it}+\lambda\left[\ln\left(\underline{I}\right)-1\right]$$

$$\ln\left(I_{it}+\delta' Z_{it}\right)=\alpha+(1-\lambda)\ln\left(I_{it-1}+\delta' Z_{it-1}\right)+\gamma^{-1}\lambda\left(\frac{\pi_{it}}{I_{it-1}}\right)+\gamma^{-1}\beta'(1-\lambda)\Delta X_{it}+u_{it}.$$

8.2 Technical appendix

8.2.1 Questionnaire design

8.2.1.1 General questions with regards to the enterprise

1. Which industrial sector does your enterprise belong to?

Industrial Sectors	Please Specify by Keyword
Handicraft	
Retail	
Wholesale	
Transportation	
Manufacturing	
Catering and Restaurants	
Other Services	

2. Is your enterprise linked with other companies?

	Please Checkmark only One Answer
Yes, branch establishment of a foreign company	
Yes, member of a franchise chain	
No, autonomous company, but I have others as well	Number:
No, autonomous company, I do not have others	

3. Which district of Hamburg city is your enterprise located in and when have you established it?

	Please Indicate Your Answer
District or postal code	
Year of enterprise establishment	

4. What legal form has your enterprise?

Legal Form	Please Checkmark Your Answer
Sole proprietorship	
German Civil Code company	
General partnership	
Limited partnership	
Limited company	
Other legal form	

8.2.1.2 The preparation of the enterprise establishment

1. What were your motives for engaging in entrepreneurship?

Motives for Engaging in Entrepreneurship	Please Checkmark All Applicable Answers
I wished to realise an idea	
I was occupationally unsatisfied	
I was unemployed	
As an entrepreneur, one enjoys a high social esteem	
I wanted to improve my income	
I wanted to continue a family tradition	

2. Did you have for the industrial sectors, which you had chosen,

	Please Checkmark Your Answers
A suitable education?	
Labour experience from your country of origin?	
Labour experience from Germany?	
Adequate industry knowledge?	
Managerial skills?	

3. Founders of a new enterprise are advised to draw up a business plan in advance. Have you built such plan for your enterprise?

Business Plan Has Been Built Regarding	Please Checkmark Your Answers	
	Yes	No
The industrial sector in general		
The market potential		
The competition situation		
The location of the enterprise		
The demand for capital		
The demand for personnel		
The expected sales and profit		

8.2.1.3 The consulting prior to enterprise establishment

1. Did you have a special demand for consulting services

	Please Checkmark Your Answers	
	Yes	**No**
When searching for a new business idea?		
Concerning the financing issues?		
Concerning the marketing issues?		
When deciding for location of your enterprise?		
Concerning legal permissions?		

2. In case that you *did not* make demands on consulting in advance, what were the reasons for?

Reasons For Not Making Demands on Consulting	**Please Checkmark Your Answers**
The costs were too high	
I did not know to whom I should refer	
I did not need consulting in advance	

3. In case you did make demands on consulting in advance, where did you go and were you satisfied with the consulting service?

How Many Times Have You Been Advised?	**Number of Consulting Services**	**Satisfaction With the Consulting** *Please give a score from 1 = 'highly satisfied' to 3= 'unsatisfied'*
Chamber of crafts/ guild		
Chamber of commerce		
Hamburg Initiative for enterprise establishments and innovations (HIE)		
Bank, savings bank		
Debt guarantee companionship (DGC)		
Tax versus management consultant		
Lawyer		
Entrepreneurial association (EA)		
Others such as: …		

4. In case that you were not satisfied with the consulting service, what were the reasons for?

Reasons	Chamber of Crafts	Chamber of Commerce	HIE	Bank	DGC	Tax Consultant	Lawyer	EA	Others
Too long waiting time									
No advice offer for my special question									
I did not understand the consulting correctly									
Too many documents and information were requested									
Mean consulting treatment due to my nationality									
Others, in particular, such as: …									

5. Have you also visited lectures and seminars for founders of a new business, and have you been satisfied with?

Yes, I Have Visited Lectures Organised by the Following	**How often? Number**	**Satisfaction With the Lectures** *Please give a score from 1 = 'highly satisfied' to 3= 'unsatisfied'*
1 ……..		
2 ……..		
No, I have not visited any lectures		

6. What consulting service have you made demands on since the enterprise establishment and how often?

Please Indicate a Number	**Since That Time … Times**	**Regularly, Every … Month**
Chamber of crafts/ guild		
Chamber of commerce		
Hamburg Initiative for enterprise establishments and innovations (HIE)		
Bank, savings bank		
Debt guarantee companionship (DGC)		
Tax versus management consultant		
Lawyer		
Entrepreneurial association (EA)		
Others		

7. Does your enterprise possess its own Internet page?

	Please Checkmark Your Answers
Yes, my enterprise does have an Internet page	
No, my enterprise does not have an Internet page	

8.2.1.4 The financing of the enterprise establishment

You might have reservations with regards to the following two questions. However, it is of significance to obtain information whether immigrant entrepreneurs face obstacles while raising start-up capital. Please take into consideration the anonymity of the survey. If you do not wish to name sums in Euros, we would highly appreciate indications of percentages at least.

1. How did the financing of your enterprise look like at the stage of establishment?

Sources of Start-Up Capital	Please in Euros or Per cent
Own capital	
Loans from family members/ friends	
Bank loan	
Public subsidiaries	

2. Where did your own capital result from at the stage of establishment?

Sources of Own Capital	Please in Euros or Per cent
Own savings or heritage	
Family	
Affiliates or friends	
Others, in particular, such as: …	

3. How did you raise the capital? Did you have difficulties to provide securities to the credit grantors?

	Please Checkmark Your Answer
Yes, I did have difficulties	
No, I did not have difficulties	

4. What securities did you provide to the credit grantors?

Securities	Please Checkmark Your Answer
Not applicable, no securities required	
Property (for instance, real estate, machinery, receivables)	
Personal securities	

5. Which type of credit institutions does your bank belong to?

Type of Credit Institutions	Please Checkmark Only One Answer
A savings bank	
A commercial bank	
A post bank	
Several credit institutions	
I do not have any bank connection	

6. Have you acquired any public subsidiaries?

	Please Checkmark Your Answer
Yes, I have acquired	
No, I have not acquired	

7. In case that you have not acquired public subsidiaries, what was the reason for?

Reasons	Please Checkmark Only One Answer
Did not file an application because I was not aware of those public subsidiaries	
Did not file an application because the proceedings were too complicated for me	
I filed the application too late, only after the start-up	
My house bank wanted to handle only larger projects	
I did not receive any approval of the chamber	
My own capital was insufficient	
I could not offer sufficient credit securities	

8. In the event that you have acquired public subsidiaries, what did the subsidiaries consist of?

Subsidiaries Consist of	Please Checkmark Your Answer
Long-term loan	
Undisclosed shareholding of the Hamburg investment company	
Securities provided by DGCs	
Subsidiaries for consulting service	

9. From where did the subsidiaries originate?

Origin of Subsidiaries	Please Checkmark Your Answer
Banks of the German federation	
Hamburg city	
From both stated above	

8.2.1.5 The obstacles with regards to the German authority

1. Regarding which official licences and permissions did you face obstacles?

Official Licences and Permissions	Please Checkmark Your Answer
Residence permit	
Work permit for self-employment	
Legal permissions concerning the industry	
Chamber of crafts	
Commercial register	

2. Did you call in a lawyer or could you solve the problems yourself?

	Please Checkmark Your Answer
Not applicable, there were no problems present	
I did call in a lawyer	
I could solve the problems myself	

8.2.1.6 The problems subsequent to the enterprise establishment

1. What difficulties or crises did you have to contend with since the enterprise establishment and when?

Difficulties Or Crises	Please Indicate the Year
Financing	
Accounting and tax obstacles	
Technical manufacturing facilities	
Estimate of demand	
Unfavourable location	
Problems with members of staff	
Problems with the family or within the household	
Official permits concerning the business extension	

2. Who controls the costs and revenues development in your enterprise and in what time intervals?

Time Intervals	Weekly	Monthly	Quarterly	Once in Year
Ourselves, by means of own computing				
Ourselves, by means of controlling the bank statements and invoices				
The tax adviser				

8.2.1.7 The employment issues

1. How many employees (including the owner) and apprentices work in your enterprise and how many of them are family members?

	Number	**Number of Family Members**
Employees		
Apprentices		

2. How many employees (including the owner) are males and how many females?

Gender of Employees	**Please Specify Your Answer**
Number of males	
Number of females	

3. Does your enterprise have predominantly 'national' business relationships, in other words, which country of origin do your employees, customers, and suppliers come from?

	Solely Compatriots	**Mainly Compatriots**	**Mainly from Germany**	**From Different Countries**
Employees come from				
Customers comes from				
Suppliers comes from				

8.2.1.8 The entrepreneur's personality and performance

1. Could you please indicate your age and gender in conclusion?

	Please Specify Your Answer
Age in years	
Male	
Female	

2. Please checkmark your country of origin versus that of your family.

	Please Checkmark Your Answer
Afghanistan	
China	
Former-Yugoslavia	
Iran	
Poland	
Turkey	

3. How do you evaluate your German language skills?

German Language Skills	Please Checkmark Your Answer
Entirely fluent	
Professionally sufficient	
Could be better	

4. Have you visited the school in your country of origin or in Germany, and how long did the schooling last?

	In Germany	In Country of Origin
Years of schooling received		

5. What is your highest vocational education received?

Vocational Education	Please Checkmark Your Answer
Skilled labour	
Master craftsman	
University	
Semi-skilled labour	

6. Are you member of any professional association or any chamber?

Professional Association and Chamber	Please Checkmark Your Answer
Professional association	
Chamber of crafts	
Chamber of commerce	

7. Are you willing to state the volume of sales realised in the last year?

Performance Indicator	Please Specify the Amount in Euros
Volume of sales	

8.2.1.9 Retrospect

1. If you review once again, what was your biggest problem with regards to the enterprise establishment?

…….

2. What was your biggest initial entrepreneurial problem?

…….

Thank you for your highly appreciated effort that you made replying to this questionnaire!

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9.2 Law texts and data sources

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