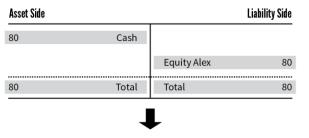
# The rise of Shadow Banking Money in the digital Age

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





2. Sarah obtains a loan from the bank.

Side	Liability S			Asset Side
60		Deposit Sarah	Cash	80
80		Equity Alex	Loan Sarah	60
140	1	Total	Total	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		
		Equity Alex	80
80	Total	Total	80
80	Total		5

#### 2. Sarah obtains a loan from the bank.

Asset Side			Liability Side
80	Cash	Deposit Sarah	60
60	Loan Sarah	E avritu A lav	0.0
		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 60 60	Cash Loan Sarah Loan Julia	Deposit Sarah Deposit Ryan Deposit Julia	0 120 0
		Equity Alex	80
200	Total	Total	200

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

2. Sarah obtains a loan from the bank.

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

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

#### 6. Ryan buys coffee from Sarah.

Asset Side			Liability Side
80 60 60	Cash Loan Sarah Loan Julia	Deposit Sarah Deposit Ryan Deposit Julia	60 60 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

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#### **@EndOfBanking**

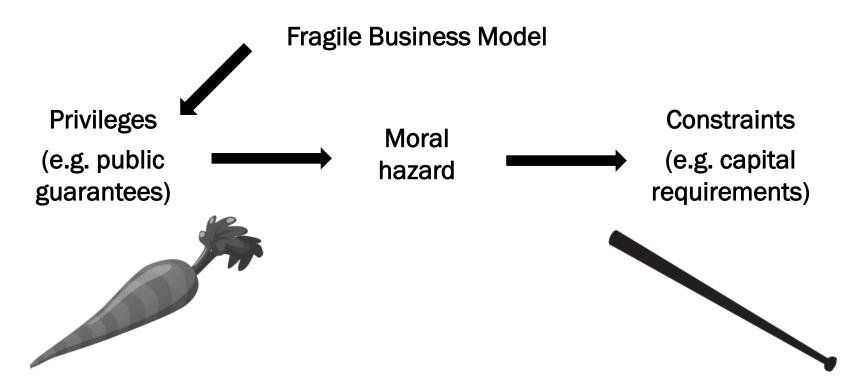
### **Fractional Reserve Banking is fragile**

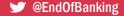


Source: Bundesarchiv, Bild 102-12023 / Georg Pahl / CC-BY-SA 3.0



### **Fragility calls for Banking regulation**





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Asset Side			Liability Side
80	Cash		
		Equity Alex	80
80	Total	Total	80
80	Total		5

#### 2. Sarah obtains a loan from the bank.

Asset Side			Liability Side
80	Cash	Deposit Sarah	60
60	Loan Sarah	E avritu A lav	0.0
		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 60 60	Cash Loan Sarah Loan Julia	Deposit Sarah Deposit Ryan Deposit Julia	0 120 0
		Equity Alex	80
200	Total	Total	200

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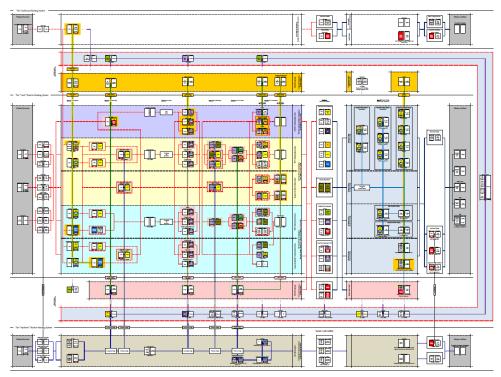
### But wait, what about MBS,CDO,CDS,REPO & CO



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



### **Welcome to Modern Finance**

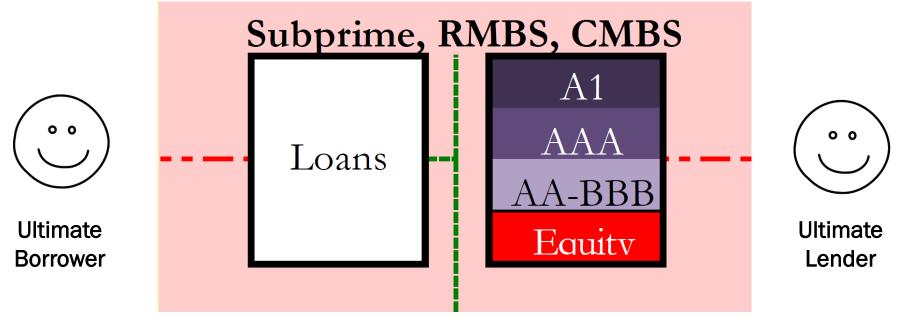


Source: Pozsar et al. (2010)

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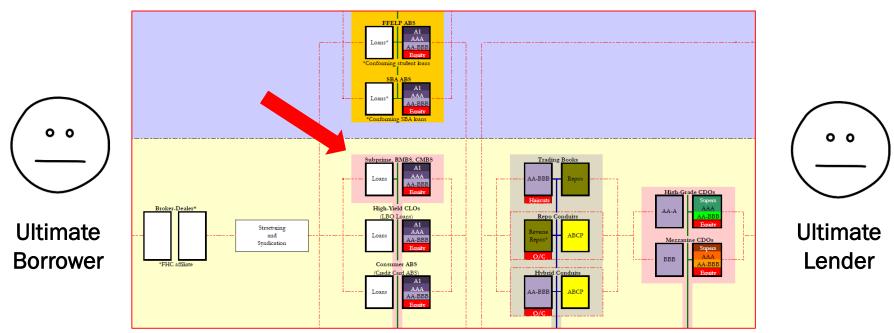
### The signature product of the financial crisis of 2008



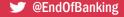
Source: Pozsar (2010)

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### The signature product of the financial crisis of 2008



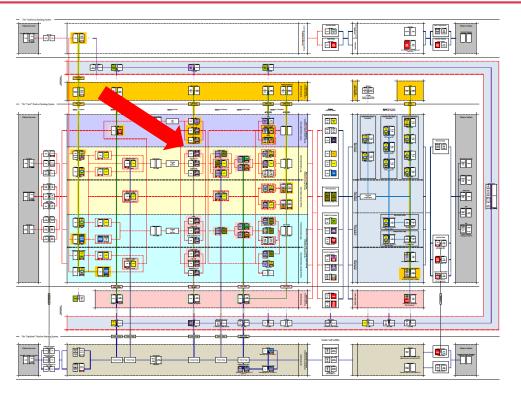
Source: Pozsar (2010)



### **The Rise of Shadow Banking**



Ultimate Borrower







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



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

Asset Side	MM	IMF L	iability Si	de	Asset	Side	Ba	nk	Liabili	ty Side
60	Cash	Shares Sa Shares Ry		) )	20 60	Loan to S	Cash Sarah	Equity	Alex	80
60	Total	Total	60	 D	80		Total	Total		80

┸

#### 3. Alex securitizes Sarah's loan.

Asset Side	MM	MF Liabili	ty Side	Asset Side	Bai	nk Liabi	lity Side
60	Cash	Shares Sarah Shares Ryan	0 60	20 54 6	Cash ABS Sarah 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	MN	IMF Liabili	ty Side	Asset Side	Ba	nk Lia	ability Side
11	Cash	Shares Sarah	0	69	Cash	Repo	49
49	Repo	Shares Ryan	60	54 6	ABS Sarah Equity SPV	Equity Alex	80
60	Total	Total	60	129	Total	Total	129

#### The Future of Money, Frankfurt



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

Asset Side	MM	MF Liabili	ty Side	Asset Side	Ba	nk Liabi	ility Side
60	Cash	Shares Sarah	60	20 60 Loa	Cash n to Sarah	Equity Alex	80
60	Total	Total	60	80	Total	Total	80

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

Asset Side	MN	IMF Liabili	ty Side	Asset Si	ide B	ank Lia	bility 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

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

Asset Side	MM	MF Liabilit	ty Side	Asset	Side	Bank	Liability	/ Side
60	Cash	Shares Sarah Shares Ryan	0 60	20 60	Cash Loan to Sarah		lex	80
60	Total	Total	60	80	Total	Total		80

3. Alex securitizes Sarah's loan.

Asset Side	MM	IMF Liabil	ity Side	Asset Side	Ba	ink Liabi	ility Side
60	Cash	Shares Sarah Shares Ryan	0 60	20 54 6	Cash ABS Sarah 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	MN	IMF Liabili	ty Side	Asset Side	Ba	ink L	iability Side
11 49	Cash Repo	Shares Sarah Shares Ryan	0 60	69 54 6	Cash ABS Sarah Equity SPV	Repo Equity Ale	49 ex 80
60	Total	Total	60	129	Total	Total	129

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

Asset Side	MM	IMF Liabili	ty Side	Asset Side	e Ba	ink Li	iability Side
71 49	Cash Repo	Shares Sarah Shares Ryan Shares Julia	0 120 0	9 54 60 6	Cash ABS Sarah Loan Julia Equity SPV	Repo Equity Ale	49 •x 80
120	Total	Total	120	129	Total	Total	129

7. Alex securitizes Julia's loan.

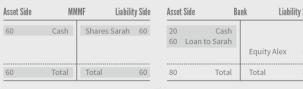
Asset Side	MM	IMF Liabil	ity Side	Asset Side	e Ba	nk Li	ability Side
71 49	Cash Repo	Shares Sarah Shares Ryan Shares Julia	0 120 0	9 54 54 12	Cash ABS Sarah ABS Julia Equity SPV	Repo Equity Ale	49 x 80
120	Total	Total	120	129	Total	Total	129

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

Asset Side	MN	IMF Liabil	ty Side	Asset Side	Ba	nk Li	ability 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 Ale	x 80
120	Total	Total	120	178	Total	Total	178

#### The Future of Money, Frankfurt





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

Asset Side	MM	MF Liabili	ty Side	Asset	Side	Bank	Liabili	ity Side
60	Cash	Shares Sarah Shares Ryan	0 60	20 60	Cas Loan to Sara	h	y Alex	80
60	Total	Total	60	80	Tota	al Total		80

3. Alex securitizes Sarah's loan.

Asset Side	MM	IMF Liabi	lity Side	Asset Side	Ba	nk Liabil	ity Side
60	Cash	Shares Sarał Shares Ryan	n 0 60	20 54 6	Cash ABS Sarah 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	MA	1MF Liabi	lity Side	Asset Side	e Ba	nk Li	iability Sid
11 49	Cash Repo	Shares Sarah Shares Ryan	0 60	69 54 6	Cash ABS Sarah Equity SPV	Repo Equity Ale	49 x 80
60	Total	Total	60	129	Total	Total	129

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

Liability Side	Asset Side	Bank	Liability	Side	Asset Side	MM	MF Liabili	ty Side	Asset Side	Ba	ink Liab	ility Side
es Sarah 60	20 60 Loan to	Cash Sarah			71 49	Cash Repo	Shares Sarah Shares Julia	0 60	9 54	Cash ABS Sarah	Repo	49
		E	Equity Alex	80			Shares Ryan	60	60 6	Loan Julia Equity SPV	Equity Alex	80
60	80	Total	lotal	80	120	Total	Total	120	129	Total	Total	129

7. Alex securitizes Julia's loan.

Cash

Repo

Total

MMMF

Asset Side

71

49

120

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

Asset Side	MM	IMF Liabili	ity Side	Asset Side	e Ba	nk Lia	bility Side
71 49	Cash Repo	Shares Sarah Shares Ryan Shares Julia	0 120 0	9 54 60 6	Cash ABS Sarah Loan Julia Equity SPV	Repo Equity Alex	49 80
120	Total	Total	120	129	Total	Total	129

Asset Side

9

54

54

12

129

Liability Side

49

80

129

Bank

Repo

Total

Equity Alex

Cash

Total

ABS Sarah

ABS Julia

Equity SPV

Liability Side

Shares Sarah 0

Shares Ryan 120

Shares Julia 0

9. Ryan buys freshly roasted coffee from Sarah.

Asset Side	MM	MF Liabili	ty Side	Asset Si	de	Bank	Liability Sid
22	Cash	Shares Sarah	60	58	Cash	Repo	98
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	MM	MF Liabili	ty Side	Asset Side	e Ba	nk Li	iability Side
71	Cash	Shares Sarah	60	9	Cash	Repo	49
49	Repo	Shares Ryan	60	54	ABS Sarah		
		Shares Julia	0	54	ABS Julia		
				12	Equity SPV	Equity Ale	x 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		MF Liabil	Liability Side		de Ba	nk Lia	Liability Side	
71	Cash	Shares Sarah	60	9	Cash	Repo	49	
49	Repo	Shares Ryan	60	60	Loan Sarah			
		Shares Julia	0	54	ABS Julia			
				6	Equity SPV	Equity Alex	x 80	
120	Total	Total	120	129	Total	Total	129	

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

Total

Asset Side	MM	MF Liabi	ity Side	Asset Side	Ba	nk Lia	ability Side
22 98	Cash Repo	Shares Sarah Shares Ryan Shares Julia	0 120 0	58 54 54 12	Cash ABS Sarah ABS Julia Equity SPV	Repo Equity Alex	98 x 80
120	Total	Total	120	178	Total	Total	178

120

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

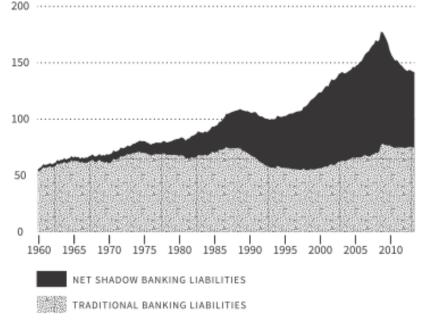
Asset Side	MM	MF Liabilit	ty Side	Asset Sid	e Ba	nk Li	iability Side
11 49	Cash Repo	Shares Sarah Shares Ryan Shares Julia	0 60 0	69 0 54 6	Cash Loan Sarah ABS Julia Equity SPV	Repo Equity Ale:	49 x 80
60	Total	Total	60	129	Total	Total	129

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### **Shadow banking is important**



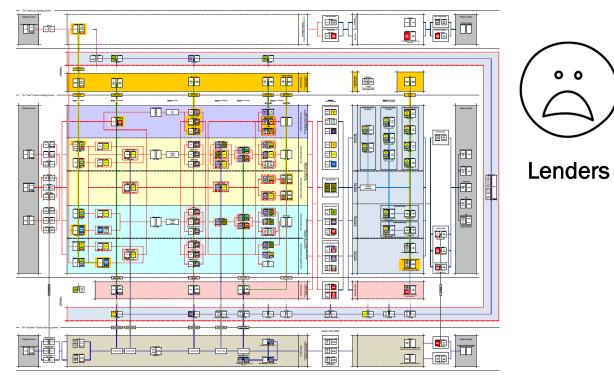
Source: McMillan (2014), based on Adrian, Covitz, and Nellie (2014) and Federal Reserve Fund of Flows Data



### But, why so complicated?

Borrowers

0 0

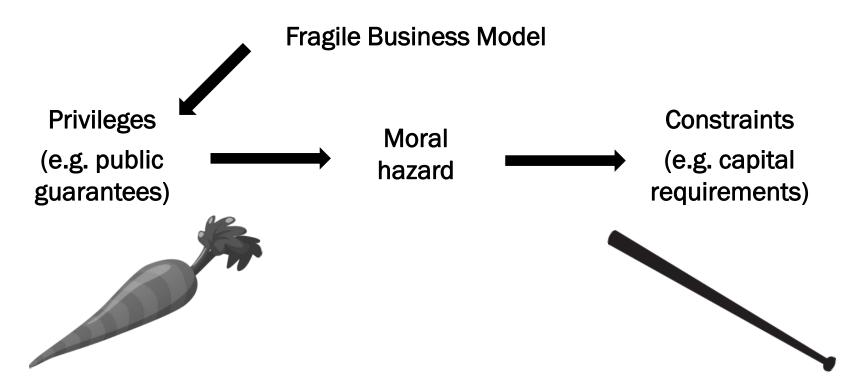


Source: Pozsar et al. (2010)

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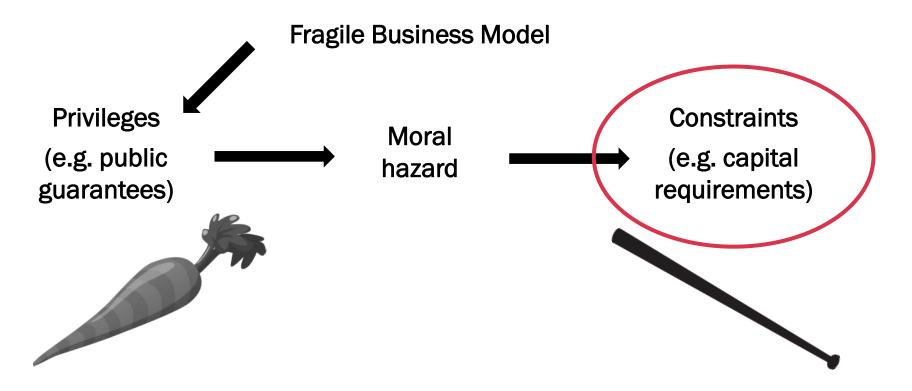
### It's the regulation, stupid!





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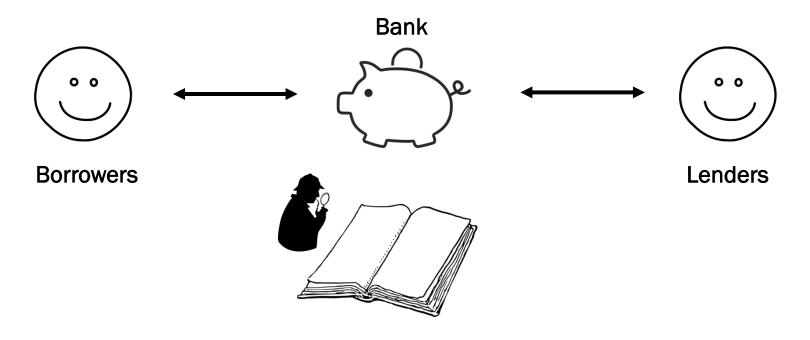
### It's the regulation, stupid!





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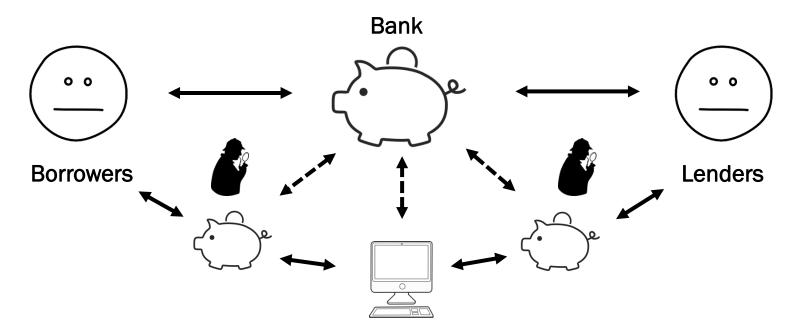
### **Regulating banks in the industrial age**





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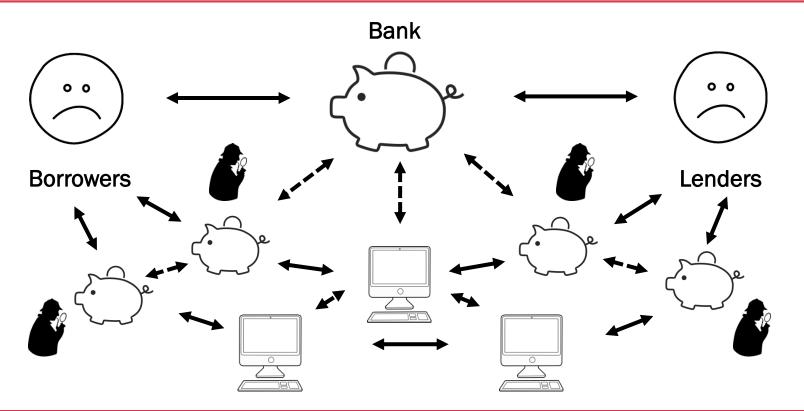
### **Regulating banks in the digital age? Difficult ...**





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### ... really difficult

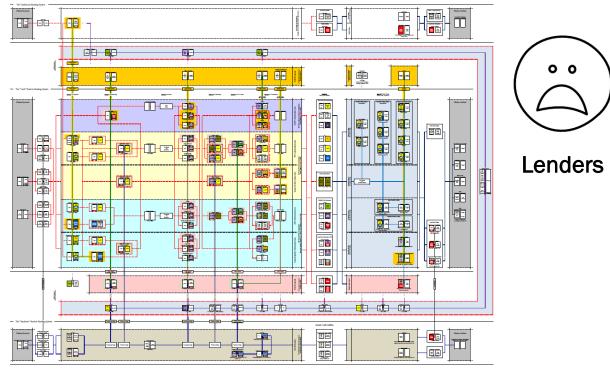




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### ... actually, impossible

Borrowers



Source: Pozsar et al. (2010)

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### 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

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## 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 – 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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