

The rise of Shadow Banking

Money in the digital Age

The Future of Money
Frankfurt, 24. Nov 2018
Jonathan McMillan



THE END OF BANKING

MONEY, CREDIT, AND THE DIGITAL REVOLUTION

1. Alex establishes a bank.

Asset Side		Liability Side	
80	Cash		
		Equity Alex	80
80	Total	Total	80



2. Sarah obtains a loan from the bank.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	60
60	Loan Sarah	Equity Alex	80
140	Total	Total	140



3. Sarah buys a coffee roaster from Ryan.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
		Equity Alex	80
140	Total	Total	140

1. Alex establishes a bank.

Asset Side		Liability Side	
80	Cash		
		Equity Alex	80
80	Total	Total	80



2. Sarah obtains a loan from the bank.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	60
60	Loan Sarah	Equity Alex	80
140	Total	Total	140



3. Sarah buys a coffee roaster from Ryan.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
		Equity Alex	80
140	Total	Total	140

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
		Equity Alex	80
140	Total	Total	140



4. Julia obtains a loan from the bank.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
60	Loan Julia	Deposit Julia	60
		Equity Alex	80
200	Total	Total	200



5. Julia buys a coffee roaster from Ryan.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	120
60	Loan Julia	Deposit Julia	0
		Equity Alex	80
200	Total	Total	200

1. Alex establishes a bank.

Asset Side		Liability Side	
80	Cash		
		Equity Alex	80
80	Total	Total	80



2. Sarah obtains a loan from the bank.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	60
60	Loan Sarah	Equity Alex	80
140	Total	Total	140



3. Sarah buys a coffee roaster from Ryan.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
		Equity Alex	80
140	Total	Total	140

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
		Equity Alex	80
140	Total	Total	140



4. Julia obtains a loan from the bank.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
60	Loan Julia	Deposit Julia	60
		Equity Alex	80
200	Total	Total	200



5. Julia buys a coffee roaster from Ryan.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	120
60	Loan Julia	Deposit Julia	0
		Equity Alex	80
200	Total	Total	200

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	120
60	Loan Julia	Deposit Julia	0
		Equity Alex	80
200	Total	Total	200



6. Ryan buys coffee from Sarah.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	60
60	Loan Sarah	Deposit Ryan	60
60	Loan Julia	Deposit Julia	0
		Equity Alex	80
200	Total	Total	200



7. Sarah repays her loan.

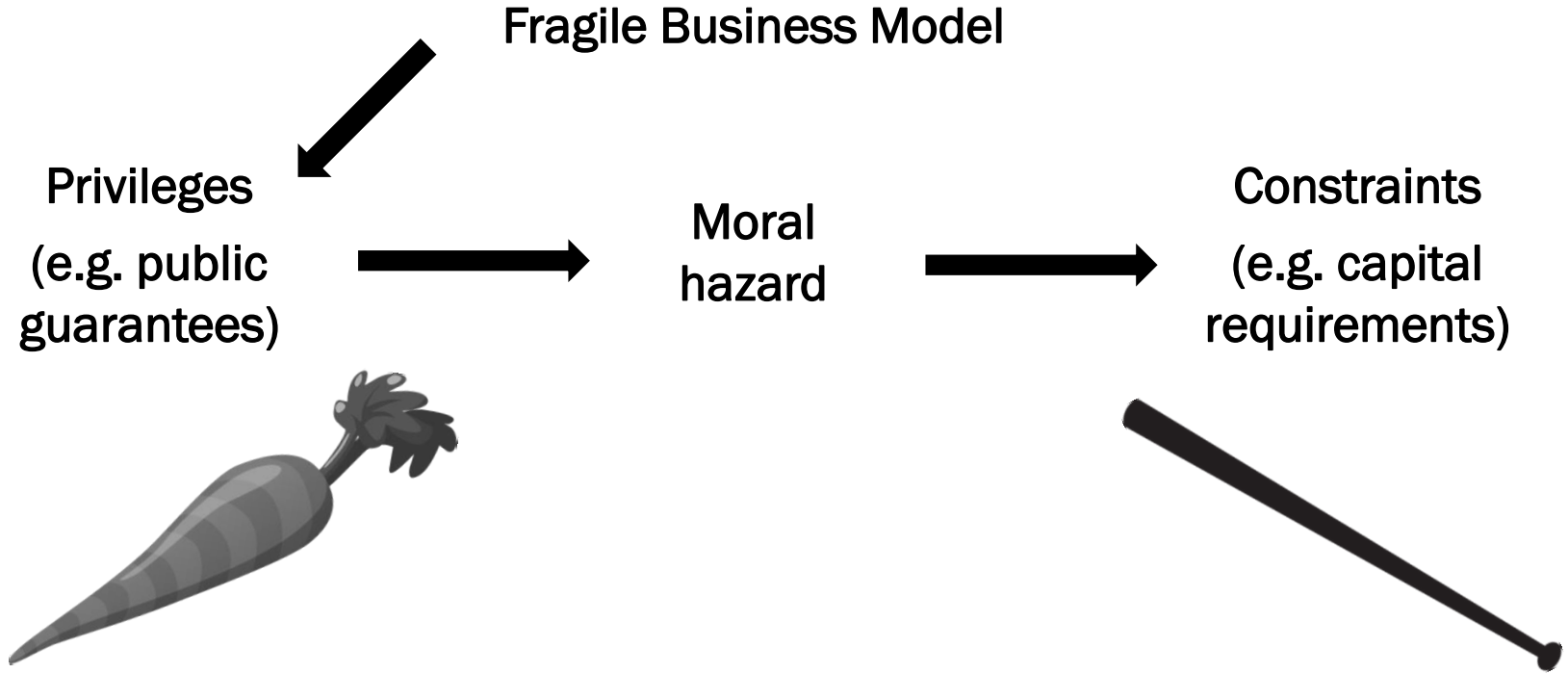
Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
0	Loan Sarah	Deposit Ryan	60
60	Loan Julia	Deposit Julia	0
		Equity Alex	80
140	Total	Total	140

Fractional Reserve Banking is fragile



Source: Bundesarchiv, Bild 102-12023 / Georg Pahl / CC-BY-SA 3.0

Fragility calls for Banking regulation



1. Alex establishes a bank.

Asset Side		Liability Side	
80	Cash		
		Equity Alex	80
80	Total	Total	80



2. Sarah obtains a loan from the bank.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	60
60	Loan Sarah	Equity Alex	80
140	Total	Total	140



3. Sarah buys a coffee roaster from Ryan.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
		Equity Alex	80
140	Total	Total	140

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
		Equity Alex	80
140	Total	Total	140



4. Julia obtains a loan from the bank.

Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	60
60	Loan Julia	Deposit Julia	60
		Equity Alex	80
200	Total	Total	200



5. Julia buys a coffee roaster from Ryan.

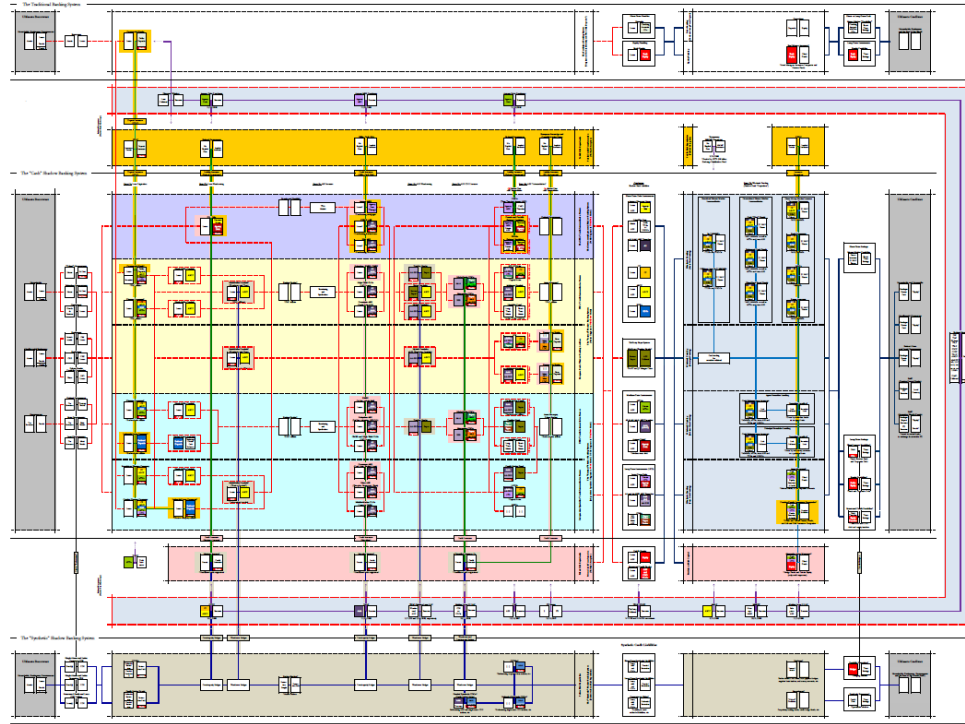
Asset Side		Liability Side	
80	Cash	Deposit Sarah	0
60	Loan Sarah	Deposit Ryan	120
60	Loan Julia	Deposit Julia	0
		Equity Alex	80
200	Total	Total	200

But wait, what about MBS,CDO,CDS,REPO & CO



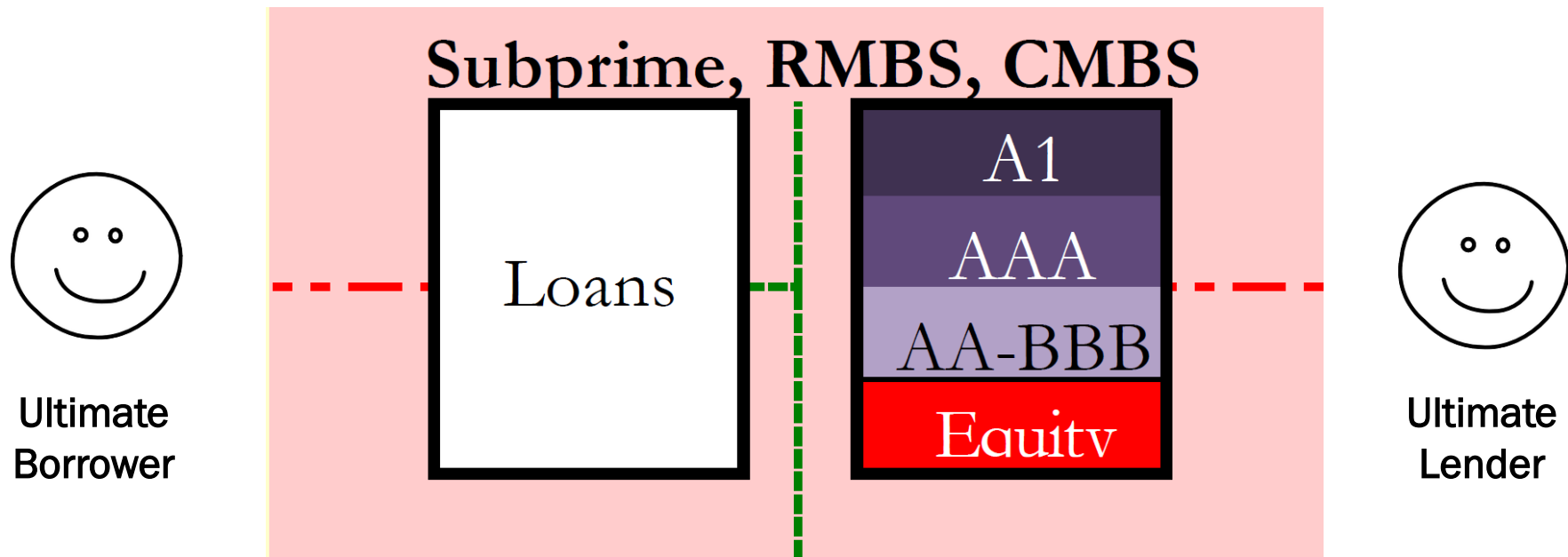
Source: Unknown (from <https://assets.nerdwallet.com/blog/wp-content/uploads/2017/02/Bookkeeper-and-teller.jpg>)

Welcome to Modern Finance



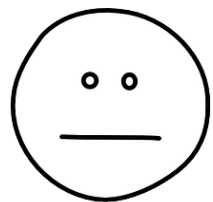
Source: Pozsar et al. (2010)

The signature product of the financial crisis of 2008

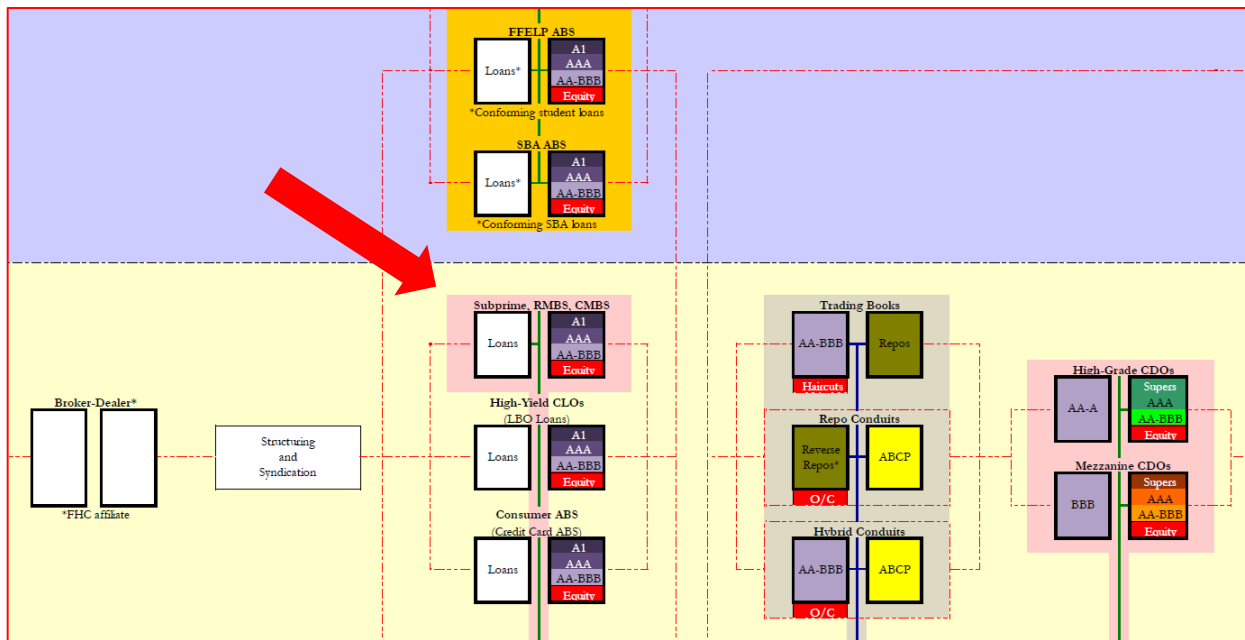


Source: Pozsar (2010)

The signature product of the financial crisis of 2008



Ultimate
Borrower

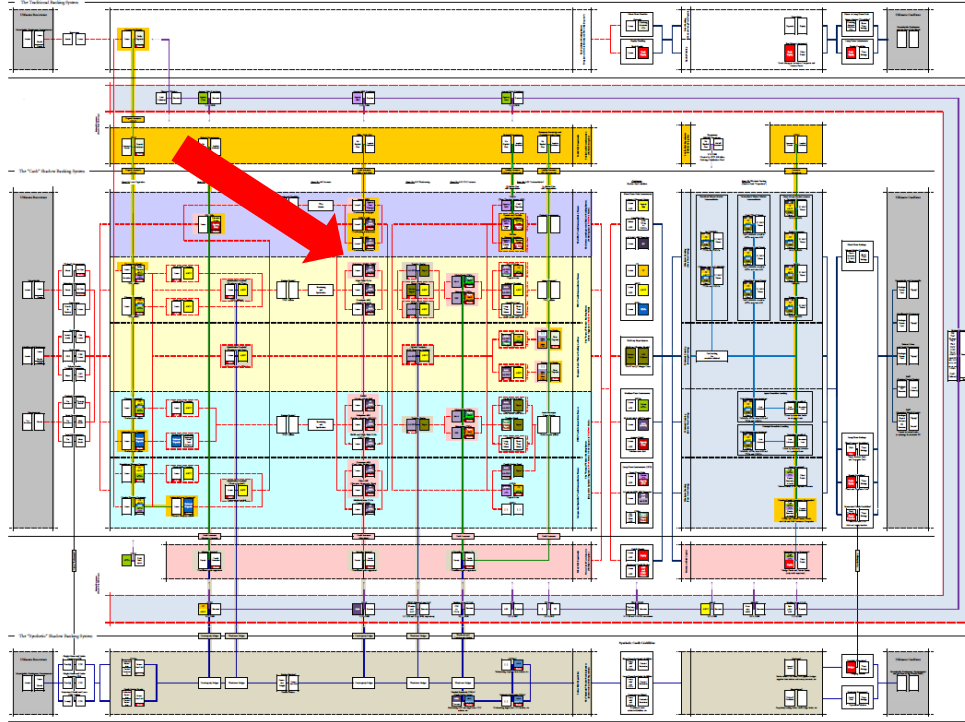


Source: Pozsar (2010)

The Rise of Shadow Banking



Ultimate
Borrower



Ultimate
Lender

1. Sarah obtains a loan and deposits the money into her MMMF account.

Asset Side		MMMF	Liability Side		Asset Side	Bank	Liability Side	
60	Cash		Shares Sarah	60	20	Cash		
					60	Loan to Sarah		
							Equity Alex	80
60	Total		Total	60	80	Total	Total	80



2. Sarah buys a coffee roaster from Ryan, using the MMMF's payment services.

Asset Side		MMMF	Liability Side		Asset Side	Bank	Liability Side	
60	Cash		Shares Sarah	0	20	Cash		
			Shares Ryan	60	60	Loan to Sarah		
							Equity Alex	80
60	Total		Total	60	80	Total	Total	80



3. Alex securitizes Sarah's loan.

Asset Side		MMMF	Liability Side		Asset Side	Bank	Liability Side	
60	Cash		Shares Sarah	0	20	Cash		
			Shares Ryan	60	54	ABS Sarah		
					6	Equity SPV	Equity Alex	80
60	Total		Total	60	80	Total	Total	80



4. Alex borrows money from the MMMF with a repo.

Asset Side		MMMF	Liability Side		Asset Side	Bank	Liability Side	
11	Cash		Shares Sarah	0	69	Cash	Repo	49
49	Repo		Shares Ryan	60	54	ABS Sarah		
					6	Equity SPV	Equity Alex	80
60	Total		Total	60	129	Total	Total	129

1. Sarah obtains a loan and deposits the money into her MMMF account.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
60	Cash	Shares Sarah 60	20	Cash	
			60	Loan to Sarah	
					Equity Alex 80
60	Total	Total 60	80	Total	Total 80



2. Sarah buys a coffee roaster from Ryan, using the MMMF's payment services.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
60	Cash	Shares Sarah 0	20	Cash	
		Shares Ryan 60	60	Loan to Sarah	
					Equity Alex 80
60	Total	Total 60	80	Total	Total 80



3. Alex securitizes Sarah's loan.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
60	Cash	Shares Sarah 0	20	Cash	
		Shares Ryan 60	54	ABS Sarah	
			6	Equity SPV	
					Equity Alex 80
60	Total	Total 60	80	Total	Total 80



4. Alex borrows money from the MMMF with a repo.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
11	Cash	Shares Sarah 0	69	Cash	Repo 49
49	Repo	Shares Ryan 60	54	ABS Sarah	
			6	Equity SPV	
					Equity Alex 80
60	Total	Total 60	129	Total	Total 129

5. Julia obtains a loan and deposits it in the MMMF as well.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 0	9	Cash	Repo 49
49	Repo	Shares Julia 60	54	ABS Sarah	
		Shares Ryan 60	60	Loan Julia	
			6	Equity SPV	
					Equity Alex 80
120	Total	Total 120	129	Total	Total 129



6. Julia buys a coffee roaster from Ryan, using the MMMF's payment services.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 0	9	Cash	Repo 49
49	Repo	Shares Ryan 120	54	ABS Sarah	
		Shares Julia 0	60	Loan Julia	
			6	Equity SPV	
					Equity Alex 80
120	Total	Total 120	129	Total	Total 129



7. Alex securitizes Julia's loan.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 0	9	Cash	Repo 49
49	Repo	Shares Ryan 120	54	ABS Sarah	
		Shares Julia 0	54	ABS Julia	
			12	Equity SPV	
					Equity Alex 80
120	Total	Total 120	129	Total	Total 129



8. Alex borrows more money from the MMMF via repo.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
22	Cash	Shares Sarah 0	58	Cash	Repo 98
98	Repo	Shares Ryan 120	54	ABS Sarah	
		Shares Julia 0	54	ABS Julia	
			12	Equity SPV	
					Equity Alex 80
120	Total	Total 120	178	Total	Total 178

1. Sarah obtains a loan and deposits the money into her MMMF account.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
60	Cash	Shares Sarah 60	20	Cash	
			60	Loan to Sarah	
					Equity Alex 80
60	Total	Total 60	80	Total	Total 80



2. Sarah buys a coffee roaster from Ryan, using the MMMF's payment services.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
60	Cash	Shares Sarah 0	20	Cash	
		Shares Ryan 60	60	Loan to Sarah	
					Equity Alex 80
60	Total	Total 60	80	Total	Total 80



3. Alex securitizes Sarah's loan.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
60	Cash	Shares Sarah 0	20	Cash	
		Shares Ryan 60	54	ABS Sarah	
			6	Equity SPV	
					Equity Alex 80
60	Total	Total 60	80	Total	Total 80



4. Alex borrows money from the MMMF with a repo.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
11	Cash	Shares Sarah 0	69	Cash	
49	Repo	Shares Ryan 60	54	ABS Sarah	
			6	Equity SPV	
					Equity Alex 80
60	Total	Total 60	129	Total	Total 129

5. Julia obtains a loan and deposits it in the MMMF as well.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 0	9	Cash	
49	Repo	Shares Julia 60	54	ABS Sarah	
		Shares Ryan 60	60	Loan Julia	
			6	Equity SPV	
					Equity Alex 80
120	Total	Total 120	129	Total	Total 129



6. Julia buys a coffee roaster from Ryan, using the MMMF's payment services.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 0	9	Cash	
49	Repo	Shares Ryan 120	54	ABS Sarah	
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			6	Equity SPV	
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120	Total	Total 120	129	Total	Total 129



7. Alex securitizes Julia's loan.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 0	9	Cash	
49	Repo	Shares Ryan 120	54	ABS Sarah	
		Shares Julia 0	54	ABS Julia	
			12	Equity SPV	
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120	Total	Total 120	129	Total	Total 129



8. Alex borrows more money from the MMMF via repo.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
22	Cash	Shares Sarah 0	58	Cash	
98	Repo	Shares Ryan 120	54	ABS Sarah	
		Shares Julia 0	54	ABS Julia	
			12	Equity SPV	
					Equity Alex 80
120	Total	Total 120	178	Total	Total 178

9. Ryan buys freshly roasted coffee from Sarah.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
22	Cash	Shares Sarah 60	58	Cash	
98	Repo	Shares Ryan 60	54	ABS Sarah	
		Shares Julia 0	54	ABS Julia	
			12	Equity SPV	
					Equity Alex 80
120	Total	Total 120	178	Total	Total 178



10. The repo on Sarah's ABS is not rolled over.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 60	9	Cash	
49	Repo	Shares Ryan 60	54	ABS Sarah	
		Shares Julia 0	54	ABS Julia	
			12	Equity SPV	
					Equity Alex 80
120	Total	Total 120	129	Total	Total 129



11. Alex reverses the securitization and puts Sarah's loan back on his balance sheet.

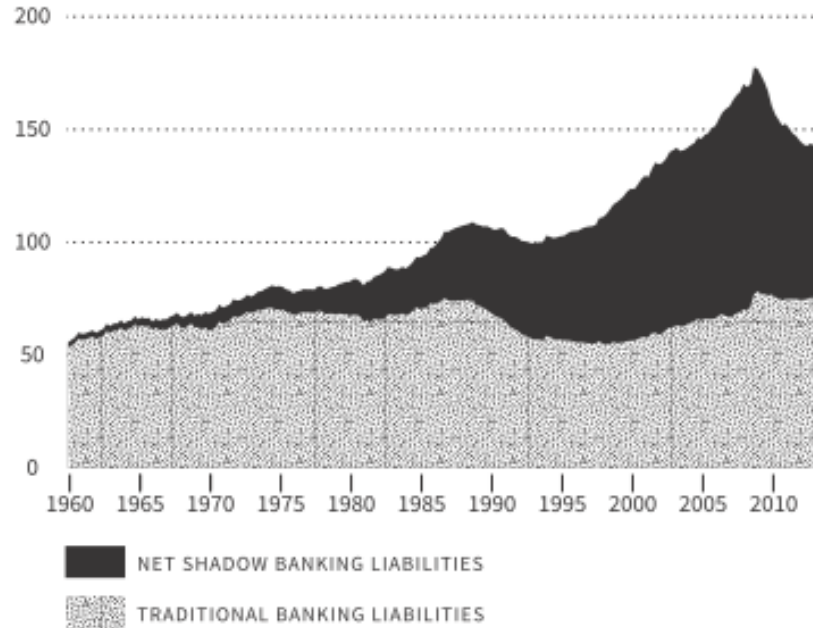
Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
71	Cash	Shares Sarah 60	9	Cash	
49	Repo	Shares Ryan 60	60	Loan Sarah	
		Shares Julia 0	54	ABS Julia	
			6	Equity SPV	
					Equity Alex 80
120	Total	Total 120	129	Total	Total 129



12. Sarah withdraws her MMMF share and pays back her loan.

Asset Side	MMMF	Liability Side	Asset Side	Bank	Liability Side
11	Cash	Shares Sarah 0	69	Cash	
49	Repo	Shares Ryan 60	0	Loan Sarah	
		Shares Julia 0	54	ABS Julia	
			6	Equity SPV	
					Equity Alex 80
60	Total	Total 60	129	Total	Total 129

Shadow banking is important

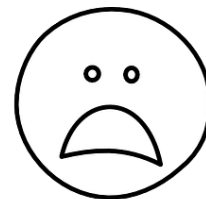
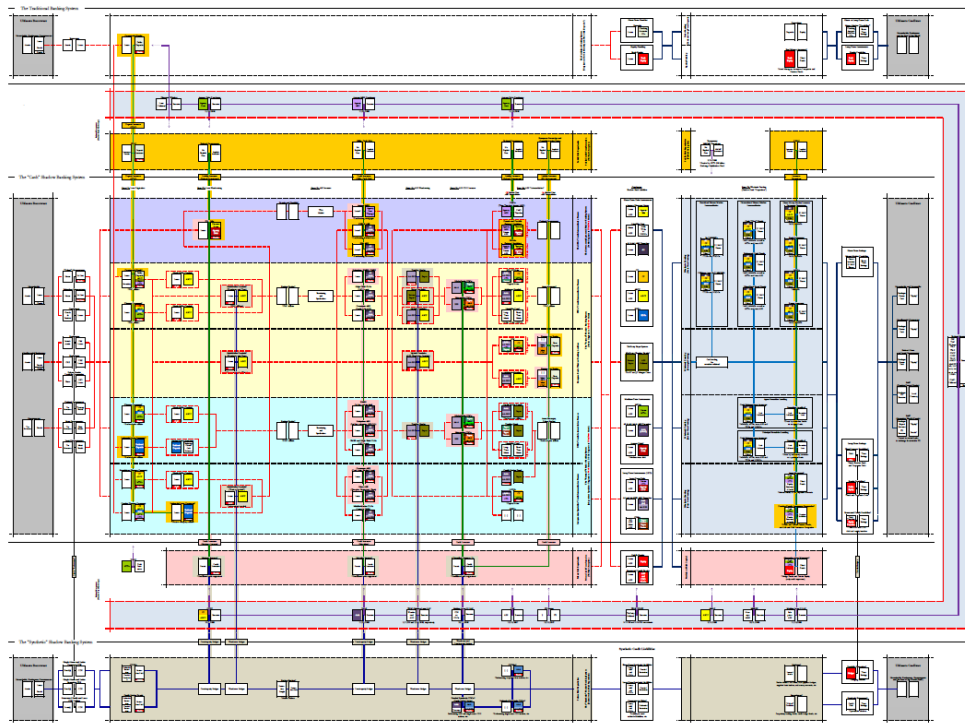


Source: McMillan (2014), based on Adrian, Covitz, and Nellie (2014) and Federal Reserve Fund of Flows Data

But, why so complicated?



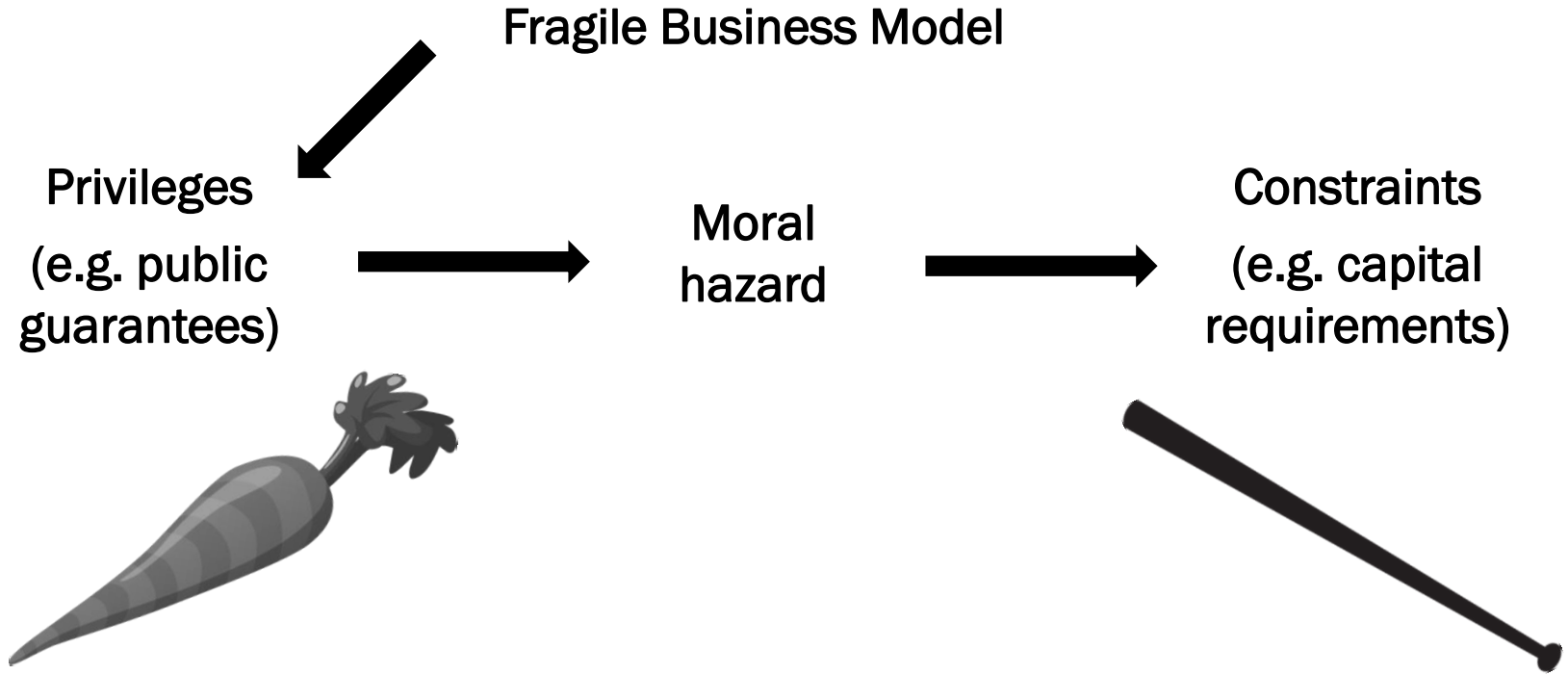
Borrowers



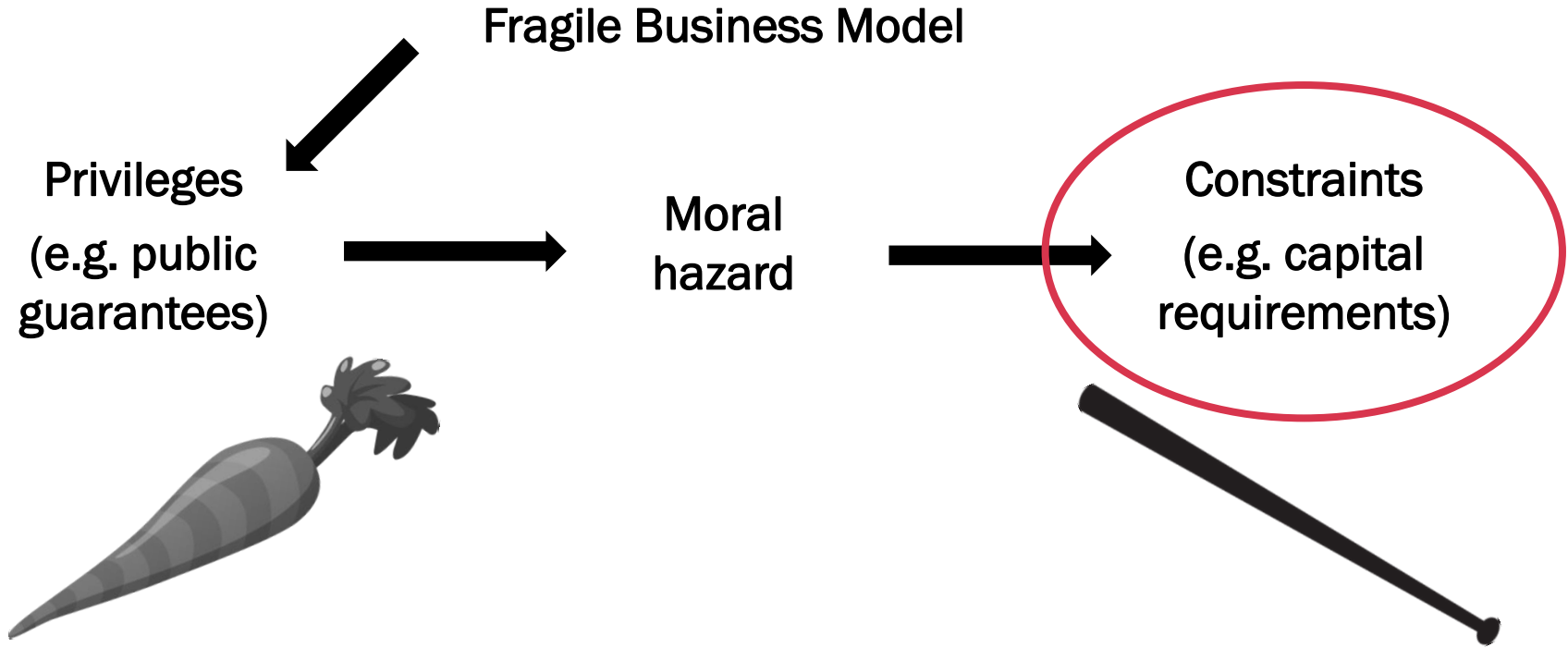
Lenders

Source: Pozsar et al. (2010)

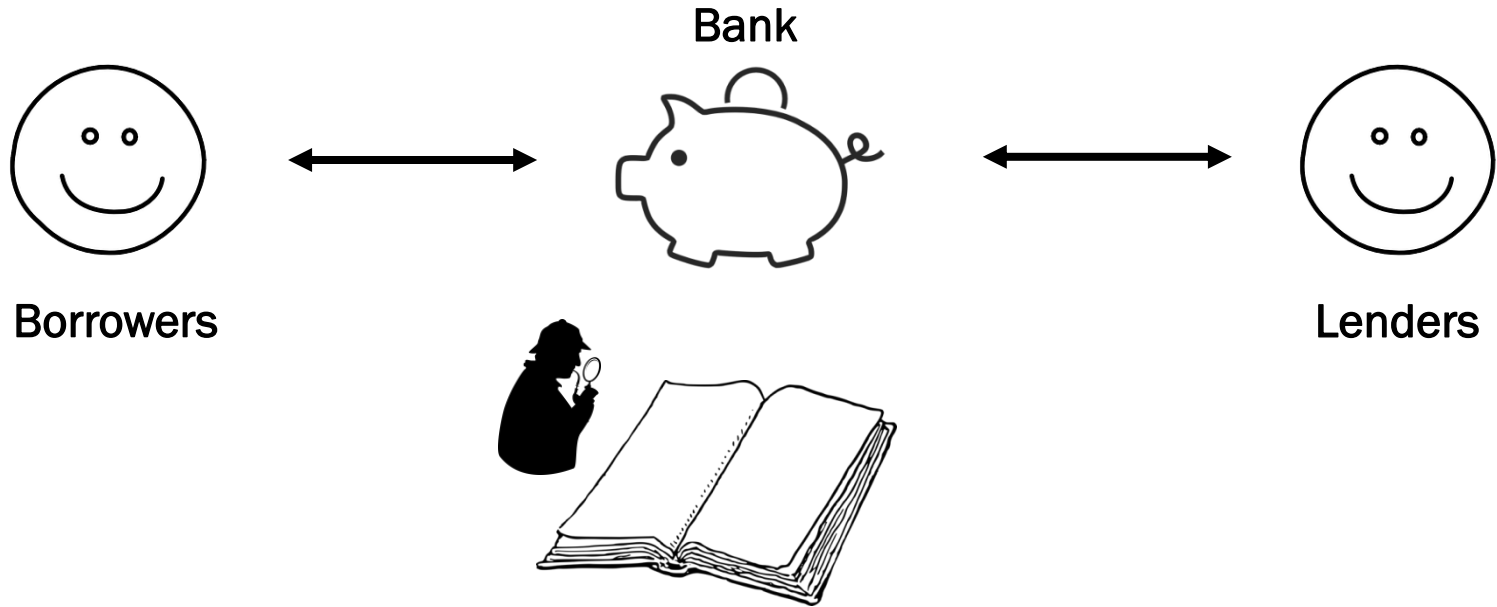
It's the regulation, stupid!



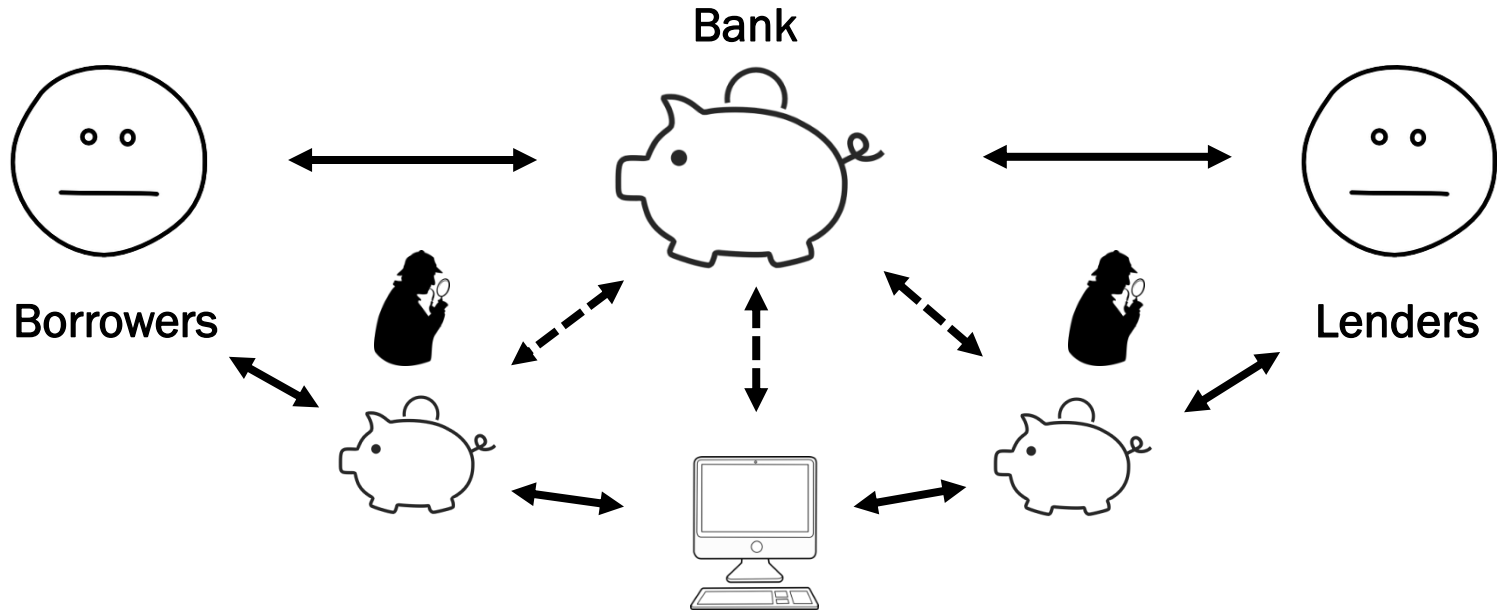
It's the regulation, stupid!



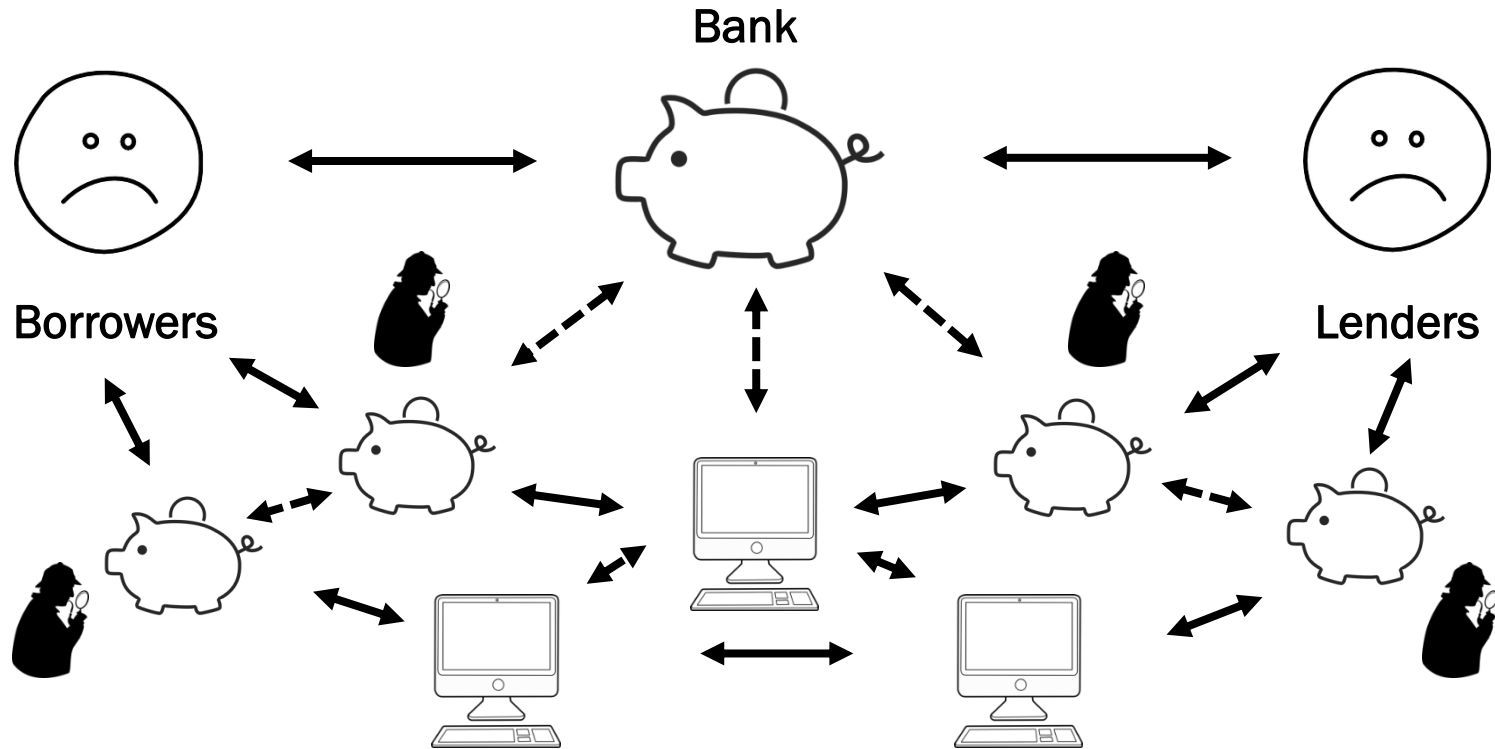
Regulating banks in the industrial age



Regulating banks in the digital age? Difficult ...



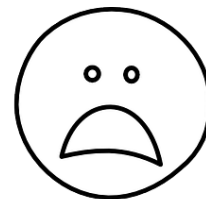
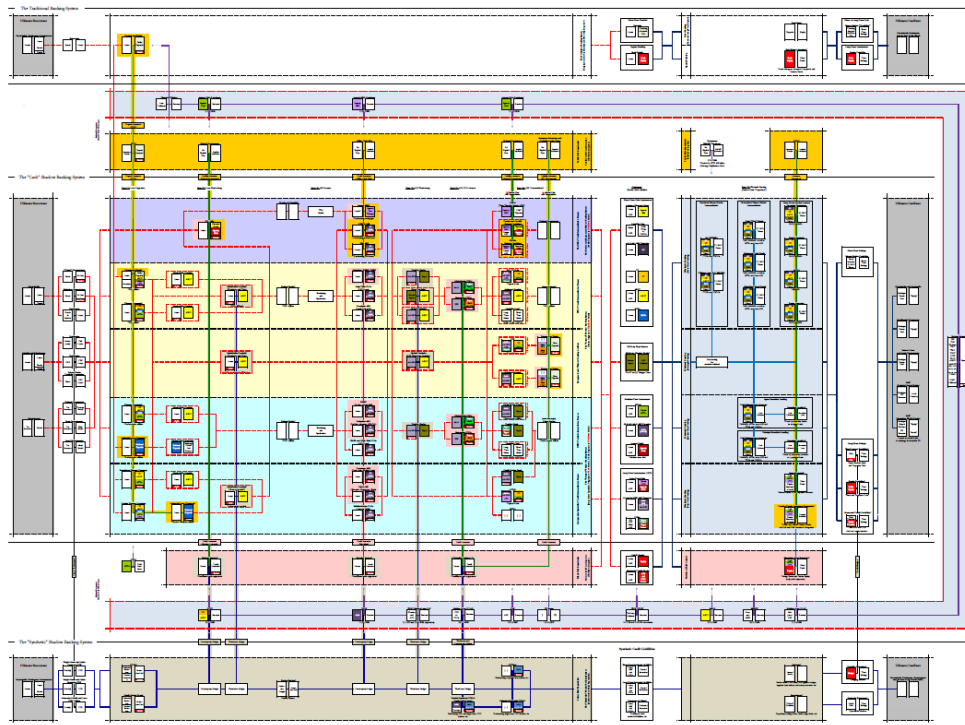
... really difficult



... actually, impossible



Borrowers



Lenders

Source: Pozsar et al. (2010)

Narrow bankers run into the same problem as regulators



Photo: Valerie Hinojosa (CC BY-SA 2.0)

Narrow Banking in the digital age



Photo: *Composita*, CC0 Creative Commons

The Systemic Solvency Rule

The value of the real assets of a company has to be greater or equal to the value of the company's liabilities in the worst financial state

The Systemic Solvency Rule

Non-financial companies



The Systemic Solvency Rule

Non-financial companies



Financial companies

- Mutual Funds
- P2P Lending Platforms



The Systemic Solvency Rule

Non-financial companies



Financial companies

- Mutual Funds



- P2P Lending Platforms



- Banking Institutions





THE END OF BANKING

MONEY, CREDIT, AND THE DIGITAL REVOLUTION

The End of Banking – The Book

What is it about?

The End of Banking distinguishes itself from other books about the financial crisis of 2007–08 in several ways.

First, it reveals the fundamental financial techniques that are common to all forms of banking—whether it is performed by medieval goldsmiths or by today’s managers at investment banks.

Second, it offers a lucid and accessible account of shadow banking.

Third, and most importantly, The End of Banking does not rehash the same old regulatory patches or radical reform proposals from the past. Instead, it elaborates a new and intuitive idea of how to adapt the financial system to the digital age.

The End of Banking – The Book

What others think about it:

«An interesting and challenging vision»

(Vítor Constâncio, Vice-President of the European Central Bank)

«An important book about finance»

(Reuters Breakingviews, Dominic Elliott)

«An absolutely new perspective»

(Financial Times Alphaville, Izabella Kaminska)

«This thought-provoking book makes radical proposals that strike at the source of fragility in banking and which should be considered seriously.»

(Anat R. Admati, Professor of Finance and Economics, Stanford Graduate School)

«The End of Banking is easily the ‘deepest’ examination of our financial system in a generation.»

(Robert C. Hockett, Professor of Law, Cornell University)

«In this book, McMillan embraces the digital revolution and shows, clearly and compellingly, how it can be used to create a financial system that is much better, much simpler and much fairer. Read it urgently and dare to think big.»

(William R. White, Chairman of the Economic and Development Review Committee at the OECD)

Find out more on www.endofbanking.org

Impressum

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