

# LENDING MARKETS IN TRANSITION?

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Adair Morse

University of California, Berkeley

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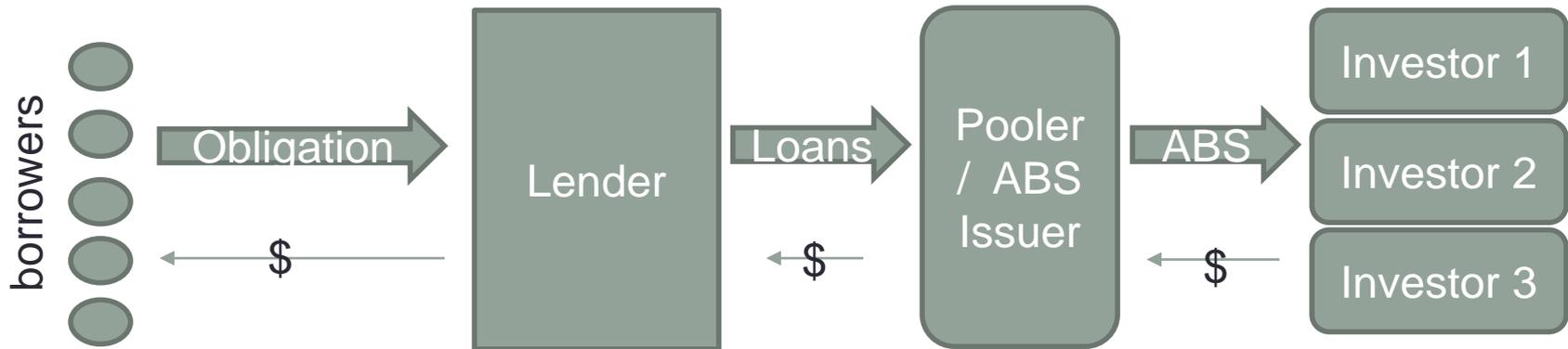
“Financial Innovation: Online Lending to Households and Small Businesses”

- Material for this talk largely draws from an article I wrote a few years ago, but updated:
  - “Peer-to-Peer Crowdfunding: Information and the Potential for Disruption in Consumer Lending?” *Annual Review of Financial Economics*, December 2015

# Outline

- i. Disintermediation & Investing
- ii. Information about Borrowers & Contract Design
- iii. Macroeconomic Picture
- iv. Regulation

## Traditional Lending Model: e.g., credit cards

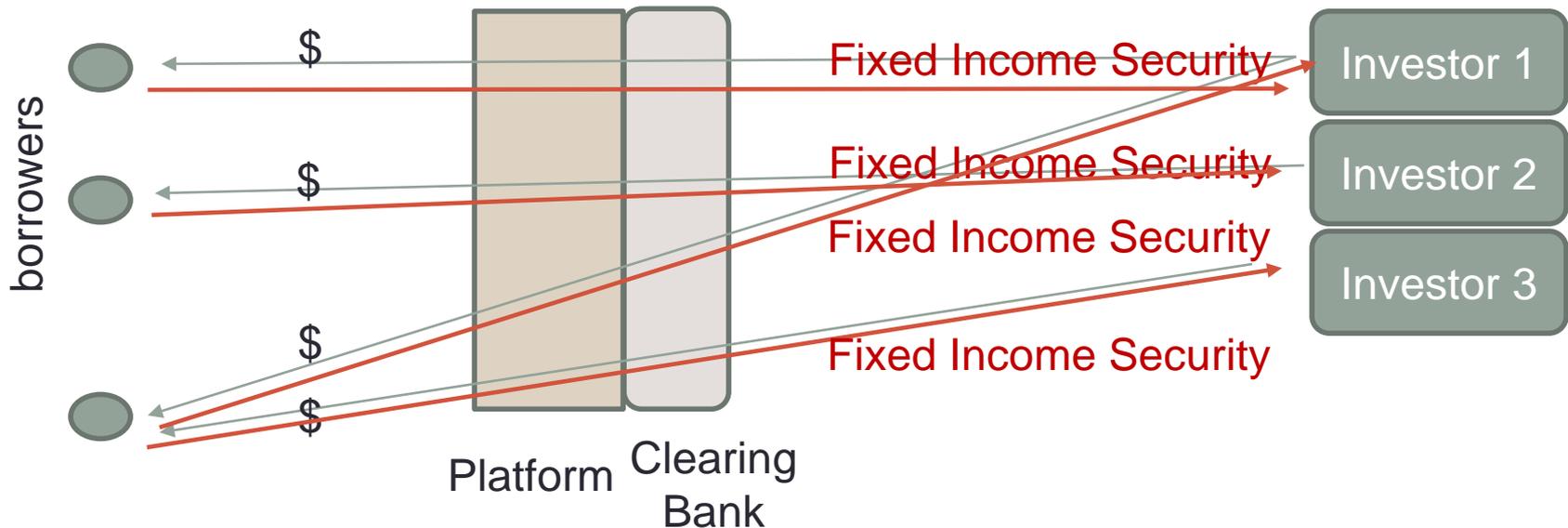


What really does the word disintermediation mean?

# Platforms: Application Process in P2P

- A typical consumer Peer-to-peer:
- Prospective borrower enters application data into platform
  - Income (sometimes with verification)
  - Amount of desired loan
  - Duration of desired loan
  - Some demographics
  - Waiver allowing platform to pull credit history from registry
- Platform posts application information for investors to see. Investors can be anyone.
  - Investors bid/commit to invest increments on the desired loan
  - If the loan offering gets bids covering the desired loan amount, the loan is filled.

# P2P Platforms: Disintermediation

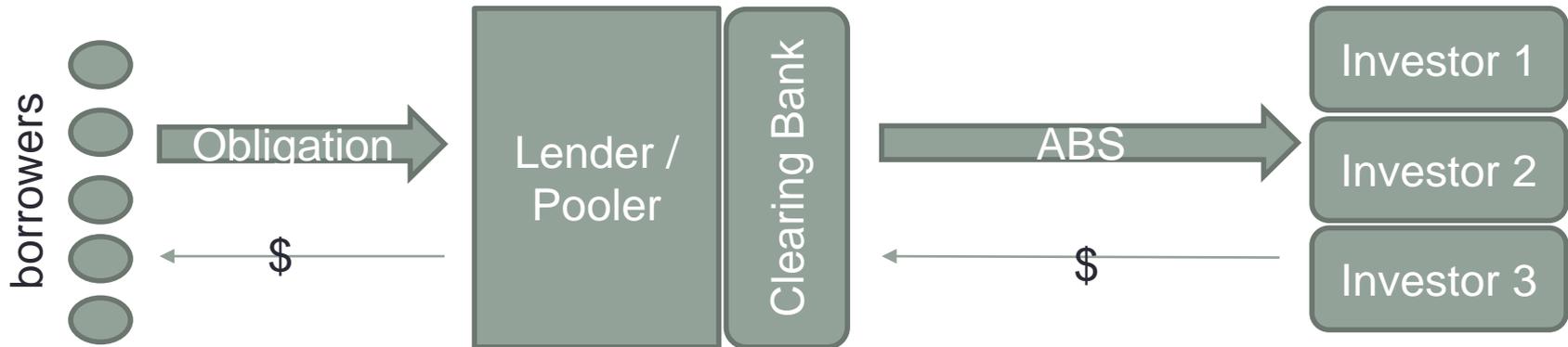


Disintermediation is in removing investment bank that issues ABS

# Platforms: Application Process in ~~P2P~~

- Note: Not all platforms are P2P
- Many platforms instead are **asset packagers**
  - Big U.S. examples:
    - SOFI (student loans): mixed model
    - OnDeck (small business loans)
  - They gather prospective borrowers on the platform
  - Package them according to risk buckets
  - Have a pass-through relationship with a bank that issues ABS-like securities to (generally) institutional investors
    - Or variants of this

# Asset Packager Platforms: Disintermediation



Disintermediation is still in removing investment bank that issues ABS

# Disintermediation: Investor Returns?

- Financial intermediation costs 2% of asset value: Philippon (2014)
  - Removal of one layer of financial services should provide rents
- Platforms also argue: use information better to price credit risk
  - (Details: Next bullet point in outline)
- If EITHER disintermediation saves on transaction cost OR platforms are able to use information to price risk, there should be rents that someone can capture:
  - Better pricing for borrowers?
  - Higher risk-adjusted investor returns?
  - Abnormal profits by platforms?

# Disintermediation: Investor Returns?

- So, how have investors done?
  - Quick answer: We don't know. Time horizon from 2008 – today is simply not long enough for risk adjustment
  - What investors in U.S. say:
    - Looked for anything that gave fixed income yield during this period.
    - ABS consumer loans, for example, performed 3.4% over 2009-2014
    - Barclays Investment Grade Bonds performed 5.5%
    - Lending Club & Prosper performed ~ 7%
  - Since then, stock price concerns by many platforms
    - Why... concerns over:
      - Business cycle concerns about non-performing loans looming ????
      - Not serving the “looking for ANY yield” any more?
      - Governance & regulation

# Disintermediation: Investor Returns?

(continued)...

- How about individuals who never really had access to ABS market?
  - In theory, investors can diversify across borrowers and/or hedge background risk
    - Are they?
    - Waiting for evidence on research front
- Moot question?
  - Most of investors are not crowd, but rather hedge funds and large institutions
- SO MANY unanswered questions!

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# Proximity: Theoretic Underpinnings

- Jaffee Russell / Stiglitz Weiss : More information via proximity => improved access or price
  - Subsequent screening literature: Petersen and Rajan (1994), Boot and Thakor (2000); Berger and Udell (2002); Petersen (2004); Berger, Miller, Petersen, Rajan, and Stein (2005); Stein (2002); Karlan (2007); Iyer and Puri (2012); Schoar (2014); many others
- Signaling literature
  - Use of narratives text (non-costly?) in application to signal quality
  - Signals of “friends” investing (skin in the game)
- Ex post moral hazard reduction?
  - Does the observable nature or friends exposure change repayment behavior?

# Proximity: Baseline question: Is there room for improvement?

- Does credit scoring over and above traditional credit scores (credit history + debt:income) improve predictions on default?
  - Or just in-sample data mining a host of demographics
  - Iyer, Khwaja, Luttmer Shue (2015): It is possible to profitably sort individuals even within pooling of borrowers in a credit score bucket (a few points)

# Proximity

- 1) Is there proximate knowledge in the crowd?
  - Freedman and Jin (2014), (also see Everett (2010))
    - When investor-lenders “endorse and bid” – big IRR improvement
    - Could be other investors following connected investors to higher risk classes
    - But, at least partially due to information in the crowd
      - Reduction in default rates by 4%
  - NOTE! Endorsements without investment do worse
    - Costly skin in the game (Spence 1973)

# Proximity

- 1) Is there proximate knowledge in the crowd?
  - But how important is this question going forward?
    - Do we think that people are going to put costly effort to manually provide information about prospective borrowers who are friends or within their network
    - Scale of this thought seems too far-reaching for the distribution of who has wealth
  - And, how does the fact that most (in U.S.) investors are hedge fund or similar?
  - My view is that “wisdom in the crowd” is not the right way to think about marketplaces
  - More promising: “proximate information” (or just more information) by use of technology afforded by platforms

# Proximity

- 1) Is there proximate knowledge in the crowd?
  - 2) Can borrowers make lenders proximate through a narrative
- Herzenstein, Sonenshein and Dholakia (2011) study individuals using identify claims to influence lenders
    - Trustworthy and successful improve financing terms,
    - But no effect in default... narratives can bias investors? (troubling)
    - Also see Gao and Lin (2012) for more on deceit
  - Other research looks at linguistic clarity, face features & race
    - Pope & Snyder – racial statistical discrimination is profitable
  - Promising is hard coding of narrative info Michels (2012)
    - Disclosure items make finance cheaper and are relevant for defaults
    - Algorithms!

# Proximity

- 1) Is there proximate knowledge in the crowd?
  - 2) Can borrowers make lenders proximate through a narrative
  - 3) Can local indicators be a proxy for proximity?
- Crowe and Ramcharan (2013):
    - Crowd investors incorporate relevant local house price effects in deciding on both the provision of funds and the rate to charge
  - A lot more research can be done here –
  - Regulators are going to have a lot to say about discrimination in this realm

# Proximity

- 1) Is there proximate knowledge in the crowd?
  - 2) Can borrowers make lenders proximate through a narrative
  - 3) Can local indicators be a proxy for proximity?
  - 4) Can network be a proxy for proximate information?
- Lin, Prabhala, and Viswanathan (2013) : Who your friends are as a proxy for your economic setting
    - Prospective borrowers on Prosper with high credit quality friends
    - succeed in fundraising more often, face lower interest rates, and default less.
  - Big Data = big implications!
  - See new work of Theresa Kuchler, Johannes Stroebel et al using facebook data

# Proximity

- 1) Is there proximate knowledge in the crowd?
  - 2) Can borrowers make lenders proximate through a narrative
  - 3) Can local indicators be a proxy for proximity?
  - 4) Can network be a proxy for proximate information?
  - 5) Does everyone have to have proximate knowledge or does information diffuse?
- Herding/cascades: first research says yes.
  - More work needed here as the investors pool changed over time

# Contract design

- Question that is not fully explored in literature:
- Are the contracts in the credit markets optimal
  - For whom?
- Afternoon session today is very much about the use of information in (either implicitly or explicitly) the design of contracts

## Examples:

- Papers of pricing model (next slide)
  - Wei and Lin (2013)
  - Franks, Serrano-Velarde, Sussman (2016)
- Papers about duration of installment loans
  - Hertzberg et al (2015)
  - Basten, Guin, Koch (2015)
- Installment versus credit line ?

# Is Information from investors more valuable than volume? Evidence from pricing models

- Wei and Lin (2013): study Prosper's switch from price setting via auction versus assignment
  - Auction: interest rate price the margin when supply = demand
  - Assignment: a coarser system in which Prosper pre-assigns an interest rate based on credit scoring
  - Finding: Under assignment, loans are funded with a higher probability at a higher price, with a higher default rate.
    - Interpretation 1: Prosper may be increasing the pool of borrowers who get funded by pricing the high risk types
    - Interpretation 2: coarser pricing = more pooling of risk (Stiglitz and Weiss (1980)), => higher price & loan-cost induced default
- Franks, Serrano-Velarde, Sussman (2016): study SME version of this experiment for British Funding Circle
  - Finding: More volume under assignment, less precise default predictions

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# Macro Picture

- Do platforms expand access to credit?
- What do platforms do to the overall risk of household sector?
  - Understand the micro implications

## Lending Club Stats from Morse (2015, Annual Review of F.E.)

Census Income Quintile	Annual Income	Loan Amount	Interest Rate	Term Months	Loan-to-Income	Payment-to-Income	Count	% of Sample
1st	19,944	4,722	18.1%	36.2	0.237	0.100	423	1.9%
2nd	32,425	8,478	16.0%	36.8	0.261	0.107	2,464	10.9%
3rd	50,314	13,206	14.8%	40.8	0.262	0.097	7,694	33.9%
4th	80,216	17,636	13.6%	42.2	0.220	0.078	8,158	35.9%
5th	148,303	21,305	12.4%	42.1	0.144	0.050	3,968	17.5%
Total	75,674	15,542	14.1%	41.0	0.205	0.075	22,707	100.0%

Take Away 1: These are large debt-to-income loans.

Take Away 2: The borrowers are not low income.

## Lending Club Stats from Morse (2015, Annual Review of F.E.)

Type of Loan	Annual Income	Loan Amount	Interest Rate	Term Months	Count	% of Sample	Payments
Car	65,993	8,556	0.134	39.2	185	0.8%	\$267.29
Credit Card	74,017	15,406	0.134	39.8	5,680	25.0%	\$475.58
Debt Consolidation	75,468	16,350	0.141	41.6	13,797	60.8%	\$492.27
Home Improvement	87,893	15,056	0.129	41.8	1,120	4.9%	\$444.33
House	82,617	16,912	0.139	41.7	138	0.6%	\$506.25
Major Purchase	78,365	9,740	0.129	39.4	443	2.0%	\$301.56
Medical	73,325	8,375	0.191	38.0	122	0.5%	\$289.11
Moving	76,911	8,325	0.193	37.6	73	0.3%	\$290.08
Other	68,913	9,702	0.197	40.0	696	3.1%	\$324.56
Renewable Energy	99,977	12,602	0.194	42.5	11	0.0%	\$401.91
Small Business	92,278	17,023	0.193	40.9	253	1.1%	\$557.48
Vacation	63,913	6,003	0.190	36.9	55	0.2%	\$211.76
Wedding	70,315	11,703	0.194	39.4	134	0.6%	\$394.56
Total	75,674	15,542	0.141	41.0	22,707	100.0%	\$473.86

Take Away 3: These loans are overwhelmingly debt consolidations (credit card debt generally). Also see new work by Balyuk (2016)

## Survey of Consumer Finance Stats from Morse (2015)

Income Quintile	Mean Consumer Debt	Percent with No Borrowing	Debt Conditional on Borrowing	Household Income	Debt-to-Income
1st	7,968	52.4%	15,194	14,908	0.575
2nd	9,458	43.6%	21,702	31,358	0.306
3rd	16,777	30.0%	55,923	49,985	0.339
4th	22,198	22.6%	98,438	78,977	0.280
5th	35,351	33.0%	107,058	247,445	0.204
Average	17,208	37.5%	45,839	75,631	0.361

But....

	Education Loans	Vehicle Loans	Credit Card Debt	Line of Credit	Other Loans	Total Consumer Debt
Average	4,833	3,938	2,650	4,506	1,281	17,208

Take Away 4: The LC people consolidating \$15k are extremely heavy on high-cost debt relative to the population

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Take Away 5: Mean interest rates on LC loans are 14.1%. Plus borrower pays origination fee, with size depending on risk bucket. It adds another 3% to the 41 month installment loan.

- Not cheap: 17%
- But revealed preference

## Survey of Consumer Finance Stats from Morse (2015)

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Income Quintile	Mean Interest Rate of Highest Debt
1st	14.50
2nd	14.04
3rd	13.86
4th	13.28
5th	13.01
Average	13.63

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Take Away 5 (continued): Compared to average borrower, LC loans are expensive.

- Why?
- From Take-away 4, these borrowers have high debt (countering relatively high income and pretty good FICO scores).

# Summary: Picture of borrowers

- These are prime borrowers
  - Who have decent credit scores
  - And above-median income
  - But large debt
- Refinancing credit card debt into installment platform products
  - By revealed preference, it must be that they are paying more (20-29%) on credit cards
- This is not expansion of credit per se.
  - By in fact it does expand credit, because it expands the credit capacity of these high debt borrowers
    - What happens when they ramp up the credit cards AND have the platform loans?(!)

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Take Away 6: Payments are about \$480 per month. Is that constraining?

## Consumer Expenditure Survey: Household Budget Share for Consumption Goods

Clothing / Jewelry	0.033
Housing	0.191
Food at home	0.268
Food away	0.046
Alcohol/ Tobacco	0.021
Personal Care	0.009
Communication & Media	0.040
Entertainment Services	0.026
Utilities	0.061
Other Transportation	0.097
Health & Education	0.073
Other Non-durable	0.028
Home Furnishings	0.062
Entertainment Durables	0.004
Vehicles	0.041
Sum of yellow	0690

- Is \$480 in monthly payments large relative to a \$70,000 income?
- First, taxes. Assume 25%
  - Leaves \$4400 per month
- Let's look at household budget shares
  - (table from Bertrand & Morse (2014))
  - Minimum of 69% absorbed by relatively inflexible items. Maybe 79%.
  - Leaves \$900-\$1300 in disposable income per month.
  - Is \$480 constraining? Yes

# Macro: Profile of borrowers (consumer)

- Statistics from Mach and Carter (2016):
  - Almost \$50 billion in loans were sought on LC platform in 2015 by 3.3 million people
  - Average loan sought is \$10,000
  - 13% are funded
- De Roure, Pelizzon, Tasca (2016) study German context of P2P where the choice set for households is more defined
  - Households mostly have credit card debt from local bank
  - Thus can use the choice of new platforms is more of a direct comparison of new versus the observable credit card data
  - Find: platforms charge higher rates, but fair in risk-adjusted sense

# Macro: Profile of borrowers (SME)

- Schweitzer & Barkely (2016), smaller, younger, less profitable firms with less collateral apply to platforms compared to bank loans
  - Li (2016): Firms with more growth but less internal cash or collateral go to marketplace lending;
    - This extra risk is priced
- 
- Me: Is risk priced enough?
    - Recent struggles of some SME lenders
    - History of SME lending failure: How does platform resolve lack of recourse and ex post moral hazard?
- 
- Lin & Zhang (2016): Marketplace investors invest closer to home in equity (as opposed to debt) – clustering of equity marketplace

# Macro: Aggregate risk

- People have credit capacity slack, but little disposable income breathing room
- Default happens on Lending Club loan when:
  - (1) small shock to disposable income or expenses
  - (2) continually run a deficit, re-ramping up credit cards and eventually getting into trouble again
    - Very common in consumer finance data
- Evidence: Hertzberg, Liberman, Paravisini (2015): FICO scores decline on average, because of distribution skewing to the left.

# Macro: Aggregate Risk

## Important tangent

- I have often thought that one reason payday loans are much more used in the UK (15% of population) than the U.S. (5%) is because the accepted form is online
- Hundtofte & Gladstone (2016): find that applicants applying via mobile apps are riskier than those applying via the internet during a roll-out of a Mobile App
  - Early work, but these authors have a great question that has a lot of implications

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# Regulation: “The Wild West”

- Some aspects to consider
  1. Discrimination via platform demographics
    - E.g., In the U.S., zip codes are not allowed in bank lending because correlated with race.
    - But we know from work by Crowe and Ramcharan (2013) that zip code data can be used for pricing risk
  2. Are platforms banks?
    - Platforms generally use a pass-through bank (like other non-bank lenders do) to avoid regulations of being a bank
  3. Transparency (standardization) in risk buckets
    - Investor-lenders count on lenders to truthfully place prospective borrowers into risk buckets
    - No regulation on this accounting
  4. Credit registry

# Final thoughts: Evolution vs. Disruption

- Do peers matter: perhaps, but only social media peers
- Evolution not disruption:
  - Future is as much about integration of platforms, networks into traditional banking than about disrupting markets
    - OnDeck relationship with J.P. Morgan
  - How much of finance will transfer to completely new players?
    - Depends on specifics of contracts:
    - Eg: Houses, cars
      - Are platforms at an advantage in managing servicing on collateral?
      - Are platform investors wary of 30 year contracts?
      - Where is the secondary market?
- On thing is for sure: Platform technology is here to stay