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Funding Self-Employment – The Role of Consumer Credit

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Abstract

In this paper we investigate whether self-employed households use consumer loans to finance their business activities. In particular, it is shown that self-employed households use personal overdrafts significantly more often than employee households do. This difference remains when controlling for financial and non-financial household variables: a discrete change from wage employment to self-employment results in an average rise in overdraft usage of 14.1%. These findings are corroborated when analyzing the correlation between consumer loan take-ups and consumption of self-employed households. Intermingling of personal and business resources is more likely when the household is credit constrained; when the household head is younger; and when financial assets within the household are lower.

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Funding Self-Employment – The Role of Consumer Credit*

Christoph Kneiding[1] and Alexander Kritikos[2]

1. Introduction

The availability of external finance is a crucial success factor and poses a major obstacle for many small and micro enterprises around the world. A growing literature addresses questions pertaining to funding issues and proposes solutions of how credit availability can be ensured within this sector (Hancock and Wilcox, 1998; Berger and Udell, 1998; Harhoff and Körting, 1998). Unlike large corporations, small and micro enterprises cannot rely on a set of funding sources composed of custom-made business loans or professional equity solutions. This is mainly due to two reasons: (i) because of low profitability prospects, banks have not designed loan products tailored to the specific needs that are typical for this sector and/or (ii) banks avoid high risk profiles – a legitimate stance given the informational opacity of small and micro businesses.[3]

This study analyses two funding sources that are traditionally labelled as 'private' and are therefore subsumed under the term consumer credit: personal overdrafts and personal instalment loans.[4] Together with mortgage debt and credit card debt, consumer credit makes up the bulk of debt sources that most households hold (Yilmazer and DeVaney, 2005). Our research was motivated by the conjecture that small and micro businesses tend to intermingle private and business finances, which accordingly results in a smooth transition between these two.

Intermingling is defined as 'the use of household assets for the support of the business and/or the use of business assets (other than wage and salary payments) for support of the household' (Yilmazer and Schrank, 2006). Typical examples of intermingling are direct loans from the business to the household and vice versa, or the use of a business asset for personal use (Haynes et

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[3] According to Berger and Udell (1998), informational opacity is 'perhaps the most important characteristic defining small business finance'.

[4] For notational brevity, when speaking of personal overdrafts respectively personal instalment loans, I will simply refer to 'overdrafts' and 'instalment loans' below. Business loans are explicitly exluded from these considerations.

al., 1999). Recent research in this field has shown when intermingling takes place and who does it. Still, we know little about the means used for it. The present study aims at closing this research gap by examining the role of consumer credit in the process of intermingling. So far, the data sources that have been analyzed to quantify the extent of intermingling were not suitable to determine the role of consumer credit. For example, Haynes and Avery (1996) find fault that 'unfortunately, loan types were not identified in the data set [we used] so far'. Furthermore, as Parker (2004) notes, to date most of the evidence that has been delivered on non-standard forms of finance is anecdotal, and academic research has been sporadic. Using a different data set than previous researchers, this study is the first to examine intermingling by means of funds obtained through consumer credit. Furthermore, it links intermingling to different loan types, which significantly extends the present literature on this topic.

For our analysis we apply a two-step procedure. We first examine how the self-employment status of a household influences consumer loan take-up behaviour. We find that self-employment is an important determinant of personal overdraft usage, even after controlling for a variety of household characteristics. In order to review these findings, we consequently restrict our sample only to self-employed households and develop a more direct approach to intermingling. By estimating a consumption function for each household, the interrelation between use and source of household funds is analyzed, the conjecture being that all consumer loans which have not been used for consumption must have been directed towards the business. This is a novel approach which to the best of our knowledge has not been applied before so far. It generates new insights into the financial behaviour of self-employed households and thereby significantly enhances the understanding of small business finance.

The financing behaviour we observe could be understood as an idiosyncrasy of small and micro businesses. The consequences that arise from this type of 'detouring finance' do have some severe implications that should be considered, though. First, self-employed persons who only use consumer loans for financing their business are not recognized by banks as entrepreneurs and therefore are not able to establish a credit history. This may not be a problem during the start-up phase, but it will result in severe restrictions when bigger investments are made. Second, consumer loans are by definition not geared to the exigencies of small business owners. Particularly, they lack features that might be important during start-up, e.g. amortization-free periods. Third and most importantly, the intermingling of resources may put the household at additional financial and liability risks. As Yilmazer and Schrank (2006) state, it is likely that loans from household to business are less well documented and less likely to be repaid than other loans. It is this mere lack of a written loan agreement which puts the household in a riskier position.

The remainder of this paper is structured as follows. Based on a short review of the relevant literature (Section 3), Section 4 provides the rationale underlying the empirical tests and establishes the central hypotheses of this study. Section 5 details the data and variables used and presents the results of the empirical analysis. Section 6 summarizes the results, and reviews the limitations of our approach.

2. Previous Literature

2.1. Theories of Intermingling

As intermingling has so far mostly been analyzed by the family business literature, its theoretical foundation is provided by 'The Sustainable Family Business Model' developed by Stafford et al. (1999). The model describes business and household as interacting systems whose responses to changes in either system have effects on the other system. It is assumed that family and business in entrepreneurial families are intermingled to some degree and that entrepreneurship is located within the social context of the family. Consequently, separate spheres and complete enmeshment of family and business simply represent special cases (Stafford et al., 1999). Olson et al. (2003) point out that, based on this model, the family system can be a source of capital for the business system, e.g. by using savings, liquidating investments, using unpaid family labour in times of pressure or asking family employees to take a cut in pay.

Hence, as Yilmazer and Schrank (2006) put it, financial intermingling is a resource decision, and needs to be separated from bootstrapping. While bootstrapping describes a set of non-financial strategies used by start-up companies to manage their liquidity (Winborg and Landstrom, 2001), intermingling may continue much beyond start-up. Furthermore, intermingling goes beyond bootstrapping as it can include 'direct transfers of cash in the form of gifts or loans or credit card purchases' (Yilmazer and Schrank, 2006).

2.2. Review of Empirical Research Examining Intermingling

Small and micro businesses are generally not publicly traded and are not required to release financial information. This lack of data is probably the main reason why small business finance has been 'one of the most underresearched areas in finance' (Berger and Udell, 1998). In the U.S., research has grown tremendously in this field due to the influx of several different data sets - most importantly, the National Survey of Small Business Finances (NSSBF). It provides information on the income situation of small businesses (less than 500 employees) as well as the availability of different types of external finance. One cannot reconstruct, though, how financial institutions book the various types of loans they make to the firms. Therefore, Samolyk (1997) concludes that

‘although it is generally believed that loans booked as mortgage or consumer loans are often used to finance small business activities, the [NSSBF] survey data cannot be used to quantify the extent to which this is the case.’

Hence, collecting data on small business finances entails a number of pitfalls. Many researchers have ascertained that especially proprietorships and partnerships tend to intermingle business and personal finances, which renders an accurate measurement of their finances almost impossible (Bradbury, 1996; Mester, 1997; Samolyk, 1997; Bitler, Robb and Wolken, 2001). Most of this evidence is anecdotal, though, and empirical analyses are scarce (Haynes and Avery, 1996). For the case of family-owned businesses, Haynes et al. (1999) have used data from a national survey on 673 business-owning households. They find that the finances of the business and the family seem to be ‘inextricably intertwined’. According to their study, intermingling occurs particularly often in sole proprietorships; when the business owes money to financial institutions and when the owner is older, more experienced, and without children in the household. Haynes and Muske (2003) and Muske, Fitzgerald and Haynes (2003) deepen this research by analyzing specific subsets of the data utilized by Haynes et al. (1999). Finally, Yilmazer and Schrank (2006) compare the determinants of intermingling in family and non-family businesses. They conclude that intermingling of household and business financial resources is probably more influenced by business characteristics and household net worth than by other household characteristics or whether a business is a family business. To the best of our knowledge, no study has so far analyzed what role consumer credit plays in the context of intermingling.

The determinants of consumer loan demand by households have been analyzed in a series of previous studies (Yilmazer and DeVaney, 2005; Crook, 2001; Manrique and Ojah, 2004). Their primary focus, however, has been the interrelation of loan demand and credit constraints or the development of household debt over the life cycle. The question of intermingling, though, has not been treated in any of these studies. Though Yilmazer and DeVaney (2005) employed a variable that captured self-employment, they did not further interpret its interactions with consumer loan demand.

3. Method

3.1. Hypotheses

Due to the intermingling of financial resources (as described in the last section) Haynes and Avery (1996) conjecture that compared to other households the debt structure of small business owning households is more heavily weighted towards sources of capital that can be easily used in the business. Furthermore, they assume that the total amount of debt held by self-employed

households is higher than the debt holdings of employee households, because the household head has the 'added burden of providing financial capital to the business' (Haynes and Avery, 1996). They call this phenomenon 'hidden financing', because the business may not legally hold the loan, but in reality it is the business' responsibility to repay it. Based on these theoretical assumptions as well as the empirical evidence that is provided by the extant literature (Haynes et al., 1999; Muske, Fitzgerald and Haynes, 2003; Yilmazer and Schrank, 2006) we state as

Hypothesis 1: Self-employed households tend to intermingle personal and business finances by using consumer loans for business purposes.

Intermingling is a resource decision that can be motivated by different factors. Explanations may lie in the management type as well as in the legal form of the firm (e.g. if it is a family business or a business managed by couples sharing a personal and a business relationship (so-called 'copreneurs'), Muske, Fitzgerald and Haynes, 2003); in the business and household financial characteristics (Yilmazer and Schrank, 2006); or in the geographical location of the business and gender of the business owner (Haynes et al., 1999). The arguably most self-evident explanation, though, might be that intermingling is simply driven by a lack of funding alternatives. For, as has already been stated above, access to external (commercial) finance still poses a major obstacle to many micro and small enterprises. Owners may therefore bypass these difficulties by 'cross-subsidizing' their business through consumer credit. This leads to the formulation of

Hypothesis 2: Credit constrained businesses show a higher incidence of intermingling than businesses that are not credit constrained.

3.2. Data Source

The data used in this study are obtained from the German Survey of Income and Consumption *(Einkommens- und Verbrauchsstichprobe, EVS).* The survey was conducted in 2003 under the guidance of the German Federal Statistical Office and can partly be compared to the US Survey of Consumer Finances (SCF). It targets households of all social domains and therefore delivers a representative picture of income and consumption of the total population. For reasons of representativeness, the sample was stratified by census region (16 German federal states), type of household, social situation of the head of household and net household income.

The EVS data entails major advantages. Besides delivering a representative picture of household finances in Germany, this data set is arguably more reliable than tax statistics, which regularly suffer from underreporting problems (Hamilton, 2000; Eardley and Corden, 1996). Furthermore,

by collecting data on loan take-ups and consumption within a quarterly acquisition period, the EVS survey design permits a more direct measurement of intermingling than the SCF survey, which captures this circumstance rather imprecisely (e.g., by asking if the business owed money to the household). This problem has already been mentioned by Yilmazer and Schrank (2006), who point out that the SCF survey data might as well be a measure of delayed repayment of loans or withheld salaries, and not necessarily of intermingling.

The EVS survey was originally designed to collect data on the private consumption of German households. As the self-employed tend to intermingle private and business finances (which coherently results in a smooth transition in the perception of 'private' and 'business' loans) the EVS data can be used to unveil these connections as will be shown in this article. An important caveat is the fact that the EVS does not contain variables describing the entrepreneur's business. Hence, our study is of an explorative nature, trying to shed light on this rather unsought borderland between private and business finance.

3.3. Sample Selection

There are around 43,000 households in the sample, of which approximately 8,650 are based in Eastern Germany. For the purpose of this study, a subsample was created comprising 1,954 self-employed and 25,663 employee households (including civil servants and blue-collar workers).[5] This classification is based on the social situation of the head of household, i.e. the person who earns the main income within the household. Within this sample, self-employment is concentrated on services (55.8%), construction (13.8%), trade (8.1%), and credit and insurance industry (6.1%).

3.4. Measurement Issues

Intermingling is a two way street (Yilmazer and Schrank, 2006): resources can be transferred from the household to the business and vice versa. Generally, it is found that the greatest incidence of intermingling is of the household-to-business type (Haynes et al., 1999). This study will therefore focus on this mode of intermingling. Many researchers distinguish between family and non-family businesses, the definition of this term being vastly inconsistent across the literature (a comprehensive overview of different definitions is provided by Sharma, 2004). As the EVS data set does not allow for this kind of discrimination, this study will only focus on the household's employment status. Variable definitions and sample means as well as standard deviations are provided in Table 1 in the Appendix.

[5] Thus, the sample proportion of the self-employed is 7.0%. A larger sample would reduce sampling fluctuations; alternatively, one could draw a stratified sample from the employee category and retain all the observations in the self-employed group (cf. Rees and Shah, 1986). For reasons of accuracy we decided to retain the original sample size.

In a first step, we will analyse the incidence of consumer credit usage by self-employed and employee household. This univariate comparison will deliver a first picture of financing differences within both groups. In a second step we will approach the question of intermingling via two models. The first model will include consumer loan take-up as the dependent variable and the household's employment status as an independent variable, controlling for various household characteristics. This procedure will give first evidence on how consumer loan usage varies within comparable household types that differ in their employment status. The second analysis is restricted to the sample of self-employed households and establishes a consumption function that is determined inter alia by consumer loan take-ups. It rests on the assumption that all funds that have been generated from consumer credit and were not used for consumptive purposes have been transferred to the business (s. Figure 1) and were not used for savings. This approach will enable us to measure intermingling directly and not only through comparison with other households.

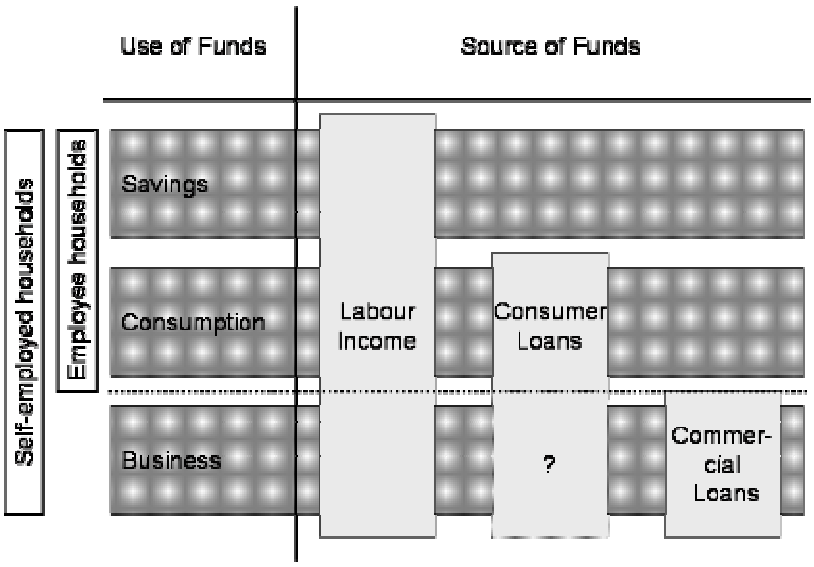

Figure 1: Source and Use of Funds in Employee and Self-Employed Households.

The final analysis aims at describing central features of households that practice intermingling from the household to the business. For this purpose, self-employed households will be separated according to their tendency to intermingle.

4. Results

4.1. Incidence of Consumer Credit Usage

Consumer credit usage is measured via two variables: loan usage within the reporting year, and average quarterly interest amount paid. The latter variable acts as a rough proxy for the total loan amount drawn. This relation holds under the assumption that the central determining factors of

interest payments, namely interest rates and loan terms (for the case of instalment loans), are more or less equally distributed between self-employed and employee households.

Table 2: Usage of Overdrafts and Instalment Loans.

Variable	Employment Status	Mean	Test on In-dependence	Number of Observations
Overdraft used	Self-Employed	0.42	58.25*** [a]	1,924
	Employee	0.33		25,406
Quarterly interests paid on overdraft (€)	Self-Employed	34.05	-12.14*** [b]	1,954
	Employee	14.62		25,663
Instalment loan used	Self-Employed	0.14	45.85*** [a]	1,940
	Employee	0.21		25,508
Quarterly interests paid on instalment loan (€)	Self-Employed	20.62	-3.94*** [b]	1,954
	Employee	12.55		25,663
Both loan types used	Self-Employed	0.10	10.01** [a]	1,922
	Employee	0.12		25,355
Quarterly interests paid on both loan types (€)	Self-Employed	17.18	-2.73** [b]	1,954
	Employee	12.42		25,663

** significant at a 1% level *** significant at a 0.1% level

[a] Chi-Square test [b] t-test

Variables were tested for independence of the two groups of self-employed and employee households (cf. Table 2). We find that self-employed households use overdrafts more often and to a greater extent than employee households do. Instalment loans, in turn, are more frequently used by employee households, whereas loan amounts taken by self-employed households exceed those of their counterparts. Employee household use both loan types at the same time more often than self-employed households do, whereas quarterly interest amounts paid by self-employed households exceed those of their counterparts if both loan types are taken at the same time. All these differences are statistically highly significant, as is evidenced by the t and chi-square values. When comparing these results to previous findings, it is noteworthy that the higher loan amounts of self-employed households fall in line with the conjectures of Haynes and Avery (1996).

The fact that self-employed households show a palpable preference for overdrafts might be explained by the advantage that overdrafts are far more flexible than instalment loans and

therefore might be more apt for the exigencies that the day-to-day business of self-employed household poses. However, the conceivable explanations for the observed deviations between self-employed and employee households are manifold. For example, the higher usage of overdrafts could be explained by the higher mean income of self-employed households (cf. Table 1). The same reasoning may hold for the higher loan amounts that are drawn by self-employed households. Consequently, it will be necessary to control for different household characteristics in order to find out if loan take-up is significantly correlated to employment status. The next chapter aims at answering this question.

4.2. Evidence of Household-to-Business Intermingling

4.2.1. Indirect Evidence of Intermingling

The first analysis is based on a logit regression model in which consumer loan take-up is modelled as a function of the household's employment status. Control variables are derived from a series of previous studies on loan usage by households (Haynes and Avery, 1996; Manrique and Ojah, 2004; Yilmazer and DeVaney, 2005; Crook, 2001), and can be split up into financial and non-financial variables. They are comprised of household income, financial and non-financial assets, age and age-squared of the household head, marital status, education, gender, nationality, household size, and geographical region. Three separate regressions were run in order to explain the usage of (1) overdrafts, (2) instalment loans, and (3) both loan types simultaneously:

$$(1)\ Pr(OVDRFT) = \alpha_0 + \beta\ SELFEMP + \sum_{i=controls} \chi_i control_i + \varepsilon$$

$$(2)\ Pr(INSTLOAN) = \alpha_0 + \beta\ SELFEMP + \sum_{i=controls} \chi_i control_i + \varepsilon$$

$$(3)\ Pr(BOTH) = \alpha_0 + \beta\ SELFEMP + \sum_{i=controls} \chi_i control_i + \varepsilon$$

A likelihood ratio test was conducted that supported the inclusion of interaction terms. Effects arising from heteroskedasticity were mitigated by basing the estimates on robust standard errors. Regression results are presented in Table 3.

Table 3: Logit Estimates of Factors Determining Consumer Loan Usage.

	Overdraft Used	**Instalment Loan Used**	**Both Loan Types Used**
INCOME	0.0249***	0.034***	0.040***
	(0.0023)	(0.003)	(0.003)
FINASSET	-0.019***	-0.051***	-0.058***
	(0.0032)	(0.003)	(0.007)

NONFIN	-0.001***	-0.004***	-0.005***
	(0.0004)	(0.001)	(0.0009)
AGE	0.080***	0.128***	0.154***
	(0.012)	(0.015)	(0.019)
AGE2	-0.121***	-0.176***	-0.207***
	(0.0151)	(0.018)	(0.024)
FINASSET*AGE	0.0002***	0.0007***	0.0007***
	(0.00006)	(0.00005)	(0.0001)
NONFIN*AGE	0.00002***	0.00005**	0.00006***
	(8.40e-06)	(0.00002)	(0.00002)
HHSIZE	0.069***	0.009	0.039
	(0.014)	(0.017)	(0.020)
REGION	-0.148***	0.307***	0.106**
	(0.034)	(0.038)	(0.048)
MARRIED	-0.125***	0.179***	0.099
	(0.038)	(0.047)	(0.058)
COLLEGE	-0.064	-0.327***	-0.251***
	(0.035)	(0.044)	(0.055)
FEMALE	0.0251	-0.046	-0.021
	(0.032)	(0.038)	(0.048)
GERMAN	0.052	0.002	-.0002
	(0.101)	(0.116)	(0.139)
SELFEMP	**0.599*** **	**-0.078**	**0.100**
	(0.053)	**(0.072)**	**(0.085)**
Constant	-1.954***	-3.297***	-4.453***
	(0.254)	(0.310)	(0.385)
Pseudo R^2	0.037	0.080	0.080
Observations	27,330	27,448	27,277

Robust standard errors in parentheses
*** significant at a 0.1% level ** significant at a 1% level * significant at a 5% level

How does the employment status affect debt holdings? The self-employment dummy shows a significant positive effect only on the usage of overdrafts. The corresponding logit of 0.599 translates into an increase of 82% in the odds ratio of loan take-up when the household's status changes from wage employment to self-employment. This finding supports the intermingling hypothesis, as self-employment remains an important determinant of overdraft usage, even after controlling for a variety of household characteristics. It is noteworthy that both household types show no significant discrepancy in the usage of instalment loans (as well as both loan types simultaneously). The notion arises that intermingling might be concentrated on overdrafts, as their utilisation is not tied to any pre-specified conditions like e.g. in the case of car loans. Consequently, self-employed households seem to take advantage of the inherent flexibility that overdrafts offer, as has already been conjectured above.

The effect of financial household characteristics on loan usage is consistent throughout the different regressions and falls in line with previous findings for the most part. Household income

exerts a positive influence on consumer loan take-ups, as has been evidenced by Crook (2001), Manrique and Ojah (2004), and Yilmazer and DeVaney (2005). Financial and non-financial assets are negatively associated to holding consumer debt, with a rather small coefficient for non-financial assets indicating a negligible effect of this variable. The first result corroborates the findings of Crook (2001), while the latter is not underpinned by previous research. Yilmazer and DeVaney (2005) as well as Crook (2001) detect a positive relation between non-financial assets and consumer debt holdings. The coefficients of the two interaction dummies that were included in order to control for joint effects of age and assets indicate that they virtually do not influence households' consumer debt holdings at all.

With regard to non-financial household characteristics, the results show some deviations from previous studies. Age of the household head is positively correlated to holding consumer debt, whereas the negative sign of age-squared indicates a below-average trend. This is corroborated by the findings of Yilmazer and DeVaney (2005), but runs counter to Manrique and Ojah (2004). Household size has a positive influence on holding overdrafts, but no significant bearing on instalment loans or both loan types simultaneously. Manrique and Ojah (2004), in turn, also observe a positive influence of household size on holding consumer debt.

The region dummy indicates that overdrafts are less often and instalment loans are more often used in East than in West Germany. The latter also applies to both loan types simultaneously. This might be explained by strategic lending behaviour of commercial banks rather than differing needs between both regions. For the case of business loans, strong empirical evidence on differences in credit supply in the German market has been delivered by Harhoff and Körting (1998) as well as Lehmann, Neuberger and Rathke (2004).

Married household heads show a higher probability of holding instalment loans, while the inverse relation is valid for overdrafts. Compared to household heads without a college education, those with a college education are less likely to hold instalment loans or both loan types simultaneously. This effect of education has also been observed by Manrique and Ojah (2004) and Yilmazer and DeVaney (2005). Gender and nationality of the household head do not show any significant influence on holding consumer loans.

4.2.2. Marginal Effects

In a second step, we analyzed the marginal effects that self-employment status exerts on consumer loan take-up at different levels of age, income, and financial assets. (cf. Table 4 in the Appendix). Marginal effects provide information about changes in the probability of holding each type of debt

with respect to a given independent variable (Yilmazer and DeVaney, 2005). All other variables are held constant at their sample means (e.g., the column labelled AGE_30 means that the age variable is set to the value 30, while all other independent variables are kept at their sample means).

Significance levels suggest that a meaningful interpretation of coefficients has to be restricted to the usage of overdrafts. First of all, the average marginal effect of self-employment on overdraft usage indicates that a discrete change in the self-employment dummy from 0 to 1 results in a rise in overdraft usage of 14.1%. When controlled for different levels of age, the marginal effects exhibit a hump-shaped trend, with a peak at the age of 50. At this age, a change from wage employment to self-employment of the household head leads to a 15% increase in overdraft usage. Rising levels of income and financial assets imply positive, but constantly falling marginal effects of self-employment. Consequently, even at high levels of household income and financial assets, a discrete change in the self-employment dummy still leads to a rise in overdraft usage. For the case of non-financial assets, a slightly diminishing, but rather constant marginal effect is observed that levels out at around 13%.

4.2.3. Direct Evidence of Intermingling

So far, it has become clear that there are obvious differences in the usage of overdrafts between self-employed and employee households. Still, we have not been able to measure intermingling directly. For this purpose, it is necessary to analyze the interrelation between source and use of household funds. From a bank's perspective, consumer loans are intended for consumption, a variable that is measured by the EVS survey. The following analysis is based on the assumption that all funds that have been generated from consumer credit and were not used for consumptive purposes must have been transferred to the business (s. Figure 1). Investment in financial (e.g. shares) and non-financial (e.g. real estate) assets is deliberately ignored in this context, as terms and conditions of consumer loans are not apt for this kind of capital spending. Based on the findings of the previous section it is supposed that self-employed households earmark funds that are drawn from overdrafts for consumption *and* business purposes, while funds derived from instalment loans are mainly spent for consumptive purposes.

In order to test this conjecture, an OLS model is specified, with consumption as the dependent variable. It comprises all relevant aspects of household consumption, including inter alia aliment, clothes, rent, energy and fitments as well as expenditures on education, leisure time and culture. Control variables are largely adopted from the logit model determined in section 4.2.1., whereas assets are neglected as their effect on consumption is dubious. Three different regressions were

run, each of them employing one of the loan dummies for overdrafts, instalment loans and both loan types:

$$(1)\ CONSUMPT^{t} = \alpha_0 + \beta\ OVDRFT^{t} \sum_{i=controls} \chi_i control_i + \varepsilon$$

$$(2)\ CONSUMPT^{t} = \alpha_0 + \beta\ INSTLOAN^{t} \sum_{i=controls} \chi_i control_i + \varepsilon$$

$$(3)\ CONSUMPT^{t} = \alpha_0 + \beta\ BOTH^{t} \sum_{i=controls} \chi_i control_i + \varepsilon$$

Unlike the first model, loan take-ups are only measured within the acquisition period (this is indicated by the superscript t) in order to assess the temporal concurrence with household consumption. Regression results are displayed in Table 4.

First of all, two variables can be identified that clearly exert a positive influence on household consumption: household income and household size. This result is not very surprising, given that a higher income and more household members are factors that obviously spur consumption. With regard to the loan dummies, the findings from the previous chapter are confirmed. When the household had used instalment loans or both loan types during the observed period, this had a significantly positive effect on consumption. For the case of overdrafts, in turn, no such correlation could be observed. We may conclude that self-employed households use their revenues from taking up overdrafts for different purposes than private consumption (at least to an extent that dilutes any statistical significant influence on consumption in this model). This finding substantiates the results of the previous chapter and gives further support to the intermingling hypothesis that private loans are used for non-private purposes.

Table 4: OLS Estimates of Consumption Function for Self-Employed Households.

	Model I	**Model II**	**Model III**
INCOME	0.260***	0.267***	0.263***
	(0.019)	(0.019)	(0.019)
AGE	0.005	-0.047	-0.006
	(0.099)	(0.096)	(0.098)
AGE2	.0498	0.104	0.062
	(0.105)	(0.102)	(0.103)
HHSIZE	0.721***	0.699***	0.726***
	(0.142)	(0.140)	(0.144)
REGION	-0.486	-0.445	-0.477
	(0.255)	(0.245)	(0.250)
MARRIED	0.523	0.580	0.532
	(0.482)	(0.462)	(0.481)
COLLEGE	0.254	0.317	0.268
	(0.293)	(0.286)	(0.292)

FEMALE	0.520	0.473	0.513
	(0.397)	(0.396)	(0.397)
GERMAN	-0.633	-0.546	-0.714
	(0.796)	(0.798)	(0.797)
OVDRFT ^{t}	**0.131**		
	(0.242)		
INSTLOAN ^{t}		**4.992*** **	
		(0.989)	
BOTH ^{t}			**2.601*** **
			(0.722)
Constant	1.777	2.583	1.985
	(2.398)	(2.341)	(2.389)
R^2	0.298	0.320	0.301
Observations	1,954	1,954	1,954

Robust standard errors in parentheses
*** significant at a 0.1% level ** significant at a 1% level * significant at a 5% level

4.2.4. Characteristics of Intermingling Households

The final analysis aims at describing central features of households that practice intermingling from the household to the business. For this purpose, the sample of self-employed households was split into those that held overdrafts, and all remaining households. This segmentation is based on the results presented above, which indicate that the former group shows a tendency to intermingle compared to the latter. We are aware that this approach is rather intuitive and therefore might entail problems of missing accuracy, as not all self-employed households that hold overdrafts necessarily do enmesh their personal and business finances. Hence, the following analysis is of an explorative nature, and accordingly should be interpreted with caution.

Table 5: Comparison of Intermingling and Non-Intermingling Households.

Variable	Tendency to Intermingle	Mean	Test on In-dependence	Number of Observations
Income	Yes	17.37	0.18 [b]	806
	No	17.47		1,118
Financial Assets	Yes	51.27	6.08*** [b]	806
	No	90.99		1,118
Age of Household Head	Yes	45.16	4.64*** [b]	806
	No	47.17		1,118
Female	Yes	0.24	0.14 [a]	806
	No	0.23		1,118
Copreneurs	Yes	0.08	3.02 [a]	806

	No	0.06		1,118
“Redlined” Industry	Yes	0.06	2.30 [a]	806
	No	0.04		1,118
Credit Constrained	Yes	0.30	8.96** [a]	803
	No	0.23		1,116

** significant at a 1% level *** significant at a 0.1% level

[a] Chi-Square test [b] t-test

Results of a test on independence are presented in Table 5. Three significant differences emerge: first, households that have a tendency to intermingle hold lower levels of financial assets than their counterparts, though their incomes are practically equal. The first finding is corroborated by Yilmazer and Schrank (2006), who found that households with more than $10,000 of net worth were on average 10-12% less likely to be owed money by the business than those with less than $10,000 of net worth. They reported a similar result concerning business net income, which cannot be compared to the income variable in this analysis, though, as it is based exclusively on household data.

Second, the head of households that tend to intermingle their finances is on average 2 years younger than those of households that do not intermingle. This finding is confirmed by Haynes and Avery (1999) who found older household heads less likely to intermingle. The reverse was found by Yilmazer and Schrank (2006), who reported a positive, albeit very weak, correlation between age and the probability of intermingling.

Third, intermingling households exhibit a greater likelihood of being credit constrained. The variable is proxied by a dummy that contains the information if the household owned or rented its residence, with ownership indicating no credit constraints. This approach was introduced by Runkle (1991) who posited that it is more likely that renters would not have easy access to credit markets and, thus, suggests the opposite is generally true for homeowners. Manrique and Ojah (2004) remark that this insight is particularly convincing if one takes into account the collateral value of real-estate property. The interpretation of this finding is straightforward: intermingling is applied significantly more often when the household is credit constrained. In most cases, business loans have to be collateralized with household assets (e.g. property). If this is not possible, households have to resort to different means of funding – like consumer loans. It is plausible to assume that consumer loans are easier to obtain than commercial loans, given the less stringent credit checks as well as the fact that any full age household member can apply for such a loan.

This confirms our second hypothesis which stated that credit constrained households show a higher incidence of intermingling than households which are not credit constrained.

No significant differences were found for gender of the household head (in line with Haynes and Avery, 1999, and Haynes et al., 1999), copreneurship (in line with Yilmazer and Schrank, 2006), and the fact if the business was based in a typically "redlined" industry. This expression refers to industries that tend to be avoided by commercial banks when extending loans, as they are known to convey high default rates. For the case of Germany, typical examples of redlined industries are construction and catering. The initial expectation that businesses that tend to intermingle are based in redlined industries was not confirmed, though. This might be due to the low sampling rate of less than 5% within the subsample of self-employed households.

5. Conclusions

Aside from anecdotal reports and the results of few empirical studies, little is known about the intermingling of private and business finances by self-employed households. Particularly, economists have so far paid no attention to how intermingling takes place, i.e. what sources of finance are transferred from the household to the business. Using data from the 2003 German Survey of Income and Consumption (EVS), this paper documents some evidence on the role played by personal overdrafts and instalment loans for the funding of self-employed activity.

The empirical findings support the conjecture that self-employed households use consumer loans for business purposes that was formulated in Hypothesis 1. It is shown that intermingling is concentrated on overdrafts, which is explained by the fact that the utilisation of overdrafts is not tied to any pre-specified conditions like e.g. in the case of car loans. Consequently, self-employed households seem to take advantage of the inherent flexibility that overdrafts offer. This gives support to the 'hidden financing' conjecture established by Haynes and Avery (1996). The findings of this study also suggest that intermingling of personal and business resources is more likely when the household is credit constrained. Obviously, intermingling constitutes a financing strategy when regular business loans are not accessible. This finding supports our second hypothesis.

An important caveat to this study is that due to data restrictions, intermingling could only be measured indirectly. We therefore discourage from interpreting the size of certain coefficients obtained in the estimations. Emphasis should rather be put on the direction and significances of the specific variables highlighted in this study. In order to obtain more exact information on this important topic, researchers should put effort into building a comprehensive data set on small

business finances in Germany. Comparable to the SCF in the US, questions should be included that directly address tendencies of financial intermingling between the household and the business, while simultaneously collecting information on loan types and amounts. Particular emphasis should be put on the question if intermingling is primarily done by credit constrained households, as our exploratory findings indicate. As Haynes and Avery (1996) have stated, ‘the small business finance picture can only be completed when the finances of the business and the household can be assessed concurrently’.

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Appendix

Table 1: Descriptive statistics, weighted by employment status.

Variable	Employees		Self-employed	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**
Financial Characteristics				
INCOME (quarterly gross household income, in thousands of €)	15.88	8.04	17.42	11.53
FINASSET (total household financial assets, in thousands of €)	38.75	61.28	74.09	142.08
NONFIN (total household non-financial assets in thousands of €)	147.61	247.76	288.76	616.59
CONSUMPT (total quarterly household consumption, in thousands of €)	8.40	4.94	9.61	6.71
Non-Financial Characteristics				
AGE (age of household head)	43.52	9.56	46.35	9.46
HHSIZE (number of household members)	2.73	1.27	2.85	1.39
REGION (0=West Germany, 1=East Germany)	0.20	0.40	0.14	0.35
FEMALE (household head female; 0=no, 1=yes)	0.31	0.46	0.23	0.42
MARRIED (0=not married, 1=married)	0.66	0.47	0.66	0.47
GERMAN (0=not German, 1=German)	0.98	0.13	0.98	0.13
COLLEGE (0=no college education, 1=college education)	0.19	0.39	0.39	0.49
INSTLOAN (usage of instalment loan(s) within household; 0=no, 1=yes)	0.21	0.41	0.14	0.35
OVDRFT (usage of overdraft(s) within household; 0=no, 1=yes)	0.33	0.47	0.42	0.49
BOTH (usage of instalment loan(s) and overdraft(s) within household)	0.12	0.33	0.10	0.30
QUINTINST (amount of quarterly interests paid on instalment loans, in €)	12.55	78.94	20.62	159.93
QUINTOV (amount of quarterly interests	14.62	59.66	34.05	137.93

paid on overdrafts, in €)				
QUINTBOTH (amount of quarterly interests paid on instalment loan(s) and overdraft(s), in €)	12.42	70.88	17.18	109.53
Number of observations	**25,663**		**1,954**	

Table 4: Marginal Effects of Self-Employment on Probability of Holding Different Types of Debt.

	Overdraft Used	Instalment Loan Used	Both Loan Types Used
Average	0.141***	-0.010	0.008
Age			
AGE_30	0.086***	-0.002	0.001
AGE_40	0.129***	-0.007	0.005
AGE_50	0.149***	-0.016	0.016
AGE_60	0.126***	-0.019	0.025
AGE_70	0.082***	-0.010	0.013
Income			
INCOME_20	0.144***	-0.011	0.009
INCOME_40	0.148***	-0.016	0.015
INCOME_60	0.135***	-0.019	0.022
INCOME_80	0.111***	-0.018	0.025
INCOME_100	0.083***	-0.014	0.020
INCOME_120	0.058***	-0.009	0.013
INCOME_140	0.038***	-0.006	0.007
INCOME_160	0.025***	-0.003	0.003
Financial Assets			
FINASSET_20	0.149***	-0.018	0.018
FINASSET_40	0.142***	-0.011	0.008
FINASSET_60	0.127***	-0.005	0.003
FINASSET_80	0.106***	-0.002	0.001
FINASSET_100	0.084***	-0.0007	0.003
FINASSET_120	0.065***	-0.0002	0.0001
FINASSET_140	0.048***	-0.0001	0.00003
FINASSET_160	0.034***	-0.00003	9.28e-06
Non-Financial Assets			
NONFIN_100	0.143***	-0.012	0.010
NONFIN_150	0.141***	-0.011	0.008
NONFIN_200	0.139***	-0.009	0.006
NONFIN_250	0.137***	-0.008	0.005
NONFIN_300	0.134***	-0.006	0.004
NONFIN_350	0.131***	-0.005	0.003
NONFIN_400	0.127***	-0.004	0.003

*** significant at a 0.1% level ** significant at a 1% level * significant at a 5% level