Internet Appendix for "The Effects of Information on Credit Market Competition: Evidence from Credit Cards"

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Figure A.1: Total bank credit cards

This figure shows the number of bank credit cards by month in 2015. The dashed vertical line represents the date of the transaction.

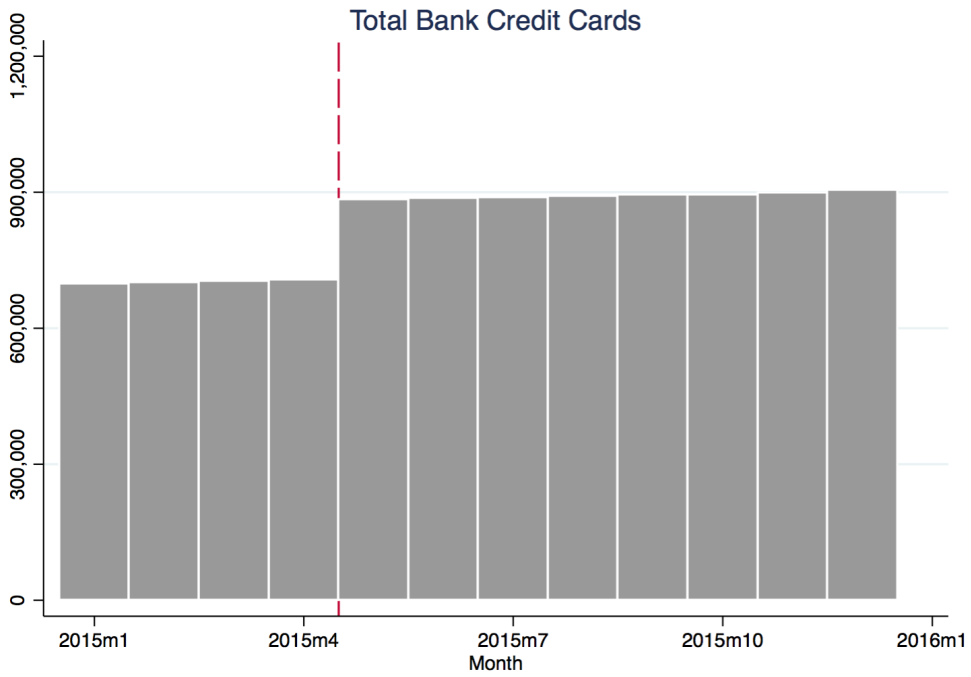

Figure A.2: Histogram of changes in predicted bank default

This figure shows the histogram of the changes predictions of the logarithm of bank default in the next 6 months as of August 2014, trimmed at the 1st and 99th percentiles. See text for details.

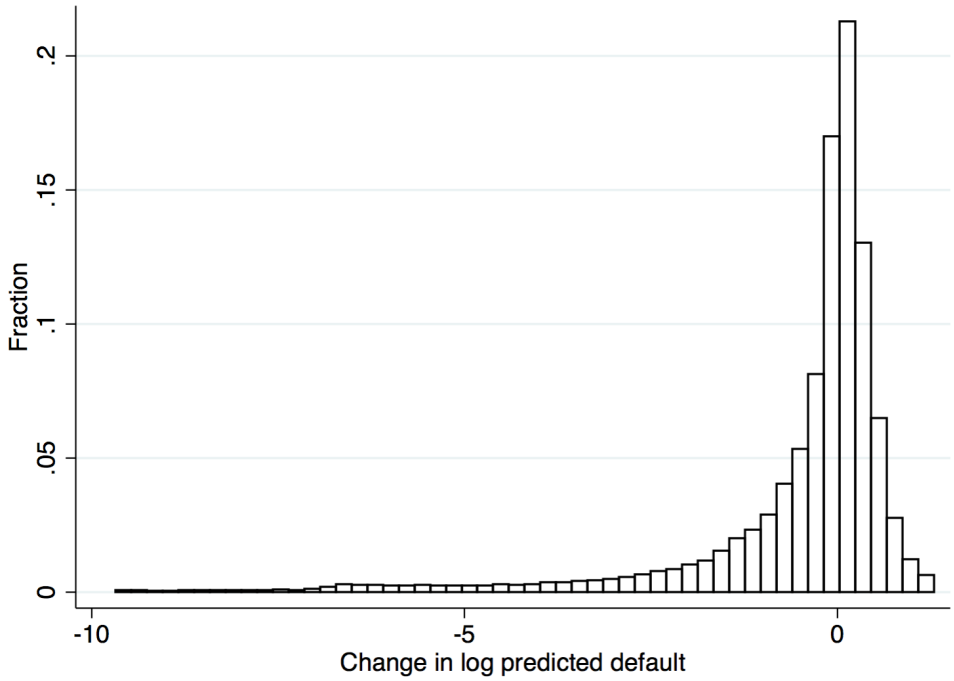

Figure A.3: Characteristics across deciles of changes in predicted bank default

This figure shows panels of average characteristics of the Lender's borrowers grouped according to the change in logarithm of predicted default as defined in the text.

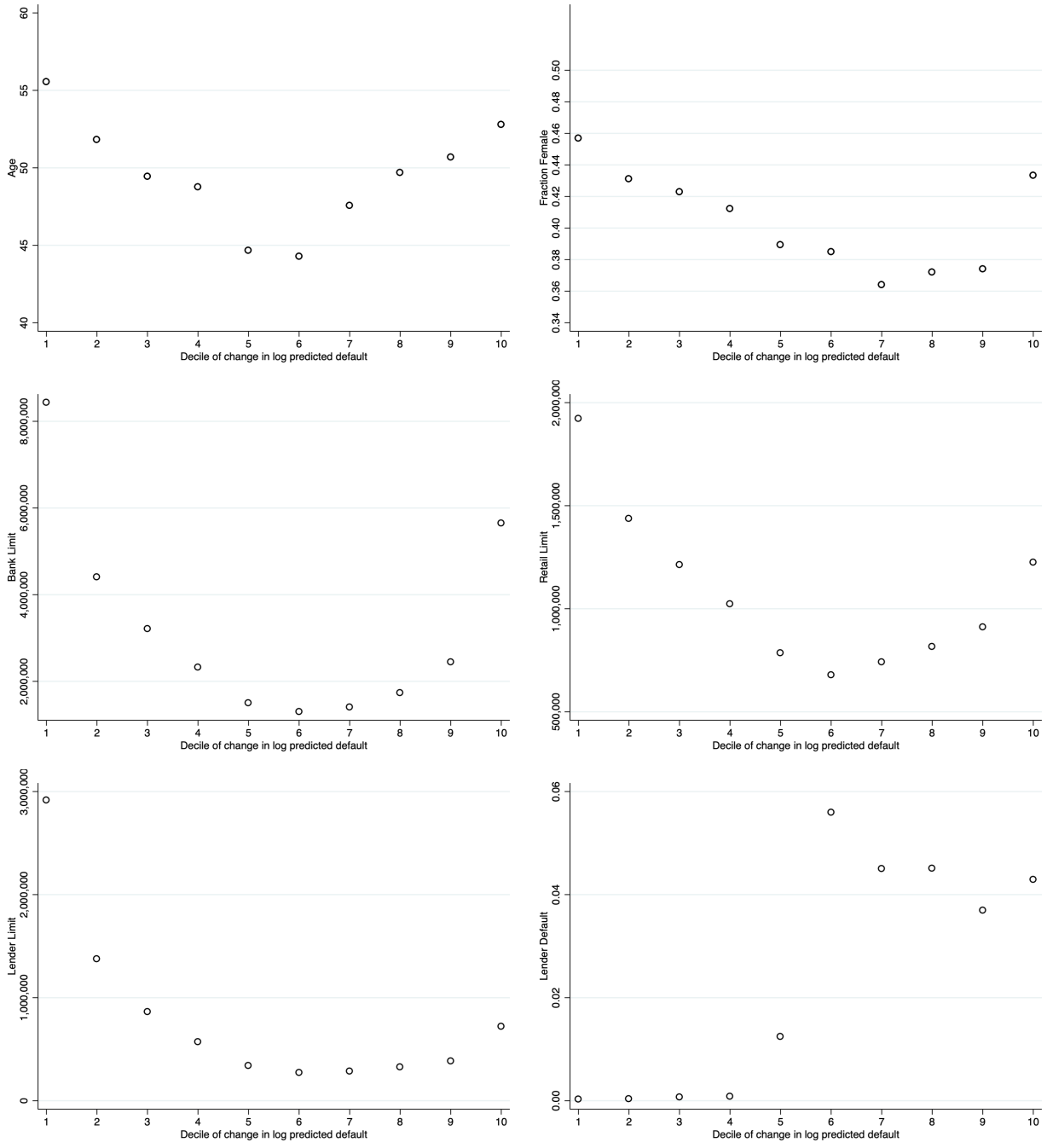

Figure A.4: Lender credit limits

This figure shows the evolution of the Lender's average credit limit and the fraction of individuals with positive credit limit. The dashed vertical line represents the month of the transaction.

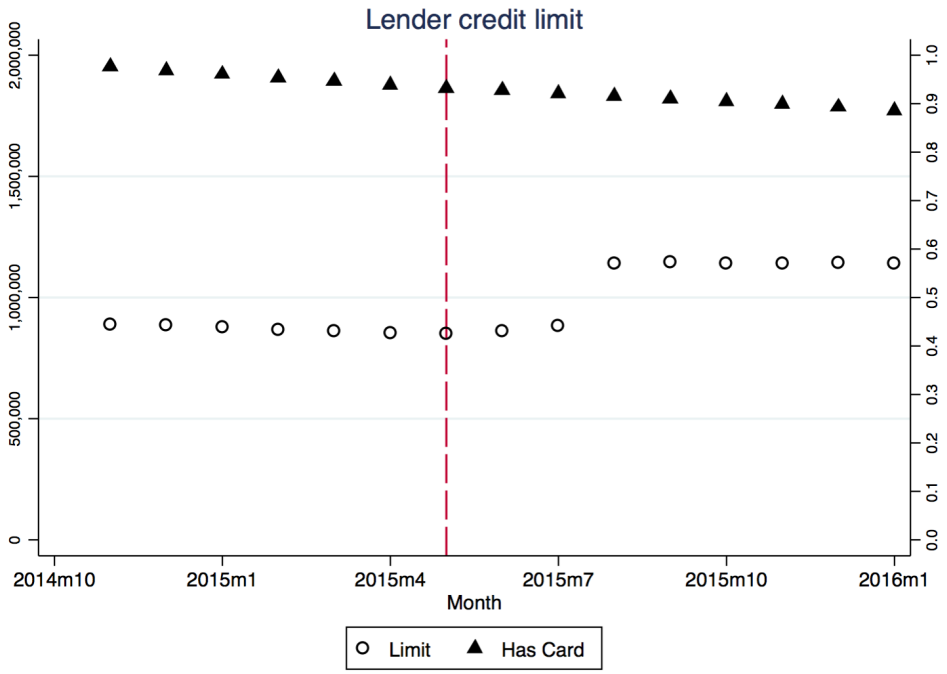

Table A.I: Transaction analysis: robustness using fixed effects

This table shows the output of regression (1) (columns 1 and 2) and regression (2), where individual fixed effects are replaced by fixed effects constructed by the interaction of 5-year age bins, marital status, income bin, retail default status, retail credit limit deciles, bank credit limit deciles, number of bank accounts, and total number of accounts. Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). The sample corresponds to retail or Lender borrowers. The data is a balanced panel. Standard errors are robust to heteroskedasticity. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)
	Limit	Limit	Limit
Lender x t_{-1}	-34.14^{***}	25.96^{***}	
	(3.31)	(0.96)	
Lender x t_0	11.10^{*}	26.90^{***}	
	(5.76)	(1.38)	
Lender x t_1	99.85^{***}	15.11^{***}	
	(7.56)	(1.67)	
Lender x t_2	156.31^{***}	24.00^{***}	
	(12.13)	(2.07)	
Lender x Bank x t_{-1}			-60.10^{***}
			(3.43)
Lender x Bank x t_0			-15.80^{***}
			(5.89)
Lender x Bank x t_1			84.74^{***}
			(7.68)
Lender x Bank x t_2			132.31^{***}
			(12.22)
Sample	Banks	Retail	All
Dep. variable Mean	2,383.36	933.02	1,208.27
Observations	7,560,495	7,560,495	15,120,990
R-squared	0.48	0.54	0.30
Clusters	504,033	504,033	504,033

Table A.II: Transaction analysis: extensive margin

This table shows the output of regression (1) (columns 1 and 2) and regression (2) (column 3), where the outcome is a dummy for whether the individual has a credit card. Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). The sample corresponds to retail or Lender borrowers. The data is a balanced panel. Standard errors are robust to heteroskedasticity. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)
	Has Limit	Has Limit	Has Limit
Lender x t_{-1}	-0.0021^{***}	0.0376^{***}	
	(0.0003)	(0.0004)	
Lender x t_0	-0.0048^{***}	0.0693^{***}	
	(0.0005)	(0.0006)	
Lender x t_1	-0.0077^{***}	0.0948^{***}	
	(0.0006)	(0.0008)	
Lender x t_2	-0.0107^{***}	0.1241^{***}	
	(0.0007)	(0.0009)	
Lender x Bank x t_{-1}			-0.0397^{***}
			(0.0005)
Lender x Bank x t_0			-0.0741^{***}
			(0.0008)
Lender x Bank x t_1			-0.1025^{***}
			(0.0009)
Lender x Bank x t_2			-0.1348^{***}
			(0.0011)
Sample	Banks	Retail	All
Dep. variable Mean	0.5692	0.8412	0.5843
Observations	7,569,285	7,569,285	15,138,570
R-squared	0.94	0.79	0.95
Clusters	504,619	504,619	504,619

Table A.III: Heterogeneity by predicted probability of default: extensive margin

Columns 1 and 2 show the output of regression (3), which measures the evolution of a dummy for whether the individual has a credit card for Lender borrowers with decreases in predicted bank default rate relative to those with predicted increases, relative to event quarter -2. Column 1 reports coefficients for bank issued cards and column 2 reports coefficients for retailer issued cards. Column 3 reports the output of regression (4), where the coefficients of interest correspond to the difference in bank cards relative to retailer cards for Lender borrowers with decreases in predicted bank default rate relative to those with predicted increases, relative to event quarter -2. Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). The data is a balanced panel with one observation per individual-month. Standard errors are clustered at the individual level. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)
	Has Limit	Has Limit	Has Limit
Pred. Def. Drops $\times t_{-1}$	0.0051***	0.0033***	
	(0.0005)	(0.0006)	
Pred. Def. Drops $\times t_0$	0.0107***	0.0088***	
	(0.0007)	(0.0010)	
Pred. Def. Drops $\times t_1$	0.0161***	0.0134***	
	(0.0009)	(0.0012)	
Pred. Def. Drops $\times t_2$	0.0226***	0.0156***	
	(0.0011)	(0.0014)	
Pred. Def. Drops × Bank $\times t_{-1}$			0.0018**
			(0.0008)
Pred. Def. Drops × Bank $\times t_0$			0.0019*
			(0.0012)
Pred. Def. Drops × Bank $\times t_1$			0.0027*
			(0.0014)
Pred. Def. Drops × Bank $\times t_2$			0.0070***
			(0.0017)
Sample	Banks	Retail	All
Dep. variable Mean	0.7346	0.7574	0.8099
Observations	2,500,260	2,500,260	5,000,520
R-squared	0.94	0.89	0.57
Clusters	166,684	166,684	166,684

Table A.IV: Transaction: Lender Outcomes

This table reports the average difference in credit outcomes for the Lender's own credit card among its borrowers relative to event quarter -2. Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). The sample corresponds to all Lender borrowers with a positive credit limit prior to event quarter -2. The data is a balanced panel. Standard errors clustered at the individual level. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)	(4)	(5)
	Limit	Has Card	Balance	Balance / Limit	Default
t_{-1}	$-23,136.54^{***}$	-0.0223^{***}	$-9,319.92^{***}$	0.0006	0.0117^{***}
	(454.06)	(0.0003)	(377.28)	(0.0004)	(0.0003)
t_0	$-18,733.42^{***}$	-0.0419^{***}	$-16,018.72^{***}$	-0.0001	0.0182^{***}
	(663.95)	(0.0004)	(544.88)	(0.0006)	(0.0003)
t_1	$258,318.89^{***}$	-0.0582^{***}	$-17,610.90^{***}$	-0.0057^{***}	0.0220^{***}
	(2,994.57)	(0.0005)	(701.15)	(0.0006)	(0.0003)
t_2	$257,882.71^{***}$	-0.0758^{***}	562.35	0.0160^{***}	0.0245^{***}
	(3,051.73)	(0.0006)	(890.12)	(0.0007)	(0.0003)
Dep. variable Mean	852,809	0.9377	200,998	0.3217	0.0194
Observations	2,696,190	2,696,190	2,696,190	2,501,668	2,501,668
R-squared	0.83	0.75	0.83	0.78	0.44
Clusters	179,746	179,746	179,746	174,458	174,458

Table A.V: Interest rates: Lender

This table shows the output of the main diff-in-diffs analysis for new credit card origination regression (3), which studies the evolution of the Lenders credit card rates relative to retailers (columns 1 and 2) and to banks (columns 3 and 4), and relative to event quarter zero. Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). The data is a cross-section with one observation per credit card origination. Standard errors are clustered at the lender by month of origination level. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)	(4)
	Rate	Rate	Rate	Rate
Lender x t_{-1}	0.0001	0.0001	−0.0005	0.0004
	(0.0016)	(0.0010)	(0.0017)	(0.0017)
Lender x t_0	−0.0007	−0.0004	−0.0013	−0.0008
	(0.0015)	(0.0010)	(0.0017)	(0.0017)
Lender x t_1	−0.0011	−0.0006	−0.0021	−0.0019
	(0.0015)	(0.0011)	(0.0017)	(0.0017)
Lender x t_2	−0.0016	−0.0007	−0.0011	−0.0023
	(0.0014)	(0.0010)	(0.0015)	(0.0014)
Control group	Retailer	Retail	Banks	Banks
Fixed effect		YES		YES
Dep. variable Mean	0.0256	0.0256	0.0187	0.0187
Observations	810,746	810,741	1,238,191	1,238,103
R-squared	0.0087	0.4120	0.0857	0.4246
Clusters	450	450	452	452

Table A.VI: Outcomes from other lenders for new borrowers after the transaction

This table reports the average difference in the level of retail and bank credit limits as well as dummy variables that indicate any retail or bank credit limit as of one and twelve months after origination by origination quarter for the Lender's new borrowers relative to new retail borrowers. Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). The sample corresponds to new retail or Lender borrowers. New borrowers are defined as individuals who first appear in the credit card data on or after October 2014. The data is a cross section, with one observation for each new origination. Standard errors are robust to heteroskedasticity. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Retail Limit		Has Retail Limit		Bank Limit		Has Bank Limit	
	Month 1	Month 12	Month 1	Month 12	Month 1	Month 12	Month 1	Month 12
Lender x t_{-1}	$-3,857.21$	-334.61	-0.0304^{**}	0.0410^{*}	$13,776.23$	$-2,295.32$	-0.0095	-0.0008
	(5,812.67)	(13,773.50)	(0.0154)	(0.0236)	(34,184.26)	(54,772.11)	(0.0100)	(0.0191)
Lender x t_0	$19,885.77^{**}$	$39,855.89^{**}$	0.0359^{*}	0.1065^{***}	$-8,290.42$	$44,049.83$	-0.0008	0.0531^{**}
	(8,857.62)	(16,849.47)	(0.0208)	(0.0280)	(13,446.94)	(60,414.38)	(0.0125)	(0.0242)
Lender x t_1	$20,446.06^{**}$	$42,544.41^{**}$	0.0203	0.0928^{***}	$74,181.40^{*}$	$199,431.05^{**}$	0.0285^{**}	0.0624^{***}
	(9,286.87)	(17,912.39)	(0.0185)	(0.0253)	(40,345.74)	(88,945.67)	(0.0136)	(0.0222)
Lender x t_2	$21,121.84^{***}$	$30,699.00^{*}$	0.0441^{**}	0.0625^{***}	$38,840.45$	$70,090.91$	0.0068	0.0756^{***}
	(7,414.50)	(15,858.09)	(0.0188)	(0.0235)	(48,118.55)	(45,636.63)	(0.0116)	(0.0214)
Dep. variable Mean	23,238	65,131	0.0955	0.2023	22,390	116,729	0.0293	0.1413
Observations	70,383	70,475	70,383	70,475	70,383	70,475	70,383	70,475
R-squared	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table A.VII: New borrowers: retailers and banks

This table shows regressions of a dummy for borrowers who have a positive credit line with their initial lender, a dummy for individuals in default with their first lender, and the natural logarithm of credit limits on the interaction of event month dummies and a dummy for first-time retail borrowers. Standard errors clustered at the individual level. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)
	Has Limit	Default	log(Limit)
Retail x t_1	-0.0104^{***}	0.0000	-0.0778^{***}
	(0.0007)	(0.0000)	(0.0053)
Retail x t_2	-0.0214^{***}	0.0000	-0.0695^{***}
	(0.0008)	(0.0000)	(0.0055)
Retail x t_3	-0.0273^{***}	0.0028^{***}	-0.0559^{***}
	(0.0009)	(0.0003)	(0.0057)
Retail x t_4	-0.0327^{***}	0.0517^{***}	-0.0394^{***}
	(0.0010)	(0.0011)	(0.0058)
Retail x t_5	-0.0333^{***}	0.0947^{***}	-0.0341^{***}
	(0.0011)	(0.0016)	(0.0059)
Retail x t_6	-0.0356^{***}	0.1145^{***}	-0.0173^{***}
	(0.0011)	(0.0019)	(0.0061)
Retail x t_7	-0.0482^{***}	0.1260^{***}	0.0137^{**}
	(0.0013)	(0.0021)	(0.0063)
Retail x t_8	-0.0592^{***}	0.1357^{***}	0.0282^{***}
	(0.0015)	(0.0023)	(0.0067)
Retail x t_9	-0.0675^{***}	0.1445^{***}	0.0408^{***}
	(0.0017)	(0.0024)	(0.0070)
Retail x t_{10}	-0.0723^{***}	0.1529^{***}	0.0404^{***}
	(0.0018)	(0.0025)	(0.0073)
Retail x t_{11}	-0.0775^{***}	0.1594^{***}	0.0512^{***}
	(0.0019)	(0.0026)	(0.0075)
Retail x t_{12}	-0.0793^{***}	0.1636^{***}	0.0645^{***}
	(0.0020)	(0.0027)	(0.0077)
Retail x t_{13}	-0.0822^{***}	0.1673^{***}	0.0894^{***}
	(0.0021)	(0.0028)	(0.0080)
Retail x t_{14}	-0.0846^{***}	0.1692^{***}	0.1081^{***}
	(0.0022)	(0.0028)	(0.0082)
Retail x t_{15}	-0.0873^{***}	0.1724^{***}	0.1177^{***}
	(0.0023)	(0.0029)	(0.0085)
Observations	1,365,771	1,489,648	1,284,258
R-squared	0.0390	0.1179	0.1805
Clusters	93,111	93,103	93,111

Table A.VIII: Summary statistics for interest rates on new credit cards

This table shows summary statistics of interest rates for new loans. Sample includes all individuals with a credit card from a bank or a retailer, excluding the Lender.

	(1)	(2)	(3)
	All	Bank	Retail
Mean	0.0196	0.0151	0.0246
St. Dev.	0.0099	0.0097	0.0075
Max	0.0330	0.0330	0.0330
Median	0.0219	0.0169	0.0261
Fraction zero rate	0.0927	0.1430	0.0363
Loans	1,721,285	910,541	810,744

Table A.IX: Transaction analysis: default

This table shows the output of regression (1) (columns 1 and 2) and regression (2), where the outcome is a dummy for whether the individual is in default in any card by more than 90 days. Event quarter is centered at zero around the quarter in which the transaction is announced (May-June 2015). The sample corresponds to retail or Lender borrowers. The data is a balanced panel. Standard errors are robust to heteroskedasticity. *, **, and *** represent 10, 5, and 1 percent significance level, respectively.

	(1)	(2)	(3)
	Default	Default	Default
Lender x t_{-1}	0.0007***	0.0070***	
	(0.0002)	(0.0004)	
Lender x t_0	0.0007***	0.0109***	
	(0.0002)	(0.0005)	
Lender x t_1	0.0009***	0.0134***	
	(0.0002)	(0.0004)	
Lender x t_2	0.0005**	0.0159***	
	(0.0002)	(0.0004)	
Lender x Bank x t_{-1}			−0.0064***
			(0.0004)
Lender x Bank x t_0			−0.0102***
			(0.0005)
Lender x Bank x t_1			−0.0125***
			(0.0005)
Lender x Bank x t_2			−0.0153***
			(0.0005)
Sample	Banks	Retail	All
Dep. variable Mean	0.0062	0.0263	0.0130
Observations	7,569,285	7,569,285	15,138,570
R-squared	0.18	0.22	0.63
Clusters	504,619	504,619	504,619

Framework

In this appendix we develop a simple model of a credit card market with asymmetric information. The purpose of the model is to formalize in a simple way the differences in credit card contracts emerging from different information regimes. With this in mind, the model makes stark assumptions, particularly about borrower behavior. Throughout we assume that parameters are chosen so that equilibria exist.

Setup

There are two periods and three dates, $t = 0, 1$, and 2. Interest rates are fixed conditional on a vector of observables X_i.[23] In the first part of our analysis we drop all reference to X_i, and assume that the analysis occurs for individuals with equal values for this set of observables.

There is a continuum of individuals of mass 1 (indexed by i) who want a credit card, and who will accept any credit card with a limit that is higher than a threshold. There are two types of individuals, B and G, who differ in the limit threshold and in the profits they generate to banks, as detailed below. B-type individuals accept a card offer with any positive credit limit, while G-type individuals only accept a credit limit above a threshold $L^\star$. Individuals know their type, but banks only know that there is a fraction θ of B-type individuals. In particular, θ can be interpreted as a measure of adverse selection in the market.

There are N>>1 lenders who offer credit cards contracts under a zero-expected profits assumption. All lenders have access to the same cost of funds, which we normalize to zero,

[23] As in Agarwal, Chomsisengphet, Mahoney, and Stroebel (2018) and Liberman, Neilson, Opazo, and Zimmerman (2018), we assume that limits are the main margin of adjustment for the supply of credit cards. Our results assume rates are fixed within a set of observables, and do not preclude variation in rates across groups with different observable characteristics, consistent with the fact that retailers charge higher rates, as shown in Internet Appendix Table A.VIII. We provide evidence in favor of this assumption in subsection A.1.

and have the same information about borrowers initially.[24] Lenders make simultaneous offers for one-period credit card contracts, competing on credit limits. Lenders can offer cards with an individual limit up to a total capacity per card of C. A lender's expected net benefit of offering a credit line L is equal to RL for G type borrowers, and $-L$ for B types. Borrowers observe all lender offers, and decide whether to accept one offer. Because all lenders are symmetric initially, contract offers will be equivalent, and borrowers choose their unique card randomly.

Equilibria with a credit registry

We study sequential Nash equilibria under different information settings. As a benchmark, under symmetric information about types, all lenders offer G-type individuals a card with a limit equal to C in both periods. G-type borrowers randomly choose which bank to accept an offer from. Banks do not offer credit cards to B borrowers.

We assume first that banks learn the type of all borrowers from all banks in the next period. This is akin to a setting with credit information. A credit card offer to a randomly selected individual from the population for a limit that is higher than $L^\star$ has expected profits equal to $(1-\theta)\,R-\theta$ per dollar of limit in period 1.

We define the parameter $\theta^\star = \frac{R}{1+R}$, and note that the equilibrium depends on the relation between θ and $\theta^\star$. If $\theta < \theta^\star$, lenders offer credit cards to *all* individuals in $t=0$ and $t=1$ with limits equal to the average capacity C. In this economy, adverse selection is low but not very costly, and credit is maximized but misallocated as banks lend to bad types who always default. Conversely, when $\theta \geq \theta^\star$, banks lose money from offering any credit line. Intuitively, when adverse selection is high, no bank lends and the market unravels as in Akerlof (1970).

[24] In the empirical setting it is likely that different lenders, e.g. retailers and banks, have different cost of funds. We abstract from this heterogeneity to focus on the predictions of a model with differences in the informational environment across markets. Retailers' higher cost of funds would, for example, rationalize their reluctance to voluntarily make their information public in a setting where they compete with banks.

Lenders' informational advantage

Next we assume that incumbent lenders are only able to observe their own borrowers' type in the next period and that other lenders can never observe borrowers' type. Empirically, this can be thought of as a lender observing past repayment of its own borrowers in a setting with no credit information, e.g., among retailer borrowers who are not in default. This implies that in $t = 1$ lenders can offer their $t = 0$ borrowers contracts that are contingent on their type.

In a symmetric equilibrium, incumbent lenders offer each of their G-type borrowers a credit line of size C in $t = 1$ and make positive profits, while denying credit to all B type borrowers. Thus, lenders' expected profits from offering a credit card limit $L > L^\star$ to an average individual in $t = 0$ equal:

$$\underbrace{L \times [(1-\theta)\, R - \theta]}_{t=0} + \underbrace{(1-\theta) \times R \times C}_{t=1} = 0.$$

When $\theta > \theta^\star$, in $t = 0$ lenders lend no more but no less than $L^\star$ (to guarantee high types do not drop out of the pool of borrowers) and make negative profits, which they can compensate in $t = 1$ as long as:

$$\theta \leq \theta^{POOLING} = \frac{R}{\frac{L^\star}{L^\star + C} + R}$$

Intuitively, when adverse selection is not too high ($\theta \leq \theta^{POOLING}$) incumbent lenders invest in $t = 0$ to acquire information about their high-type borrowers. This allows lending to riskier populations with a degree of information asymmetry θ such that $\theta^\star \leq \theta \leq \theta^{POOLING}$. Note that these riskier populations would not be offered credit cards unless lenders hold an informational advantage ex post.

Empirical predictions

The analysis thus far assumes borrowers belong to a population determined by a vector of observable characteristics X_i. For simplicity, we collapse the vector to one observable variable x_i (e.g., income). We assume:

$$\frac{d\theta}{dx} < 0 \tag{6}$$

Assumption 6 implies that the proportion of B type individuals, and thus the degree of information asymmetry of a particular market, decreases with income. This implies that in a setting with no credit registry, lenders' informational advantage decreases with x_i. In a setting with a credit registry, where there is full competition ex post, individuals with higher income are likely to receive credit cards with larger limits initially. Individuals with lower incomes will not be served. In a setting with no information sharing, poorer individuals may receive a credit card with a lower initial limit, which then increases among good type borrowers.

In the empirical setting, banks observe the repayment of defaulters and non-defaulters at all banks. Thus, banks operate in what we refer to in our model as the full credit information setting. At the same time, retailers operate in a setting where only defaults are observed. Because outside lenders cannot distinguish non-defaulters from the pool of non-borrowers, the market for non-defaulters is similar to the setting with no credit information where retailers hold an informational advantage relative to other lenders. Comparing the no credit information (retailers) and credit information (banks) settings, the framework delivers the following implications, which are consistent with stylized facts shown in the paper:

- New retail borrowers have a higher default rate conditional on all observables: this follows from the correlation between observable risk and the fraction of B-types in the economy.

- New retail borrowers have lower incomes and are observably riskier: this follows from the assumption that lenders' informational advantage decreases with observable risk.

- When they lend, banks lend up to their full capacity in $t = 0$ and $t = 1$. Retailers lend a lower initial limit in $t = 0$, and subsequently increase their limit to their full capacity for borrowers who are not in default. Retail limits are thus initially lower but increase proportionally more over time.

Data Appendix

Credit Card Limit or Limit: We construct Credit Card Limit at the individual-level as the sum of limits from all bank and retail credit cards in Chilean pesos.

Bank Credit Card Limit or Bank Limit: We construct Bank Credit Card Limit at the individual-level as the sum of limits from all bank credit cards in Chilean pesos.

Retail Credit Card Limit or Retail Limit: We construct Retail Credit Card Limit at the individual-level as the sum of limits from all retail credit cards, at the individual-level, in Chilean pesos.

Lender Credit Card Limit or Lender Limit: The individual-level limit of credit cards issued by the Lender, at the individual-level, in Chilean pesos.

Credit Card Usage: We construct Credit Card Usage at the individual-level as the sum of debt balances from all bank and retail credit cards, in Chilean pesos.

Lender Credit Card Balance: The individual-level usage or debt balance of credit cards issued by the Lender, in Chilean pesos.

Credit Card Balance/Limit or Balance/Limit: We construct Balance/Limit at the individual-level as the quotient of Credit Card Balance and Credit Card Limit.

Has Credit Card: An indicator for an individual having a credit card. Has Credit Card is set to one for individuals who have a credit card and zero otherwise.

Lender: An indicator for an individual having a credit card with the Lender. Has Lender

Credit Card is set to one for individuals who have a credit card with the Lender and zero otherwise.

Default: An indicator for an individual defaulting on her bank or retail credit card. Default is set to one for bank or retail borrowers with a 90+ days delinquency and zero otherwise.

Bank Credit Card Default: An indicator for an individual defaulting on her bank credit card. Bank Credit Card Default is set to one for bank borrowers with a 90+ days delinquency and zero otherwise.

Retail Credit Card Default: An indicator for an individual defaulting on her retail credit card. Retail Credit Card Default is set to one for retail borrowers with a 90+ days delinquency and zero otherwise.

Income Bin: A discrete variable indicating an individual's IRS income bin, where one and eight are the lowest and highest, respectively. As of May 2015 (the date of the transaction) individuals in bin one and eight earn less than 606,893 and more than 6,743,250, respectively (http://www.sii.cl/valores_y_fechas/impuesto_2da_categoria/impuesto2015.htm).

Fraction in Income Bin One: An indicator for individuals with incomes in bin one. Fraction in income bin 1 is set to one for individuals with a monthly income lower than 606,893 by May 2015 and zero otherwise.

Female: An indicator for whether the individual is female. Female is set to one for female individuals and zero for male individuals.

Married: An indicator the applicant being married. Married is set to one for married

individuals and zero otherwise.

Age: The individual's age in years.

New Retail Borrower: An indicator for individuals being new retail borrowers, defined as individuals whose first credit card appears in the data as of October 2014. New Retail Borrower is set to one for new retail borrowers and zero for new bank borrowers.

Pred. Def. Drops: An indicator for individuals experiencing a drop in default predicted by a Probit model on a randomly selected 30% sub-sample of the Lender's August 2014 cross-section of borrowers.

Interest rate: The individual-level credit card's monthly interest rate in percentage.