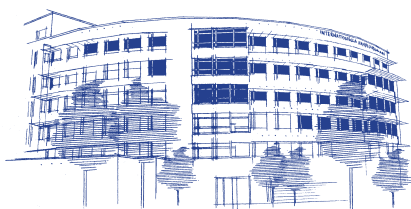


Entrepreneurship, Windfall Gains and Financial Constraints: Evidence from Germany

DOROTHEA SCHÄFER, OLEKSANDR TALAVERA, CHARLIE WEIR



JÖNKÖPING INTERNATIONAL
BUSINESS SCHOOL
JÖNKÖPING UNIVERSITY



Jönköping International Business School
Jönköping University
JIBS Working Papers No. 2010-3

Entrepreneurship, Windfall Gains and Financial Constraints: Evidence from Germany*

Dorothea Schäfer

Jönköping International Business School (JIBS) and DIW Berlin

Oleksandr Talavera

University of East Anglia

Charlie Weir

Aberdeen Business School

October 19, 2010

*We thank Christopher F. Baum, Jens Schmidt-Ehmcke, Jürgen Schupp, Axel Werwatz, Neal Galpin for their helpful comments and suggestions. The standard disclaimer applies. Schäfer and Talavera gratefully acknowledge financial assistance by the German Science Foundation (DFG). Corresponding author: Dorothea Schäfer, email: dschaefer@diw.de.

ENTREPRENEURSHIP, WINDFALL GAINS AND FINANCIAL CONSTRAINTS: EVIDENCE
FROM GERMANY

Abstract

We investigate the link between the propensity to become an entrepreneur and exogenous release from financial constraints in Germany. This is defined in terms of the movement from employment to self employment on receipt of a financial windfall. A theoretical framework developing Evans and Jovanovic (1989) is set up and tested with panel data from German households. The results show that financial constraints do exist given that individuals are more likely to start a personal business after receiving a windfall gain. The value of windfall gains has a significant but non linear effect on the decision to become self employed. The data reveal that differences in ability and income affect the change in employment status. We also report that there is no evidence that becoming self employed involves the anticipation of windfall gains.

Keywords: Entrepreneurship, windfall gains, financial constraints.

JEL: G20, M13.

1 Introduction

The question of whether funding gaps inhibit entrepreneurship has generated intense debate within both economic theory and public policy for more than two decades. In their seminal article, Stiglitz and Weiss (1981) show that information asymmetry leads to inefficient credit rationing. In contrast, de Meza and Webb (1987) argue that information asymmetry results in overfinancing for entrepreneurs. An empirical evaluation of these conflicting views is now even more important given that governments have identified entrepreneurship as an important source of employment and growth (Audretsch, 1995).¹

There is a considerable amount of research on the effect of financial constraints on entrepreneurship in the US and the UK using household panel data. However, comparable analyses of European countries such as Germany are still scarce. This paper investigates the extent to which, in Germany, the likelihood of starting a business is affected by financial constraints. Following the approach employed in previous US studies (e.g. Blanchflower and Oswald (1998)) we use household survey data to obtain self employment information. Our data come from the German Socio-Economic Panel (GSOEP). Germany has experienced a steady decline in the number of start-ups in recent years. In total, around 800 000 new firms were set up in 2008 which was roughly one half of the total number of the record year 2001.² The number of full-time start-ups fell from nearly 670,000 in 2003 to about 330,000 in 2008. In 2001, part-time entrepreneurs started over 900,000 new businesses but in 2008 it was less than 470,000. Around two thirds of all start-ups use own funds with only one third of coming from external sources. The overwhelming importance of own funds suggests that entrepreneurs face potential financial constraints. Thus, exogenous positive shocks to personal wealth may be an important driver for start-up activity in Germany.

The German government has introduced a number of policies designed to ease financial constraints and encourage business start-ups. At both federal and state levels

¹The European Commission considers entrepreneurship as a crucial element for achieving its political, social and economic objectives, see <http://www.europa.eu.int/comm/enterprise/entrepreneurship/>.

²Citation: http://www.kfw.de/DE_Home/Research/Steckbriefe.jsp.

the government has launched a large number of equity and debt programs aimed at arresting this decline. The programs include guarantees, interest rate subsidies and direct investment by state-owned financial institutions. The state-owned German Bank for Reconstruction (KfW) launches, on a regular basis, programs that promote the financing of start-ups. For example, small start-ups can benefit from a program called Start-up Money. The program started in 1998 and offers loans of up to 50,000 Euros. Larger and more capital-intensive start-ups can apply for subordinated loans from the start-up fund of the European Recovery Program or from KfW loan program for entrepreneurs. In 2004 the German government created the “ERP-EIF Dachfonds”³, a pool of funds that provides €500 million specifically for equity-investments in high-tech start-ups. It is planned to double the value of this fund in the near future. The German government has also established a credit mediator who negotiates with banks on behalf of the entrepreneur. Start-ups from universities or research institutions are eligible to be supported through scholarships under the EXIST program and founders of particularly technically challenging start-up projects can receive grants.⁴

These numerous attempts by the German administration to make entrepreneurs access to external finance more easy raises the question of how severe liquidity constraints are in Germany. We study this question by evaluating the impact of windfall gains on the probability of moving from employment to self employment.

Measuring the release from financial constraints is not straightforward, because of the two-way links between access to external financing and personal wealth. To overcome this difficulty, we hypothesize that an exogenous increase in wealth has the effect of increasing the probability of entering entrepreneurship given that financial constraints exist. A positive relationship between the propensity to enter entrepreneurship and the proxy for the exogenous wealth increase therefore suggests that financial constraints limit entrepreneurship. This hypothesis is tested by employing windfall gains as a proxy for an exogenous increase in wealth.

³ERP and EIF are the abbreviations for European Recovery Program and European Investment Fund respectively.

⁴See http://www.existenzgruender.de/englisch/self_employment/launch/support_programmes/index.php

The paper contributes to the existing literature in a number of ways. First, to the best of our knowledge, this is the first study to analyse the impact of financial constraints and their effect on the movement from employment to self employment in Germany. Second, we consider categories of individuals that exhibit similar characteristics in terms of income and ability. Third, if individuals anticipate a windfall gain, the gain will not be exogenous. We therefore evaluate the exogeneity of the windfall gain by analyzing the effects of different lags and leads of windfall gains on the self employment decision.

Our main findings can be summarized as follows. We find that windfall gains significantly increase the probability of becoming self-employed. The data reveal considerable variation in the effect of windfall gains across the income and ability subsamples. High income groups are more likely to become self-employed. In addition, high-ability groups are more likely to set up their own businesses after receiving a windfall. Finally, the results suggest that windfall gains are not anticipated and can therefore be considered as an exogenous shock to personal wealth.

The paper is organized as follows: Section 2 briefly describes the literature on financial constraints. In Section 3 we develop the theoretical model and set out the econometric methodology; Section 4 gives a description of the data and reports the results; and finally, Section 5 presents the conclusions and proposes areas of further research.

2 Literature on testing financial constraints

Empirical research into the financial constraints faced by entrepreneurs has to address two major challenges. The first is that financial constraints cannot be measured directly.⁵ It is therefore necessary to use a proxy measure and an increase in net worth provides a means of testing the presence of liquidity constraints, Evans and Jovanovic (1989) and Taylor (2001). The liquidity constraint hypothesis argues that a lack of capital, or collateral, will prevent new business start-ups.

⁵Some studies (e.g. van Praag, de Wit and Bosma (2005)) use direct reports from entrepreneurs about the financial constraints they encountered. However, reported constraints are also an imperfect measure of frictions in the financing markets because they do not reveal whether the rejection is the result of ability estimations by the bank or to asymmetric information.

The second challenge is that wealth, as the most commonly used proxy for the release from financial constraints, may be endogenously determined.⁶ Xu (1998) shows that individuals considering potential self-employment accumulate personal wealth prior to their decision to switch into self employment. This would mean that the reported relationship between wealth and self employment is endogenously, rather than exogenously, determined.

The endogeneity issue has been addressed in a number of papers, for example, Blanchflower and Oswald (1998), Taylor (2001) and Disney and Gathergood (2009). These papers use an exogenous increase in wealth as a proxy for the easing of financial constraints in relation to the self-employment decision. A number of different measures of wealth increase have been used including unanticipated windfall gains (Taylor, 2001); inheritance (Holtz-Eakin, Joulfaian and Rosen, 1994; Blanchflower and Oswald, 1998; Hurst and Lusardi, 2004)) and increased housing wealth (Disney and Gathergood, 2009). All report a significant relationship between the release from liquidity constraints and the entry into self-employment.

In addition, there is evidence from Sweden, Lindh and Ohlsson (1996), that lottery winnings increase the probability of becoming self-employed. More generally, Johansson (2000) uses an income measure of wealth and finds that liquidity constraints are present in Finland. Paulson and Townsend (2004) also find evidence that financial constraints affect entrepreneurial activity in Thailand.

An alternative form of exogenous wealth increase relates to housing assets. Black, de Meza and Jeffreys (1996) for the UK, and Hurst and Lusardi (2004) for the US find evidence of a positive relationship between increases in housing wealth and business start-ups. However, Hurst and Lusardi (2004) show that the relationship becomes insignificant when a fifth-order polynomial is specified and that only for the top 5% of the wealthiest people did the increase in financial resources via housing market gains have a significant impact on entrepreneurship.

⁶The banking literature suggests that personal wealth is the most natural candidate for capturing the relaxation of financial constraints given that it can serve either as equity or as collateral (Bester, 1985; Besanko and Thakor, 1987).

In contrast to UK and US housing markets, the peculiarities of the German housing market mean that the impact of housing wealth on the decision to become self employed is likely to be minimal. Owner occupation is still relatively rare. In addition, house prices in Germany have fallen since the mid 1990s. Therefore this form of easing of financial constraints is unlikely to have had a significant impact as an exogenous increase in wealth. We therefore analyse the impact of a broader definition of windfall gain on the decision to move from employment to self employment.

Additionally, we assess the impact of the exogenous windfall on groups of individuals sharing the same, or similar, characteristics. Such groupings would act as a proxy for individuals whose a priori propensity to enter entrepreneurship is likely to be similar and therefore variations in the entry decision will only be caused by different financial constraints. Finally, windfall gains such as bequests may be anticipated, something which questions their exogeneity as an easing of financial constraints. This proposition is analysed by the testing of lead and lag windfall gains on the decision to become self employed.

3 Theoretical background and empirical implementation

3.1 Model setup

The analytical framework used to identify the basic drivers of the occupational choice develops Evans and Jovanovic (1989). Consider the representative agent who decides at the start of the period between her own business activity or working for someone else. At the end of the period the individual gets profit from self-employment activity equal to π or wage W . We denote the self-employment decision of employed individuals at time t as $Switch_{it}$. Labour is considered as non-divisible, so that the individual can either work as an entrepreneur or as an employee. Non-divisibility makes W the opportunity cost of entrepreneurship and implies

$$Switch_{it} = \begin{cases} 1 & ; \pi - W \geq 0 \\ 0 & ; \pi - W < 0. \end{cases}$$

Self-employment generates gross returns of

$$y = \theta I^\gamma \xi \quad (1)$$

where θ is a measure of “ability”, I is the amount of business investment, $\gamma < 1$ reflects the productivity of the investment, and ξ is a log-normal disturbance whose logarithm has variance σ_ξ^2 and $E(\xi) = 1$. We assume decreasing marginal returns of investment. Individuals are considered as risk-neutral. At the time the investment decision is made, the realization of ξ is unknown, and potential entrepreneurs decide based on expected values. The individual owns equity \bar{E} to start her business but needs additional funds L from financial institutions. One unit of borrowing costs the gross interest rate R . The opportunity cost per unit of equity is r . In the absence of financial frictions the individual would invest

$$I^* = L^* + \bar{E} \quad (2)$$

where L^* is such that the marginal return of investment equals the gross interest rate R . For simplicity we assume that $r = R$. The borrowing capacity is modeled by $\hat{L}(\theta)$. We assume that financial institutions rate individuals by collecting information about their personal entrepreneurial abilities. This rating implies an increased borrowing capacity if the (observable) personal abilities go up and vice versa. The individual is financially constrained if $\hat{L}(\theta) \leq L^*$, that is, the optimal amount of borrowing exceeds borrowing capacity.

The phenomenon of borrowing capacity falling behind the desired borrowing level is a result of asymmetric information. If lenders lack private information on their clients’ ability to repay, they may limit their downside risk by binding the amount of credit on the would-be entrepreneur’s publicly observable individual characteristics. We derive the following expected net profit from starting an own business given that financial constraints exist

$$\pi_n = \theta [\hat{I}(\theta)]^\gamma - R(\hat{L}(\theta) + \bar{E}) - W(\theta) \quad (3)$$

We assume $W(\theta = 0) = \bar{w} > 0$ and $W'(\theta) > 0$. Ability θ also affects the success in employed work. This assumption implies that wage and ability are positively correlated.

Derivation of net profits with respect to a marginal increase in personal wealth \bar{E} yields

$$\frac{\delta\pi_n}{\delta\bar{E}} = \theta\gamma [\hat{I}(\theta)]^{\gamma-1} - R > 0. \quad (4)$$

The marginal return from an additional unit of equity exceeds the costs if the individual is financially constrained. Thus, more equity and the subsequent increased level of investment results in higher profits. In cases with an increase high enough to make gross profits exceeding the threshold W , individuals switch into self-employment. Thus our model predicts for all individuals sufficiently close to the marginal individual

$$\frac{\partial Switch_{it}}{\partial \bar{E}} > 0.$$

Accordingly, the exogenous wealth increase is our main variable of concern in the empirical framework.

Derivation with respect to entrepreneurial abilities gives

$$\frac{\delta\pi_n}{\delta\theta} = [\hat{I}(\theta)]^\gamma + \left(\theta\gamma [\hat{I}(\theta)]^{\gamma-1} - R\right) \frac{\delta\hat{L}}{\delta\theta} - \frac{\delta W}{\delta\theta}. \quad (5)$$

Note that the expression in brackets in (5) is positive as long as the entrepreneur is financially constrained, that is, $\hat{I} < I^*$. However, the sign of the derivative depends on the magnitude of the impact of ability on W . With a positive (negative) sign of (5) high-ability individuals are “nearer” to the switching level, and are expected to have a higher (lower) chance of switching than low-ability types if their equity E increases exogenously. Empirically, we use sub-samples of distinct ability and income groups to test how the impact of the exogenous wealth increase on self-employment is affected by entrepreneurial ability and income from employment.

3.2 Econometric specifications

As Blanchflower and Oswald (1998) and Holtz-Eakin et al. (1994), we proxy the exogenous wealth increase by windfall gains. However, our measure is broader and includes not only inheritance, but also additional extraordinary payments, such as bequests and lottery wins as defined in the GSOEP. On the basis of our theoretical predictions, we

estimate the following specification of the reduced form of the transition from full time employment to self-employment selection equation

$$Switch_{it} = \Lambda(\delta windfalls_{it-1} + \nu Z_{it} + X_t + \varepsilon_{it}) \quad (6)$$

where i represents individuals, t is time, $Switch_{it}$ is a dummy variable equal to one if the person decides to be self-employed in the next period and zero otherwise, $windfalls_{it-1}$ is a dummy variable equal to one if the person received windfall gains in the previous period and zero otherwise, Z_{it} is a vector of the person-specific variables, X_t is a set of time dummies, and Λ is the cumulative density function of the logistic distribution.

The vector Z_{it} includes factors that reflect ability and several other characteristics of the individual which we use as controls.⁷ The dummy variable *gender* is equal to one, if the person is female and zero otherwise. The individual's education is represented by *education* and is measured by the number of years in education. The variable *married* provides information about the marital status, it is equal to one if the individual is married and lives together with the partner, and it is zero otherwise. This variable proxies a typical family background. The variable *hhsz* measures the number of persons living in the particular household. Finally we employ four dummy variables which reflect the person's age: 20-30, 31-40, 41-50, and 50+.

Given that the model is testing the impact of windfall gains on the change from employment to self-employment, we include a measure of income opportunity cost. We therefore estimate the following regression for employed individuals only

$$Income_{it} = \alpha_0 + \alpha_1 educ_{it} + \alpha_2 exper_{it} + \alpha_3 married_{it} + \alpha_4 gender_{it} + AGE_{it}\Gamma + u_i + \varepsilon_{it} \quad (7)$$

where $Income_{it}$ is individual income or labour earnings, Age_{it} is the set of age dummy variables, $exper_{it}$ is the length of time with a particular firm in years, while $married_{it}$,

⁷These controls are similar to those included by others in the literature (see, e.g. Evans and Jovanovic (1989), Evans and Leighton (1989)). We experimented with other controls, including education dummies, country of origin, employment of parents. None of the additional controls affected our main results.

$gender_{it}$, $education_{it}$ is defined as before. Finally u_i is the individual specific term. We interpret this term as an individual's ability. The predicted values from this regression are rescaled to construct the foregone wages measure, $wage_{it}$.⁸

3.3 Subsamples

The empirical literature investigating the degrees of financial constraints faced by entrepreneurs has identified that individual-specific characteristics play an important role (e.g. Paulson and Townsend (2004)). Given the predictions of our theoretical model, we hypothesise that individuals that belong to different income and ability groups will have different likelihoods of becoming entrepreneurs. Consequently, we split the sample into subsamples based on personal income, as estimated in (7), and on ability. The latter is proxied by the individual specific term u_i from the same equation.⁹ The splits are based on individuals' average values of the characteristics lying in the first or fourth quartiles of the sample. For instance, a person with average labour earnings above the 75%th percentile of the distribution will be classed as high income, while a person with average labour earnings below the 25%th percentile will be classed as low income. The same process applies to ability.

4 Empirical Evidence

4.1 Data

To investigate the effects of windfall gains on the likelihood of starting a business, we use the German Socio-Economic Panel (GSOEP). It is a wide-ranging representative longitudinal study of private households. It provides information on all household members and consists of Germans living in the Old and the New German States, foreigners, and recent immigrants in Germany. The Panel started in 1984. On average there are about 47,000 personal characteristics per year. Incomplete answers and sample screening

⁸For rescaling we employ monotonic transformation, $wage_{it} = \log(\widehat{Income}_{it})$. This rescaling is needed to avoid negative expected values of predicted income.

⁹See Griliches (1977) for more details on measuring abilities.

produce a sample of 61,380 individual characteristics for the years 2000-2006. We apply a number of selection criteria to the data. First, given that we are investigating the movement from employment to self employment, we drop all unemployed people from our analysis. Second, to eliminate individuals that are still in school or are close to retirement, individuals older than 65 and younger than 20 were also excluded.

As Taylor (2001), we use data collected annually concerning labour market activity in the periods between interviews. An individual is defined as self-employed if the person answers the question "What is your current occupational status?" with "Self-employed" in the current period, but responded with other answers indicating employment in the previous period. Windfall gains are defined in the GSOEP as inheritance, donations, lottery winnings and payments due to assets such as life insurance.

Insert Table 1

Descriptive statistics for the annual means of all variables employed in the analysis are described in Table 1. We see that about one percent of German individuals started their own businesses, and six percent of individuals received windfall gains.

4.2 Econometric Results

In this section we present our estimation results on the link between the likelihood of being self-employed and windfall gains. Table 2 presents results from regressions of the self-employment dummy variable on windfall gains and our control variables for gender, household size, age dummies, marriage and education. We report marginal effects, estimated around mean points.¹⁰ Column 1 shows the results for the windfall dummy. Column 2 reports the result for the value of windfall gains. Column 3 includes a squared term for the windfall value and tests the hypothesis that above a certain value, the windfall is so large that there is no need to continue working. Column 4 shows the results when we exclude all individuals whose parents are self employed. This is done because it is possible that business owners are more likely to leave a bequest, in

¹⁰Estimations of marginal effects around median points suggest similar results.

the form of an existing business, than are non-business owners. The inheritance may therefore not result in the movement from employment to self employment and to the creation of a new business. The receipt of an inheritance could therefore be a proxy for the fact that the individual simply had a parent that was a business owner (Schäfer and Talavera, 2009).¹¹ As a result, a finding that inheritance is an important influence on the decision to start a business could be interpreted as suggesting that being the offspring of an entrepreneur increases the probability of starting a business.

Insert table 2

Column 1 indicates that the likelihood of becoming an entrepreneur increases when a person receives a windfall gain. The coefficient on *windfall* is positive and statistically significant at 1%. In Germany, receipt of a windfall gain increases the probability of starting an own business by 0.50%. The result supports the hypothesis that additional wealth matters when moving from employment to self employment and therefore suggests binding financial constraints.

The coefficient of the expected wage variable is insignificant. This finding suggests that the opportunity cost effect of earnings from regular employment is not important in Germany. Unlike Lindh and Ohlsson (1996), we find no evidence that women are less likely to become self-employed than men when receiving a windfall gain. Age decreases the likelihood of becoming self employed in Germany with the strongest results being found in the over 50 age group. The number of years in education is positive and highly significant as is household size. Marital status does not affect the probability of becoming self employed.

Column 2 shows that the value of windfalls is an important influence on the decision to enter self employment with higher valued windfalls more likely to lead to a movement into self employment. The column 3 result shows that, as hypothesised, the relationship is non-linear with higher value windfalls making it less likely for the recipient to move from employment to self employment. Column 4 shows that, for Germany, the proba-

¹¹See also Panunzi, Ellul and Pagano (2009).

bility of starting a business is positively related to windfall gains for those that are not related to business owners.

Insert Table 3

Table 3 reports the results for ability quartiles with column 1 showing the lowest ability and column 4 capturing the highest ability quartiles. We find that windfall gains do not affect the probability of becoming self employed in the lowest ability group. However, as hypothesised, the coefficient is significant and positive in the highest ability quartile. The marginal effect on becoming self employed given a windfall gain is 0.60% for the highest ability group. The significant result for the second ability quartile suggests a non linear relationship.

Insert Table 4

Table 4 shows the effect of income on the self employment decision with column 1 reporting the results for the lowest income quartile and column 4 the highest income quartile.. The results are significant and positive for the top two income quartiles only. The highest marginal effect occurs in the highest quartile, 0.80%. Thus, within the low income groups, the potential benefits are insufficient to make this group move to self-employment after receiving a windfall gain. In contrast, despite the higher opportunity cost, the high income groups are capable of achieving even higher incomes from self-employment and therefore the exogenous increase in wealth moves them over the threshold. These findings are consistent with results obtained by Hurst and Lusardi (2004) who report that the probability of becoming a business owner in the United States is a non-linear function of wealth and that only at the top of the wealth distribution is there a positive and significant relationship between an exogenous wealth increase and entrepreneurship.

The analysis is further developed by looking at the interaction of ability and income. We find that high income and high ability individuals are more likely to move into self employment on receipt of a windfall gain. The interactive term results in a marginal

effect of 1.2%, higher than for the sample as a whole. The interactive term for low income and ability groups is insignificant, suggesting a non linear relationship.¹²

The preceding analysis is based on the underlying assumption that windfalls occur randomly and that individuals do not predict the receipt of particularly inheritances. However, if individuals did predict the receipt of a windfall gain, the assumption that windfalls occur randomly would not hold. Hurst and Lusardi (2004) find that both past and future inheritances predict current business entry. This suggests that inheritances capture more than simple liquidity.

Insert Table 5

Table 5 provides an additional attempt at discriminating between the results proposed here and those of Hurst and Lusardi (2004). Instead of instrumenting personal wealth by inheritance, we employ lag and lead windfall dummy variables. Columns 1 and 2 report different lag periods, $t-1$ and $t-2$, and columns 3 and 4 different lead periods, $t+1$ and $t+2$. The significance of the windfall variable changes depending on whether it is a lag or a lead. The results for lags are significant and positive whereas those for leads are insignificant. The results therefore suggest that those moving from employment to self employment do not anticipate windfall gains.

5 Conclusions

This paper has analysed the impact of a windfall gain on the probability of moving from employment to self employment in Germany. It therefore assesses the importance of the financial constraints faced by would-be entrepreneurs. We find that windfall gains have a positive impact on the decision to move from employment to self employment. However, the results differ between different income and ability sub-samples. The analysis shows that the income matters for the top two income quartile groups and for the top ability quartile. The income results therefore suggest that financial constraints are present for high income groups but not for low income groups. Thus the opportunity

¹²The estimation results are available upon request.

cost at low incomes is not binding whereas for high income groups the additional anticipated returns are sufficient to move into self employment when financial constraints are eased. We also find a non linear relationship between ability and the movement from employment to self employment after the easing of financial constraints. We find no evidence that those moving into self employment anticipate receiving a windfall gain in the short run. Overall, the results suggest that there are binding financial constraints to entrepreneurship in Germany.

The results have important implications for policy in Germany. Faced with decreases in the number of new business start-ups, the German government has introduced a number of financial programmes designed to encourage the move into self employment. However, it may be that the types of businesses being supported, and the types of financial help being offered, have to be reassessed. In addition, the limitations placed on the assistance may also have to be re-evaluated.

References

- Audretsch, D. B. (1995), *Innovation and Industry Evolution*, MIT Press, MASS.
- Besanko, D. and Thakor, A. V. (1987), ‘Collateral and rationing: Sorting equilibria in monopolistic and competitive credit markets’, *International Economic Review* **28**, 671–689.
- Bester, H. (1985), ‘Screening vs. rationing in credit markets with imperfect information’, *American Economic Review* **75**(4), 850–55.
- Black, J., de Meza, D. and Jeffreys, D. (1996), ‘House prices, the supply of collateral and the enterprise economy’, *Economic Journal* **106**(1), 60–75.
- Blanchflower, D. G. and Oswald, A. J. (1998), ‘What makes an entrepreneur?’, *Journal of Labor Economics* **16**(1), 26–60.
- de Meza, D. and Webb, D. C. (1987), ‘Too much investment: a problem of asymmetric information’, *Quarterly Journal of Economics* **102**(2), 281–292.
- Disney, R. and Gathergood, J. (2009), ‘Housing wealth, liquidity constraints and self-employment’, *Labour Economics* **16**(1), 79–88.
- Evans, D. S. and Jovanovic, B. (1989), ‘An estimated model of entrepreneurial choice under liquidity constraints’, *Journal of Political Economy* **97**(4), 808–27.
- Evans, D. S. and Leighton, L. S. (1989), ‘Some empirical aspects of entrepreneurship’, *American Economic Review* **79**(3), 519–35.
- Griliches, Z. (1977), ‘Estimating the returns to schooling: Some exometric problems’, *Econometrica* **45**(1), 1–22.
- Holtz-Eakin, D., Joulfaian, D. and Rosen, H. S. (1994), ‘Entrepreneurial decisions and liquidity constraints’, *RAND Journal of Economics* **25**(2), 334–347.
- Hurst, E. and Lusardi, A. (2004), ‘Liquidity constraints, household wealth, and entrepreneurship’, *Journal of Political Economy* **112**(2), 319–347.
- Johansson, E. (2000), ‘Self-employment and liquidity constraints: Evidence from Finland’, *Scandinavian Journal of Economics* **102**(1), 123–34.

- Lindh, T. and Ohlsson, H. (1996), ‘Self-employment and windfall gains: Evidence from the Swedish lottery’, *Economic Journal* **106**(127), 1515–26.
- Panunzi, F., Ellul, A. and Pagano, M. (2009), Inheritance law and investment in family firms, Working Papers 2009.6, Fondazione Eni Enrico Mattei.
- Paulson, A. L. and Townsend, R. (2004), ‘Entrepreneurship and financial constraints in Thailand’, *Journal of Corporate Finance* **10**(2), 229–262.
- Schäfer, D. and Talavera, O. (2009), ‘Small business survival and inheritance: evidence from Germany’, *Small Business Economics* **32**(1), 95–109.
- Stiglitz, J. E. and Weiss, A. (1981), ‘Credit rationing in markets with imperfect information’, *American Economic Review* **71**(3), 393–410.
- Taylor, M. P. (2001), ‘Self-employment and windfall gains in Britain: Evidence from panel data’, *Economica* **68**(272), 539–65.
- van Praag, M., de Wit, G. and Bosma, N. (2005), ‘Initial capital constraints hinder entrepreneurial venture performance’, *The Journal of Private Equity* **9**(1), 36–44.
- Xu, B. (1998), ‘A reestimation of the Evans-Jovanovic entrepreneurial choice model’, *Economics Letters* **58**(1), 91–99.

Data Appendix

German Socio-Economic Panel (GSOEP)

The GSOEP - windfall gains are derived from positive answers to the following questions:

- *Did you or another member of the household receive a large sum of money or other forms of wealth (car, house, etc.) as inheritance, gift, or lottery winnings last year? We refer to money or other forms of wealth worth more than 2,500 EURO.*
- *Did you receive any sort of compensation or severance package from the company?*
- *Did you or another member of the household own any of the following savings or investment securities?*
 - *Savings account;*
 - *Savings contract for building a home;*
 - *Life insurance;*
 - *Fixed interest securities;*
 - *Other securities;*
 - *Company assets.*

How high was the income received from interest, dividends and profits from these savings and securities in the last calendar year?

Table 1: Descriptive Statistics

| Variable | μ | Median | σ | N observations |
|--------------------|-------|--------|----------|----------------|
| New Self-employed | 0.01 | 0.00 | 0.09 | 61,380 |
| Windfall dummy | 0.06 | 0.00 | 0.25 | 61,092 |
| Windfall, 100K EUR | 0.02 | 0.00 | 0.30 | 61,000 |
| Female | 0.52 | 1.00 | 0.50 | 61,380 |
| Education | 12.36 | 11.50 | 2.69 | 61,380 |
| Married | 0.72 | 1.00 | 0.45 | 61,380 |
| Age 30+ | 0.30 | 0.00 | 0.46 | 61,380 |
| Age 40+ | 0.34 | 0.00 | 0.47 | 61,380 |
| Age 50+ | 0.26 | 0.00 | 0.44 | 61,380 |
| Household Size | 3.02 | 3.00 | 1.23 | 61,380 |
| Log(Imputed Wage) | 9.97 | 10.23 | 1.00 | 61,380 |

Note: N is sample size, while σ and μ represent standard deviation and mean respectively.

Table 2: Logit Estimates of Individual Self-Employment Decision

| | (1) | (2) | (3) | (4) |
|-----------------------------|---------------------|---------------------|---------------------|----------------------|
| Windfall | 0.005*** (0.002) | | | 0.005*** (0.002) |
| Windfall value | | 0.001* (0.000) | 0.002** (0.001) | |
| Windfall value ² | | | -0.000** (0.000) | |
| Wage | 0.001 (0.001) | 0.001 (0.001) | 0.001 (0.001) | 0.001 (0.001) |
| Married | -0.002 (0.001) | -0.001 (0.001) | -0.001 (0.001) | -0.002 (0.001) |
| Female | -0.001 (0.001) | -0.002 (0.001) | -0.001 (0.001) | -0.001 (0.001) |
| Age 30 | -0.002* (0.001) | -0.002* (0.001) | -0.002** (0.001) | -0.002* (0.001) |
| Age 40 | -0.002** (0.001) | -0.002** (0.001) | -0.002** (0.001) | -0.002** (0.001) |
| Age 50 | -0.003** (0.001) | -0.003** (0.001) | -0.003** (0.001) | -0.003*** (0.001) |
| Household Size | 0.001** (0.000) | 0.001** (0.000) | 0.001** (0.000) | 0.001** (0.000) |
| Education | 0.001*** (0.000) | 0.001*** (0.000) | 0.001*** (0.000) | 0.001*** (0.000) |
| N. observations | 61,380 | 61,271 | 61,271 | 60,526 |
| Pseudo R^2 | 0.02 | 0.02 | 0.02 | 0.02 |
| Chi2 | 119.125 | 106.052 | 109.623 | 115.443 |
| d.f. | 9 | 9 | 10 | 9 |

Note: The table reports marginal effects after logit estimation of the transition into self-employment. Regressions include constant and time dummy variables. Huber-White standard errors are reported in the brackets. Marginal effects are estimated around mean points. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3: Logit Estimates of Individual Self-Employment Decision by ability quartiles

| | (1) | (2) | (3) | (4) |
|-----------------|----------------------|--------------------|---------------------|----------------------|
| Windfall | 0.002 (0.003) | 0.010** (0.004) | -0.000 (0.002) | 0.006** (0.003) |
| Wage | 0.027*** (0.009) | 0.008** (0.004) | 0.001 (0.001) | -0.001** (0.001) |
| Married | -0.005* (0.003) | -0.003 (0.002) | -0.001 (0.001) | -0.000 (0.002) |
| Female | 0.022** (0.009) | 0.007* (0.004) | -0.002 (0.001) | -0.008*** (0.002) |
| Age 30 | -0.008*** (0.002) | -0.000 (0.002) | -0.001 (0.002) | -0.001 (0.002) |
| Age 40 | -0.011*** (0.002) | -0.001 (0.002) | -0.003* (0.002) | 0.002 (0.003) |
| Age 50 | -0.008*** (0.002) | -0.003* (0.002) | -0.003** (0.001) | -0.000 (0.003) |
| Household Size | 0.002*** (0.001) | 0.001 (0.001) | 0.001 (0.001) | -0.000 (0.001) |
| Education | -0.002 (0.001) | -0.001 (0.001) | 0.001** (0.000) | 0.001*** (0.000) |
| N. observations | 14,414 | 14,372 | 15,654 | 16,930 |
| R2 | 0.03 | 0.03 | 0.03 | 0.05 |
| Chi2 | 56.500 | 31.255 | 25.146 | 82.294 |
| d.f. | 14 | 14 | 14 | 14 |

Note: The table reports marginal effects after logit estimation of the transition into self-employment. Regressions include constant, and time dummy variables. Huber-White standard errors are reported in the brackets. Marginal effects are estimated around mean points. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Logit Estimates of Individual Self-Employment Decision by income quartiles

| | (1) | (2) | (3) | (4) |
|-----------------|----------------------|--------------------|-------------------|--------------------|
| Windfall | 0.002 (0.003) | -0.000 (0.002) | 0.006* (0.003) | 0.008** (0.003) |
| Wage | -0.000 (0.000) | 0.008** (0.003) | -0.000 (0.002) | 0.009 (0.008) |
| Married | -0.001 (0.001) | -0.003 (0.002) | -0.003 (0.002) | 0.001 (0.002) |
| Female | -0.002 (0.001) | 0.006* (0.003) | -0.001 (0.002) | 0.001 (0.005) |
| Age 30 | -0.004*** (0.001) | 0.000 (0.002) | -0.001 (0.002) | -0.001 (0.004) |
| Age 40 | -0.003*** (0.001) | -0.003* (0.001) | 0.000 (0.003) | -0.004 (0.004) |
| Age 50 | -0.002** (0.001) | -0.002 (0.002) | -0.002 (0.002) | -0.005 (0.004) |
| Household Size | 0.001** (0.000) | 0.001 (0.001) | 0.001 (0.001) | 0.002** (0.001) |
| Education | 0.001*** (0.000) | -0.001 (0.000) | 0.001 (0.000) | -0.000 (0.001) |
| N. observations | 12,263 | 15,835 | 16,414 | 15,423 |
| R^2 | 0.07 | 0.03 | 0.02 | 0.02 |
| χ^2 | 74.873 | 31.752 | 22.697 | 40.821 |
| d.f. | 14 | 14 | 14 | 14 |

Note: The table reports marginal effects after logit estimation of the transition into self-employment. Regressions include constant, and time dummy variables. Huber-White standard errors are reported in the brackets. Marginal effects are estimated around mean points. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Logit Estimates of Individual Self-Employment Decision, Different windfall lags

| | $windfall_{i,t-2}$ | $windfall_{i,t-1}$ | $windfall_{i,t}$ | $windfall_{i,t+1}$ |
|----------------|----------------------|---------------------|---------------------|---------------------|
| Windfall | 0.005*** (0.002) | 0.005*** (0.001) | 0.002 (0.001) | 0.001 (0.001) |
| Wage | 0.001 (0.001) | 0.002 (0.001) | 0.001 (0.001) | 0.001 (0.001) |
| Married | -0.002 (0.001) | -0.002* (0.001) | -0.002* (0.001) | -0.002** (0.001) |
| Female | -0.001 (0.001) | -0.002 (0.001) | -0.002 (0.001) | -0.003** (0.001) |
| Age 30 | -0.002* (0.001) | -0.000 (0.001) | -0.000 (0.001) | 0.001 (0.001) |
| Age 40 | -0.002** (0.001) | -0.001 (0.001) | -0.001 (0.001) | -0.000 (0.001) |
| Age 50 | -0.003*** (0.001) | -0.002** (0.001) | -0.002** (0.001) | -0.001 (0.001) |
| Household Size | 0.001** (0.000) | 0.001*** (0.000) | 0.001*** (0.000) | 0.001*** (0.000) |
| Education | 0.001*** (0.000) | 0.001*** (0.000) | 0.000*** (0.000) | 0.000*** (0.000) |
| R^2 | 0.02 | 0.02 | 0.02 | 0.02 |
| χ^2 | 126.293 | 164.947 | 96.582 | 83.057 |
| d.f. | 14 | 15 | 14 | 13 |

Note: The table reports marginal effects after logit estimation of the transition into self-employment. Sample size is 61,380 observations. Regressions include constant, and time dummy variables. Huber-White standard errors are reported in the brackets. Marginal effects are estimated around mean points. * significant at 10%; ** significant at 5%; *** significant at 1%.