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The P2P Credit Market in Germany

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(extended Abstract)

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1. Motivation

Digital technologies have become a prerequisite for, and constant companion of, new developments in our daily life and business activity. Internet, Information Communication Technologies, data-driven technologies, modern analytical methods and virtual infrastructures penetrate into the daily life of every single household by changing her consumer and investment behavior. Today, everyone can participate interactively in digital spaces as long as they have access to the Internet. Flexible and varied relationships are formed between people and their diverse identities both in the online and offline worlds. We are already living in the so called economy of Collaborative Commons characterized by the prevalence of sharing over ownership.¹ This major structural change mainly applies to products and services that can be easily standardized and automated like a broad spectrum of services offered by traditional banks.

On the same time, during the recent financial crisis banks decrease their lending and capital stop flowing from those who have it to those who can use it to grow businesses and create jobs.² At the dawn of the emergency program loans and public bail outs the reputation of the banks was already significantly undermined in most of the western countries and their traditional role of credit providers has been criticized and put under spotlight of the public opinion.

Under this general context seems plausible the emergence of alternative market infrastructures that allow for a direct credit-lending relationships between households and businesses. Indeed, internet technology boosts the dynamics of virality and reduces the information asymmetries between conventional creditors and debtors. One promising innovation in this area is crowdfunding, a web-based peer-to-peer (P2P) marketplace where individuals can directly exchange funds at low marginal cost.³ Crowdfunding is governed by three types of actors: the borrower who present his/her credit request (or project initiator who proposes the idea and/or project to be funded); individuals or groups who support the funding request; and a moderating organization (the “platform”) that brings the parties together to launch the idea or support the borrowing request.

The credit provision in crowdfunding platforms is perceived to have lower marginal costs compared with the traditional banking system. This is true mainly for three reasons. First, crowd-based financing is an online marketplace that takes place via web-based platforms without the need of costly presence of bricks-and-mortar branches. In contrast to the traditional behemoth traditional credit providers, crowdfunding platforms

¹ See Rifkin, J. (2014). *The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism*. Macmillan.

² See Barroso Blaes, Bank-related loan supply factors during the crisis: an analysis based on the German bank lending

² See Barroso Blaes, Bank-related loan supply factors during the crisis: an analysis based on the German bank lending survey, Discussion Paper Series 1: Economic Studies No 31/2011.

³ In 2009 the crowdfunding volume was c.a \$530 Millions worldwide. After only five years, by the end of 2014, the crowdfunding industry volume projection is expected to be over \$10 billions worldwide. (Source: Bostinno.streetwise.com, crowdfundinsider.com)

represent a scalable business model because the demand for credit of each peer is independent of the total number of peers. In crowdfunding, there is no a centralized bottleneck and therefore the system can expand indefinitely without the addition of supporting infrastructures or new manpower. Second, all lenders and investors have the same information set composed of the credit score of each borrower, the corresponding interest rate and the specific characteristics of the borrowers, i.e., their financial and professional status. Information on borrowers, the financing rules and legal terms are generally set by the providers of the service and are equal for all lenders. Thus, differently from the banks, lenders cannot charge additional specific markups based on their own risk profile or specific characteristics. Finally, crowdfunding is outside the traditional banking framework and thus costs derived from regulatory requirements, as deposit insurance or minimal capital buffers for instance, do not apply.

In a competitive market, lower marginal costs means either lower prices, higher quantity or both. In terms of credit market, either consumers from the traditional banking sector would prefer to finance themselves with cheaper terms or the marginal consumer not being supplied would have access to the credit market. However, credit relations are built upon reputation and thus by nature sticky especially in countries like Germany where the Hausbank relationship principle is in place. The scope of our work is to identify if and how crowdfunding complements and/or expands the credit-lending market beyond the traditional bank lending channel. More specifically, we present estimates for the supply and demand for crowdfunding in Germany. Our conclusion is that because crowdfunding can be offered at lower marginal costs it is able to expand the credit-lending market into specific niches and enhance the efficiency of credit allocation.

2 Crowdfunding

Crowdfunding platforms offer an alternative or complementary type of financing with respect to traditional funding sources like banks, business angels, etc. where everyone can appeal for funding for their personal needs or for the development of specific projects. There exist four primary types of crowdfunding with relatively simple rules: (1) **Reward-based crowdfunding**. Businesses and non-profit organizations of all sizes post their projects and look for funds by targeting a certain amount of capital to raise (All-or-Nothing) or by keeping the entire amount raised regardless of whether or not they meet their fundraising goal (Keep-it-All). In return for a donation from fans of a project, a business or non-profit typically gives some type of incentive for participating. In this case entrepreneurs set a fundraising campaign to launch a business concept without incurring debt or sacrificing equity/shares (examples of these platforms are e.g. kickstarter and Indiegogo). (2) **Equity-based crowdfunding**. Despite it represents the smallest slice of the crowdfunding pie, equity crowdfunding contains the most potential to change the way individuals invest their money because it enables real investments in private companies. The backer receives unlisted shares of a company, usually in its early stages, in exchange for the money pledged. Examples of these platforms are e.g. AngelList, CircleUp, OurCrowd. (3) **Donation-based crowdfunding**. This is a combination of micro finance with online P2P lending. Platforms like Kiva brings to the online community the Yunus' Grameen Bank concept of small loans given to local entrepreneurs especially in emerging markets to help them funding small sized projects or credit deficiencies like short-term inventory. (4) **Credit-based crowdfunding**. This represents the classic peer-to-peer lending platform which enables borrowers to get access to funds outside of traditional banking lending channels. Prospective borrowers firstly submit their requirements, and are then matched with pools of investors who are willing to accept the credit terms. Via crowd-based crowdfunding consumers can, as an example, borrow funds from the crowd in order to renovate their home or buy a vehicle. Popular platforms of this kind are the US-based Prosper (since 2006) and Lending Club (since 2012).

For the purpose of this paper we use the term crowdfunding with the meaning of credit-based crowdfunding or crowdlending. A complete discussion of the use of this word and its potential static implications can be found in the empirical section.

2.1 Crowdfunding in Germany

In Germany, the service providers that offer crowdlending platforms must undergo a scrutiny and an examination of the business model by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin), Germany's financial supervisory authority. BaFin reserves the right to audit the business plans of individual platforms in order to exclude unauthorised banking business. To date, the crowdfunding infrastructure in Germany has been dominated by peer-to-peer crowdlending platforms. Among the others, Auxmomy, Smava, Lendico are the most widely used online marketplaces for crowdlending in Germany. However, the German market is relatively young because the platforms have been launched only recently: Auxmomy in 2007, Smava in 2007 and Lendico in 2013. Therefore, the volume of funds raised via crowdfunding platforms in Germany is still negligible compared with the loan offerings made by traditional banks. In 2013, the total German crowdfunding volume was about EUR 20 Million. For 2014 as a whole, experts forecast a market volume of about EUR 20-25 Million and expect the uptrend to continue over the medium term. Despite the fact that the volumes are still relatively small, crowdfunding is not just the latest fad but instead a trend that is still in its infancy. The growth rates are huge and ought to be sized up properly in the financial services market.

3 Conjectures and Empirical Investigation

In an efficient market, lower marginal costs of credit provision will mean either more quantity or lower prices. Thus we want to test if P2P lending is expanding the credit market to marginal consumer and/or substituting the bank system by refinancing credit takers at lower rates. Thus we have 2 conjectures:

- (1) Crowdfunding expands the German credit market to the marginal consumer;
- (2) Crowdfunding refinances costumers at better terms.

In order to identify which of the conjectures is taking place we compare P2P credit with different lines of consumer credit. In order to identify the demand we use the google hits for the word "Kredit" and instrument it with google hits for the word "auxmomy", the largest P2P credit provider in Germany. Formally:

Supply

$$(3) \text{ } Auxmomy_Volume}_{s,t} = \alpha_s + \sum_{i=1}^4 \beta_i Volume_{i,s,t-1} + \sum_{i=1}^4 \gamma_i Interest_{i,s,t-1} + \varphi demand_{s,t-1}$$

where $Auxmomy_volume$ represents the amount of credit provided by auxmomy in state 's' and time 't', α_s is state fixed effects, $\sum_{i=1}^4 Volume_{i,s,t-1}$ represents the total volume of credit line 'i' (overdraft/credit card, loans up to one year, from one to five years, above five years), $\sum_{i=1}^4 Interest_{i,s,t-1}$ represents the respective interest rate of credit line 'i', and $demand_{s,t-1}$ represents the credit demand instrumented by:

$$(4) \text{ } Kredit}_{s,t} = \alpha_s + \sum_{i=1}^4 \beta_i Volume_{i,s,t-1} + \sum_{i=1}^4 \gamma_i Interest_{i,s,t-1} + Auxmomy_{s,t}$$

where $Auxmomy_{s,t}$ is the google hits for the word Auxmomy.

Demand

The same instrumented proxy for the demand for auxmoney credit is used to determine the relationship to consumer credit lines:

$$(5) \ Demand_{s,t} = \alpha_s + \sum_{i=1}^4 Volume_{i,b,s,t-1} + \sum_{i=1}^4 Interest_{i,b,s,t-1}$$

In the sense of (4) and (5), our empirical exercise aims to characterize the P2P credit market in terms of the traditional credit market.

4 Data

The empirical scope of the present paper is to estimate the supply and demand of crowdfunding credit in Germany.

Since P2P lending is an online service all its demand can be captured by searched in Google for the word “Kredit”. However, there is the possibility that not all demand for Kredit is intend to be P2P credit. Thus we control for the word “auxmoney” in the IV approach explained in section 2. The google hits data is divided by German state and spanned monthly from January 2011 until August 2014. For states with relatively low activity (Mecklenburg-Vorpommern, Bremen and Saarland), Google does not provide data. Moreover, the data provided by Google is normalized to 100 for its highest value and all other values are relative to it with a precision of one.

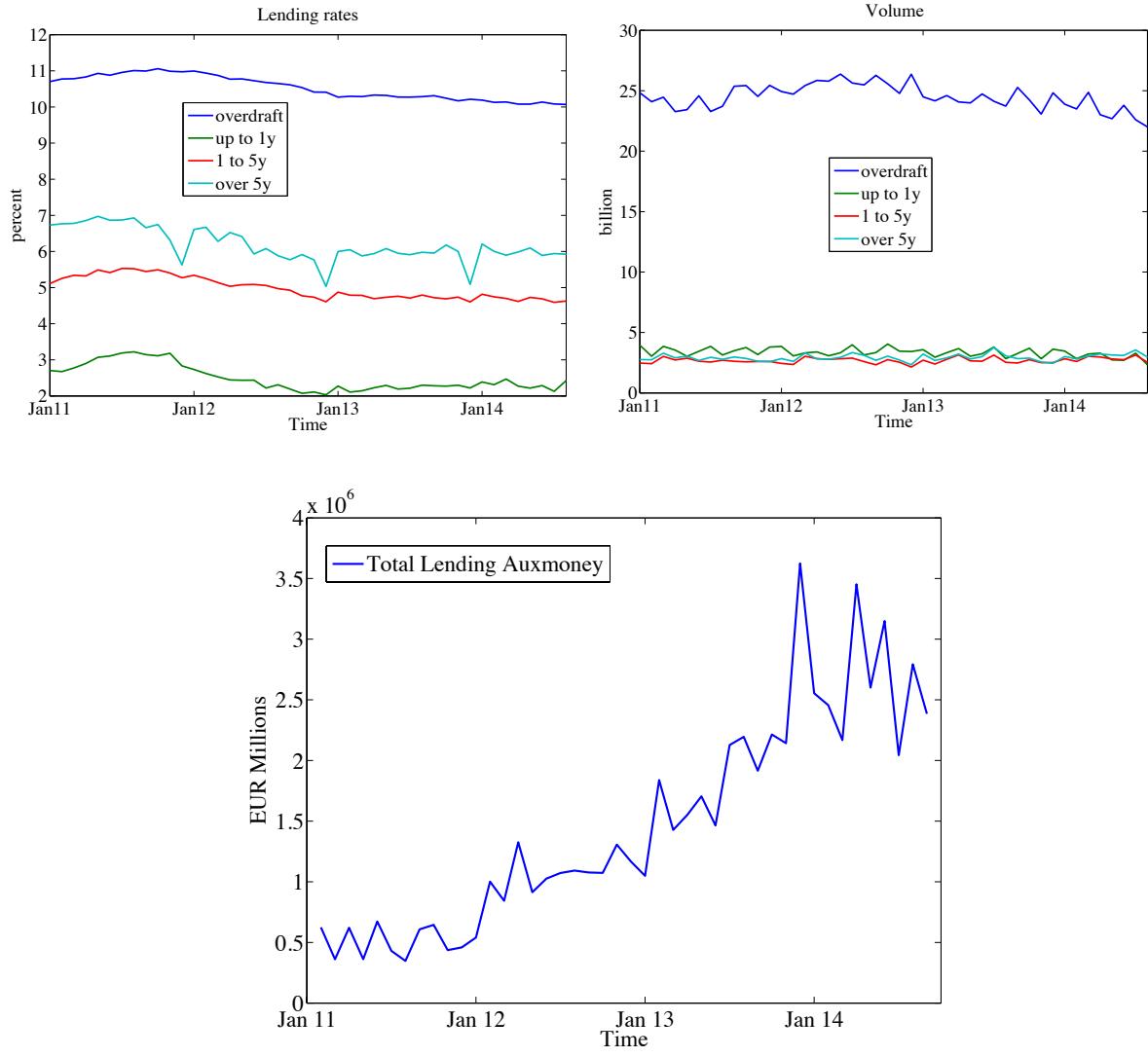
The supply of P2P credit is proxied using the total credit volume provided by Auxmoney, the largest and older P2P financial provider in Germany, and controlling for the demand. The data is provided by city and daily and is aggregated by state and monthly. The distribution of auxmoney loans maturity is described in Table 1.

Table 1: Distribution of Auxmoney Loans Maturity

Maturity	# Loans	Volume
12	1310	3,688,350
24	2533	9,221,550
36	3292	15,813,900
48	2084	16,356,700
60	1405	16,140,600

In order to characterize the German credit market by state we rely on feature specific of the German banking sector, its regional banks. In Germany, Sparkassen and Volksbanken are by law only allowed to act locally. Therefore, using data from the Deutsche Bundesbank we create a proxy for state credit provision (volume and interest rate) by aggregating the consumer credit provision of the respective Sparkassen and Volksbanken. Unfortunately the data is not available for all German states and excludes Brandenburg, Saxony-Anhalt and Thuringia.

To conclude, our panel is composed of 10 states, with monthly observation between January 2011 and August 2014.



5 Estimation

Our empirical strategy is based on an instrumental variable approach. We estimate the supply side of the market by regressing the volume of P2P credit on the demand and the market outcome of comparable markets. The same instrumented variable for the demand is used to compare the P2P market with traditional

consumer credit lines, as described in equation (5). Table 2 presents the estimation for the demand of P2P credit, which is also the first stage of the estimation. All variables have been tested for unit root. The volume of auxmoney credit and overdraft are found to have a unit root, thus they are treated in log differences. All others are in levels.

In the first stage we estimate the demand for P2P credit. Since most of the consumers of online credit will use google as a search machine, a good proxy for this demand will be the word “Kredit” (German for credit). However, nowadays almost every bank offers credit contracts online, which weakens the word “Kredit” as proxy for the P2P credit demand. Hence, we instrument it with the google hits for the word “auxmoney”. Thus, the intention of the estimation in table two is to characterize the variation in google hits for the word “Kredit” based on the variations on “auxmoney”.

Table 2: First Stage. Dependent variable is google hits for the word “Kredit”. Standard errors in brackets and *, ** and *** represent 10%, 5% and 1% confidence interval.

lag	I	II	III	IV	V
auxmoney	0.03355*** (0.00614)	0.04785*** (0.00499)	0.03886*** (0.00472)	0.02864*** (0.00593)	0.01002* (0.00529)
Overdraft, CC volume	-11.659*** (2.131)				-10.679*** (2.161)
<1y volume		-0.00003 (0.00002)			-0.00002 (0.10093)
1-5y volume			-0.00027*** (0.00007)		-5.03e-06 (0.1767)
>5y volume				-0.00011 (0.2014)	-0.00003 (0.15958)
Overdraft, CC interest	-2.7377*** (0.2987)				-1.7047*** (0.28026)
<1y interest		-1.2946*** (0.15755)			-0.65619*** (0.18257)
1-5y interest			-2.3017*** (0.19267)		-1.3489*** (0.2017)
>5y interest				-2.50639*** (0.24314)	-1.2066*** (0.2357)
Bank FE	X	X	X	X	X
Cluster	Banks	Banks	Banks	Banks	Banks
R²(within)	0.026	0.068	0.095	0.092	0.142
#Banks	103	103	103	103	103
#States	10	10	10	10	10
Period	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14
Observations	4313	4313	4313	4313	4313

Table 2 shows that “auxmoney” has some explanatory power of “Kredit”, but also that the online demand for credit is negatively related with overdraft credit and consumer credit with 1 to 5 years maturity. Moreover, the higher the interest rate of all categories the lower the demand for credit will be.

Table 3 presents the result of the second stage of the estimation. The volume of auxmoney credit is regressed on the demand for auxmoney credit and the market outcome of comparable markets. Therefore, Table 3 characterizes the P2P supply of credit. Equation I shows that overdraft and auxmoney credit are negatively

related and likely to be substitutes. Equation V shows that also consumer loans with maturity with 1-5 years is negatively correlated with auxmoney credit supply. On the other hand, credit supply is positively related with all interest rates, seen in equation I-V. Therefore we conclude that investors providing liquidity to the P2P market are otherwise supplying rather risky credit markets. Hence, we characterize the P2P investor as a risk friendly investor.

Table 3: Supply side. Dependent variable is volume of auxmoney credit in log differences. Standard errors in brackets and *,** and *** represent 10%, 5% and 1% confidence interval.

lag	I	II	III	IV	V
Kredit	0.00278*** 0.00008	0.00027*** 0.00008	0.00026*** 0.00009	0.00031*** 0.00014	0.00044*** 0.00014
Overdraft, CC volume	-0.00535** 0.00243				-0.00611** 0.00253
<1y volume		-3.15e-08 2.33e-08			-3.28e-08 2.44e-08
1-5y volume			-1.30e-07 1.00e-07		-2.73e-07** 1.20e-07
>5y volume				-1.74e-08 4.52e-08	-1.46e-08 4.88e-08
Overdraft, CC interest	0.00132*** 0.00045				0.00128*** 0.00046
<1y interest		0.0005** 0.00021			0.00046** 0.00022
1-5y interest			0.00034* 0.00027		0.00014 0.0003
>5y interest				0.00059* 0.00032	0.00017 0.00032
Bank FE	X	X	X	X	X
Cluster	Banks	Banks	Banks	Banks	Banks
R²(within)	0.029	0.036	0.068	0.042	0.015
#Banks	103	103	103	103	103
#States	10	10	10	10	10
Period	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14
Observations	4313	4313	4313	4313	4313

The characterization of the P2P credit demand presented in Table 4 follows closely the first stage estimation. In Table 4 all variation of the word credit that is not due to the word auxmoney or the volume and interest rates is excluded, which induces a high R².

On the demand side, the results are robust to all credit lines; volumes and interest rates are negatively related to P2P credit demand. Moreover, the results seem to suggest that P2P credit consumers are not from specific type. The fact that even longer term credit lines are correlated to auxmoney credit demand show that not only the marginal consumer that was previously not participating in the credit market receives credit but also less risky type of credit takers.

Unifying both sides of the market our estimations suggest that the P2P credit market enhances the traditional banking system. Further, the gain from P2P financial intermediation is that by reducing the marginal costs of

matching investors and credit takers, P2P finance allows a new matching in the market between risk friendly investors and all types of credit takers.

Table 4: Demand side. Dependent variable is google hits for the word “Kredit” instrumented with the word “auxmoney”. Standard errors in brackets and *, ** and *** represent 10%, 5% and 1% confidence interval.

lag	I	II	III	IV	V
Overdraft, CC volume	-11.882*** 0.1235				-11.335*** 0.0465
<1y volume		-0.00005*** 7.70e-06			-0.00002*** 1.06e-06
1-5y volume			-0.00062*** 0.00004		-0.00002*** 3.02e-06
>5y volume				-0.00012*** 6.47e-06	-0.00003*** 1.69e-06
Overdraft, CC interest	-3.2631*** 0.0414				-1.818*** 0.015
<1y interest		-1.7225*** 0.04217			-0.7166*** 0.0076
1-5y interest			-1.6353*** 0.0829		-1.1382*** 0.0089
>5y interest				-3.0278*** 0.0263	-1.323*** 0.0108
Bank FE	X	X	X	X	X
Cluster	Banks	Banks	Banks	Banks	Banks
R²(within)	0.8873	0.6258	0.3342	0.9121	0.9993
#Banks	103	103	103	103	103
#States	10	10	10	10	10
Period	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14	Jan.11-Aug.14
Observations	4313	4313	4313	4313	4313

6. Conclusion

The close relation in both sides of the market to overdraft credit and credit card segment shows that crowdfunding is certainly active on the margin of the credit market. In other words, investors with risk appetite are providing credit while consumers with a risky profile, who previously were not sufficiently served by the banking sector, are being served by the crowdlending platforms. Further, the relation between demand for P2P credit and medium term (1-5 year) consumer credit suggests that consumers who are not in the margin of the credit market also consider refinancing their debt through P2P services.

Therefore, this study concludes that in Germany, crowdfunding platforms partially substitute for the traditional bank lending channel by allowing risk taker investors to finance both the overdraft and the mid-term consumers.

The explanation for our results is given as follows. Crowdlending platforms allow individual investors to freely select the loans to include in their credit portfolio among the universe of investment opportunities that better match with their risk profile. By doing so, some investors chose high risk/high return strategies that finance

low rank borrowers with high potential expected rate of return. These borrowers are exactly those ones who are not financed by the traditionally low risk/low return banking channel. Indeed, to qualify for a bank loan it is likely needed substantial collateral to secure the loan, some years of business financials to support the case, an ongoing relationship with the bank and a minimum credit score. Furthermore, with the financial collapse in 2008, banks became even more risk averse and started (i) selecting credit portfolios prevalently composed of high quality credit-ranked loans and (ii) to either limit their exposure on lower credit-ranked consumers and businesses.