

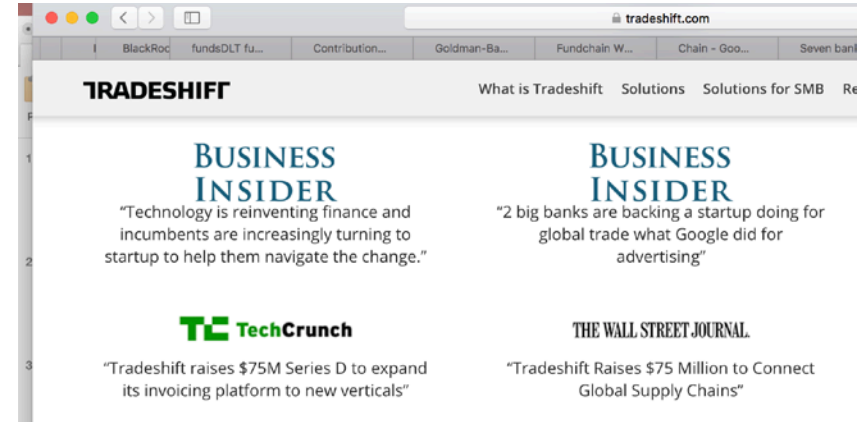
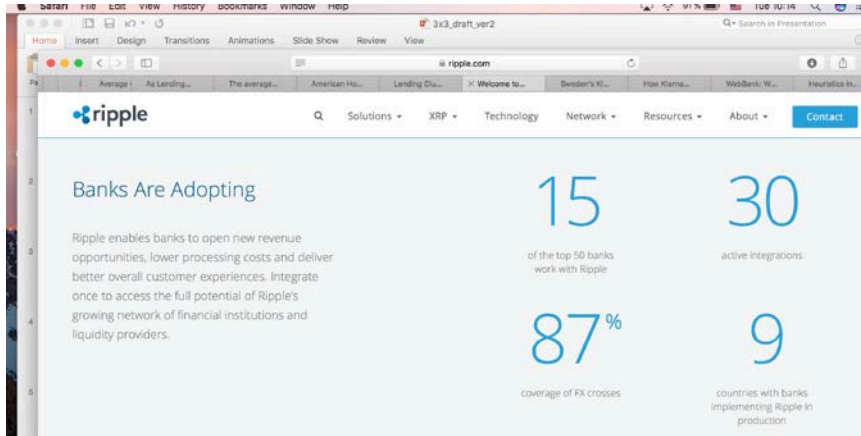
# Corporate innovation, collaborative platforms, changing market dynamics

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June 21, 2017

# Innovative platforms form market dynamics



# Innovative services: Too many options

13.10 – 13.50 **SHORT & SHARP STAGE** - One of the world's first blockchain for fund managers in action | FundsDLT

13.10 – 13.50 **SHORT & SHARP** - FundChain & Cybersecurity

*“IBM launches enterprise-ready blockchain service”*

- Reuters, March 20, 2017



# Innovative services: Too many options

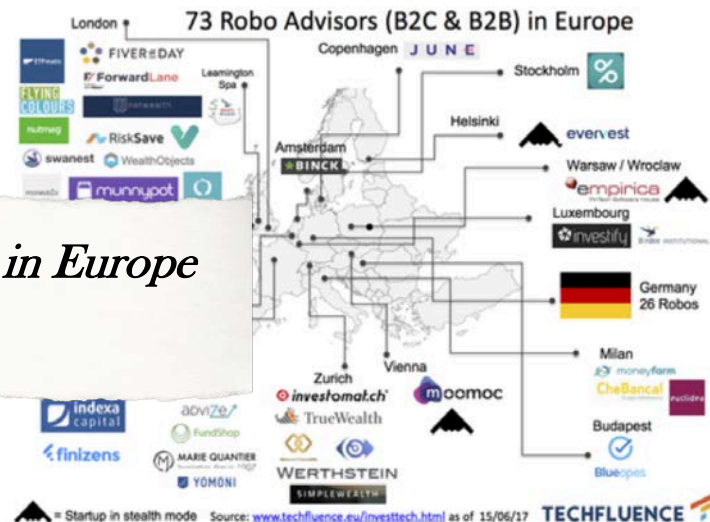
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*"IBM launches blockchain service"*

- Reuters

*"BlackRock takes Scalable Capital stake in Europe 'robo-advisor' push"* - Reuters, Jun 19, 2017



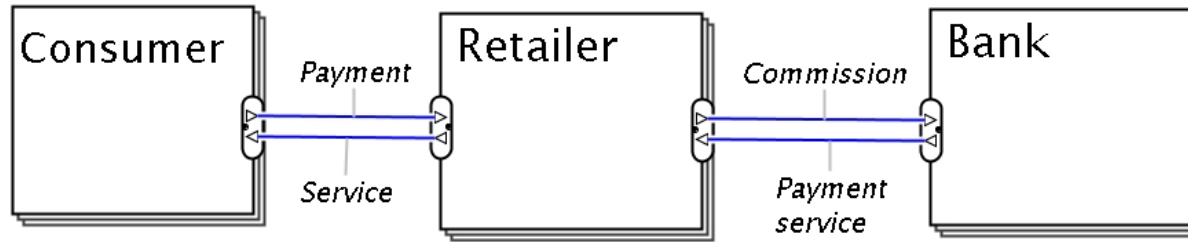
# Take-away: Transaction engineering

- What is a feasible choice?
  - All stakeholders in the constellation share an *aligned value proposition*
- Let us understand the dynamics of stakeholder relationships
  - “*Why would customers stay?*” “*Is it more beneficial to develop?*”
  - Focus on the dynamics of transaction and switching costs *ex-post*
- Important side-effect: Translating observations on relationships to conceptual models to enhance innovative service design *ex-ante*

# People are irrational in their financial decisions

- Intuition and logical thinking: Two different mechanisms (*Kahnemann, 2011*)
- Individuals might as well choose for a financial service intuitively
  - Literature tells about the phenomenon of retail investor's underperformance (*Bhattacharya et al., 2012*)
- Conceptualization translates ideas into traceable forms (*ontologies*)

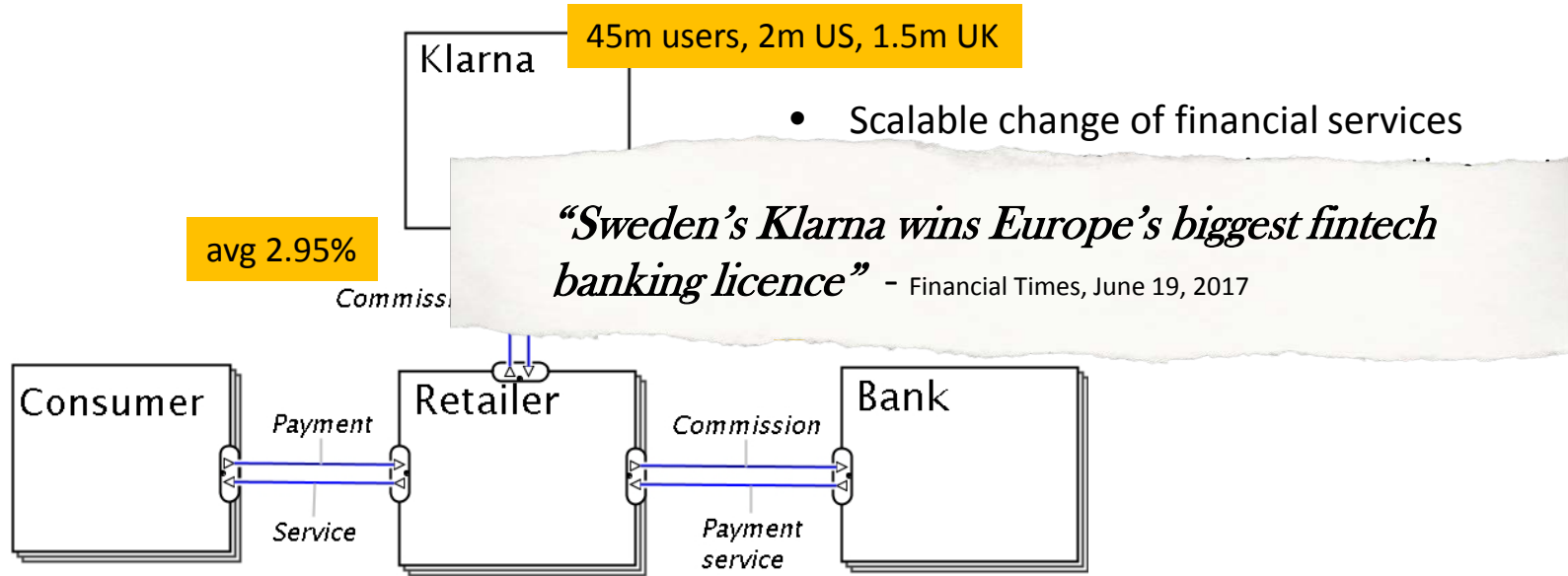
# A simple constellation



Editor: e3value, see: <http://e3value.few.vu.nl/tools/>

Transaction costs: What is the cost of value provided and received in return?

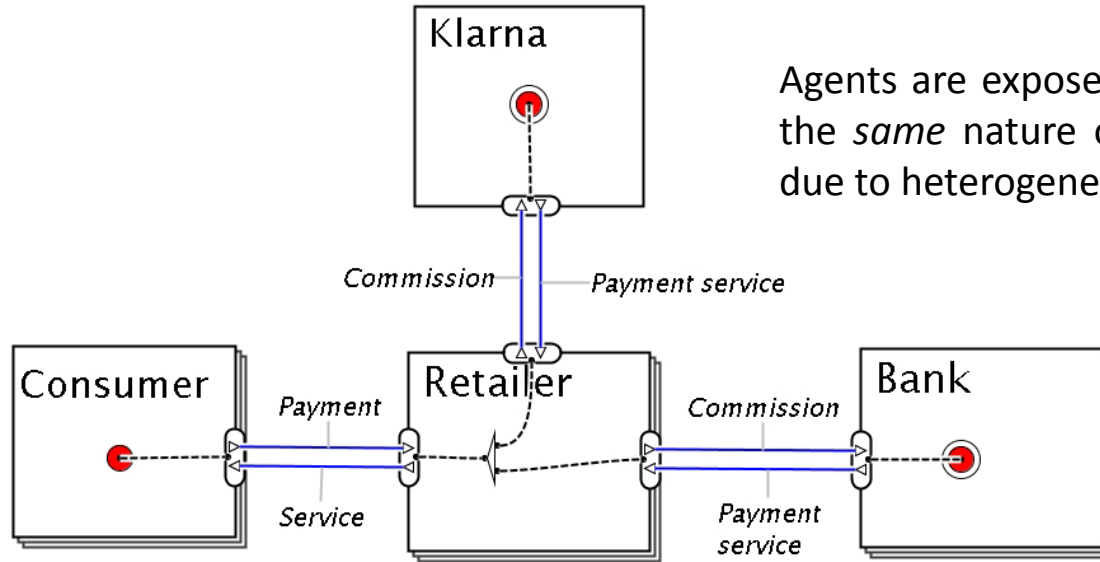
# Change in dynamics: Competition



Switching costs: What is the difference between *value* provided and received in return?



# Transitional effects: How do transactions relate?



Agents are exposed to different financial services of the *same* nature of transaction that are *in relation* due to heterogeneous setup of the network

What is the equilibrium between transaction and switching?

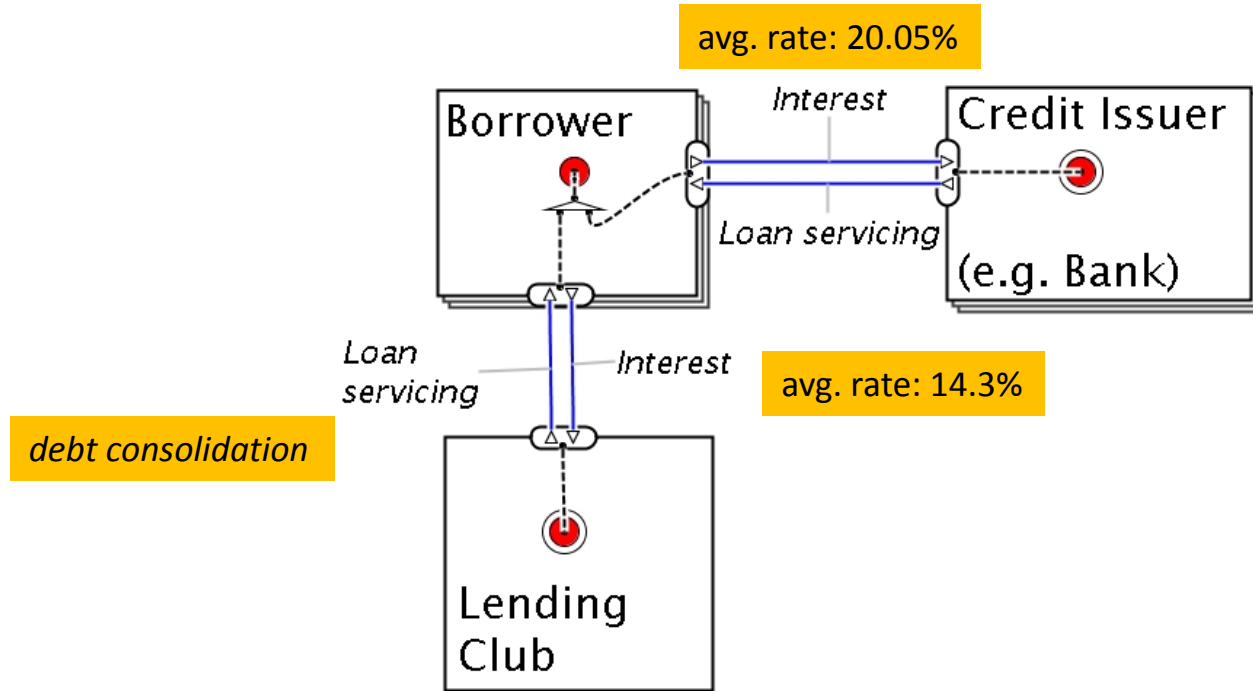
# Lending Club

- Peer2peer marketplace for debt consolidation
- Started in 2006 as a Facebook application
- Prosperous start, nowadays mixed news

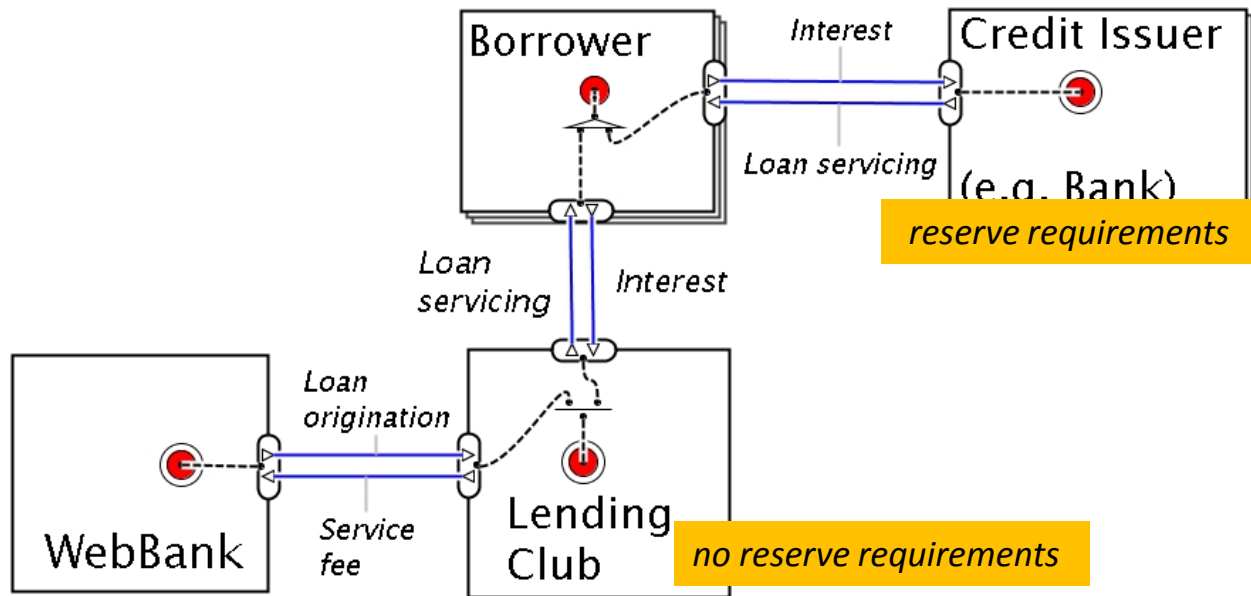
*“As Lending Club Stumbles, Its Entire Industry Faces Skepticism”* – New York Times, May 9, 2016

- Plans for regulatory measures world-wide (see e.g. China)

# Disruptive service for personal loans



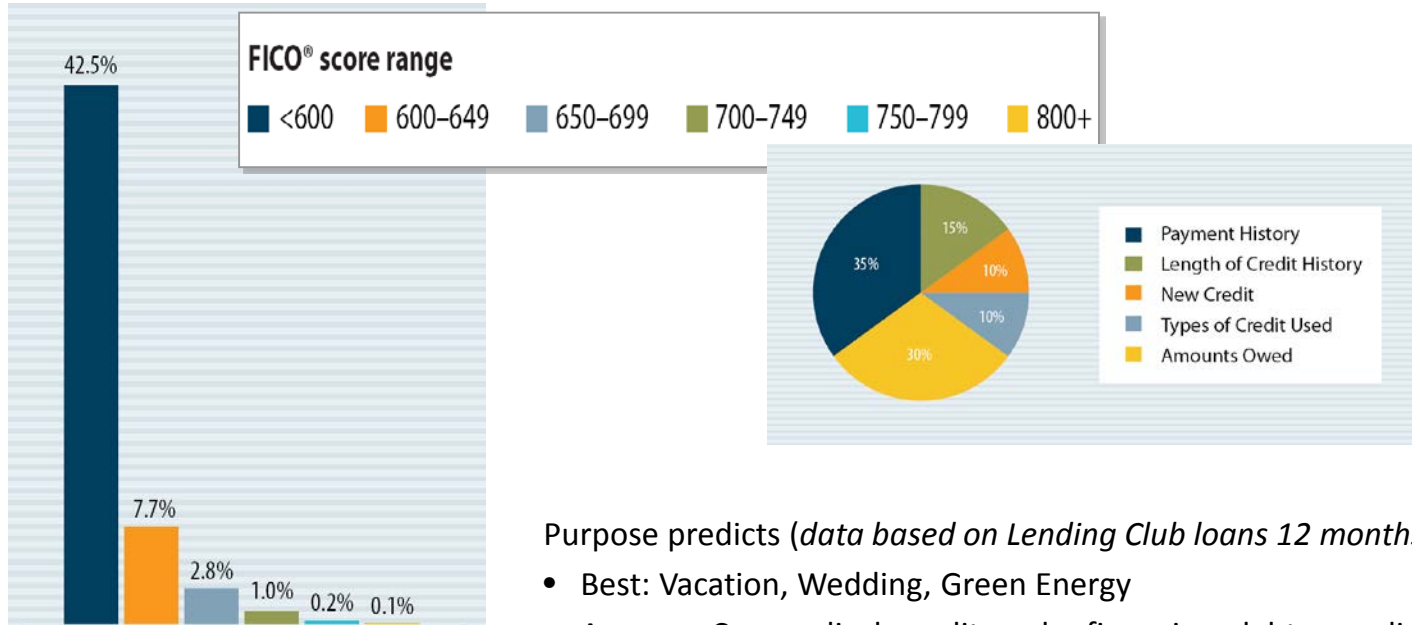
# Retail credit management via marketplace



# Potential research questions

- Question 1: Why can Lending Club offer lower rates enticing so many borrowers?
- Question 2: Why are investors willing to lend through Lending Club rather than other alternatives (such as corporate bonds)?
- Question 3: If traditional credit card issuers do not receive high interest and financing fees in the future how must the business model change?
- Question 4: Can we forecast opportunistic behavior and thus control for systemic risk?

# Q1: Defaults and credit worthiness are predictable



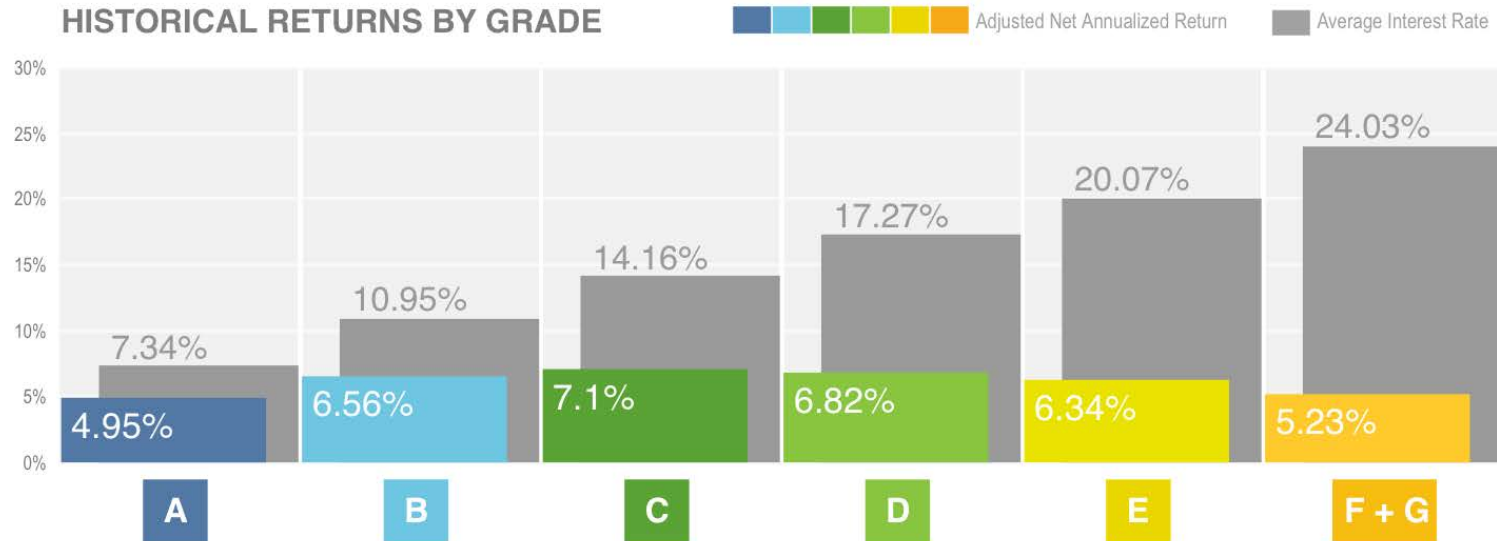
Purpose predicts (*data based on Lending Club loans 12 months and older*):

- Best: Vacation, Wedding, Green Energy
- Average: Car, medical, credit card refinancing, debt consolidation
- Worst: Moving, education, home down payment, home improvement, business loan

# Q1: Individualized pricing based on credit worthiness

- 35 different credit rating categories in total for borrowers
- An interest rate is assigned to each category
- Range of interest rates is very large from approximately 5% to 30%
  - Larger than range of credit card interest rates (usually 1 rate per card)
- Providing better pricing based on risk diversification = shared economy

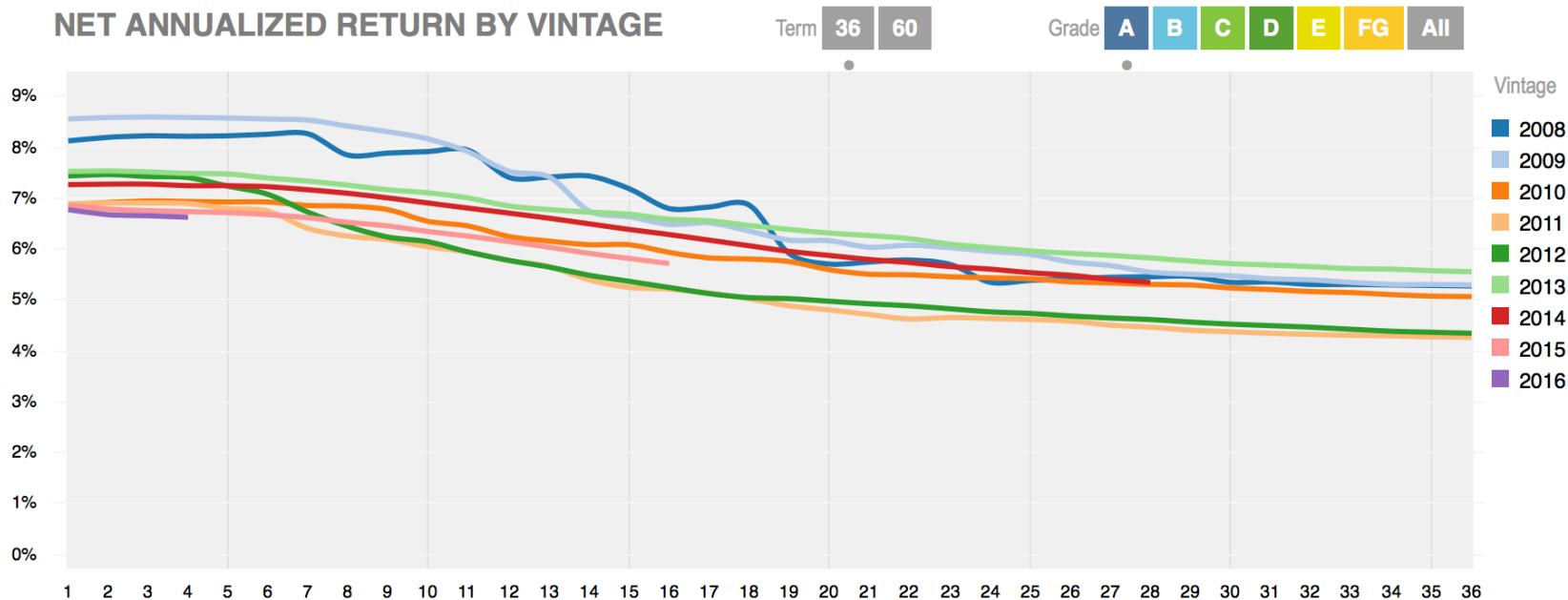
## Q2: Aggregated returns look promising



Source: Lending Club. Chart includes all loans that were issued 18 months or more before Q1 2017.

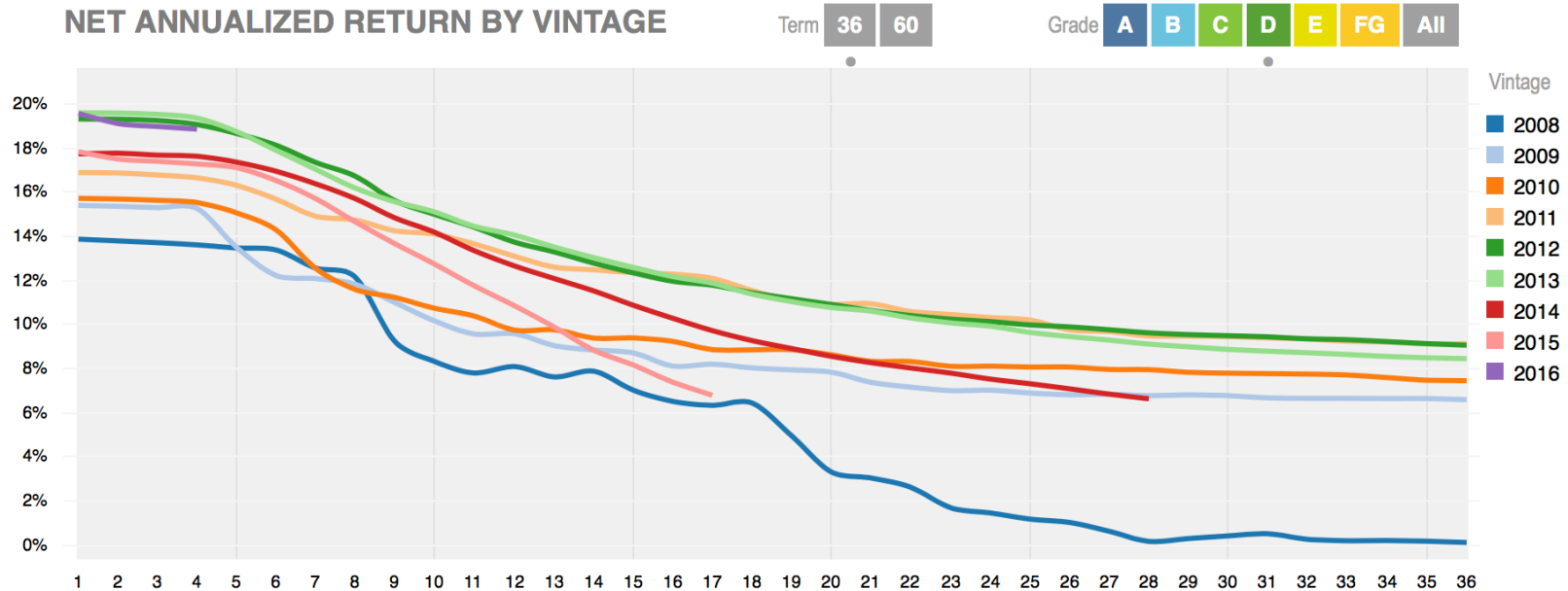


## Q2: Returns by vintage shows declining dynamics



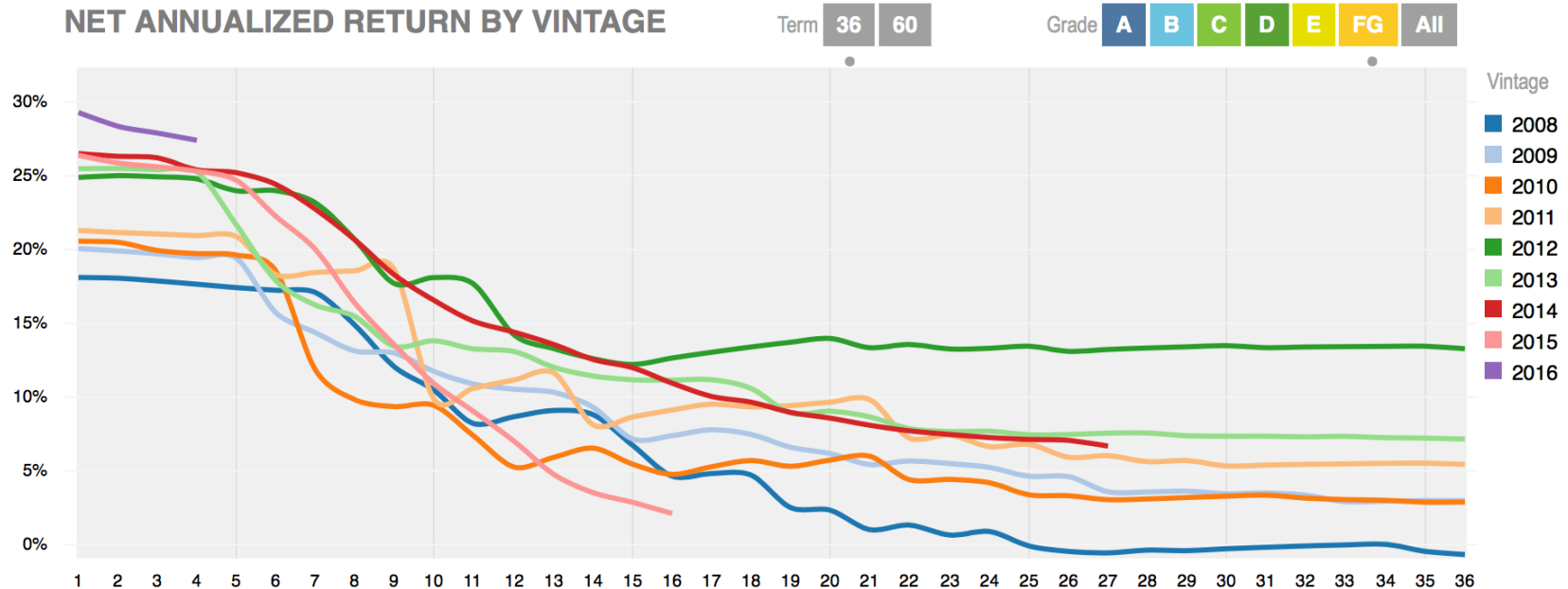
Source: Lending Club

# Q2: Returns by vintage shows declining dynamics



Source: Lending Club

## Q2: Returns by vintage shows declining dynamics

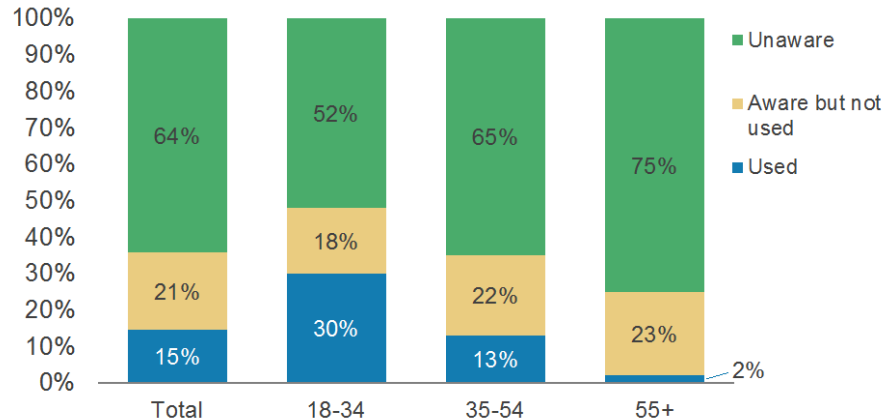


Source: Lending Club

## 2: Generational shift in tech awareness. Rate matters.

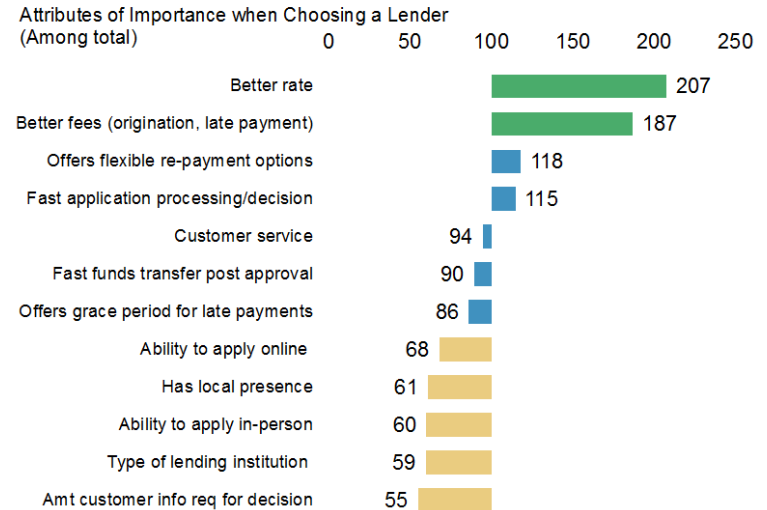
### P2P Lender Awareness and use, by age

P2P Lender Awareness and Use (by age)



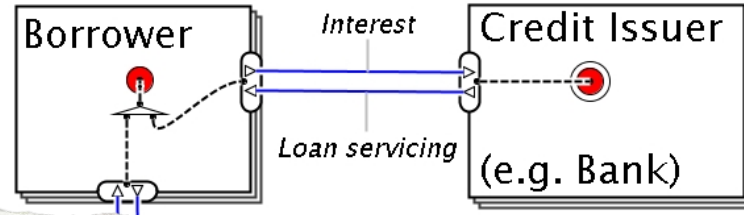
Source: AlphaWise, Morgan Stanley Research

### Important attributes when choosing a lender

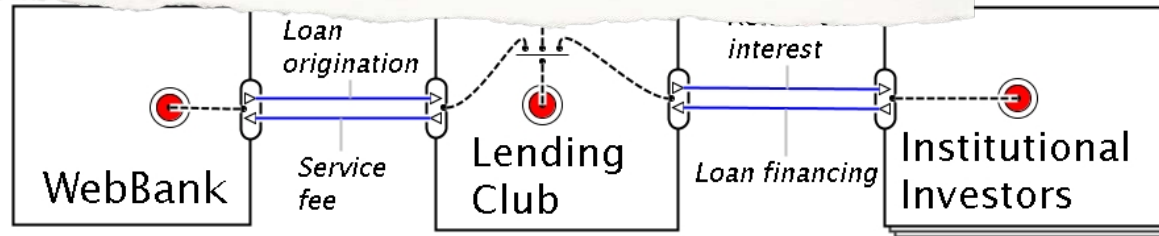


Source: AlphaWise, Morgan Stanley Research

## Q2: Where shall I Invest today?

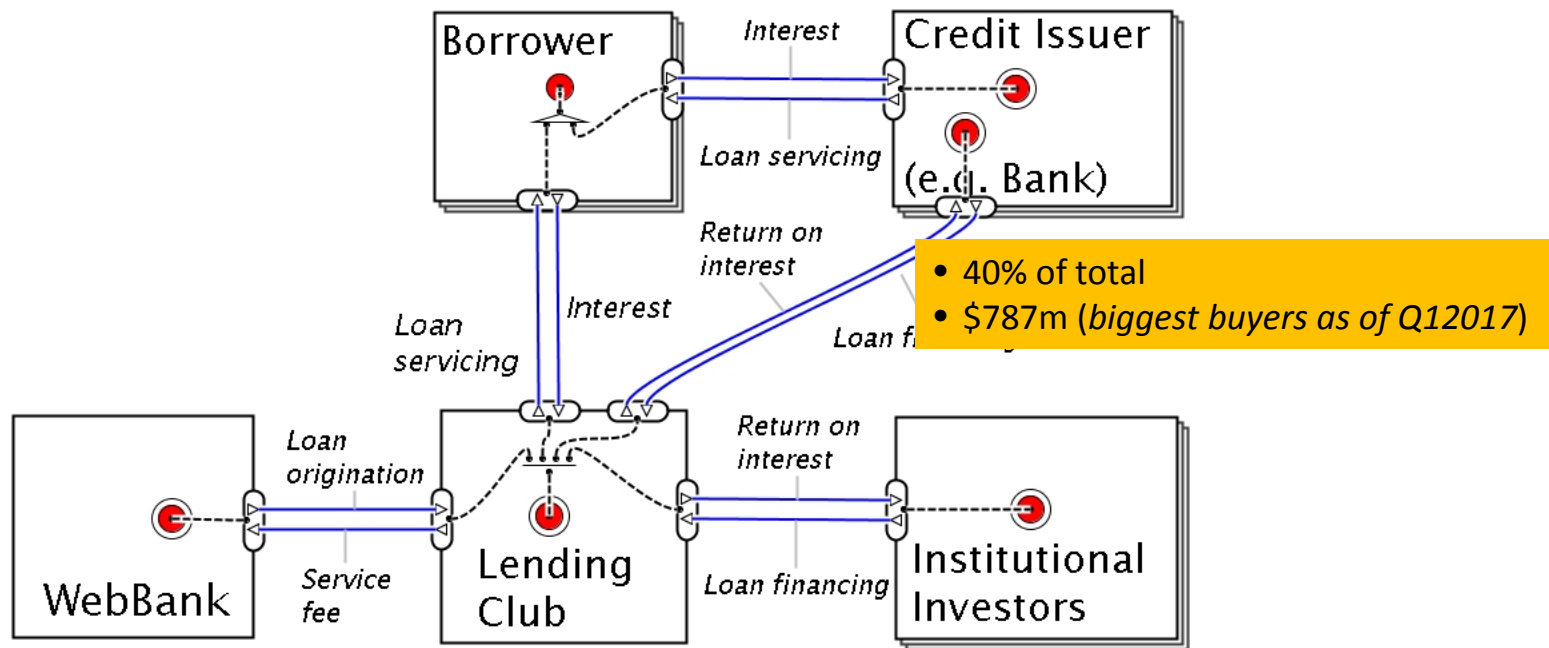


*“Peer-to-peer comes of age as alternative asset class for investors”* – Financial Times, June 11, 2017

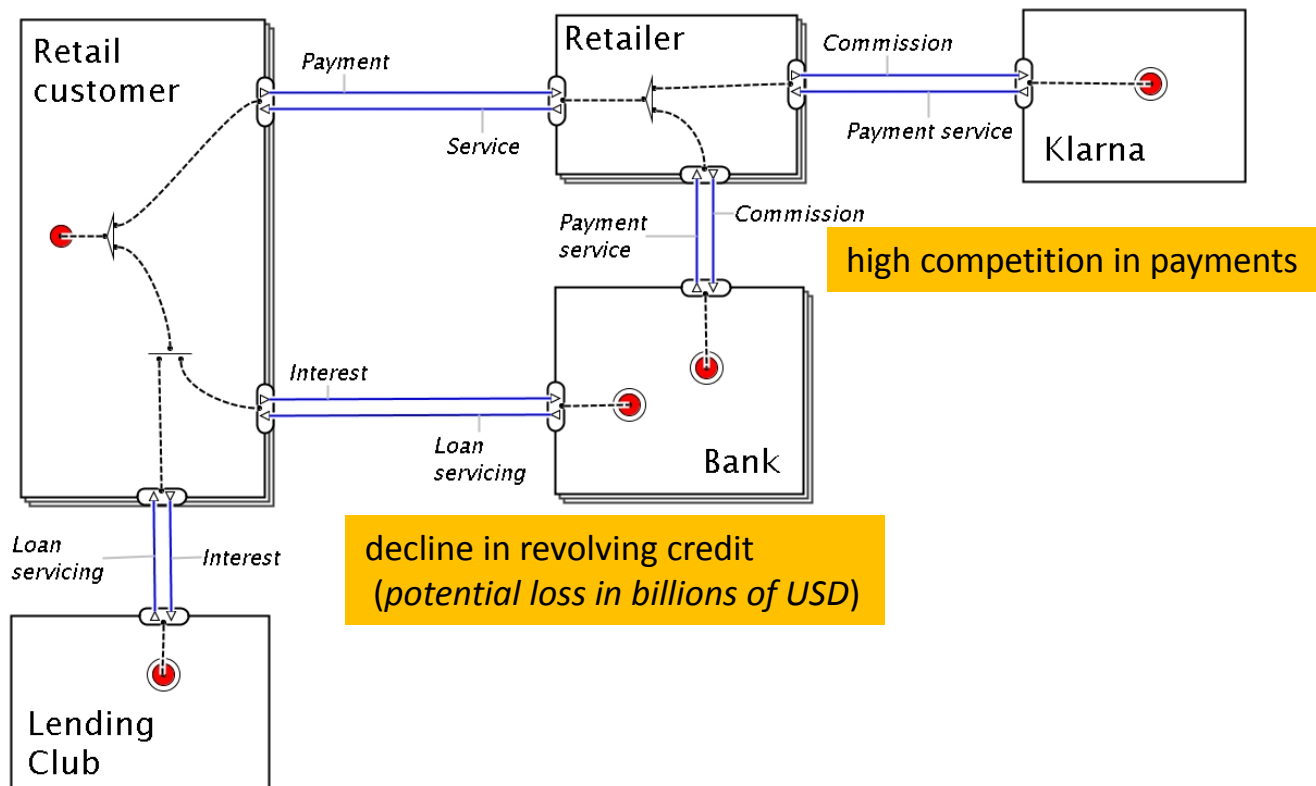


- Risk of default
- Diversification

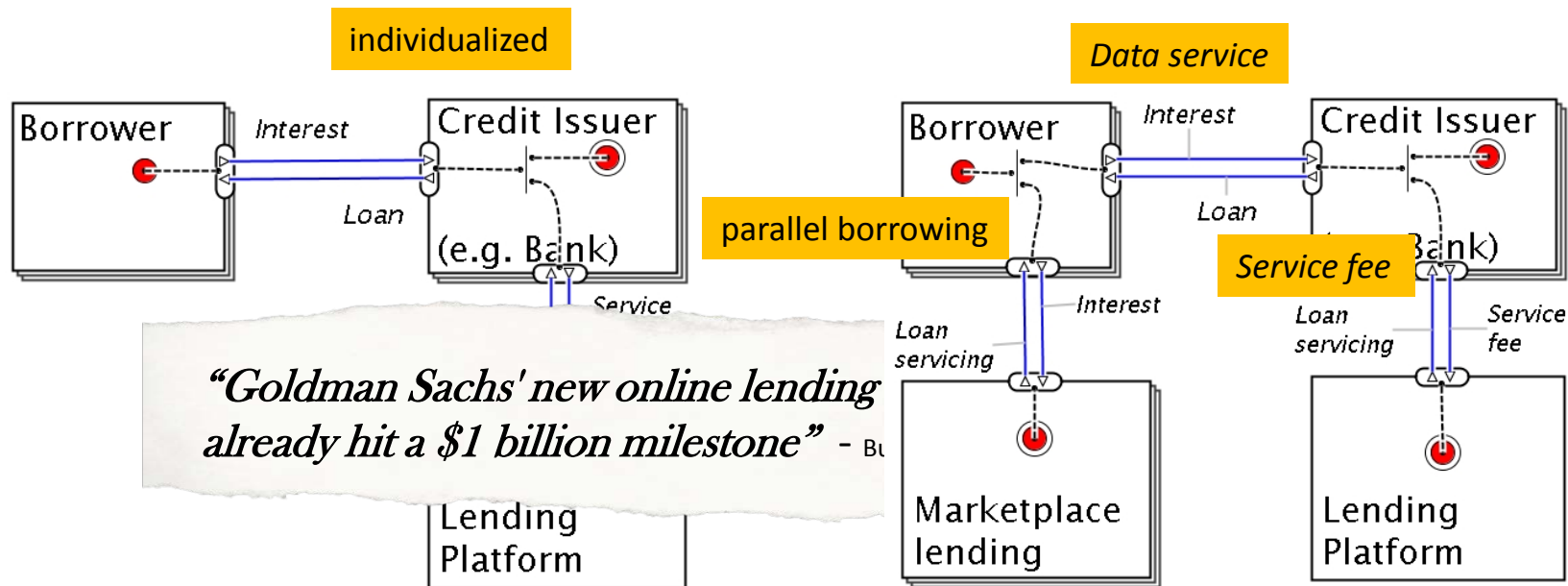
## Q2: Banks have growing interest in investing



# Q3: Retail credit market is about to change



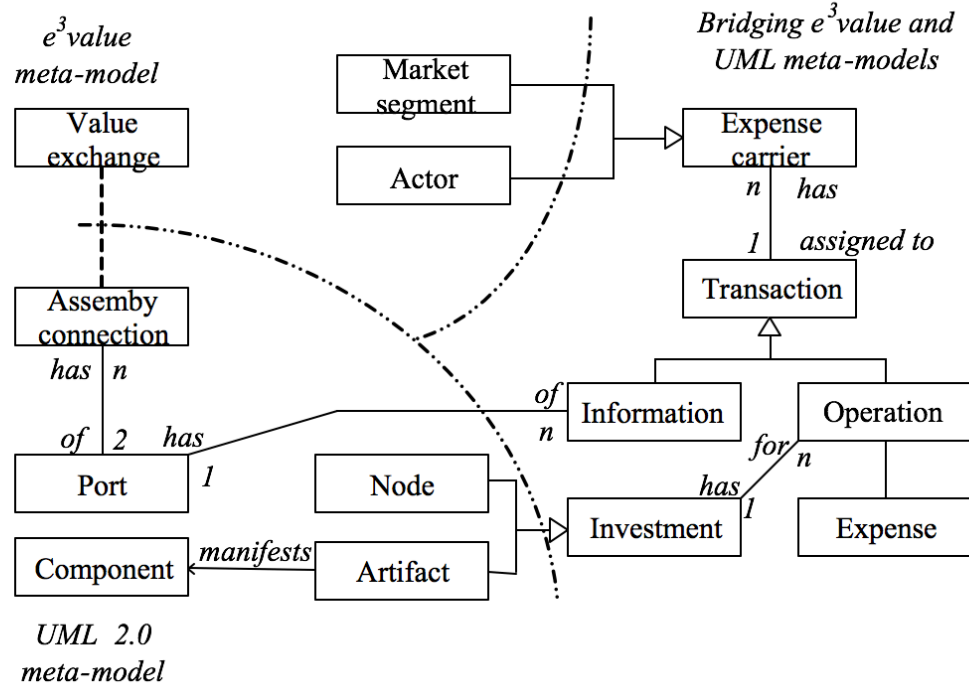
# Q3+4: Adaption. Data as asset class.



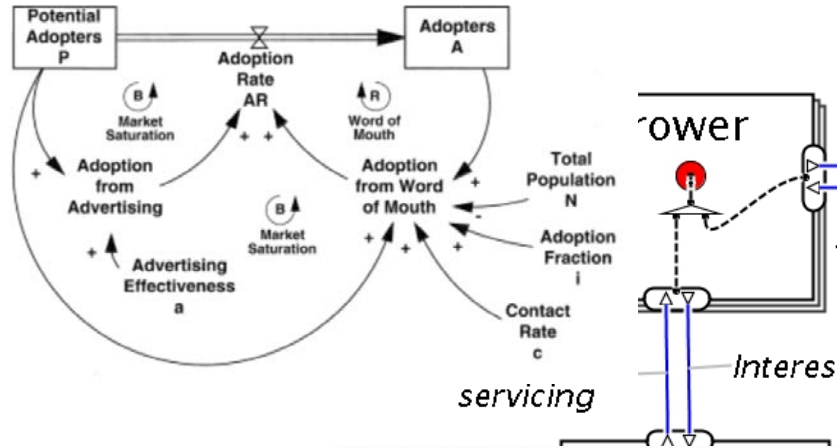
Pagano and Jappelli (2002): Banks sharing information would increase lending to safe borrowers, thereby decreasing default rates.  
Doblas-Madrid and Minetti (2013): Lenders may reduce credit in anticipation of other lenders' reaction to negative news.



# Conceptual models to translate implications...



# ... To assist multi-perspective analysis



**Algorithm 2**  $pathSelection(G_T(V, E, W), \{g_i(t)\}, v_s, v_e, t^*)$

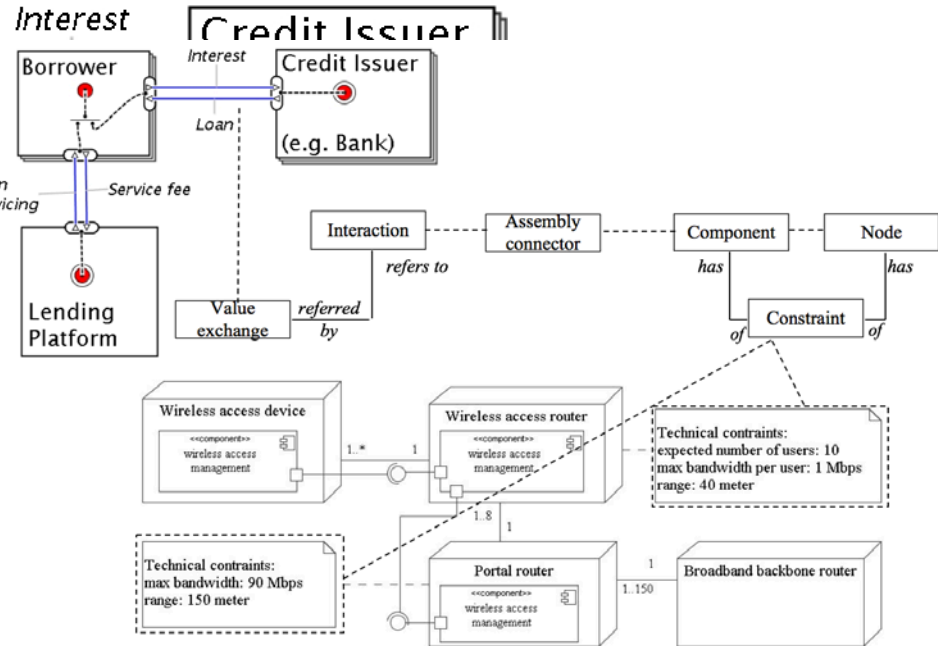
**Input:** a time-dependent graph  $G_T$ , the set of earliest arrival-time functions  $g_i(t)$  for all nodes  $v_i \in V$ , source node  $v_s$ , destination node  $v_e$ , and the optimal starting time  $t^*$ ;

**Output:** an optimal  $v_s$ - $v_e$  path  $p^*$  for starting time  $t^*$ .

```

1:  $v_j \leftarrow v_e$ ;
2:  $p^* \leftarrow \emptyset$ ;
3: while  $v_j \neq v_s$  do
4:   for each  $(v_i, v_j) \in E$  do
5:     if  $g_i(t^*) + w_{i,j}(g_i(t^*)) = g_j(t^*)$  then
6:        $v_j \leftarrow v_i$ ; break;
7:    $p^* \leftarrow (v_i, v_j) \cdot p^*$ ;
8: return  $p^*$ ;

```



# Thank you!

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