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**Shadow Banking – an assessment of measures to regulate the non-banking system**

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## **Abstract**

This study will evaluate certain proposals on banking regulation brought forward by experts in Banking and Economics and their applicability not just on traditional Banks but on Shadow Banking and the Financial System as a whole, using a scoring system.

Prof. Anat Admati, Prof. John Cochrane and Jonathan McMillan (pseud.) have devised their own policy frameworks on how to regulate the Financial System in order to prevent future crises and make the system safer.

Given the ongoing debates on how our financial system should be regulated it makes sense to measure how well these proposals would serve in addressing problems associated with Banking as well as Shadow Banking.

### Key words:

Shadow | Regulation | Systemic | Run | Arbitrage |

## **Introduction**

“Shadow Banking” as a term was first mentioned by former *PIMCO* Managing Director Paul McCulley in 2007 to describe risky off-balance sheet vehicles set up by banks to sell securitized loans (The Economist, 2016). The scope under which financial intermediary companies should be considered a shadow bank remains disputed and depends on subjective definitions and judgement (ICMA, 2012). Generally speaking, any corporate entity that performs bank-like functions such as maturity transformation while not being a fully supervised financial institutions (FI) could be categorized as a shadow bank. This means it does not fall under the typical regulatory requirements (i.e. Capital ratios, Liquidity requirements etc.) while also not obtaining “explicit” access to central bank funding or deposit insurance (IMCA, 2012; Reuters, 2012). Specialized Investment Banks, Insurance Companies, Money Market Funds, Private Equity/Debt and even some online technology firms can hence all be classified as shadow banking entities. The main amplifiers for the Global Financial Crisis (“GFC”) were certain shadow banking activities, mainly off-balance sheet conduits/Special Purpose Vehicles (“SPVs”) which were sponsored by traditional banks to circumvent (capital-)regulation. In the years leading up to the 2007/2008 GFC one saw a steep increase in the Mortgage Backed Security (“MBS”) market as well as the market for Asset Backed Commercial Papers (“ABCP”) (Sanches, 2014). Defaults in these markets are considered to be the initiating cause of bank-run like activity that caused the repo- and general credit markets to freeze up. This led to extreme illiquidity constraints and soon to insolvencies for formerly major financial actors such as *Lehman Brothers* and *Bear Stearns* (NYT, 2014). Since the GFC these particular shadow banking activities considerably reduced their securitization activity. In 2007 \$11.2trn worth of securitized products were brought to market in the US while the securities created in the Eurozone were worth € 595bn. However, in 2015 the US securitization merely stood at \$ 1.9trn and €214bn in Europe respectively (Schwarcz, 2018). The reasons for the development of shadow banking can be linked to two fundamental drivers. First, as regulatory oversight of

traditional banks has strengthened substantially, regulatory arbitrage has become ever more attractive over the decades: “(...) *traditional banks are retreating from markets with a larger regulatory burden, and (...) shadow banks fill this gap*” (Buchak et al, 2018). Secondly, technological innovations, especially online/digital, make new types of credit provision/intermediation easy and fast to set up meaning capital can be channeled and managed more easily outside the traditional banking system (Maiello, 2017). Research suggests that 60% of new shadow banking activity in the US mortgage lending market can be attributed to regulatory arbitrage, whereas 30% is due to technological innovations (Buchak et al, 2018). As regulators are very aware of the role Shadow Banking played in the GFC, there has been much discussion regarding the adequate regulatory treatment of the non-traditional banking sector. Shadow Banking activities have continuously undergone regulatory updates by the likes of Basel III and the Dodd-Frank Act. This led to the previously mentioned drop in certain shadow banking activities like securitizations and the “typical” shadow banking activities have lost their power of enabling regulatory arbitrage to boost returns.

Since the GFC, Fintech and P2P lending have received growing attention due to their potential to challenge traditional ways of how we conduct banking. It is even welcomed by regulatory bodies: “(...) *FinTech credit activity could present a range of benefits (...)*” (BIS&FSB, 2017). Yet, taking a closer look at recent developments of P2P credit intermediation reveals the same old patterns that we saw in the run up to the GFC. Especially the larger P2P lenders have engaged in securitizations of P2P loans and credit provision from banks. “*Not too long ago, the interaction between banks and online lenders seemed to be limited to partners, competitors, investors, or a combination of the three. Now, these relationships have expanded; in some instances, banks are now providing online lenders their credit facility products without the trade-off of a loan origination partnership for those credit facilities. This pure provider-*

*customer relationship is yet another compelling example of just how intertwined the ecosystem has become.” (Deloitte, 2018).*

For example, certain Hedge Funds and even traditional banks have in recent years bought up respectively created securitized loans originated by P2P lending platforms. In 2015 *Citi* launched a partnership providing a \$150m credit facility for the alternative asset management firm *Varedo Capital* which will use the money for investments in market place loans from P2P platforms and some smaller community banks have even directly invested into P2P (Press release – Lending Club, 2015). P2P marketplace loans even experience securitizations into ABSs, which are again rated by the likes of S&P, just as before the GFC. (Press release – SoFi, 2015). Such ABSs are then for instance purchased by Hedge Funds who can use them as collateral for obtaining funding from MMFs who are enjoying implicit GVT guarantees. These linkages now strikingly resemble the shadow banking system which contributed to the GFC. Bank of England Governor Mark Carney formulates his own concern as well: *“It is not clear the extent to which P2P lending can grow without business models evolving in ways that introduce conventional risks. Were these changes to occur, regulators would be expected to address such emerging vulnerabilities (...)” (Mark Carney – Bank of England, 2017).*

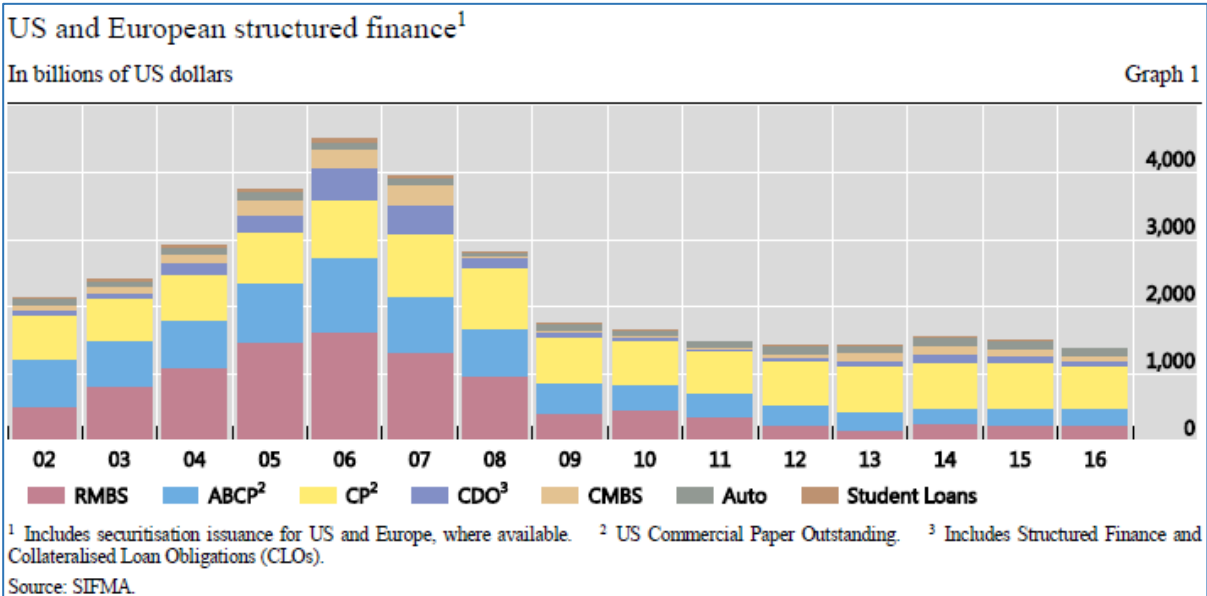
P2P loan volumes securitized into ABSs are still small. In 2018 it will probably amount to ca. \$18bn according to PeerIQ, a tiny fraction of the trillions of assets held by banks overall. (Bloomberg, 2018). However, its growth has been noteworthy as only in 2013 P2P loan securitization really started.

The first part of this paper will be a literature review on current shadow banking regulation. In the second part I will use a scoring system to evaluate certain approaches suggested towards banking regulation and their applicability on shadow banking. Those suggestions come from Prof. Anat Admati, Prof. John Cochrane and Jonathan McMillan.

**Literature Review**

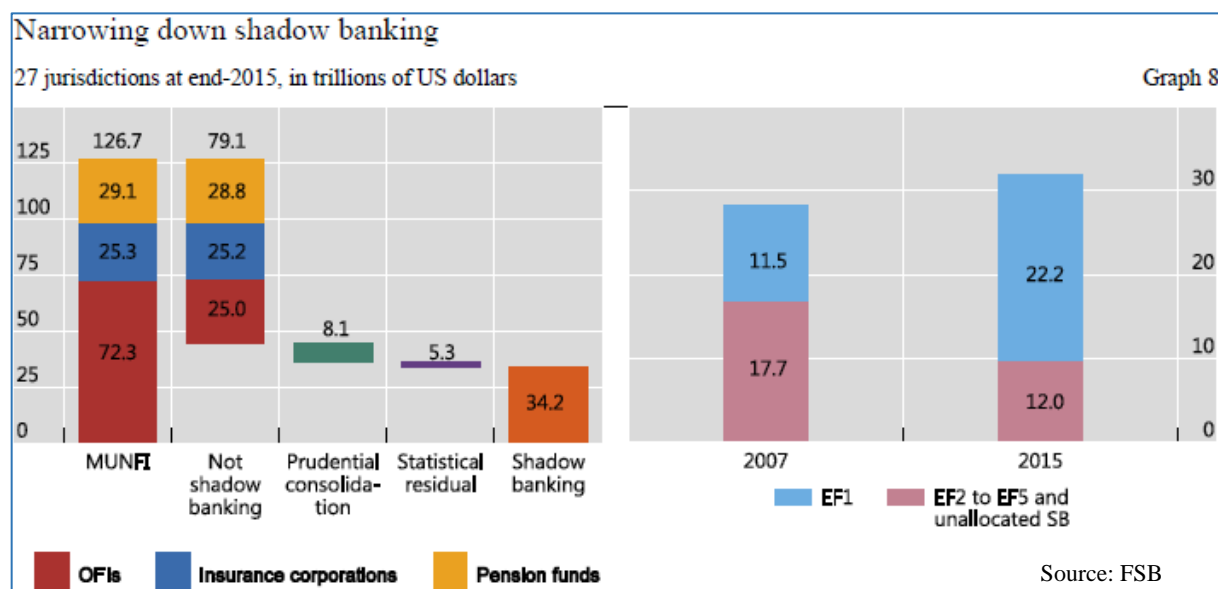
**Financial Stability Board – Assessment of shadow banking activities, risks and the adequacy of post-crisis policy tools to address financial stability concerns**

The Financial Stability Board (“FSB”) has been highly influential in shaping policy response for the banking and shadow banking system since the GFC. It regularly publishes reports and studies to be discussed by the G20 in particular. In a 2017 review the FSB assessed the current state of shadow banking and drew a number of conclusions. The FSB observes that many shadow banking activities, mostly securitizations which contributed to the GFC, have since drastically decreased in volume as can be seen in the chart below. This is mainly the case for securitized off-balance sheet conduits with explicit/implicit bank sponsoring. Major regulatory



changes have made these types of shadow banking activities much less attractive. This is due to regulation aimed at balance sheet consolidation of SPVs with their sponsors, an overhaul of risk-weights, and retention requirements to align incentives with the originator (“skin in the game”). The FSB openly appreciates this development. Regarding Money Market Funds (“MMFs”), the FSB claims that they have become more resilient, mainly due to the introduction of the VNAV rule. Albeit, the FSB notes: “While policy tools have been created to convert a portion of MMFs into floating NAV products, there is still some concern that they are prone to run risk in the event of unexpected losses”. This concern is indeed vindicated as “in some

instances Floating-NAV MMFs have indeed still experienced runs, mainly in Europe” (Adrian&Ashcraft, 2012). The FSB omits to make the point that MMFs are often used in the cash-management by corporations, who are in favor of the fixed face-value of CNAV MMFs. The VNAV ruling in the US and EU might therefore lead to investments flowing out of such



MMFs (Dierking, Mutualfunds.com, 2017). Overall the so called Economic Function 1 (“EF1”) of the FSB’s Narrow Measure of non-banks (i.e. shadow banks) has grown the most in recent years (11% in 2016 alone). EF 2-5 however have decreased in size. The EF1 comprises Collective Investment Vehicles (“CIVs”) which represent Fixed Income funds, Credit Hedge funds, MMFs and other investment fund vehicles which entail run-risk. The FSB remarks that: “(...) the considerable growth of certain investment funds combined with a relatively high degree of credit risk, as well as liquidity and maturity transformation, and, in the case of jurisdictions that reported hedge funds, relatively high levels of leverage.” Contrary to its recognition of the risks by CIVs, the FSB then concludes that it has not identified any new systemic risks for the financial system as a whole outgoing from shadow banks which would require additional global regulatory updates. The FSB mainly calls for international collaboration on regulation to avoid regulatory arbitrage. In addition, it puts a high value on strengthened monitoring standards which allegedly promotes early recognition of systemic risks by regulators.

## **Association of German Banks (“bankenverband”) – Regulation of shadow banking – 2014**

The Association of German Banks published a report in 2014 named “Regulation of shadow banking”. The report analyses mainly the directives applicable to the UK&EU and the US. It highlights the fact that demand for shadow banking products was a main driver behind the growth of the non-banking financial system. Companies, institutional investors but also insurers and pension funds and individuals were searching for safe, liquid, short-term securities they could use for their cash management and investment. The bankenverband welcomes the activity-based approach that current banking regulation takes. This helps to prevent banks from bypassing regulation via unregulated entities/conduits. The bankenverband depicts the objectives of current (shadow) banking regulation as follows: *“firstly, reforming accounting to reduce the scope that banks have for influencing the size of their balance sheets by using shadow banking entities; secondly, raising the capital requirements for transactions with shadow banking entities; thirdly, limiting the size of exposures to shadow banks. On top of this, riskier banking activities are to be separated from supposedly safe deposit-taking business by reforming the structure of banks.”* As identified by the FSB, the bankenverband makes the point that in the US and UK&EU new regulation mainly led to upsurges in supervision and updates of accounting and reporting rules which now render traditional sponsored securitization activities much less attractive for banks. This is in line with the drop in certain shadow banking activities as observed by the FSB. Securitization sponsoring (of MBS conduits for example) in the mortgage market plummeted following the GFC and those that still exist are much better accounted for regarding their risk. Major updates are i.e. **FAS 166/167 and DFA 165 (k)** in the US and similar ones in the EU through **Basel III** but also the **AIFM Directive** and **UCITS Directive** for non-bank financial companies. The bankenverband argues that regulating the securitization market is a difficult task as its participants are highly heterogenous. Further, securitized products are often distributed internationally which means that regulation should also be implemented on a global scale to avoid competitive distortion and geographical

regulatory arbitrage. On that point, the report cites IOSCO's opinion that sufficient cross-border compatibility seems to prevail for now regarding regulatory regimes of securitizations. With regards to MMFs, the bankverband makes a stronger point than the FSB, as it deems the change of CNAV to VNAV as insufficient. It considers the effect of a capital buffer or shift from CNAV to VNAV weaker than hoped. In a looming crisis there would still be a first-mover advantage for those investors "running" to redeem their holdings first. Accordingly, the first-mover advantage could only be mitigated by a "Minimum Balance at Risk" for the investors thereby disincentivizing them to fire-sell their holdings of the MMF. The Volcker rule as part of the Dodd-Frank Act and in some sense a lighter version of the Glass-Steagall Act (WSJ 2017), is disputed as it's argued that it doesn't make banks any safer because they can still engage in risky "regular" lending despite being ring-fenced (Michel, Fortune.com, 2018). Such critique however is not raised by the bankverband. It rather perceives an increased risk of migration from investors and lenders to shadow banks, as the mounting regulations make regular banking less attractive. This conclusion is in line with many other literature findings as indicated previously.

The following section will analyze the applicability of various regulatory proposals from three different academics and economists. A matrix structure will be used for this purpose. Four pain points have been identified with Shadow Banking, each bearing varying severity and hence are allocated different weights.

Weight/Relevance (3 highest, 1 lowest)	Problem (from shadow banking)	Suggested solution on banking regulations and their applicability on shadow banking					
		Prof. Anat Admati		Prof. John Cochrane		Jonathan McMillan	
		Score	Total	Score	Total	Score	Total
3	Crisis potential	1.5	4.5	1.5	4.5	2.5	7.5
2	Risk for depositors/investors	1.5	3	2	4	2	4
2	Implementation	2.5	5	1.5	3	0.5	1
1	Regulatory arbitrage	0	0	1.5	1.5	2	2
	Sum Total	5.5	12.5	6.5	13	7	14.5

The potential solutions brought forward are then scored from 0 to 3 regarding their value in addressing the problems. The score will be allotted using research in relevant literature and publications. The score is then multiplied with the weight of the problem (1 to 3) and ultimately, we will have a sum total of weighted scores for each suggested solution. Eventually, this will provide insight into how shadow banking can be regulated best using the three approaches. The final results can already be seen in the table above.

## **Crisis Potential**

Shadow Banking activities pose a risk for the overall economy and have the potential to cause a future crisis. As highlighted beforehand, shadow banks, mainly SPVs and MMFs, have been a root cause of the GFC (Sanches 2014). Bankrupt financial institutions can hurt the general economy through a prompt reduction in financial services. Taxpayers are hurt through costly bail-outs. Shadow banks can grow over time to have systemic impact when failing.

## **Risk for Depositors/Investors**

Any fund providers of shadow banks and FIs in general are exposed to risks on their holdings, whether they are in short-term liabilities or equity. Current deposit insurance aims to protect depositors from runs. The Basel Accords indirectly protect those all those who finance the operations of the FI by trying to reduce malpractice which leads to illiquidity and insolvency issues. Regulation should ideally mitigate such risk.

## **Implementation**

The feasibility of implementing a certain policy is of great importance for its effectiveness. This factor will weigh in on the overall value of a proposed regulatory framework.

## **Regulatory Arbitrage**

Regulatory arbitrage occurs by operating banking and financial intermediary activities in a way that the regulatory burden, may it be on capital or else, would be minimized (Stulz et al.).

## **Prof. Anat Admati**

Stanford Finance Professor Anat Admati brings forward the key statement that her research suggests the only viable way to regulate Banks is through a steep increase in equity capital to total assets. She suggests that a ratio of “(..) [ca.] 30% on an unweighted basis should not be

*unthinkable*” (Admati et al, 2013). Admati basically dismisses any other regulatory proposals such as the usage of hybrid securities like Contingent Convertible Bonds (“CoCos”). She argues that the only truly functioning structural changes by which the financial system could be made safe is through substantial leverage reductions on a straight equity basis. This can be achieved in 3 ways. Either through balance sheet contraction by a reduction in debt, keeping the amount of equity the same. Alternatively, one can expand the Balance Sheet by adding extra equity to the existing positions. Finally, by deleveraging over time as debt positions would be replaced by equity while overall maintaining the size of the Balance Sheet. Admati does not call for a specific policy that would prevent banks from shrinking their balance sheet in order to comply with higher leverage ratio regulation. Yet, balance sheet contraction might be chosen (at least temporarily) by many banks which would then negatively impact on credit provision for the overall economy. This was actually observed as being the case for some European Banks post-GFC (EBA Staff -Paper, 2018).

University of Chicago Professor Roger B. Myerson reviewed Admati’s framework and concurs with the positive impact of more equity on the loss-absorbency ability of a bank. In his view it is also a prudential incentive to monitor the risks of the assets of the bank by shareholders: *“[More equity has two effects.] For any given level of risk in the bank's investments, the probability of investment losses large enough to affect the depositors becomes smaller when the bank has more equity. But more equity also means that the owners who control the bank have more incentive to avoid risks of such large losses. That is, equity helps to solve moral hazard in banking.”*

Additionally, some empirical research on time-series data shows that higher bank equity ratios has no negative impact on loan volumes provided and the overall growth of the economy (Goldstein, 2013). Hence the proposed surge of the equity capital ratio should not lead to negative repercussions in the economy in the long-term. Yet, this is a debatable claim by the

mere fact of debt being tax deductible, henceforth the threshold for businesses/projects in obtaining financing by a bank would be increased using Admati's policy.

With Admati's admittedly very simple approach come substantial problems regarding shadow banking. Economist John Cochrane, who himself favors run-prone debt regulations and Pigouvian taxes, argues that mere capital regulations on banks will not prevent risks that are outgoing from shadow banks. In his view we would observe migration of capital into risky and less regulated shadow-banking entities: "*(...) [new] capital ratios (...) [are] subject to the same games as the last round of capital ratios, especially given the huge increase in complexity of capital ratio regulation.*" (Cochrane, 2014). Admati herself advocates a straight raise of equity ratios without the use of risk-weights as currently the case under the Basel Accords. Yet, she clearly fails to explicate the issue raised by Cochrane concerning the "gaming" of the system following simple equity ratio increases. Moreover, she ignores to elaborate on changing risk-taking behavior by FIs if they are put under higher leverage constraints. As Economist Sato Takafumi avers: "*(...) bigger capital requirements may induce complex risk-taking.*" (Takafumi, FT, 2009). Admati's simple assumption that a substantial increase in the equity ratio, disregarding the asset side of banks' balance sheet will suffice is rightfully doubted within the banking community itself (Perona, 2013).

While acknowledging the relevance of shadow banks within the financial system Admati surprisingly dismisses to focus on them deliberately from a regulatory point of view: "*In the context of this discussion an indiscriminate reference to 'the shadow banking system' is unhelpful. Institutions outside the regulated sector that operate without sponsors from the regulated part of the financial system tend to have significantly less leverage than regulated banks.*" (Admati et al. 2013). She recognizes the importance shadow banking played in firing up the GFC, yet her recommendations and synopsis never depict concrete measures to ensure a higher equity ratio on banks of i.e. 30% won't lead to capital/investment shifts to shadow banks

who could become systemically important. Bank & Shadow Bank depositors respectively investors could again be put at high risk through direct (balance sheet) or indirect exposure between the traditional banks and shadow banks. In that sense, if regulators would genuinely follow the suggestion of Admati and essentially abandon every other regulatory measure taken to this day, this doubtlessly reverses the fall in the volumes of (risky) off-balance sheet conduits, securitizations, etc. These two main points of critique are stated in the Journal “European Economy – Banks, Regulation, and the Real Sector”: *“As a consequence, increased capital requirements might induce banks to invest in riskier assets, with higher expected returns but also more severe tail risks. This could expose banks to higher risks. In addition, from a systemic point of view, there is the further issue that more risky activities could end up being carried out through non-regulated shadow vehicles”* (European Economy, 2015).

Given this, I score Admati’s solution the following:

Crisis Potential: Total score **1.5 of 3**. A higher equity ratio will make banks more resilient ceteris paribus. However, Banks would with all likelihood increase their risk-taking over time. Such Moral Hazard issue is not really addressed by Admati. Shadow Banking would commence to flourish again, just as before the GFC. A study by IMF researcher Jihad Daher et al. show that: *“(…) once capital ratios reached around 23 percent, the marginal benefit of raising them further started to shrink; nearly the same percentage of crises were avoided as when capital minimums were at 30 or even 40 percent”* (Philadelphia FED, 2018). Simultaneously, the Minneapolis FED estimates that an increase of capital ratios to around 23.5% implies an annual GDP drop of up to 1.52% and a rise in average loan interest rates by 60bps. (Philadelphia FED, 2018). Barth and Miller write in the Journal of Risk and Financial Management that *“(…) simply adding more capital requirements is not the way to promote a safer and sounder banking system”* (J. Risk Financial Manag. 2018, Vol. 11 (4)).

Risk for Depositors/Investors: Total score: **1.5 of 3**. Again, the higher equity ratio will in concept make an insolvency more unlikely if everything else remains constant. Yet, the failure of Admati to explicate how everything else would remain constant with no increased risk-taking by banks remains. This makes me infer that depositors and any kind of investors in Financial Intermediaries are in the medium to long-term exposed to considerably growing risks in terms of the liquidity situation of the FI. Investors/Depositors in somewhat longer-term debt from FIs are equally exposed to the higher risk. No clear strategy is set out by Admati that investors in MMFs or other shadow banking entities would benefit from the higher equity ratio regarding their risk.

Implementation: Total score: **2.5 of 3**. Admati's policy proposal would be fairly easy to implement. As we have the 3% equity/asset ratio under Basel III today it would simply mean raising that ratio to i.e. 30%. Conceptually and structurally not much would change.

Regulatory arbitrage: Total score: **0 of 3**. Admati's proposal is in no way addressing the issue related with regulatory arbitrage through shadow banking activities. Regulatory arbitrage would be an inevitable consequence of her policy framework. Shadow banking conduits would experience a substantial revival.

### **Prof. John Cochrane**

John Cochrane is Economics Professor at Chicago Booth. In his paper "Toward a run-free financial system" Cochrane calls for the restructuring of liabilities on banks' balance sheets. He argues that run-prone short-term liabilities such as deposits are the main factor causing a bank-run and ultimately a financial crisis. Banks' abilities to hold these liabilities as they do today should be massively restricted. Cochrane clearly outlines that in fact the run began in the shadow banking system and following constrains (i.e. liquidity issues, fire sales, etc.) it spread

over to the general financial system: *“At its core, our financial crisis was a systemic run. The run started in the shadow banking system of overnight repurchase agreements, asset-backed securities, broker-dealer relationships, and investment banks.”* (Cochrane, 2014). Cochrane envisions the case where banks’ deposits as well as MMFs and Repo providers must be backed entirely by short-term Treasury securities. Given that MMFs have already undergone regulation to remove runnability he admits the better standing of MMFs today, yet he upholds his own framework as the preferable solution.

Cochrane deems asset regulation (for example via risk-weights) a vain exercise. He puts forward his point that regulation should concentrate on the liability side, by eliminating runnability. Regulating asset activities is of lower priority to him: *“The story of how banks evaded risk regulation and capital regulation (...) is a good warning against putting too much faith in longer and more detailed asset and capital regulation in the future.”* (Cochrane, 2014). In order to enforce restrictions regarding short-term debt he also suggests a Pigouvian tax model that applies a certain flat rate on each Dollar held by a traditional bank and not backed by treasuries. Overall Cochrane also supports the “systemic run view” which argues that regulating the interconnectedness is fairly meaningless as the GFC demonstrated that runs happened to a range of banks regardless of their actual balance sheet connectedness with struggling entities (Cochrane, 2014). Further, he recognizes that any institution, whether official bank or not can grow and become dangerous if issuing runnable debt. Cochrane propagates: *“In this vision, demand deposits, fixed-value money-market funds, or overnight debt must be backed entirely by short-term Treasuries. Investors who want higher returns must bear price risk. Intermediaries must raise the vast bulk of their funds for risky investments from run-proof securities. For banks, that means mostly common equity, though some long-term or other non-runnable debt can exist as well. For funds, or in the absence of substantial equity, that means shares whose values float and, ideally, are tradable.”* (Cochrane, 2014).

A potential issue here is the definition of runnable debt. Cochrane makes no clear description of what he considers “run-prone”. Thus, if we assume that debt with maturity of i.e. one week would be allowed by banks or FIs in general, it is likely that they would load up on them as much as possible. Yes, investors of these debt instrument would face price risk, nevertheless they could reject to roll over their debt en masse (as occurred through massive repo haircuts and rollover stops during GFC). A bank with a high maturity mismatch for instance by holding mostly long-term loans as assets could still face a credit crunch and have to fire-sell assets. The issue regarding liquidity positions of banks is in fact to some extent addressed by the Net Stable Funding Ratio (“NSFR”) and Liquidity Coverage Ratio (“LCR”) through the Basel Accords. Yet again, similar to Admati, Cochrane bemoans the regulatory overload of Basel III and thereby implicitly advocates for less of such “traditional” regulation. I.e. his solution would remove those aforementioned regulations with the probable side effect of an increase in liquidity risk. Pure deposit accounts would be (relatively) safe, due to the treasury backing, but it would be too simple to assume that systemic risk would be eliminated.

Cochrane confesses that banks naturally would attempt to: *“financial-engineer their way around restrictions on short-term debt issue, as they engineered their way around capital regulation. For example, a bank can synthesize borrowing by put-call parity in options markets”* (Cochrane, 2014). He then argues that nonetheless *“[d]etecting hidden run-prone financing will require a few regulators, but the project is an order of magnitude easier than current asset regulation, capital regulation, and stress testing”* (Cochrane, 2014). But it is not really clear though on which basis his view is founded. Like he said himself, Banks would try to arbitrage their way around, so why should they not succeed? For instance, one can argue that banks might be tempted to engage in different types of “acceptance banking”. Banks could basically define for themselves whatever is classified as acceptable trade credit which could be guaranteed by banks or shadow banks. These acceptances might be circulated as money-

equivalent just as in the 19th century with potentially destabilizing consequences. It might be hard to stop shadow banks from guaranteeing trade credit obligations in ways that replicate traditional deposit taking banking. Another more modern example would be cryptocurrencies that are privately created and somewhat used as a substitute to the FIAT money.

Cochrane, also leaves out certain macro-economic considerations that are crucial elements of our current financial system. His proposals would undo the inside-money creation that banks currently undertake. Handing over money creation to public authorities without allowing private entities to engage might have disadvantageous results for the overall growth of the economy. This is because: “ ‘(...) [*There are*] *positive benefits to private rather than public creation of purchasing power*’ ” (Sissoko, 2016). As noted earlier on Admati, Cochrane understands the risk of gaming the system following plain equity ratio increases. Yet, he fails to see the same and other risk arising from his own proposal (or at least to elaborate on their management).

To sum up, merely removing deposits from banks can have these aforementioned unintended consequences due to the “ ‘*remarkable ability of innovative financial systems to replicate bank like maturity transformation*’ ”(Sissoko, 2016). This, combined with the hazard of distressing the economy from removing banks’ ability to create money/liquidity for a growing economy, replacing this by pure outside money creation (100% reserve banking) should be a call for cautiousness. In fact, a recent paper by *Banque de France* analyzed the financials of 400 French Banks in 1930/1931 observing that despite an increase in the money supply (from the GVT) the French economy experience deflation and recession as a result of reduced credit provision. Deposits were moved to T-Bond backed accounts. And the central bank was unable make up for reduced bank credit provision (Banque de France, 2018).

By and large, Cochrane’s solution would eliminate typical “banking” respectively inside money creation by traditional banks (and Shadow Banks). However, it might be difficult for regulators

to ensure that such policy is thoroughly enforced, and that banks or shadow conduits won't find sophisticated ways to circumvent such legislation, i.e. through banker's acceptances, cryptocurrencies, fancy derivative-structures or so called "near-monies" (cf. Allen, The Journal of Law and Economics 1993).

I thus score Cochrane's framework as follows:

Crisis Potential: Total Score: **1.5 of 3**. Under Cochrane's scenario FIs could invest any way they want; asset side regulation is removed. Very risky assets could be chosen alike to Admati's proposal. Additionally, maturity mismatches would still be an issue for banks. These two factors could bring down any FI despite the new full backing of deposits through GVT securities. "*Even once [full-reserve banking] is in place, a bank could still become insolvent or suffer a liquidity squeeze, with potentially disastrous results for those that had backed it and the economy as a whole*" (The Economist, 2016). Such view is indeed backed by a respected central bank itself, the Swiss National Bank, which issued a statement regarding its opposing stance towards the introduction of full-reserve banking in Switzerland (see "Vollgeld Initiative" referendum). It argues a full-reserve banking system "*(...) could not deliver on its promise to guarantee a secure financial system and ensure greater prosperity through directly issued central bank money. (...) A sovereign money system could not prevent credit cycles and asset bubbles.*" (Swiss National Bank, 2018). Also, we are faced with the possibility of banks/shadow banks finding ways to circumvent the "ban on deposits". Further, as indicated empirical research (Banque de France) using historical data suggests negative implications for economic growth and performance. This comes from transferring deposits from commercial to GVT-entities and thereby eliminating inside money creation, the remaining outside money creation by the Central Bank is an insufficient substitute.

Risk for depositors/investors: Total Score: **2 of 3**. Traditional depositors would now hold on to de facto riskless GVT T-bills. Default risk would be non-existent, yet some price risk would indeed prevail (very low though, but even T-bill values are volatile). Further, it's not fully clear that Cochrane would achieve the elimination of run-prone liabilities, i.e. the “*run-free financial system*” he propagates. Maturity transformation would still be conducted by banks with all likelihood, using the lowest maturity/duration permitted to fund longer-term loans. Any investors holding securities issued by banks or shadow entities other than then GVT-backed deposits would still face risks. This still creates liquidity risk for the debt providers of the banks/shadow banks.

Implementation: Total Score **1.5 of 3**. Implementation could be of difficulty in that 100% reserve banking would have to be introduced and this ideally on a global scale to prevent arbitrage. Proponents of full-reserve banking believe a transition would be fairly easy. Economist Milton Friedman made this claim in 1965 as did the authors of the *Chicago Plan* in the 1930s (cf. Friedman, 1965; Douglas et al., 1939). Yet, practically a transition away from our current fractional reserve banking system is unprecedented and hence potential risks and repercussions from implementation are difficult to estimate.

Regulatory arbitrage: Total Score **1.5 of 3**. It would be more difficult compared to Admati's proposal. Yet, full-reserve banking in the way that is proposed by Cochrane would very likely experience various arbitrage activities, through replication of deposits through near-monies, cryptocurrencies, banker's acceptances etc. Beyond, arbitrage opportunities can arise by international regulatory differences.

## **Jonathan McMillan – The End of Banking**

One of the most extreme proposals regarding the regulation of the banking system (and implicitly shadow banking system) comes from the book “The End of Banking”. It advocates a complete overhaul of the banking and financial system via new accounting rules and use of online and algorithmic technology. This fundamental amendment would occur through the suggested “systemic solvency rule”. In essence, any company would only be allowed to hold as much financial assets as it holds equity in its balance sheet. The definition of financial assets is different from the traditional one. McMillan defines a financial asset as any asset which is in itself a liability on another company’s balance sheet. Henceforth, simple cash holdings for example would not be considered a financial asset anymore. This approach would lead to a case comparable to Cochrane’s one. Banks, non-banks and any private institution in general would be unable to create inside money for the economy following the introduction of the systemic solvency rule. The creation of money to support a growing economy would be put in the hands of government authorities, namely Central Banks. Yet, as history has demonstrated a smooth and functioning outcome is contentious. This critique can be formulated as follows: “(...) *[McMillan’s] 100%-reserve banking reform does not address fluctuations in the demand for money. Centralised monetary authorities do neither have access to the right information, nor within the right timeframe, to accurately provide extra media of exchange when needed by the public. Private entities, in direct contact with the public, can.*” (Noizet, 2015)

Basically, one can grant the critique that through the systemic solvency rule and the required centralized money creation we would find our economies in a situation which in theory works frictionless. However, it practically creates an array of issues and mismatches that typically arise when public authorities intervene to achieve private market efficiencies. As indicated earlier in relation to Cochrane’s suggestions, introducing a de facto 100% – reserve banking system would with all likelihood be “(...) *unlikely to work, given the long history of financial*

*innovation in the face of new regulatory restrictions. Not only would new forms of money evolve outside the net, but so also would new sources of credit.” (Dow et al, 2015)*

Now, to put this development into context of McMillan’s proposals and the implied claim that P2P lending platforms will be fully stable (i.e. default free) after the systemic solvency rule is not that obvious. Yes, all forms of banking, i.e. inside money creation, whether traditional or “in the shadow”, would in theory be terminated. Yet, P2P platforms themselves might experience volatility to the detriment of (former) depositors who hold a preference for fixed value claims but are now forced to hold P2P loan-pool portfolios. In China which has the largest marketplace lending platforms in the world, 100’s of P2P platforms have defaulted already in 2018 with investors (mostly individual savers) losing their investments. (Bloomberg, 2018). The investments into these P2P platforms in China were conducted to generate above-market returns, often by issuing loans to borrowers with questionable credibility. Investors are not using them as liquid, tradable deposit-like asset holding as envisioned by McMillan. Nevertheless, it is not obvious how McMillan can claim so confidently that marketplace lending platforms are as stable as they assert (already claimed in 2014). A panic could occur one way or another and thereby cause volatility for individuals and their holdings in P2P asset portfolios. This would be an unfavourable outcome for all those people who today are just “ordinary depositors”.

Another important aspect to consider is that McMillan advocates a cash-less society. McMillan propagates the abolishment of cash without even discussing the associated downsides. Privacy issues would be a huge concern and the main argument against a cashless monetary system. (Cochrane, 2016). For more insights on privacy in connection with cash see “(...) Kahn (2018) *for a discussion on the importance of cash, focused on the (legitimate) role of privacy in transacting. Alternatively, some part of these transactions might migrate to private*

*cryptocurrencies such as Bitcoin*” (Bank of Canada, 2018). Cash has unique valuable characteristics which cannot be replaced by mere digital money (Bank of Canada, 2018).

Finally, McMillan fails to describe how the systemic solvency rule could be implemented on a global scale, which is what is fundamentally needed for it to bear fruit in reining the financial system. Nowadays, “tax havens” are an ever-recurring matter of discussion and show how regulatory arbitrage can impact tax regimes. For the systemic solvency rule to have the impact which is envisioned by McMillan a global agreement between de facto all jurisdiction would be essential. As has been analysed and brought to light in numerous publications, international convergence of accounting standards proves immensely difficult.

Cross-border adoption of accounting standards like the IFRS, far less groundbreaking than the systemic solvency rule would be, already pose vast implementation difficulties: *“In spite of the international adoption of IFRS, numerous studies suggested that many countries, especially developing countries, lack necessary infrastructures for the consistent application of IFRS. Thus, the convergence of accounting standards on de jure level may not necessarily lead to convergence de facto.”* (Xinyun, 2017).

McMillan’s framework is scored the following:

**Crisis Potential: Total Score 2.5 of 3.** Assuming the systemic solvency rule is indeed being implemented on a global mutual scale, fractional reserve banking and shadow banking would cease to exist which would lower structural risk to the economy and financial system anymore. capital misallocations respectively asset bubbles would have confined impact to immediate investors. Bank-runs in the historical sense would not exist and hence could not transpire in a way that happened during the GFC. Unlike Cochrane’s solution a buildup of asset bubbles is also less likely due to the systemic solvency rule where debt cannot be used to purchase financial assets. Empirical research studies show credit-fueled bubbles are much more damaging than those without much leverage (University of Bonn & University of California –

joint study, 2015). According to the study, recessions following equity bubble bursts are worse if fueled by debt. Hence, one can claim that McMillan's full-reserve banking system is superior to Cochrane's in averting the negative impact of crises. Both Cochrane and McMillan advocate a full-reserve system, however Cochrane still allows for credit to fund other credit which is not an option in McMillan's framework.

Risk for Depositors/Investors: Total Score **2 of 3**. Depositors would now be forced to hold a portfolio of pooled loans as a substitute for bank deposits. This exposes them to price risk. Yet, with the presumption that these P2P marketplace portfolio shares are holding triple-A loans (i.e. with very low risk and with the implicit very low returns) we would have a quasi-deposit with merely small volatility. Volatility would be a fraction of those on a stock portfolio. Even market values of corporate bonds nowadays are around 1/3 as volatile as stocks (BlackRock, 2018). Certain studies however back the view that adverse selection/moral hazard issues are currently existing throughout P2P lending platforms (Käfer, 2016). Statistical testing on P2P products with a different risk/return outlook indicate that especially lower-rated loan portfolios have recently failed to sufficiently make up their higher risks through returns (c.f. Emekter et al. 2015).

Implementation: Total Score **0.5 of 3**. Implementation would by far be the biggest hurdle concerning McMillan's proposal. Problems arise on many fronts. As exemplified above, as of now it is hard to see political ability or even willingness to converge the accounting standards we have today on a global scale. Thus, it's hard to imagine how a rule as fundamentally disruptive as the systemic solvency rule could experience successful implementation. The abolishment of cash as money-medium also entails an array of unaddressed problems and concerns on a cash-free society are still overwhelming.

Regulatory arbitrage: Total Score **2 of 3**. Again, by assuming a full implementation of the systemic solvency rule around the world, regulatory arbitrage in the traditional sense would be rendered infeasible due to the end of inside money creation and the financing of financial assets with debt. However, even in this case, it remains an issue how well the rule could be enforced and if fraudulent accounting activities (and auditing) would not be able to circumvent the systemic solvency rule.

### **Conclusion**

This thesis aimed to evaluate controversial policy recommendations on how to regulate our current financial and banking system, including shadow banking, so that systemic crisis risk is reduced (or even removed), and steady economic growth is supported. A scoring system was used to assess 4 crucial factors to be addressed by 3 policy frameworks and how shadow banking in particular is adequately dealt with. The scoring implies that McMillan's policy proposal is the most valuable. John Cochrane is the second-best and Admati comes last. The concepts of the policy proposals are fairly unique, and it becomes clear that each has its own advantages and drawbacks. Nonetheless, the total score of each proposal eventually adds up to an almost equal outcome. The individual drawbacks have been a major focus in this thesis as they are highly relevant in assessing the actual value of the individual proposals and which for obvious reasons are barely discussed by the authors themselves. Neither of the three policies analyzed is close of being implemented as of today, not just due to their very disruptive nature but because of the uncertainties and side effects which are elaborated on in this paper.

The conclusion is that if any of these policy frameworks would ever be considered by monetary authorities a prudent in-depth analysis of the downsides, trade-offs and implications would be absolutely essential. Before a chosen policy would then be implemented, a contingency plan would be required so that all the relevant side effects could be dealt with adequately.

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