

# Regulatory Networks in the US Blockchain Industry

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# Introduction

- Big question: Who is going to regulate the blockchain industry?
- We answer: Who is regulating firms in blockchain consortia?
  
- Blockchain – a network industry
- Decentralization – new actors
  
- Econometric model results: core-periphery structure; most central are federal regulators, few regional feds, some state and self-regulatory bodies

- Distributed Ledger Technology (DLT)  $\equiv$  a method of achieving consensus of replicated, shared, and synchronized data spread across multiple nodes
  - Think: consensus algorithm + peer-to-peer network
- A Blockchain is a subset of DLT with certain structural and cryptographic properties

- Data: self-reported US regulators from firms' 10k/20f/annual reports/FED's res. plans



**HYPERLEDGER**

Sawtooth, Iroha, Fabric, Burrow, Indy, etc.

Table 1: HQ Country for Firms with Regulator Info

HQ Country	Number of Firms
USA	20
Canada	6
Australia	5
Japan	5
France	3
Switzerland	3
United Kingdom	3
Germany	2
Italy	2
Netherlands	2
Spain	2
Sweden	2
Brazil	1
China	1
Peru	1
Russia	1
South Korea	1
Total	60

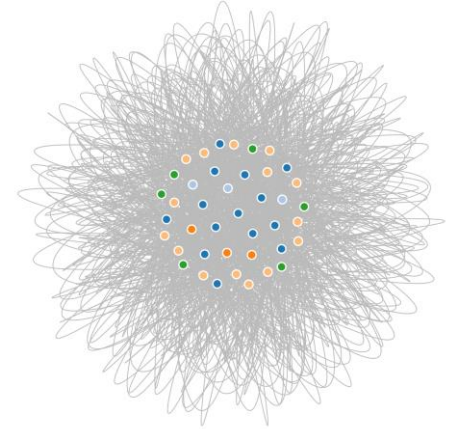
Table 2: US Regulators

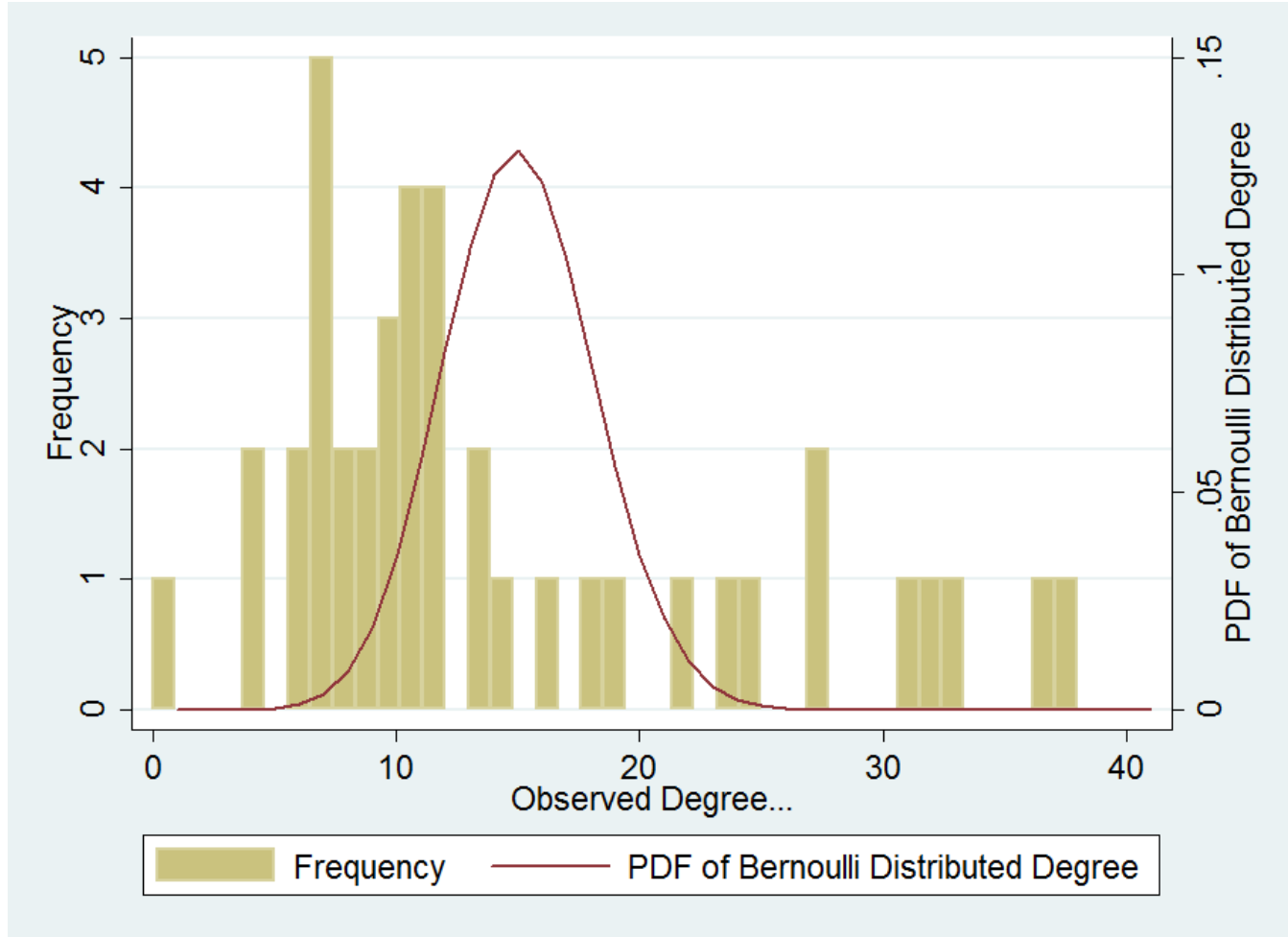
Federal Regulators	Federal Reserve Regional Banks	Self-Regulatory Agency	Private Regulators	State Regulators
CFPB	Fed Atl	FINRA	CME Group	AL BD
CFTC	Fed Bos	MSRB	NSCC	AZ DFI
FCC	Fed Dallas	NFA	NYSE	CA DoBO
FDIC	Fed NY			CO DB
Fed BoG	Fed Philly			CT DoB
FFIEC	Fed SF			DE SBC
FSOC				FL OFR
FTC				IDoFaPR DoB
IRS				MA CoB
NAIC				NY DoFS
OCC				OH DFI
SEC				OSBC of DE
SIPC				PA DoB
Treas				TX DoB
				UT DFI
				NE DI

# Methodology

## Network analysis of the network of regulators

- Nodes: regulators;
- Edges: joint regulation of at least one firm;





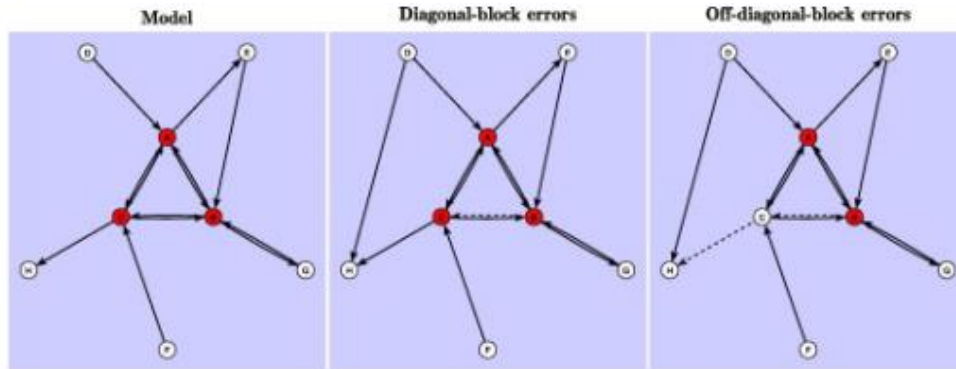
Agency	Degree
SEC	38
FINRA	37
Fed BoG	33
FDIC	32
CFTC	31
CFPB	27
NY DoFS	27
OCC	25
Fed NY	24
NFA	22
TX DoB	19
CA DoBO	18
Treas	16
Fed Atl	14
CT DoB	13
CME Group	13
DE SBC	12
AL BD	12
PA DoB	12
Fed Bos	12
SIPC	11
MSRB	11
NYSE	11
FL DoBF	11
IL DoFaPRDoB	10
Fed SF	10
Fed Dal	10
IRS	9
Fed Philly	9
NAIC	8
UT DFI	8
NSCC	7
AZ DFI	7
FFIEC	7
CO DB	7
FSOC	6
MA CoB	6
OH DFI	4
NE DI	4
FCC	0

*h-degree of a node  $n$  in a weighted network is equal to  $h$  if  $h$  is the largest natural number such that  $n$  has at least  $h$  links each with strength at least equal to  $h$ .*

Agency	Degree	H-Degree
SEC	38	9
FINRA	37	8
Fed BoG	33	8
FDIC	32	8
CFTC	31	9
CFPB	27	7
NY DoFS	27	7
OCC	25	7
Fed NY	24	6
NFA	22	7
TX DoB	19	4
CA DoBO	18	5
Treas	16	3
Fed Atl	14	2
CT DoB	13	2
CME Group	13	3
DE SBC	12	3
AL BD	12	1
PA DoB	12	1
Fed Bos	12	2
SIPC	11	2
MSRB	11	3
NYSE	11	3
FL DoBF	11	2
IL DoFaPRDoB	10	2
Fed SF	10	1
Fed Dal	10	1
IRS	9	1
Fed Philly	9	1
NAIC	8	1
UT DFI	8	2
NSCC	7	1
AZ DFI	7	1
FFIEC	7	1
CO DB	7	1
FSOC	6	1
MA CoB	6	1
OH DFI	4	1
NE DI	4	1
FCC	0	1



- Fitting into a core-periphery model (Craig and Von Peter 2014)



- Error score: 19% (57 errors out of a total of 300 edges)

Agency	Tier
SEC	Core
FINRA	Core
Fed BoG	Core
FDIC	Core
CFTC	Core
CFPB	Core
NY DoFS	Core
OCC	Core
Fed NY	Core
NFA	Core
TX DoB	Core
CA DoBO	Core
Treas	Core
Fed Atl	Core
CT DoB	Periphery
CME Group	Periphery
DE SBC	Periphery
AL BD	Periphery
PA DoB	Periphery
Fed Bos	Periphery
SIPC	Periphery
MSRB	Periphery
NYSE	Periphery
FL DoBF	Periphery
IL DoFaPRDoB	Periphery
Fed SF	Periphery
Fed Dal	Periphery
IRS	Periphery
Fed Philly	Periphery
NAIC	Periphery
UT DFI	Periphery
NSCC	Periphery
AZ DFI	Periphery
FFIEC	Periphery
CO DB	Periphery
FSOC	Periphery
MA CoB	Periphery
OH DFI	Periphery
NE DI	Periphery
FCC	Periphery

# Conclusion

Network fits core-periphery model;

Regulation: 'tiered' (not flat);

Core: federal agencies, some state regulators (CA, CT, NY, TX), self-regulatory agencies;

Governance and supervision on multiple levels.