Shadow Money & Green New Deal

Gordon Schücker

Realize that everything connects to everything else.

– Leonardo da Vinci

1. Introduction to Shadow Banking

2. Status Quo

3. Green New Deal

1. **Introduction to Shadow Banking**

2. Status Quo

3. Green New Deal

Definition of the shadow banking system

- Vague term with many possible definitions
- One possible broad definition of the *shadow banking system*:

  All bank-like activities and entities outside of the traditional banking system

- The Financial Stability Board calls shadow banking "*non-bank financial intermediation*".
- Some call it "market-based finance".

Introduction video | ‘08 crisis visualized

The Crisis of Credit Visualized by Jonathan Jarvis

What is money?

30 year US government bond certificate

- Nobody agrees
- "Traditional" measures of money supply
  - M0, M1, M2 (various measures combining currency in circulation, bank deposits and checking accounts)
- How about a US government bond?
  - Highly liquid (i.e. can easily be converted to cash)
  - Satisfies the three main functions of money: *medium of exchange, unit of account* and *store of value*

What is money? | View of the Federal Reserve

***The problem is that we cannot extract from our statistical database what is true money conceptually**, either in the transactions mode or the store-of-value mode. One of the reasons, obviously, is that the proliferation of products has been so extraordinary that the true underlying mix of money in our money and near money data is continuously changing. As a consequence, while of necessity it must be the case at the end of the day that inflation has to be a monetary phenomenon, **a decision to base policy on measures of money presupposes that we can locate money.** And that has become an increasingly dubious position.*

– Alan Greenspan, FOMC Policy Meeting June 28, 2000, Federal Reserve

Collateral as building block in financial markets

- ***Collateral:*** something pledged as security for repayment of a loan, to be forfeited in the event of a default.
  E.g. a house in a mortgage.

> *Collateral is one of the building blocks on which the financial markets are constructed. Used for a number of purposes – […] including* ***secured funding with market counterparties and central banks****, […] - the role of effective collateral management in monetizing assets has never been more important.*

– Manmohan Singh, Collateral and Financial Plumbing (2014)

Repo | Investopedia explanation video

Repo | Market size

- Major source of financing on Wall Street.
- **Daily trading volume in the repo market in 2008 on average about $7 trillion**, vs. $80 billion on the New York Stock Exchange

  (US GDP in 2008: about $14 trillion).
- About $10 trillion in repo outstanding world wide as of today.

Repo | Accepted collateral and shadow money

- Accepted collateral for repo transactions:
  - often “high quality assets” such as government bonds
  - mortgage backed securities (MBS)
  - But “anything” is possible, even stocks
- Since repos enable to transform assets into cash they can be considered as money or ***shadow money***.

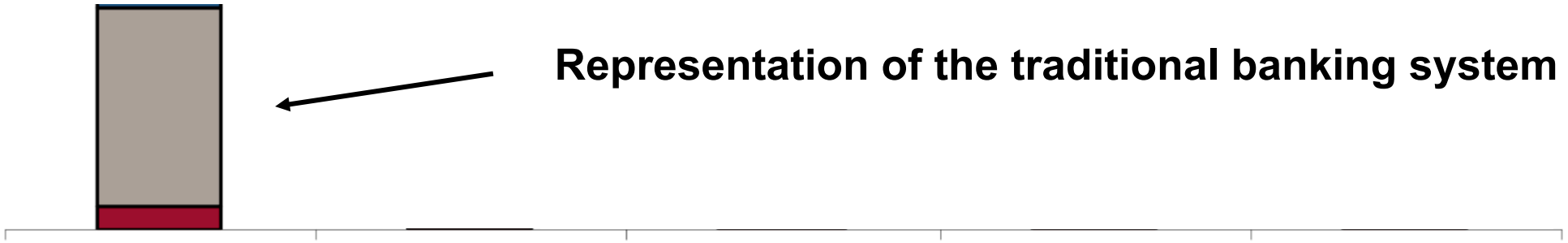
Basel III - High Quality Liquid Asset (HQLA)

- Every major global financial institution is required by the Basel III regulation to hold a certain percentage of assets in "*high quality liquid assets*" (HQLA), e.g. domestic government bonds.
- HQLA requirements can be seen as shadow money reserve requirements (also known as *liquidity coverage ratio* (LCR)).
- In a stress situation, HQLAs can be repoed or sold for central bank reserves.
- Important: **<u>regulators decide what is and what is not a HQLA</u>**. This has major political implications.

Stylized map | Traditional and shadow money

Inside Money (bank created money)

Outside Money (central bank reserves and cash)

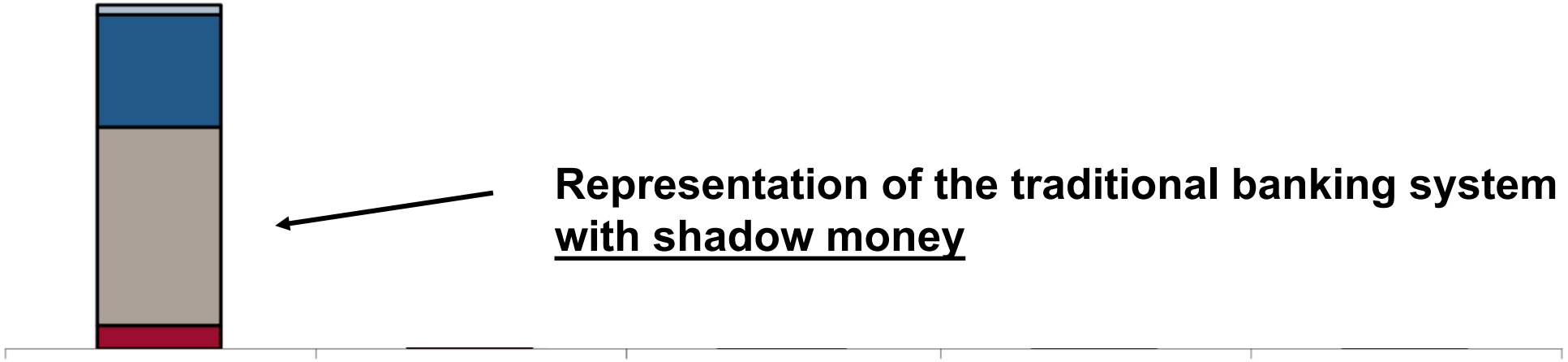


Representation of the traditional banking system

Source: Credit Suisse

Stylized map | Traditional and shadow money

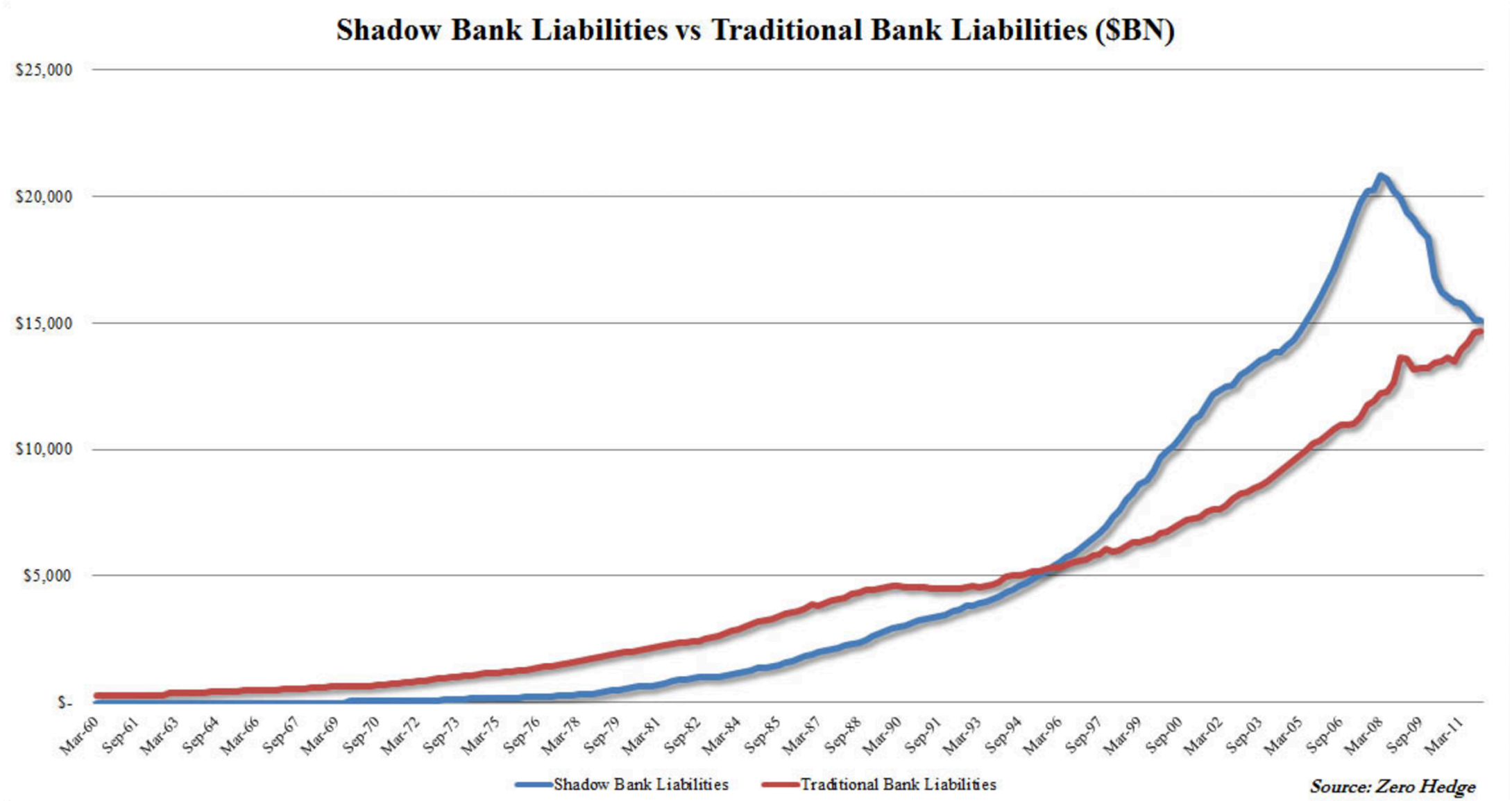
- Private Collateral Money (private collateral available for repo, e.g. mortgage backed securities)
- Public Collateral Money (public collateral available for repo, e.g. government bonds)
- Inside Money (bank created money)
- Outside Money (central bank reserves and cash)



Representation of the traditional banking system with shadow money

Source: Credit Suisse

Traditional vs shadow banking in the US during the ‘08 crisis

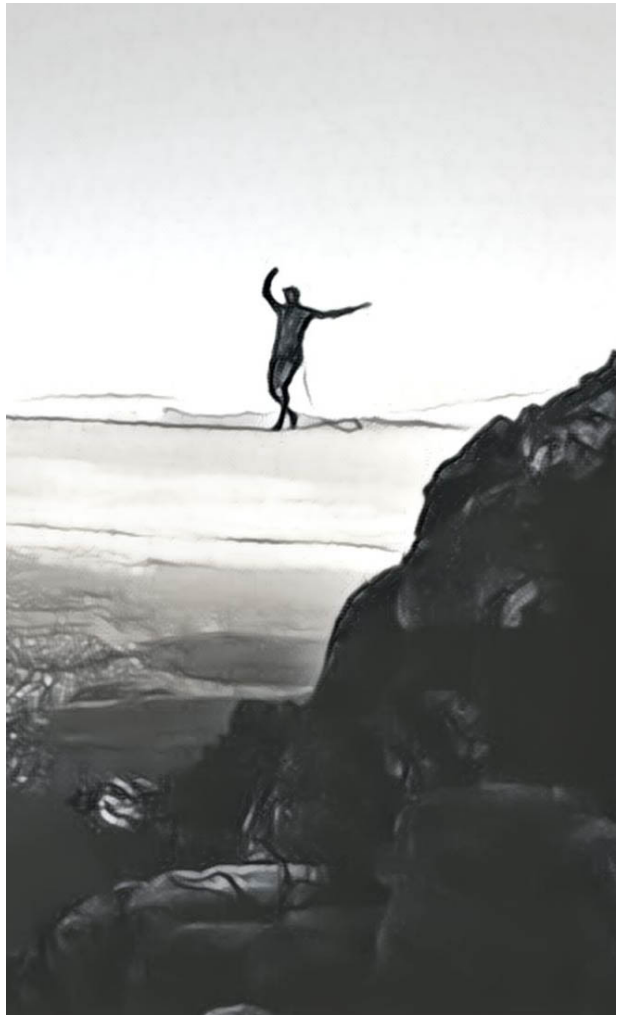


Risks in the shadow banking system

- Bank-like activities are subject to the same risks present in the traditional banking.
- Example of bank-like activity: **maturity transformation**, i.e. borrowing on a short term basis while lending on a long term basis. Possibility of **“a run on a shadow bank”.**
  - Lehman Brothers financed most of its operations via 7 days repos, when trust “evaporated”, long term “investments” (such as subprime mortgage portfolios) had to be “fire sold” leading to its bankruptcy (and the near collapse of the entire global financial system).
- Some entities might not have access to central bank funding or government bailouts. (Especially not when located in a different jurisdiction.)
- Introduction of HQLA requirements as a result of the '08 crisis.

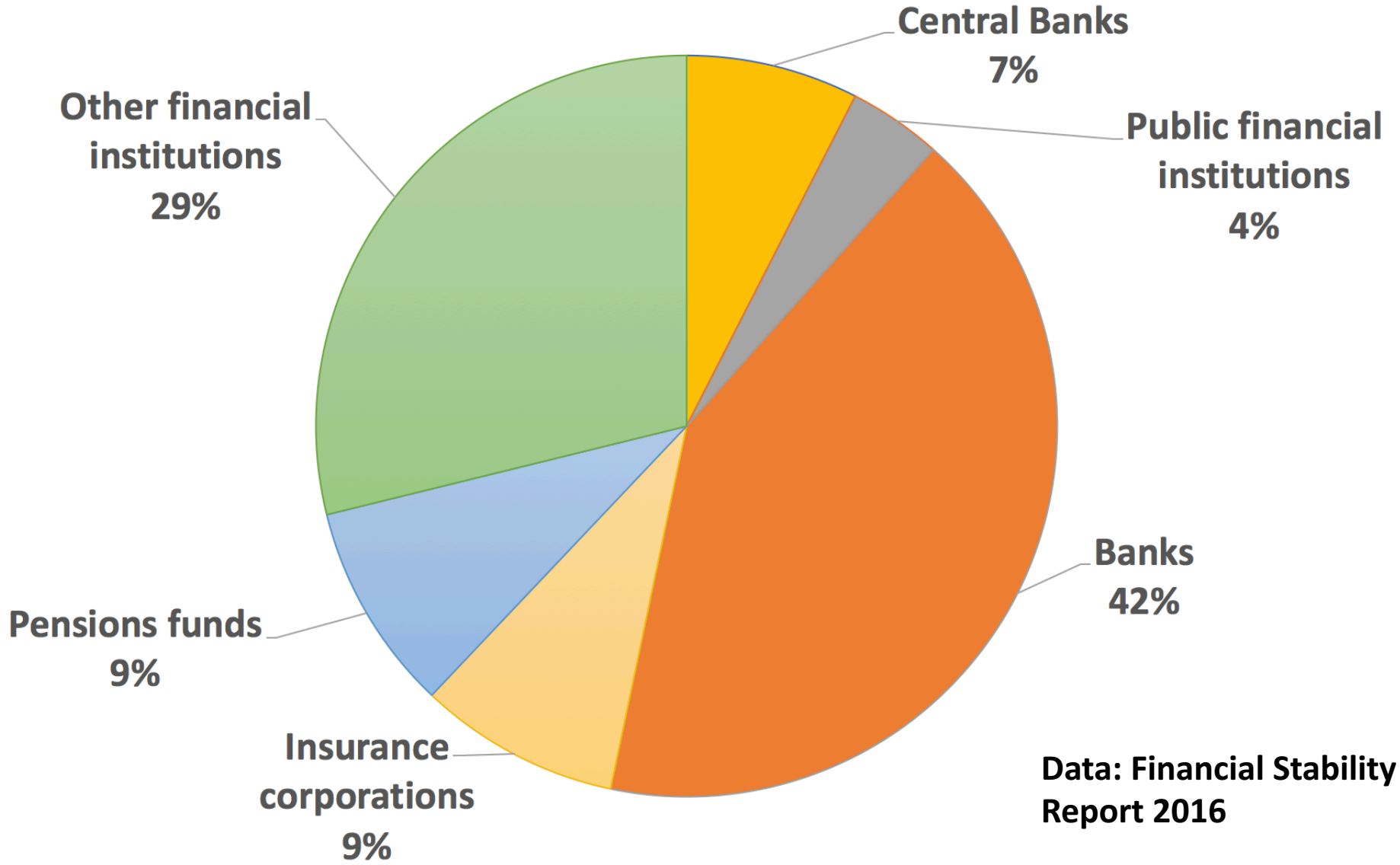
Regulators vs risk management

- Regulators are mostly reactive, not proactive.
- Current HQLA regulation might have prevented or reduced the severity of the ‘08 crisis.
- Prob. won’t prevent the next crisis as it will arise somewhere else.
  - Ironically, forcing for example Italian banks to hold Italian government bonds via HQLA will do little if it turns out that Italian bonds are the next toxic asset.



Mapping of the global financial system

Total global financial assets: $321 trillion (410% of world GDP)



Data: Financial Stability Board Report 2016

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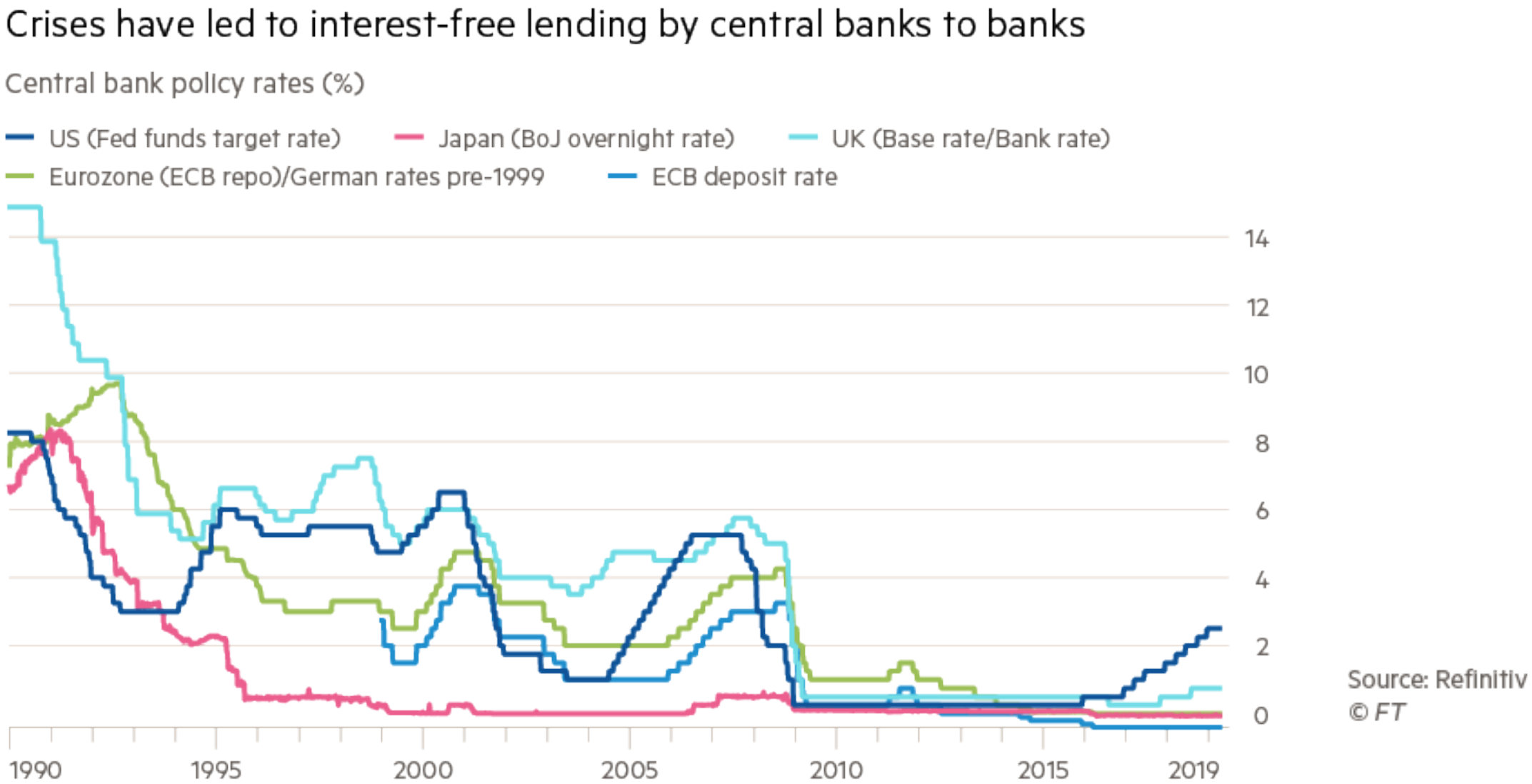
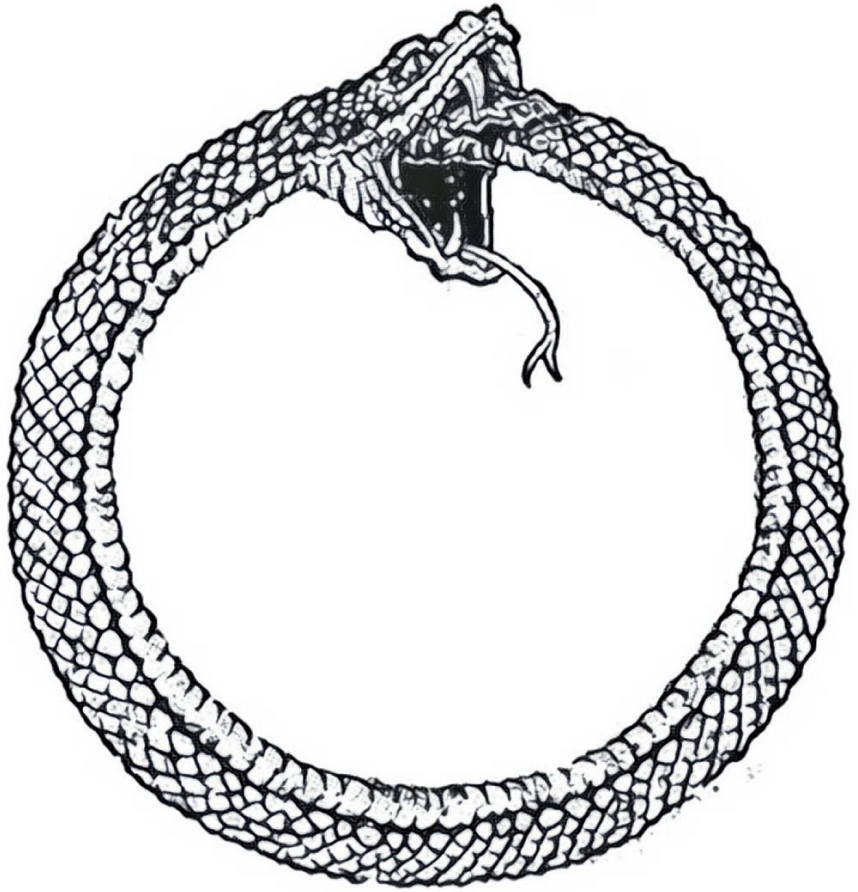
(sub) 0% interest rates for a decade (or two for Japan)



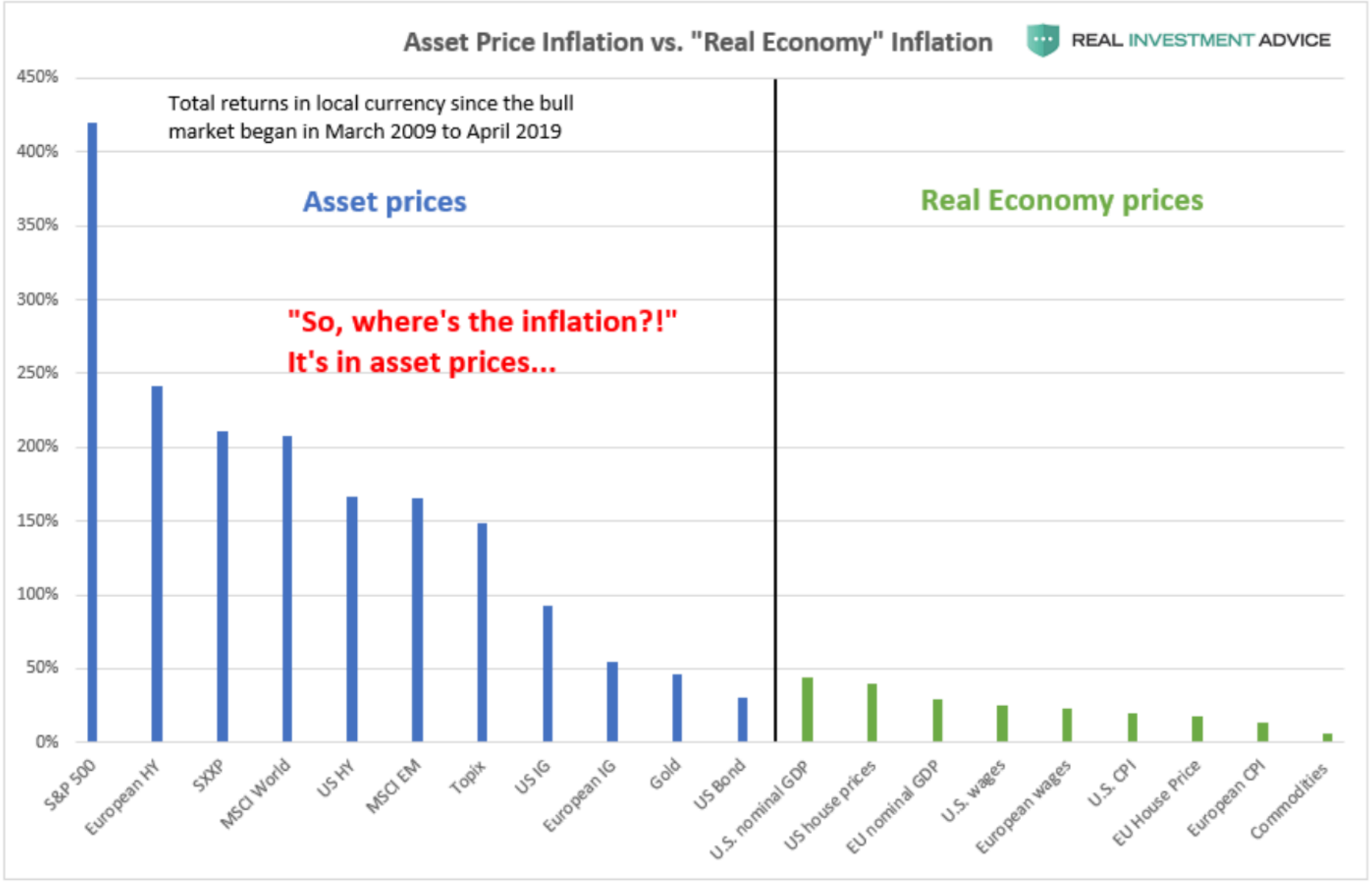
Central banks are signaling interest rate cuts again

“Reach for yield” pushes everyone into risky assets

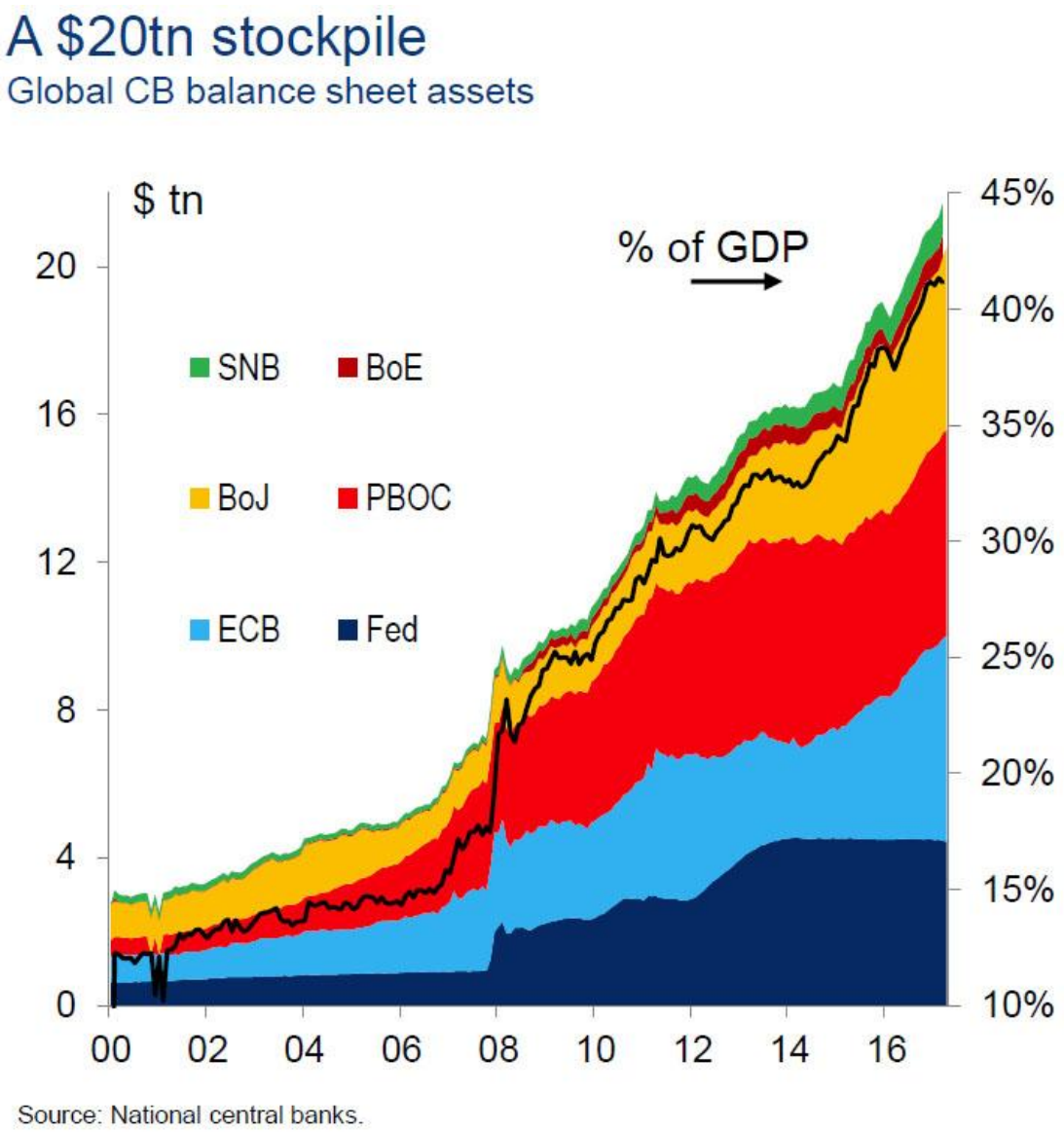
- Collateral loan obligations (CLOs) are “in” again.
- Companies issue debt to buy back their own stock (financial engineering high returns).
- Retail and pension funds sell equity insurance products to “enhance” yield.
- Government and global debt exploding (in particular in China & US).
- Increase use of currency derivatives (currency swaps)



… lifting asset prices around the world



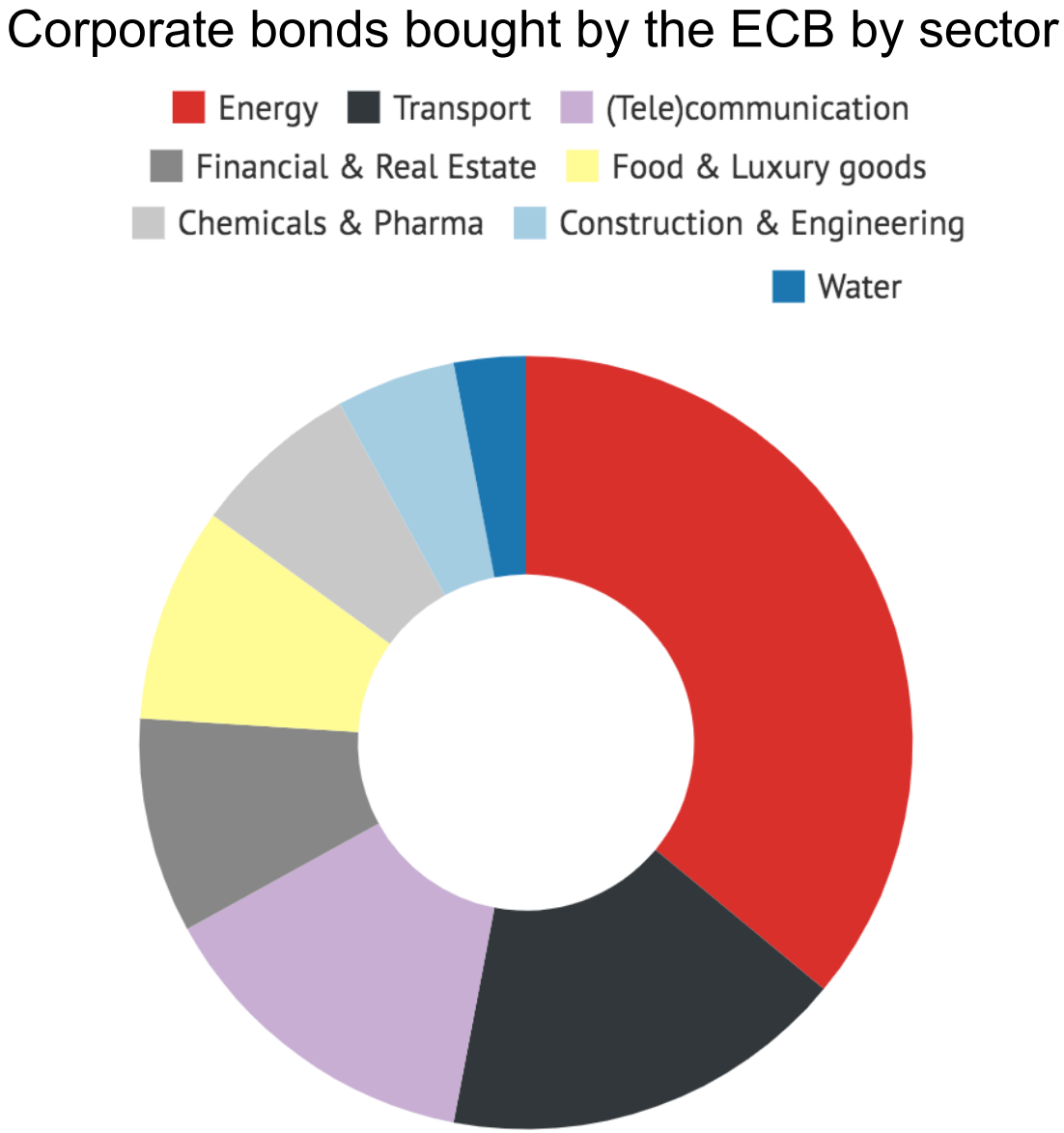
Central banks buying assets to "stimulate the economy”



CB = central bank
SNB = Swiss National Bank
BoE = Bank of England
BoJ = Bank of Japan
PBOC = People’s Bank of China
ECB = European Central Bank
Fed = Federal Reserve Bank

What are central banks buying?

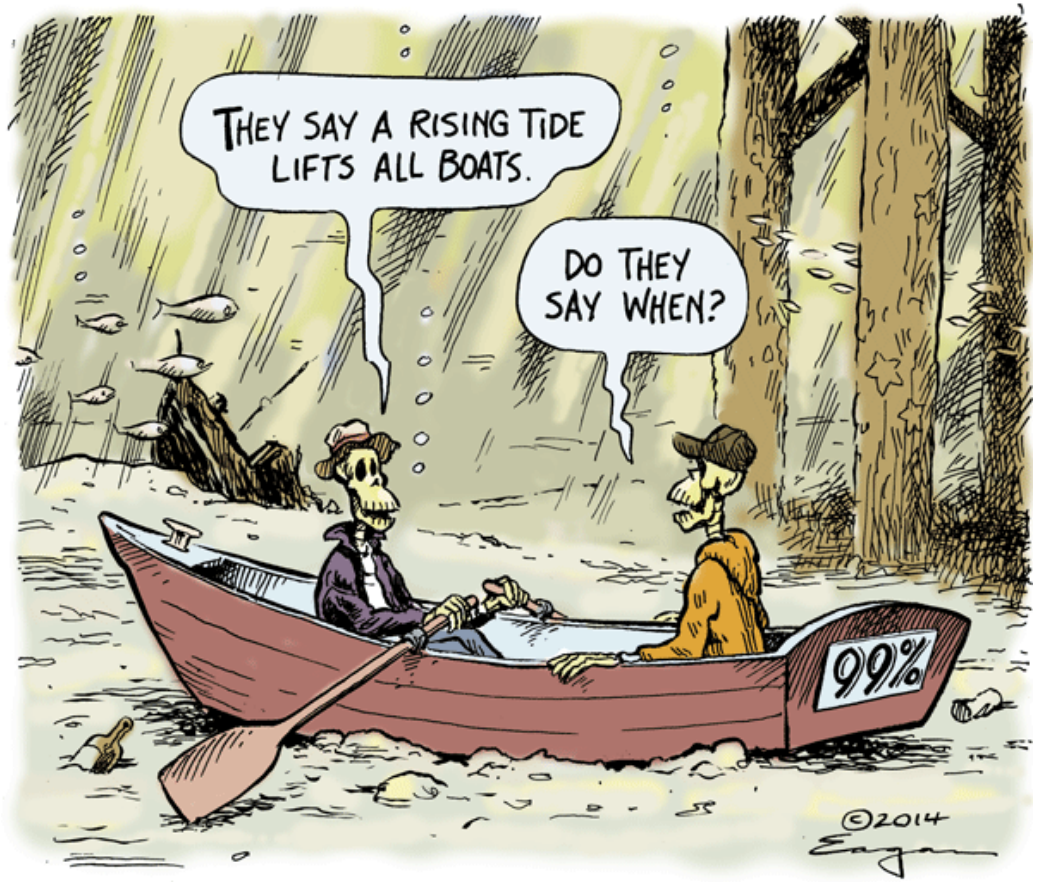
- ECB buys EU government bonds, now also buys corporate bonds (i.e. also bonds from Total, Volkswagen, Bayer, etc.)
- Swiss National Bank buys US stocks (esp. Tech stocks)
- Bank of Japan buys every local asset, including lots of stocks
- Central banks plan to buy more assets again soon
- Maybe they could buy more “useful” things?



“Trickle Down Economics” according to Ben Bernanke

Easier financial conditions (= low interest rates) *will promote economic growth. For example, lower mortgage rates will make housing more affordable and allow more homeowners to refinance. Lower corporate bond rates will encourage investment.* ***And higher stock prices will boost consumer wealth and help increase confidence, which can also spur spending.*** *Increased spending will lead to higher incomes and profits that, in a virtuous circle, will further support economic expansion.*

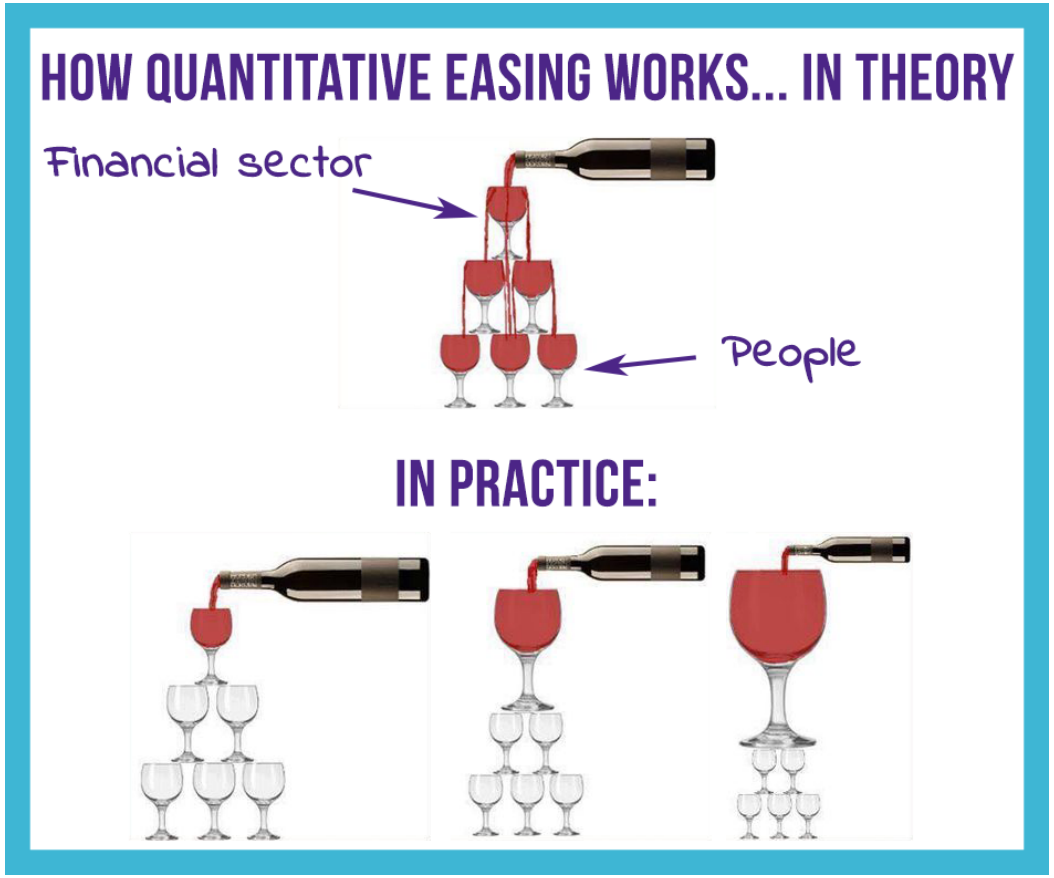
– Ben Bernanke, at the time chairman of the Federal Reserve, Op-Ed in the Washington Post (Nov. 2010)



Central banks causing inequalities | No trickle down effect?

- Bank of England finds that large central bank asset purchases increase inequalities.
- *The most relevant period for assessing wealth effects is the one since mid-2014, as it is mostly* ***asset purchases that are viewed as creating asset price inflation****. […] For the euro area, there has been an absolute gain: households of all wealth levels have seen their wealth increase as a share of their mean income. […]* ***Wealthier households, however, benefited more in relative terms compared with poorer households***.

– European Central Bank Annual Report 2016



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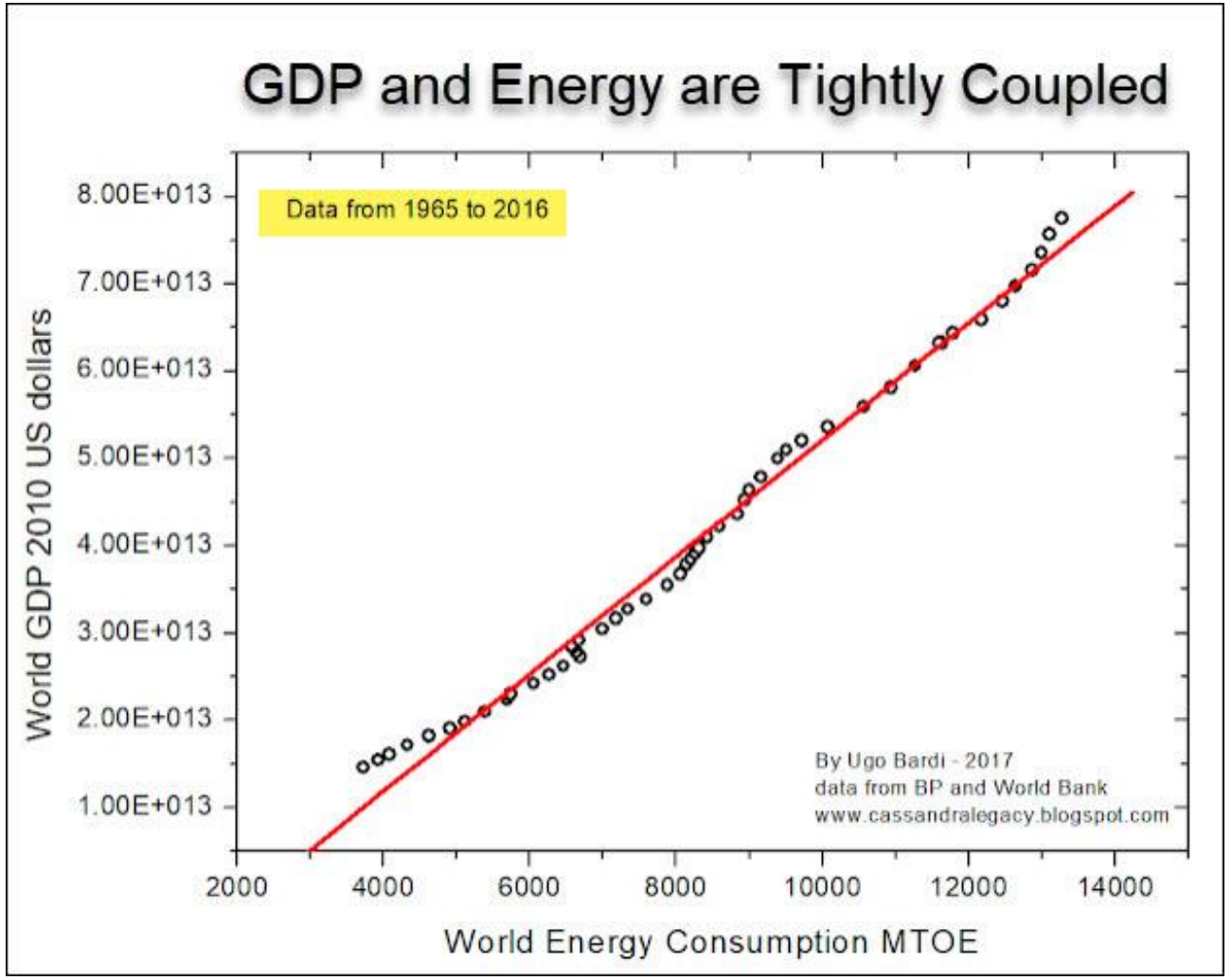
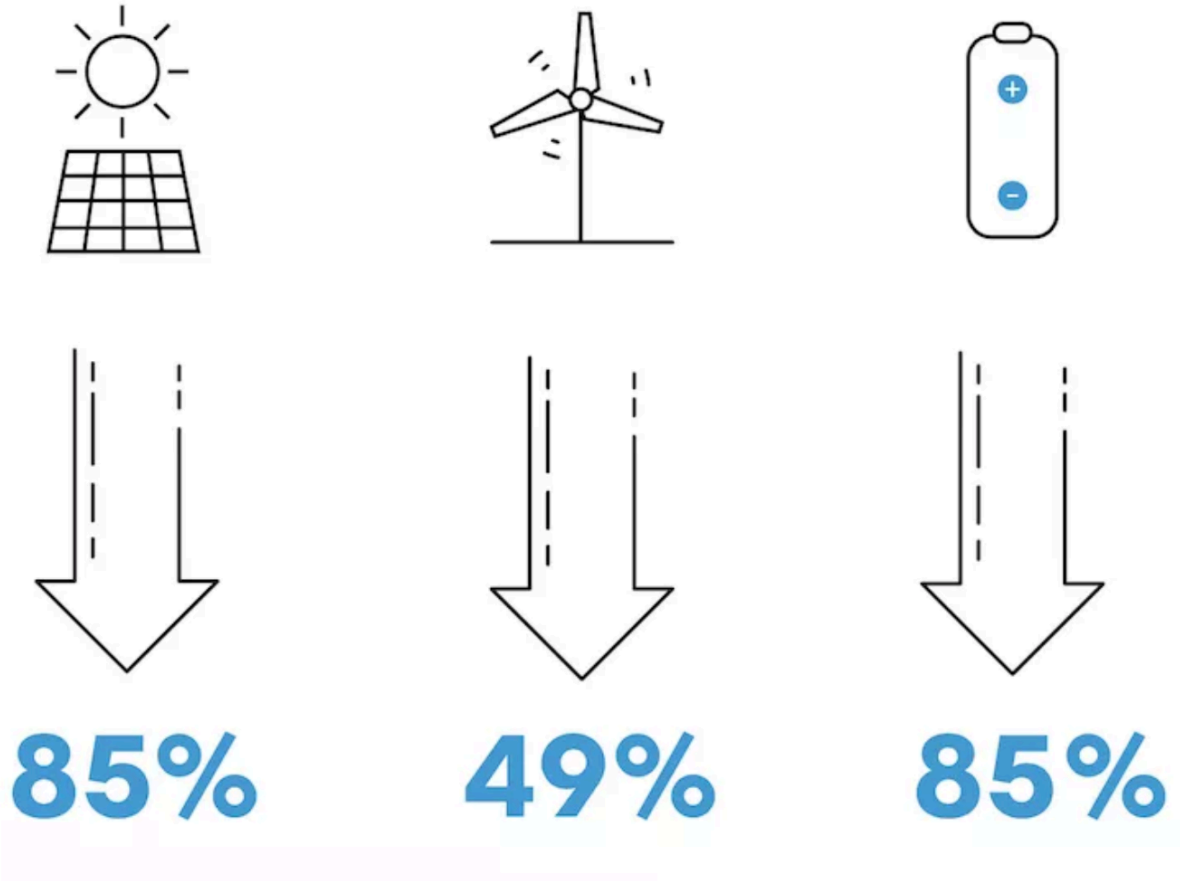
Energy consumption | Highly correlated to GDP

- Per year capital energy consumption in Germany
  4 tonnes of oil equivalent (TOE) or 45 000kWh
- Germany's share of renewables from total energy consumption: **15%** (40% for electricity)
- Each year, the world burns as much fossil fuels as Earth produced in several million years.
- Fossil fuels are getting more expensive to extract.



Renewables often cheaper than fossil fuels (in certain countries)

- Per MWh, solar & wind already cheaper than coal (**without incentives or higher CO2 price**)
- In some cases even solar & wind + batteries cheaper than coal
- Technology still improving fast, prob. in 10 years, even cheaper than existing gas and coal capacity in some countries



PRICE DROPS IN SOLAR, WIND, BATTERIES SINCE 2010. CREDIT: BNEF.

100% solar energy for Europe & North Africa

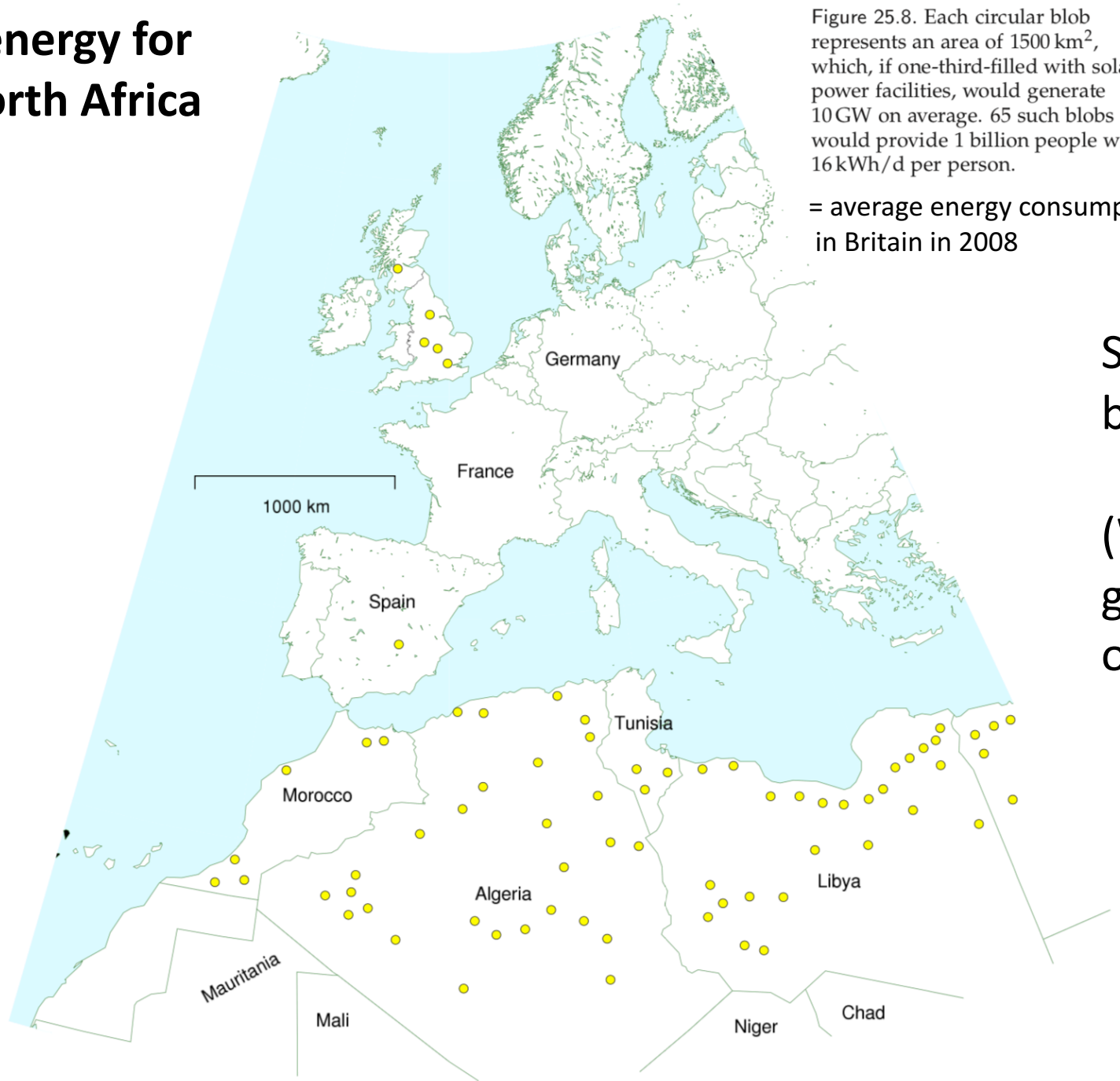


Figure 25.8. Each circular blob represents an area of 1500 km^2, which, if one-third-filled with solar power facilities, would generate 10 GW on average. 65 such blobs would provide 1 billion people with 16 kWh/d per person.

= average energy consumption in Britain in 2008

Suggested Desert Tech plan back in 2010.

(Would require a geopolitically stable region of course…)

Source: “Sustainable Energy — without the hot air” by David JC MacKay (2008)

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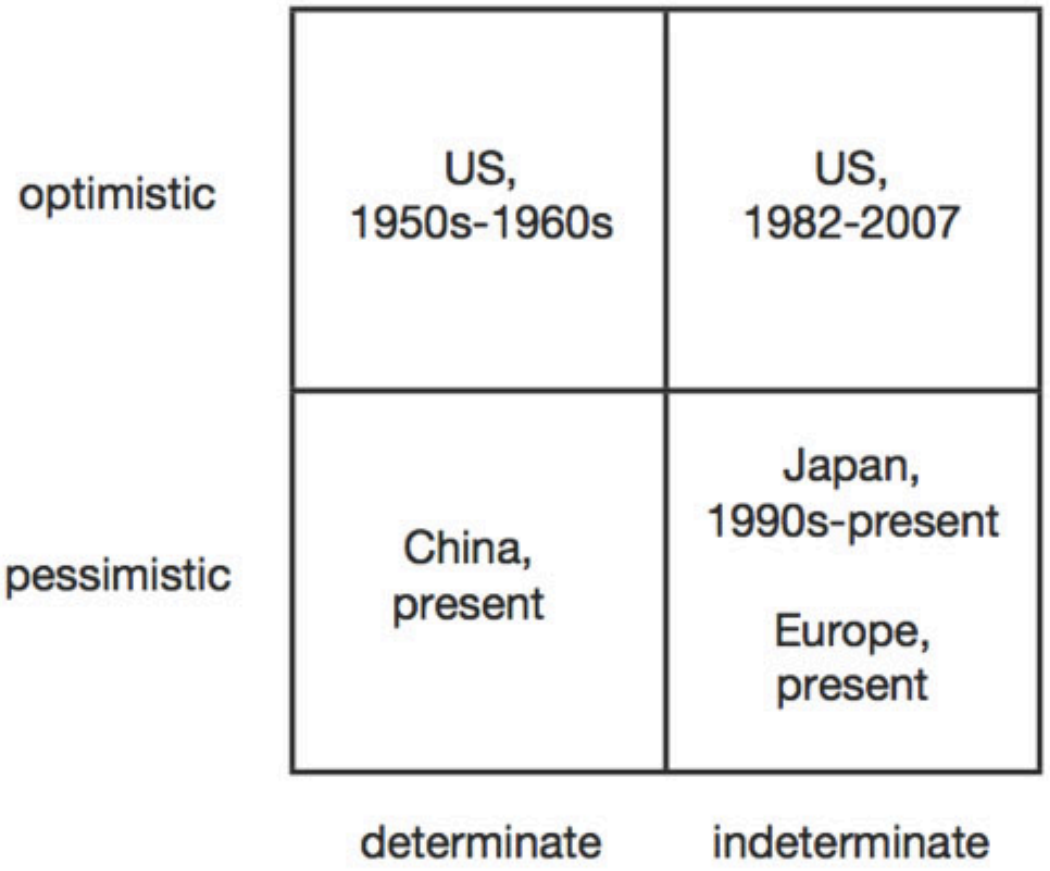
Vision about the future | Aim at 100% renewable for EU?

- Currently in Europe: culture is indeterminate and pessimistic about the future.
- Maybe not blowing up the planet could be a worthwhile new goal?
- Ideal case: 100% renewable will be cheaper than current fossil fuel energy (at least for some countries).
- Many “low hanging fruits”, i.e. electrification of heating and transportation, flexibilization of energy demand, reduce consumption of energy intensive activities, sharing economy



– Peter Thiel in “Zero to One: Notes on Startups, or How to Build the Future” (published in 2014)

How to fund it? European Investment Bank (EIB)? (1/2)

- Spoiler alert: Ticket price does **not** matter (i.e. “it costs €5 trillion, too expensive!” (?)).
- If renewable energy source cheaper than fossil fuel, then investments pay for themselves.
- Current developed economies **already pay 6 – 10% of GDP in energy bill** (mostly fossil fuel imports).
- EIB is already funding infrastructure projects across Europe (i.e. issues bonds to fund investments)

The described plan has been proposed by DIEM25’s leader Varoufakis

How to fund it? European Investment Bank (EIB)? (2/2)

- EIB bonds are already considered HQLA (high quality liquid assets)
- EIB is the closest financial instrument to a Eurobond (i.e. liabilities shared across all European nations)
- EIB bonds are already being bought by the ECB
- Only issue: small in size (EIB balance sheet €0.5 trillion vs €13 trillion for EU government debt)

Green bonds

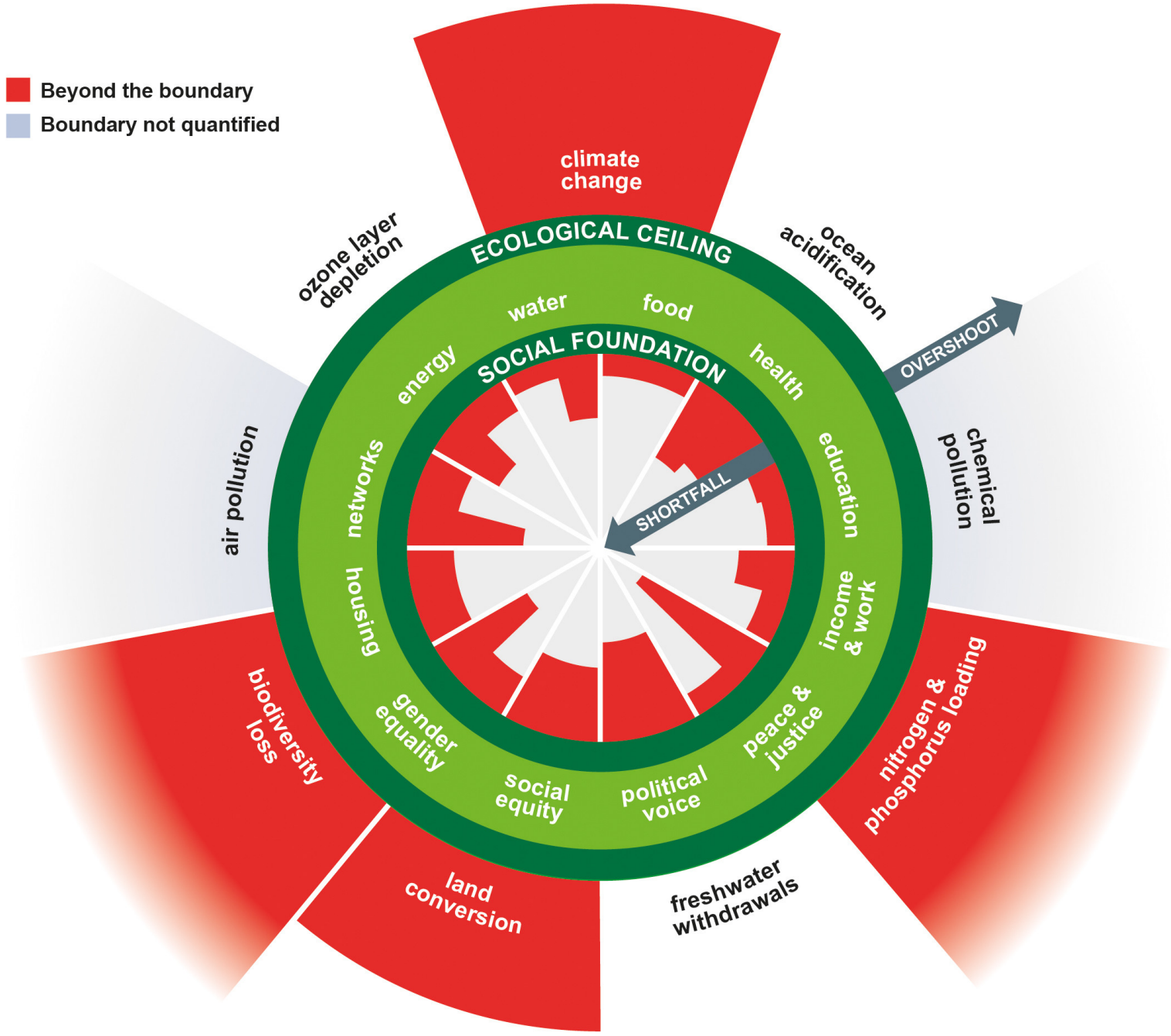
- The EIB remained the largest supranational green bond issuer in 2016, funding EUR 3.8bn in the Climate Awareness Bond (CAB) format. The Bank has supplied EUR 15.2bn in CABs since 2007 across 11 currencies, making it also the largest overall issuer in the global green bond market.

Solution: Increase size of EIB?

- Increase EIB by issuing debt, say 2-5% of GDP per year.
- If ECB has to inject liquidity into markets again, let it buy EIB bonds.
- Build and invest in renewable infrastructure across Europe, possibly beyond.

Pros & Cons of EIB funded Green New Deal?

- Pros:
  - Ends austerity in Europe, creates many jobs (EU wide fiscal policy)
  - Decreases Europe's external reliance on energy imports (i.e. oil wars)
  - Can start immediately (not having to wait until "finding taxes")
  - May save money in the long run
  - Decarbonizes energy consumption
  - Focus specific, thus hopefully more efficient
  - Could create a lucrative export market
- Cons:
  - End of the status quo
  - May be seen as circumventing nation's sovereignty
  - May create inflation, particularly if return on investment not positive
  - May not be enough



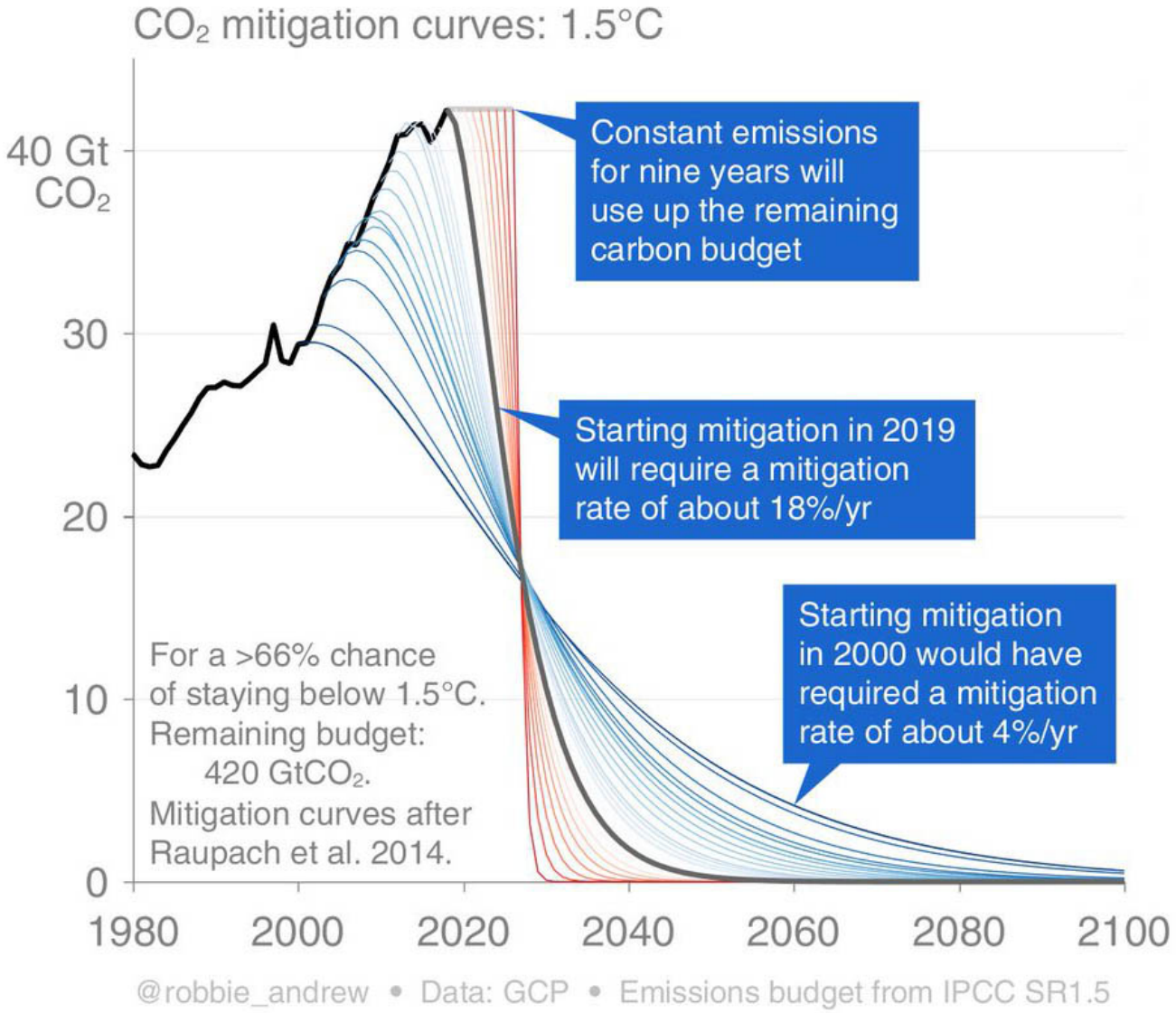
Source: Doughnut Economics – Kate Raworth

Current crisis is multidimensional

- Greenhouse gasses are not the only thing that matters.
- Renewables consume lots of resources too.
- In particular, biodiversity loss and land conservation will likely not be solved by “growth”.

Emergency State| If increased fiscal policy is not enough

- Further resource mobilization
  - Internalize external costs, i.e. sharply increase costs of pollution.
  - E.g. high CO2 price (with fair redistribution of proceeds to prevent Yellow Vest like uprising), possible tax cuts elsewhere.
  - Job retraining to smooth any transition
  - Rewilding, clean-ups, mobilize jobless workforce to do so
- Ideally with the fewest rules possible to allow creative problem solving



Conclusion | Massive changes are required

- Politicians and everyone else have been asleep at the wheel for too long.
- Education is key to increase awareness and acceptance of possibly painful changes (at least at first).
- Solutions exist, the better the plan, the higher the chances of success.
  Many can be seen as opportunities.

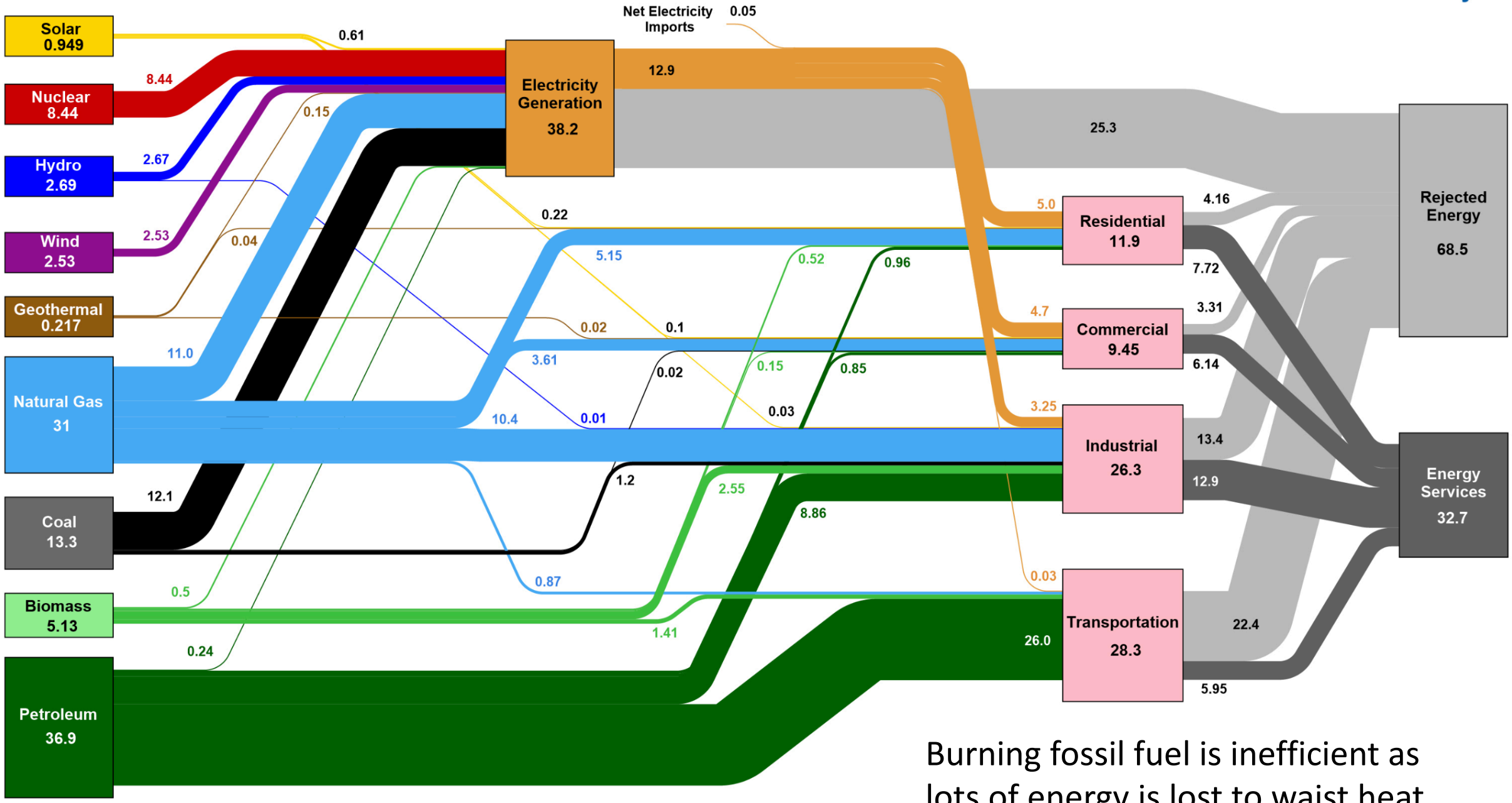
Thank you for listening!

Questions?

Bonus slides

Estimated U.S. Energy Consumption in 2018: 101.2 Quads

Lawrence Livermore National Laboratory



Burning fossil fuel is inefficient as lots of energy is lost to waist heat

Climate modelling is difficult and is dogged by uncertainties. But uncertainty about exactly how the climate will respond to extra greenhouse gases is no justification for inaction. If you were riding a fast-moving motorcycle in fog near a cliff-edge, and you didn't have a good map of the cliff, would the lack of a map justify *not* slowing the bike down?

Source: "Sustainable Energy — without the hot air" by David JC MacKay (2008)

Climate models and precautionary measures

Joseph Norman†, Rupert Read§, Yaneer Bar-Yam†, Nassim Nicholas Taleb *
†New England Complex Systems Institute, §School of Philosophy, University of East Anglia, *School of Engineering, New York University

THE POLICY DEBATE with respect to anthropogenic climate-change typically revolves around the accuracy of models. Those who contend that models make accurate predictions argue for specific policies to stem the foreseen damaging effects; those who doubt their accuracy cite a lack of reliable evidence of harm to warrant policy action.

These two alternatives are not exhaustive. One can sidestep the "skepticism" of those who question existing climate-models, by framing risk in the most straightforward possible terms, at the global scale. That is, we should ask "what would the correct policy be if we had no reliable models?"

We have *only one* planet. This fact radically constrains the kinds of risks that are appropriate to take at a large scale. Even a risk with a very low probability becomes unacceptable when it affects all of us – there is no reversing mistakes of that magnitude.

Without any precise models, we can still reason that polluting or altering our environment significantly could put us in uncharted territory, with no statistical track-record and potentially large consequences. It is at the core of both scientific decision making and ancestral wisdom to take seriously absence of evidence when the consequences of an action can be large. And it is standard textbook decision theory that a policy should depend at least as much on uncertainty concerning the adverse consequences as it does on the known effects.

Further, it has been shown that in any system fraught with opacity, harm is in the dose rather than in the nature of the offending substance: it increases nonlinearly to the quantities at stake. Everything fragile has such property. While some amount of pollution is inevitable, high quantities of any pollutant put us at a rapidly increasing risk of destabilizing the climate, a system that is integral to the biosphere. Ergo, we should build down CO2 emissions, even regardless of what climate-models tell us.

This leads to the following asymmetry in climate policy. The scale of the effect must be demonstrated to be large enough to have impact. Once this is shown, and it has been, the burden of proof of absence of harm is on those who would deny it.

It is the degree of opacity and uncertainty in a system, as well as asymmetry in effect, rather than specific model predictions, that should drive the precautionary measures. Push a complex system too far and it will not come back. The popular belief that uncertainty undermines the case for taking seriously the 'climate crisis' that scientists tell us we face is the opposite of the truth. Properly understood, as driving the case for precaution, uncertainty radically *underscores* that case, and may even *constitute* it.

From 1769 to 2006, world annual coal production increased 800-fold. Coal production is still increasing today. Other fossil fuels are being extracted too – the middle graph of figure 1.7 shows oil production for example – but in terms of CO_2 emissions, coal is still king.

The burning of fossil fuels is the principal reason why CO_2 concentrations have gone up. This is a fact, but, hang on: I hear a persistent buzzing noise coming from a bunch of climate-change inactivists. What are they saying? Here's Dominic Lawson, a columnist from the *Independent*:

> "The burning of fossil fuels sends about seven gigatons of CO_2 per year into the atmosphere, which sounds like a lot. Yet the biosphere and the oceans send about 1900 gigatons and 36 000 gigatons of CO_2 per year into the atmosphere – ... one reason why some of us are sceptical about the emphasis put on the role of human fuel-burning in the greenhouse gas effect. Reducing man-made CO_2 emissions is megalomania, exaggerating man's significance. Politicians can't change the weather."

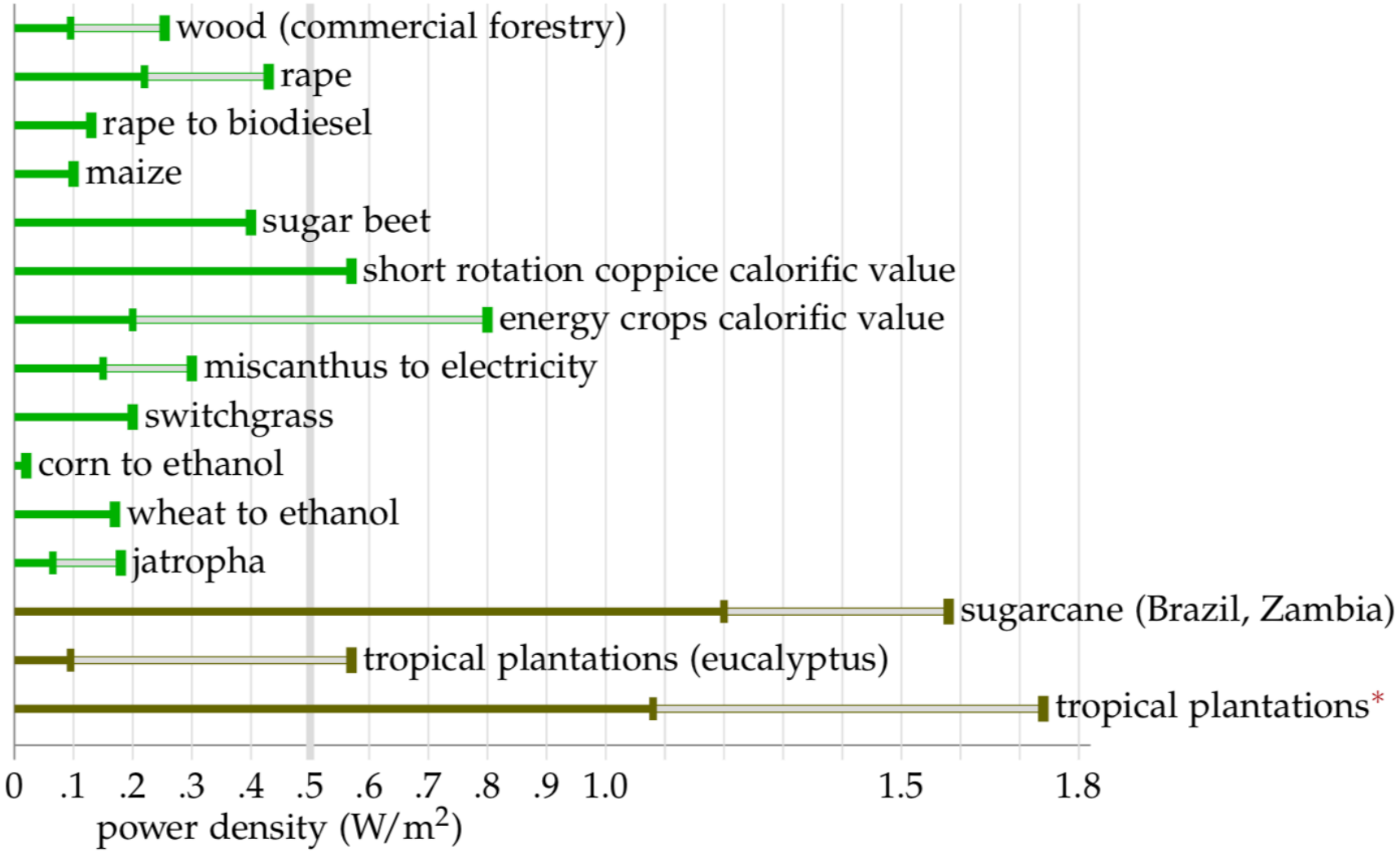
Now I have a lot of time for scepticism, and not everything that sceptics say is a crock of manure – but irresponsible journalism like Dominic Lawson's deserves a good flushing.

The first problem with Lawson's offering is that *all three numbers* that he mentions (seven, 1900, and 36 000) are *wrong!* The correct numbers are 26, 440, and 330. Leaving these errors to one side, let's address Lawson's main point, the relative smallness of man-made emissions.

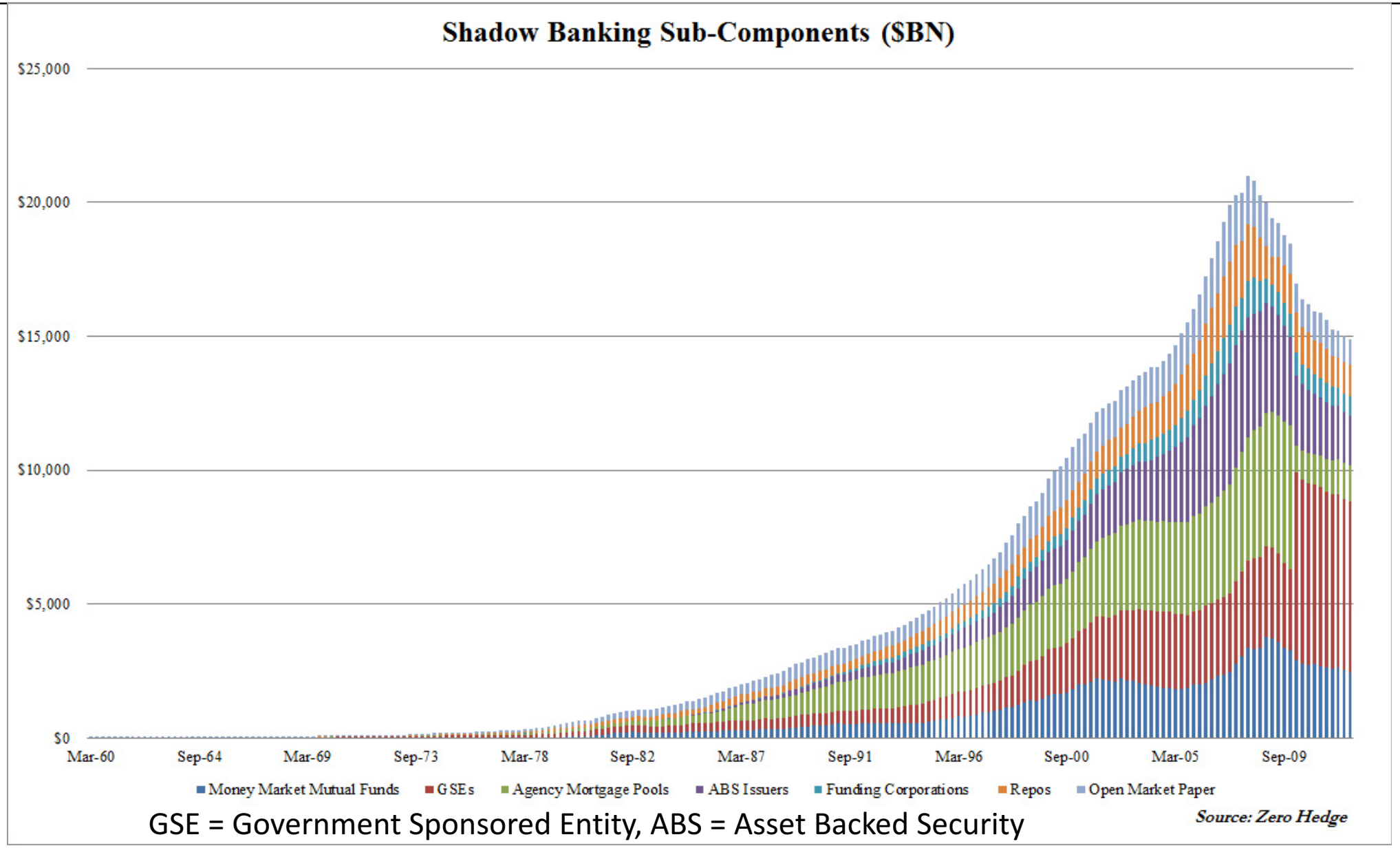
Source: "Sustainable Energy — without the hot air" by David JC MacKay (2008)

Yes, natural flows of CO_2 *are* larger than the additional flow we switched on 200 years ago when we started burning fossil fuels in earnest. But it is terribly misleading to quantify only the large natural flows *into* the atmosphere, failing to mention the almost exactly equal flows *out* of the atmosphere back into the biosphere and the oceans. The point is that these *natural* flows in and out of the atmosphere have been almost exactly in balance for millenia. So it's not relevant at all that these natural flows are larger than human emissions. The natural flows *cancelled themselves out*. So the natural flows, large though they were, left the concentration of CO_2 in the atmosphere and ocean *constant*, over the last few thousand years. Burning fossil fuels, in contrast, creates a *new* flow of carbon that, though small, is *not cancelled*.

The average harvestable power of sunlight in Britain is 100 W/m^2. The most efficient plants in Europe are about 2%-efficient at turning solar energy into carbohydrates, which would suggest that plants might deliver 2 W/m^2; however, their efficiency drops at higher light levels, and the best performance of any energy crops in Europe is closer to 0.5 W/m^2.

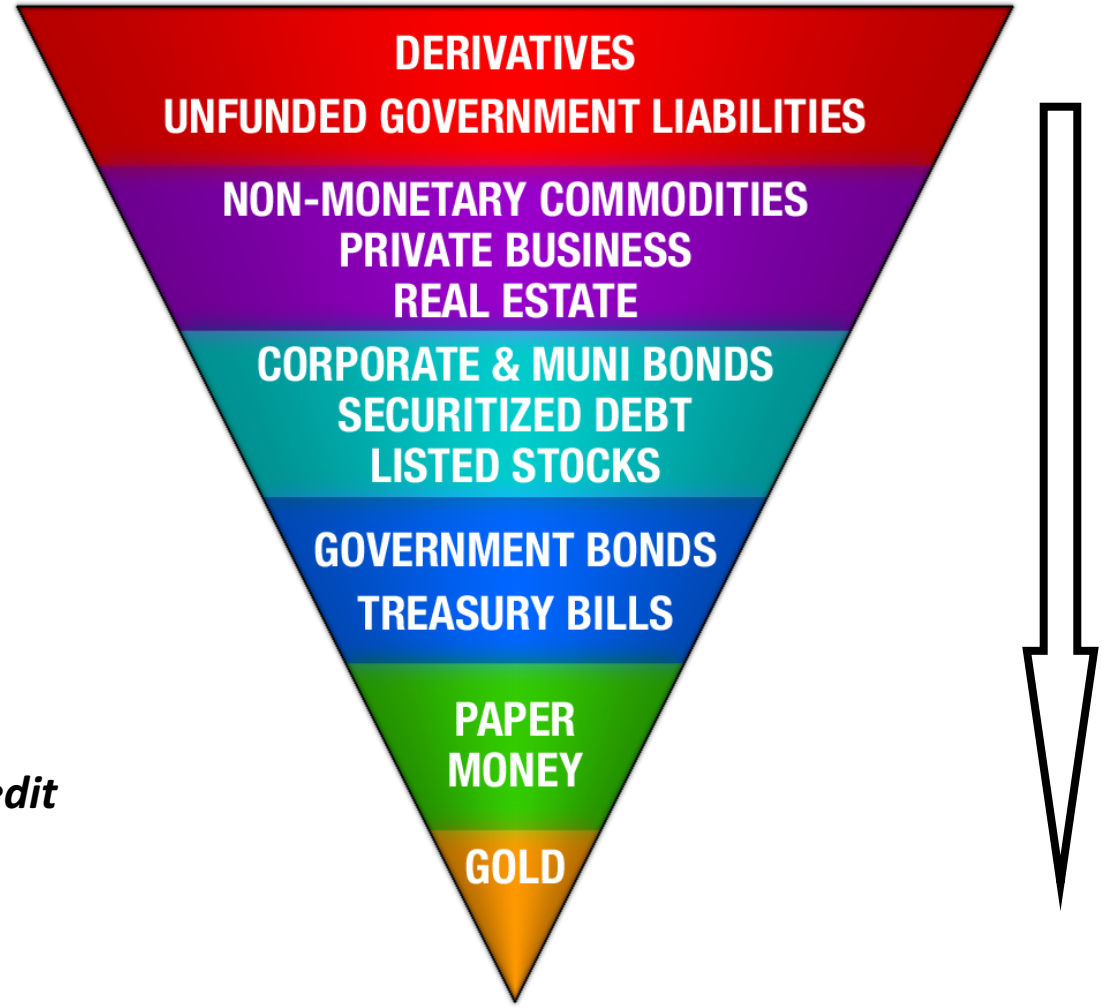


Bonus Chart | US shadow banking sub-components



GSE = Government Sponsored Entity, ABS = Asset Backed Security

Exter's Pyramid | Hierarchy of Risk



More trust required

Less liquid (harder to sell)

Further away from "real" wealth

Gold is money,

everything else is credit

– JP Morgan

Less trust required

More liquid (easier to sell)

Closer to "real" wealth

Stylized map | Traditional and shadow money

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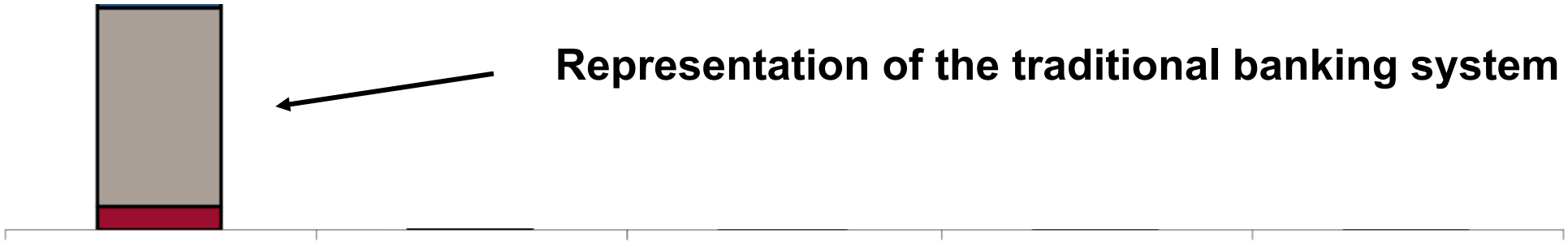
Outside Money (central bank reserves and cash)



Representation of the traditional banking system

Source: Credit Suisse

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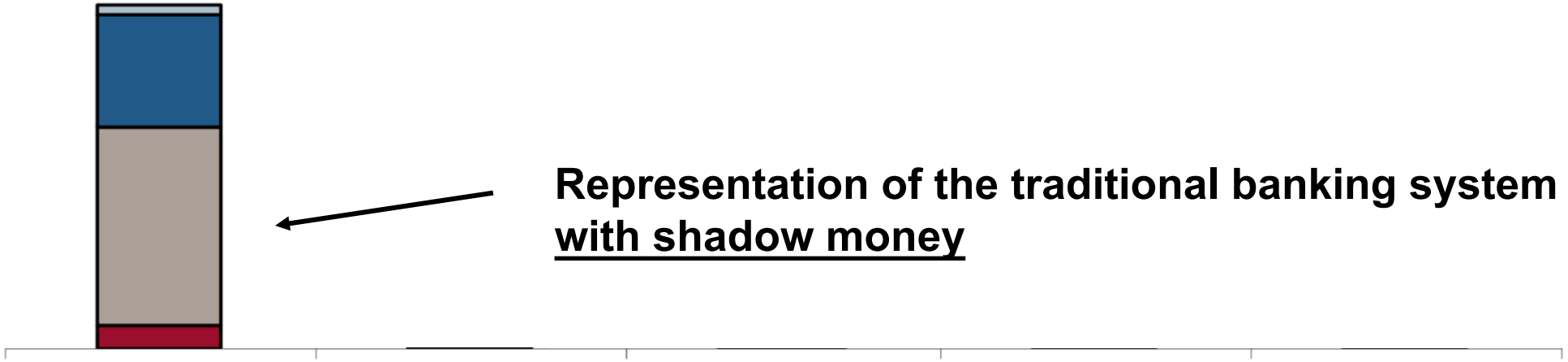
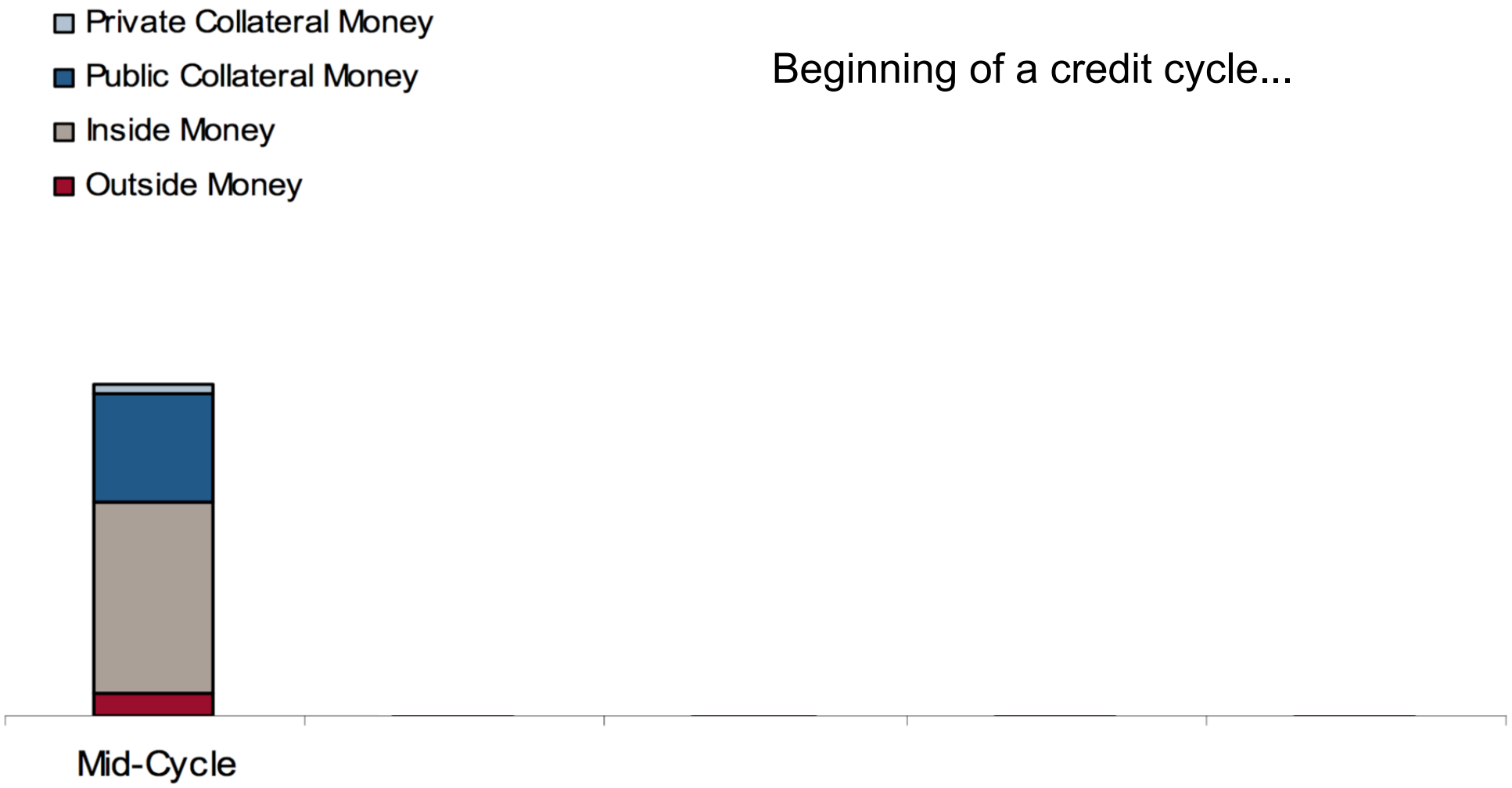


Representation of the traditional banking system with shadow money

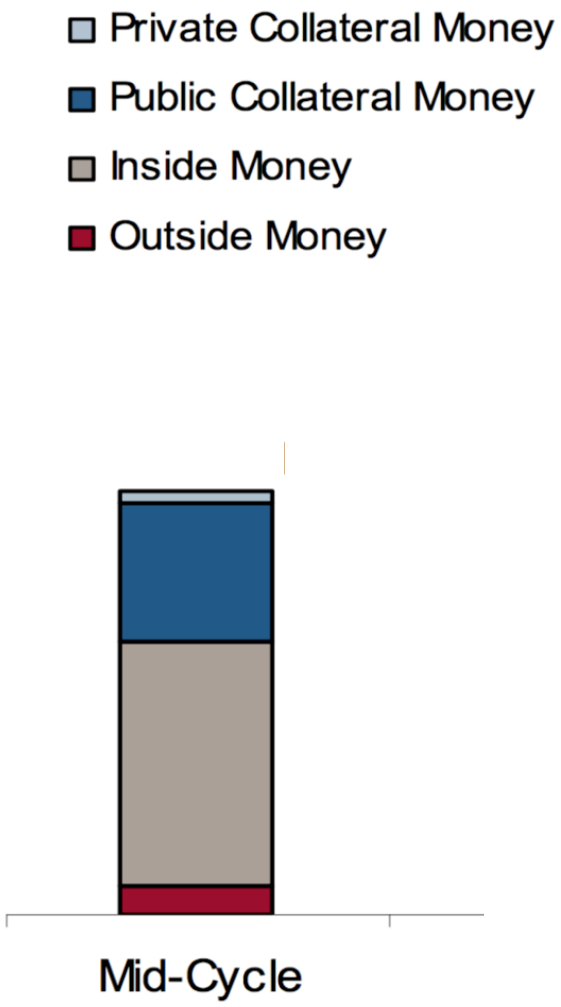
Source: Credit Suisse

Stylized map | Credit boom & bust with shadow money



Source: Credit Suisse

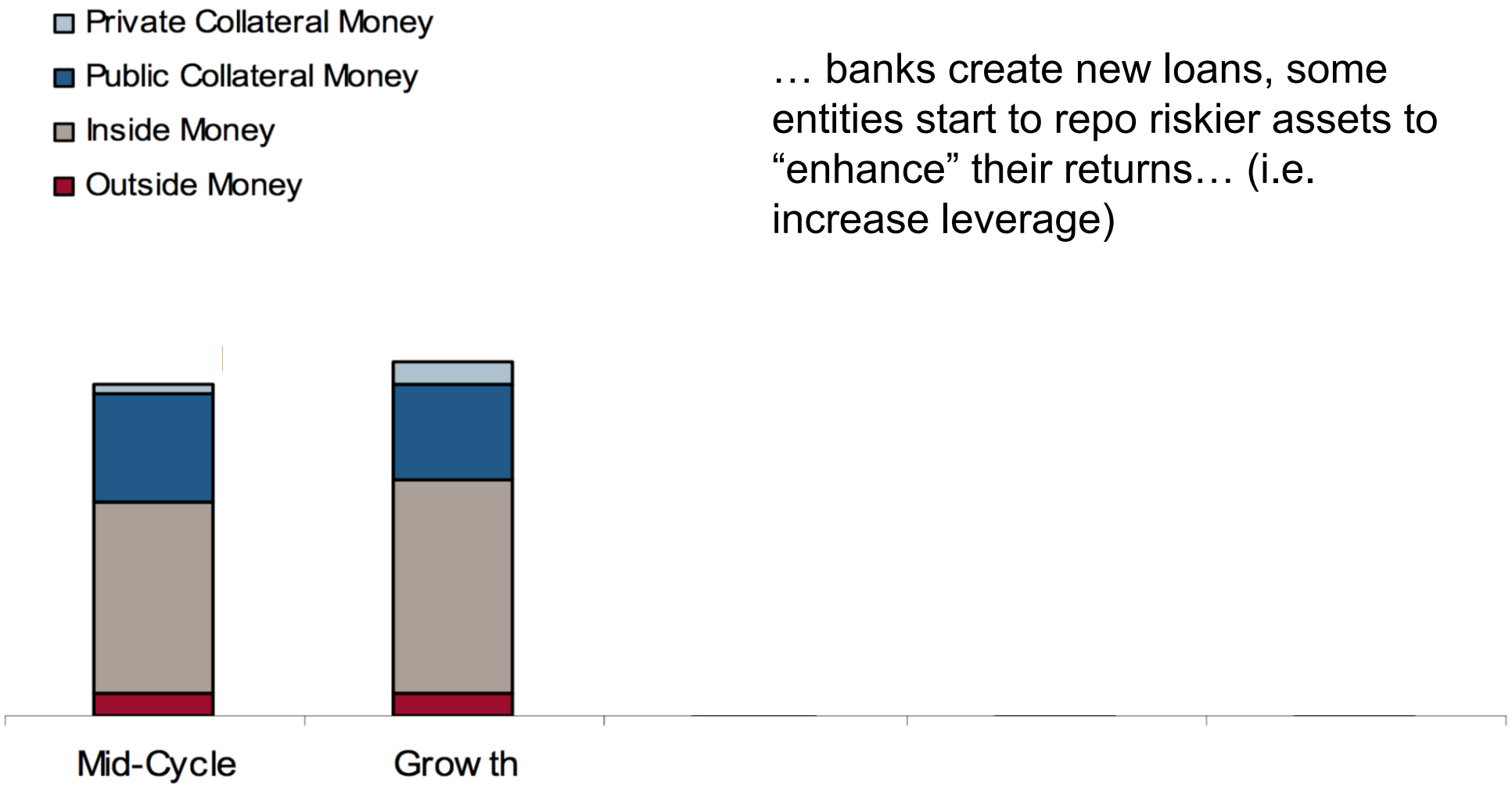
Stylized map | Credit boom & bust with shadow money



Growth phase with mild CPI inflation…

Source: Credit Suisse

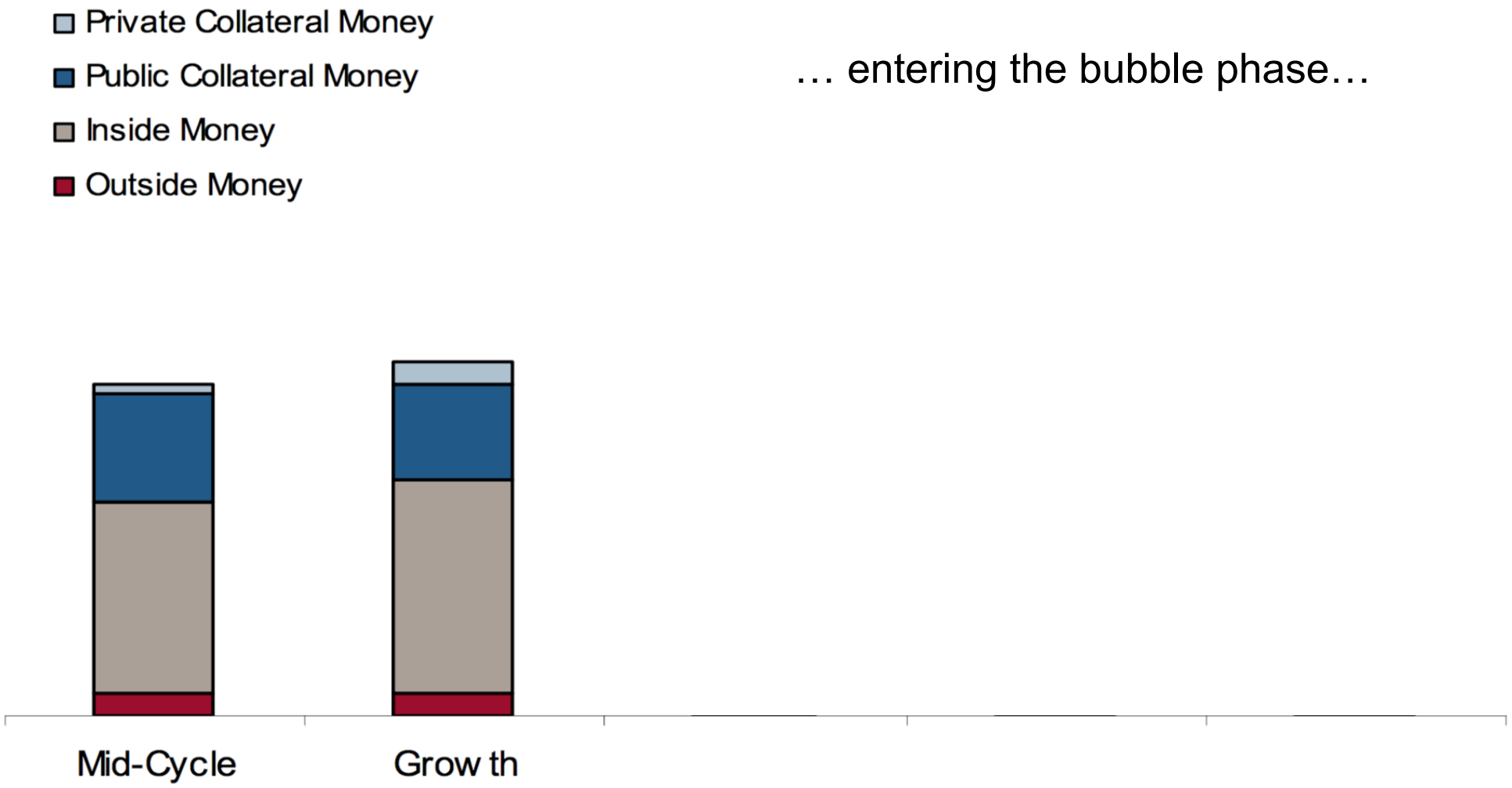
Stylized map | Credit boom & bust with shadow money



… banks create new loans, some entities start to repo riskier assets to "enhance" their returns… (i.e. increase leverage)

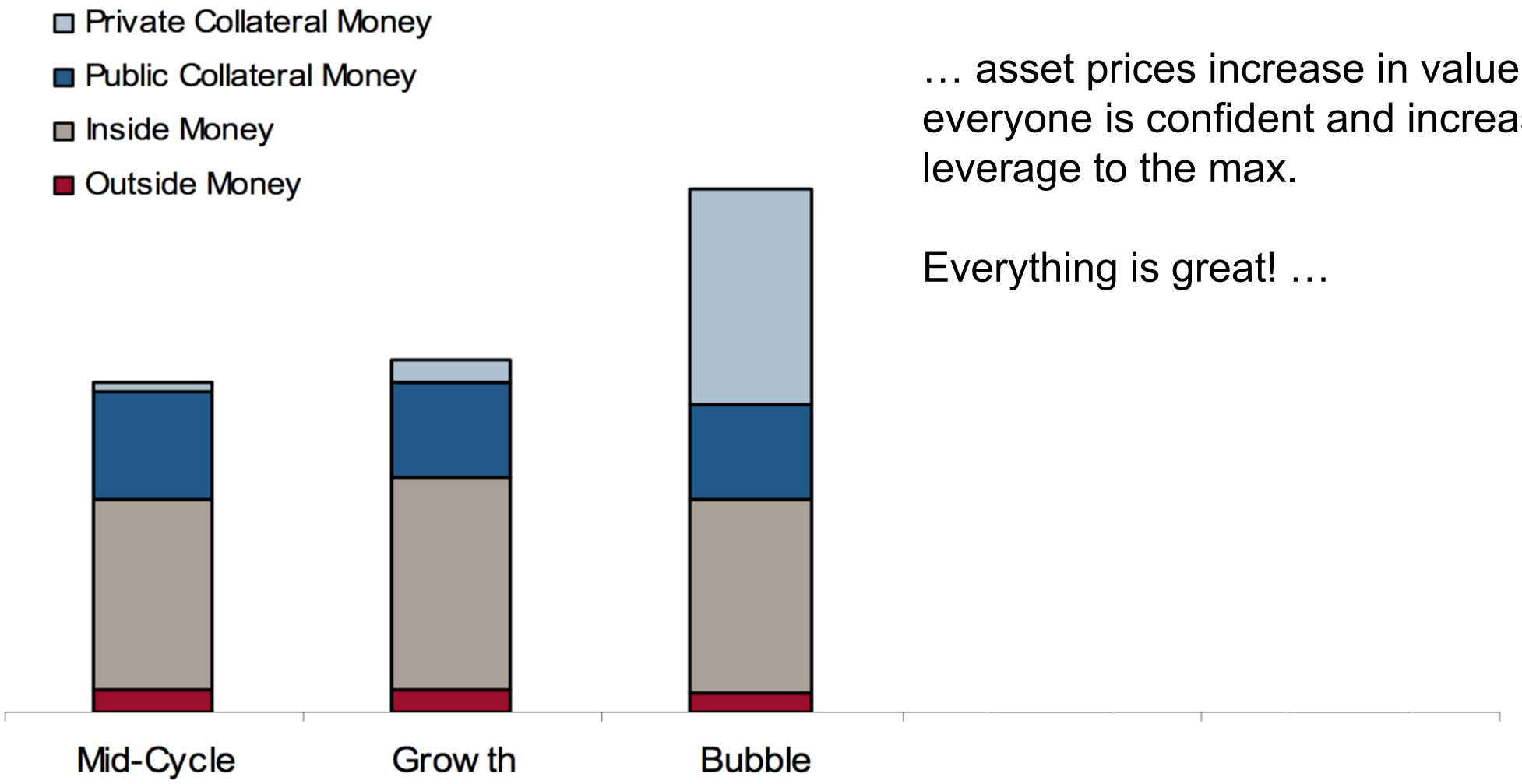
Source: Credit Suisse

Stylized map | Credit boom & bust with shadow money



Source: Credit Suisse

Stylized map | Credit boom & bust with shadow money

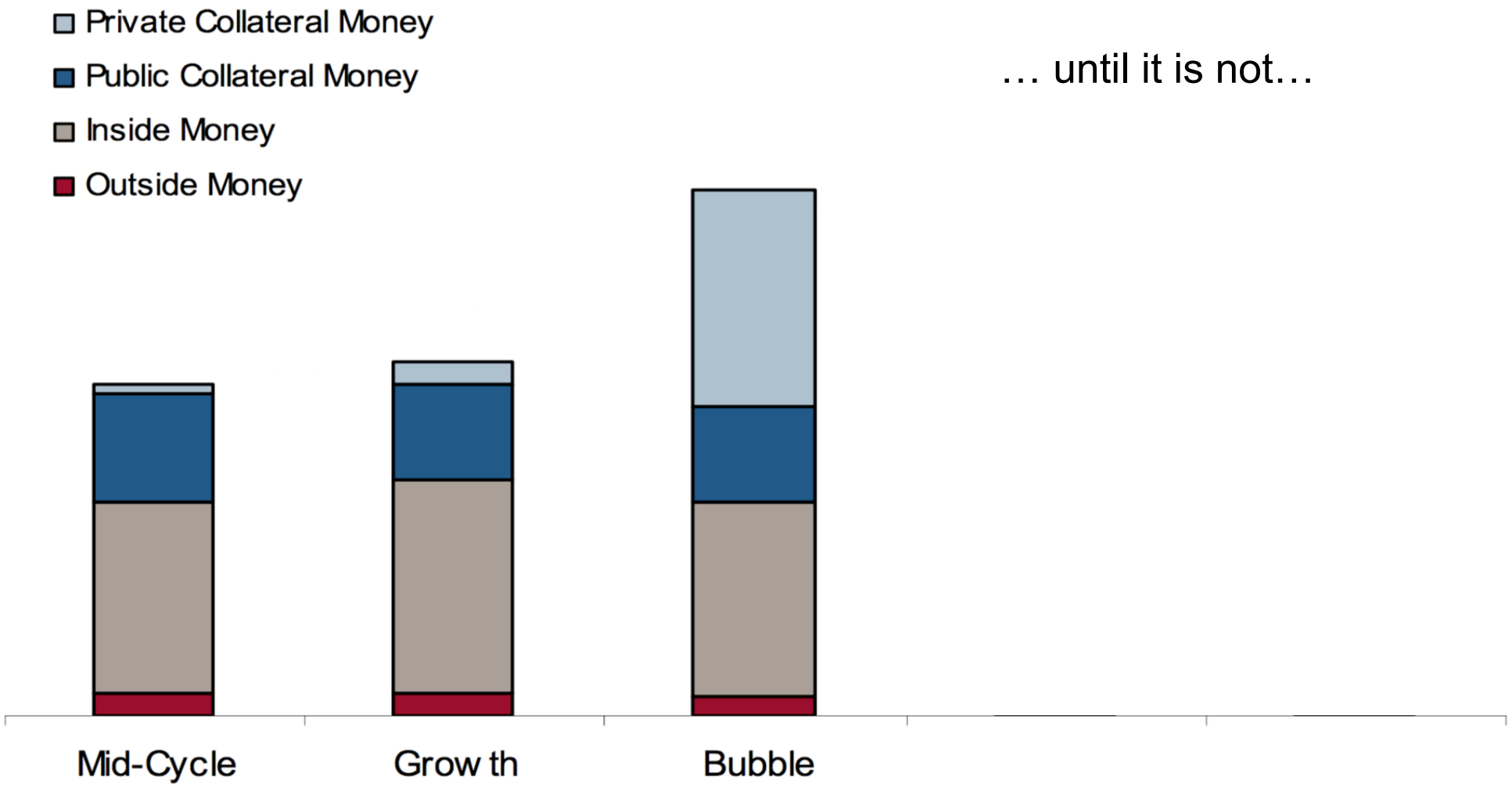


… asset prices increase in value, everyone is confident and increases leverage to the max.

Everything is great! …

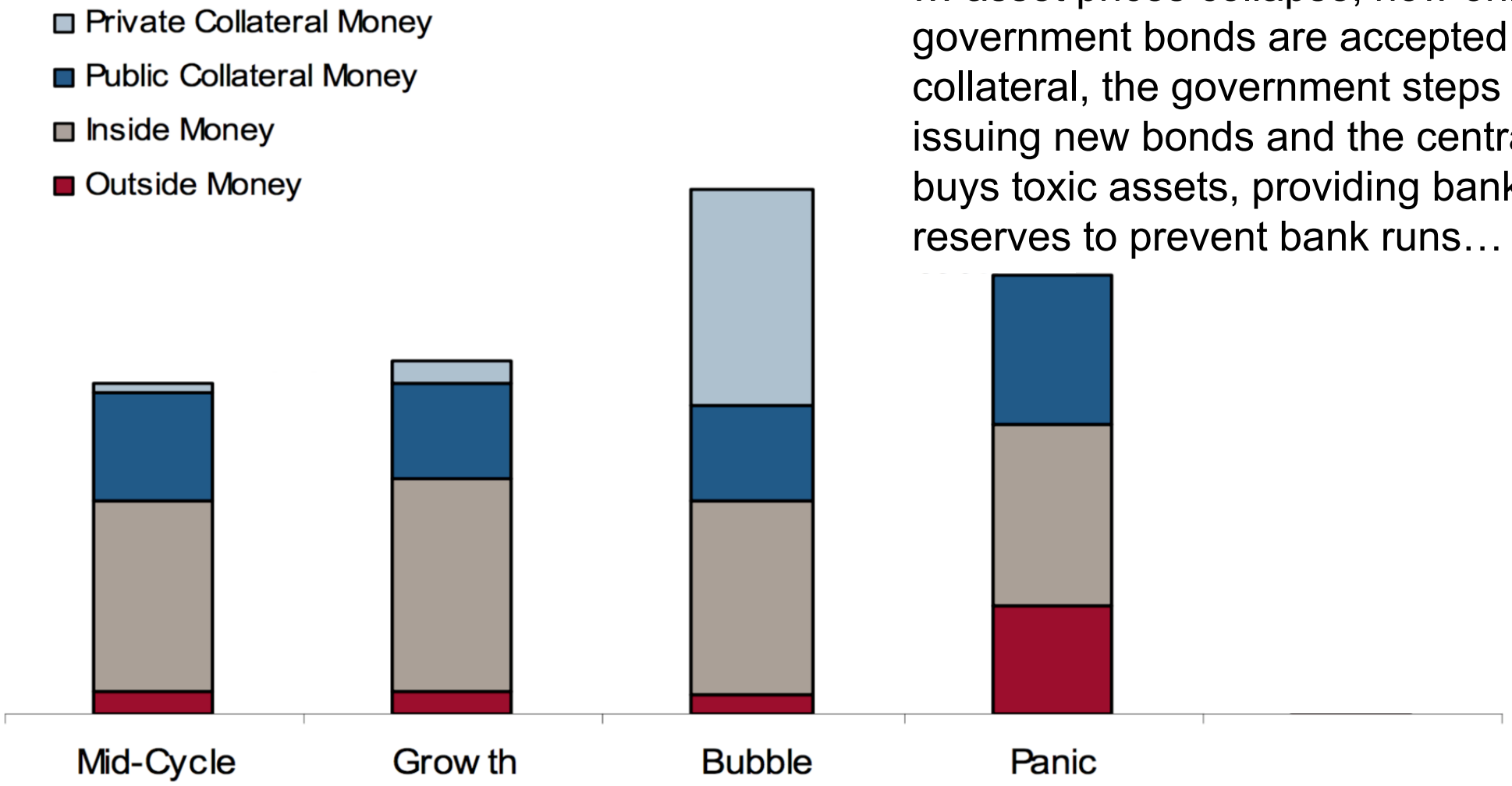
Source: Credit Suisse

Stylized map | Credit boom & bust with shadow money



Source: Credit Suisse

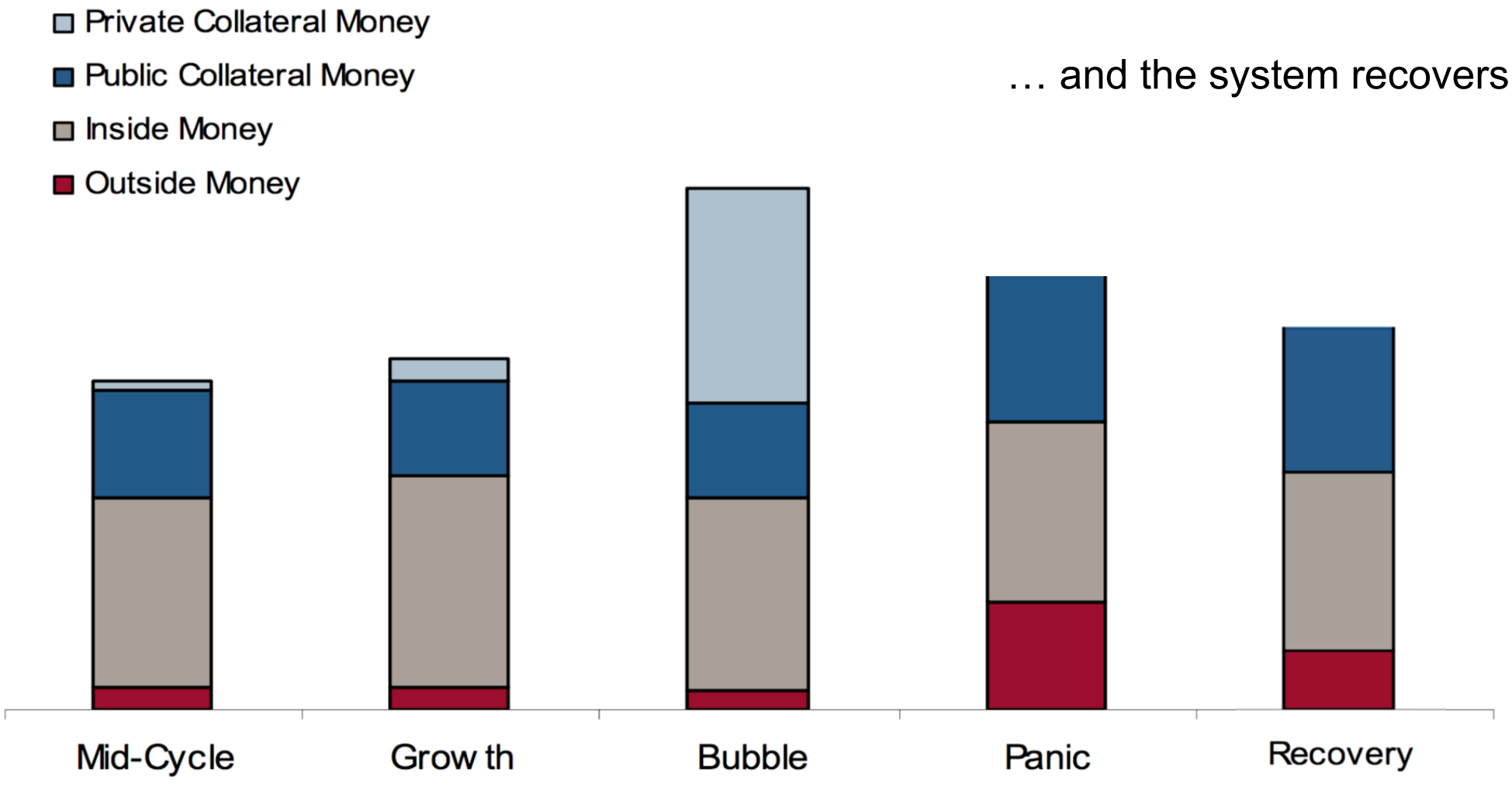
Stylized map | Credit boom & bust with shadow money



… asset prices collapse, now only government bonds are accepted as collateral, the government steps in by issuing new bonds and the central bank buys toxic assets, providing banks with reserves to prevent bank runs…

Source: Credit Suisse

Stylized map | Credit boom & bust with shadow money



Source: Credit Suisse