



# Just another database format? ...

Why economists should pay attention to  
blockchains and distributed ledgers.

# Two questions, really.

- Why economists should pay attention to blockchain.
- Why blockchain experts should pay attention to economists.

Footnote: This talk is all about the economics of blockchain, not about cryptocurrencies. We already heard about that.

# About myself.

Oliver Beige [@ecoinomia](#)

- Industrial engineer (MS U Karlsruhe).
- Industrial organization economist (Ph.D. UC Berkeley).
- Bosch, Daimler Silicon Valley, EIT Digital, SAP.
- Now agnostic blockchain consultant & researcher.

I spend most of my work hours designing collective decision processes, inside firms and across markets (and other networks).

# Blockchains: truly disruptive innovation or mostly innovation glitter?

“The Internet of Value”, “The most radical innovation since double entry bookkeeping”, “Say goodbye to the middleman!”

“Should I use a blockchain for this?” — “(Almost surely) No!”

“Blockchain will change far more things than we think, and it will be far less glamorous than we think.”—me.

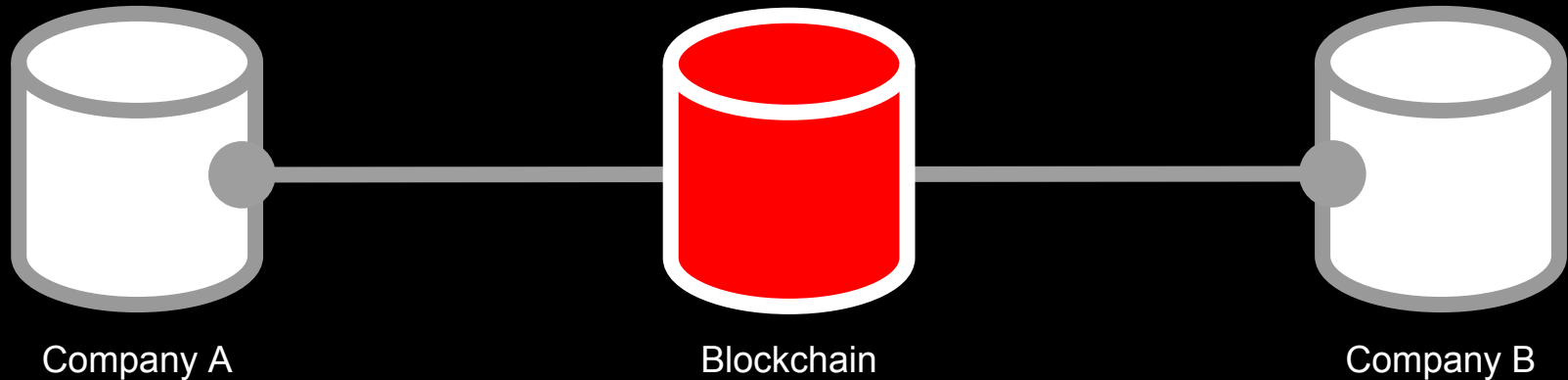
# So what's the big thing about blockchains?

“A blockchain is a system of record sitting right on the transaction.”

- “System of record”: Authoritative, archival database (ledger, register), the verified “source of truth” for all things commercial (typically within enterprises).
- “Transaction”: We’ll talk about that in a second.
- “Sitting right on the transaction” (in accounting-speak): between accounting entities; (in econ-speak): in the market.

# So what's the big thing about blockchains?

“A blockchain is a system of record sitting right on the transaction.”



# So what about those transactions?

- “In a perfect socialist transportation network, there will be no tram accidents.”
- “In a perfect classical economy, there will be no contract disputes.”

...because in textbook economics, all transactions are  
“sharp in by clear agreement, sharp out by clear performance.”

# The many definitions of transaction

- **Textbook economics:** “The exchange of two things of value, typically a good or service for a payment.”
- **Accounting:** “A credit against a debit of the same (monetary) value.”
- **Finance/banking:** “The shift of monetary value from one account to the other.”
- **Databases:** “The shift of {money, goods, anything} from one database to another.”
- **Legal:** “Whatever is written in the contract.”
- **Transaction costs economics:** “The whole thing, from finding a partner, to bargaining, to exchanging things, to re-evaluating (and possibly renegeing), to initiating and concluding any disputes.”



# So what about those transactions?

- “In a perfect socialist transportation network, there will be no tram accidents.”
- “In a perfect classical economy, there will be no contract disputes.”

...because in textbook economics, all transactions are  
“sharp in by clear agreement, sharp out by clear performance.”

# Transaction costs: the sand in the gears of markets

- **Ronald Coase** (1937): “Without transaction costs, enterprises would have no purpose.”
- **Ronald Coase** (1960): “Without transaction costs, contract law would have no purpose.”
- **Oliver Williamson** (1975): “Enterprises (hierarchies) are better when: high upfront investment, high risk of renegeing.”
- **Oliver Hart** et al. (1986): “Firms are better at executing incomplete contracts.”

# So what about those transactions?

- In the grand scheme of things, all things can go wrong during a transaction: before, during, after.
- That's (mostly) ok if it happens inside a firm.  
Because hierarchy. Because boss decides.
- Not ok in a market. Because renegeing.
- Because endless costly disputes (arbitration, lawsuits, bad feelings...). Because coercion.

# Market transactions in the time of blockchains

- Blockchain offers a consensus on facts about the transaction: a market-based, equal-access single source of truth.
- It makes commitments credible (think smart contracts!).
- Credible commitments build trust. I can credibly restrain myself from renegeing on a transaction.

# What does this mean for economists?

- Industrial organization thinks about how industrial activity is split between firms and markets.
- In particular: market imperfections!!! ZOMG!
- Asymmetric information, market power, externalities, etc.
- We build (hopefully efficient) processes for markets.
- Just like industrial engineers build (hopefully efficient) processes for firms.

Game theory: interactive decision theory between (non-cooperating) partners.

# So what can we do to help?

“Cryptoeconomics”: Consensus mechanisms as a game.

- Incentives, solution concepts, social vs. private returns.

On-chain governance vs. social governance.

- What to do if your blockchain malfunctions?
- Building M2H2M systems: humans interfering in automated systems.

“Conflict, mutuality, and order”

- Mapping your transaction on a blockchain (or a relational database...)



That's all, folks!  
...

[@ecoinomia](#) for slides and snide comments.