**The quest to stabilize an unstable system by financial engineering.**

**Reply to Sam Langfield**

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We are grateful to Sam Langfield for writing a piece in response to our article in JCMS (De Grauwe and Ji(2019)). We make two claims in that article. First, financial market discipline tends to work pro-cyclically, i.e. during booms there is little perception of risk and as a result financial markets exert too little discipline; during the bust there is excessive risk perception and, as a result, financial markets exert too much discipline (Minsky(1986), Akerlof and Shiller(2009)). No amount of repackaging of government bonds, e.g. by tranching the government bonds ("***tranche-first***" in the terminology of Langfield) will solve this endemic instability problem of financial markets. Note that we do not claim that "financially engineered government debt would enforce market discipline" as Langfield maintains. In fact our claim is the opposite. Financial engineering will do little towards changing the procylicallity of financial markets in imposing discipline.

Second, we argue that during systemic crises the senior tranche of "Sovereign Bond-Backed Securities" (SBBS), as proposed by Brunnermeier, et al. (2017) will cease to be a safe asset that is comparable to the underlying safe bond. Langfield calls this "***pool-first***".

In order to counter our claims Sam Langfield develops a simple model in the tradition of modern finance theory based on the efficient markets hypothesis. In this model the spread of a bond vis-à-vis the safe bond is uniquely determined by the default risk and the size of the default loss. He then uses this model to show that the disciplinary feature of securitization (in the form of interest rate spreads during crisis, pre-crisis and post-crisis periods, see Figure 1 in this article) is present only for "tranche-first" design but not for the "pool-first" one. More importantly Langfield shows within the confines of this model that one can find a buffer of subordinated debt (junior tranche) that is not too large and that will maintain the unsubordinated debt (credit tranche) as safe as the underlying safe bond.

We believe there are several problems with Langfield's analysis. First, the condition for a safe asset '*i*' to exist in the tranche-first case, is that the fraction of individual subordinated debt, $s_i$, should be at least equal to the loss rate $L_i$, i.e. $s_i \geq L_i$ for all i. In the pool-first case, the fraction of average subordinated debt should be at least equal to the average loss rate, i.e. $s \geq \bar{L}$. In order to arrive at this conclusion the author explicitly excludes the possibility that a country can experience 100 percent haircut upon default, i.e. the scernario that $L_i = 1 \; and \; \pi_i > 0$ is excluded. Using the same data information from Cruces and Trebesch (2013), we find that several default cases that occurred in the past have a loss rate very close to 1 and some are as high as 97% (see Table 1). These figures are estimates from the past and hence caution should be given when excluding the scenario of $L_i = 1$ and $\pi_i > 0$, i.e. even under the assumptions of the model the tranche-first securitization can fail to generate a safe asset.

TABLE 1—HAIRCUT ESTIMATES BY TYPE OF RESTRUCTURING AND ERA

| | Observations | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| *By type of estimate* | | | | | |
| Market haircut ($H_M$ as in equation (1)) | 180 | 40.01 | 27.02 | −9.80 | 97.00 |
| SZ haircut ($H_{SZ}$ as in equation (2), "preferred") | 180 | 37.04 | 27.28 | −9.80 | 97.00 |
| Face value reduction | 180 | 16.77 | 30.55 | 0.00 | 97.00 |
| *By type of creditor* | | | | | |
| Bank debt restructuring | 162 | 37.05 | 27.90 | −9.80 | 97.00 |
| Bond debt restructuring | 18 | 36.97 | 21.60 | 4.70 | 76.80 |
| *Rescheduling versus debt reduction* | | | | | |
| Rescheduling only | 123 | 24.15 | 16.67 | −9.80 | 73.20 |
| With reduction in face value | 57 | 64.84 | 24.94 | −8.30 | 97.00 |
| *By era* | | | | | |
| 1978–1989 | 99 | 25.57 | 18.83 | −9.80 | 92.70 |
| 1990–1997 | 48 | 51.81 | 28.48 | 3.30 | 92.30 |
| 1998–2010 | 33 | 49.96 | 31.30 | −8.30 | 97.00 |
| *By type of debtor* | | | | | |
| HIPC or donor funded | 23 | 87.03 | 6.97 | 62.80 | 97.00 |
| All other countries | 157 | 29.72 | 20.61 | −9.80 | 92.70 |

Source: Cruces and Trebesch (2013)

A second problem of Langfield's analysis is that it considers only default risks in determining the price (yields) of the bonds. There are, however, different other sources of risk (uncertainty) that have to be taken into account, especially during financial crises when agents face not so much quantifiable risk but difficult to quantify uncertainty (in the sense of Knight). De Grauwe and Ji (2013) find evidence that a significant part of the surge in the spreads of the peripheral Eurozone countries during 2010–11 was disconnected from underlying increases in the debt to GDP ratios and other related default factors.

Let us consider two sources of uncertainty that matter in pricing government bonds and that are not taken into account in Langfield's analysis: uncertainty about the default loss and uncertainty resulting from liquidity crises.

*1. Uncertainty about the default loss*

Surprisingly Langfield considers the default loss, $L_i$, to be known at the moment the price of the bond is established (see his equation (3.1)), while $L_i$ is a variable to be realized in the future. There is great uncertainty about the future default loss, especially during times of crisis when investors face uncertainty in the sense of Knight, i.e. risks that cannot be quantified. Langfield concludes that a junior tranche (subordinated debt) of 35% will generally be sufficient to keep the senior tranche safe. But how does he know that during a crisis, holders of the senior tranche will be confident about this? The nature of uncertainty during crises is such that investors can be gripped by fear and panic leading them to sell the senior tranche bond in order to get "the real thing", i.e. the safe German bond. Such movements of fear and panic are endemic during financial crises. At that moment, panicky investors do not look at historical data to evaluate the risk of future losses. So many other sources of risk then come into play, e.g. the fragility of the Eurozone and the ensuing redenomination risk; the willingness of the ECB to provide unlimited amount of liquidity in the government bond markets and the uncertainty about the political dynamics. No historical data can inform us about these risks. These risks (uncertainties) are likely to be of great importance and could make the perceived values of $L_i \; and \; \bar{L}$ significantly larger than the simulation exercise in Langfield's article, requiring a much higher s to make the safe asset truly safe. Put differently, these uncertainties create tail risks. Just looking at the past will not do to convince panicky investors that their safe asset is safe.

In addition, prospect theory as proposed by Tversky and Kahneman (1979) informs us that investors value gains and losses differently. They tend to place more utility weight on perceived losses than on perceived gains. There is a large amount of empirical and experimental evidence confirming the existence of loss aversion. All this is absent from Langfield's analysis that is solely based on a risk-neutral assumption. Yet it matters. When during a crisis investors fear losses, the existence of loss aversion is likely to amplify these

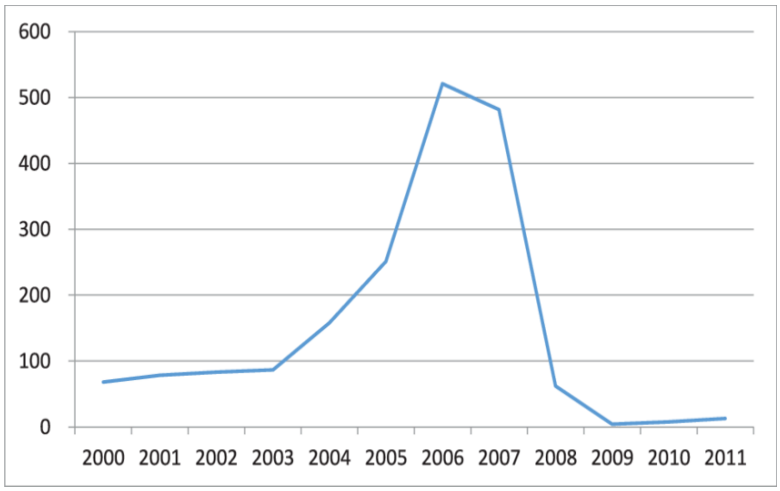
fears and to lead investors to sell the subordinated and the safe assets thereby reducing the total volume of SBBSs.

*2. Liquidity risk*

During financial crisis there is a scramble for liquidity. Everybody wants to be liquid and will try to become more liquid by selling assets. The senior tranches of SBBS (the safe asset) issued by a given financial intermediary are likely to be substantially less liquid than the underlying safe bond, in particular the German government bond. As a result, in their attempt to become more liquid the holders of these senior tranches will want to sell these in order to acquire the more liquid German bond. The senior tranches will cease to be a safe asset. The only way out is for the ECB to buy the senior tranches. But this would be quite paradoxical. It would show that it is not the senior tranches of the SBBS that are safe but the liabilities of the ECB (the money base). The ultimate safe asset is the money base provided by the central bank. All this casts doubts about the need to create a "safe asset" that in times of crises will turn out to be inferior to the money base created by the central bank.

All this should not come as a surprise. The CDOs created prior to the financial crisis of 2007-08 had the same structure as the SBBS and promised the holders of senior tranches a high degree of safety. During the crisis these promises could not be held and the market of CDOs collapsed as shown in Figure 1.

Figure 1: Global CDO Issuance during 2000-2011 (Bln USD).




Source: Created using data from the Securities Industry and Financial Markets Association

Modern finance theory has tended to study risk that is easily quantifiable. This has made it possible to develop highly sophisticated mathematical models. These, however, have created two problems. First, by concentrating on the quantifiable it has tended to ignore risks (uncertainty) that is not easily quantifiable. As a result, major errors were made in predicting the risk inherent in certain types of financial assets. This is also the problem of the theoretical literature that has been used to propose the creation of a safe asset through financial engineering. We believe that more research work is necessary in the safe asset proposals. Further work should include more cautious estimates of the potentially large default losses and more realistic assumptions about investors based on behavioural finance.

Second, the use of these sophisticated mathematical models has created a "pretence of knowledge" (Hayek(1989)) that we simply do not have. It strikes us that the proponents of financially engineered safe assets are supremely confident about the safety of these assets. This confidence is misplaced as the models used to derive the risk characteristics of these assets do not take into account some of the most important sources of risk. The latter arise from the fact that capitalism is characterized by movements of optimism and euphoria alternating in unpredictable ways with pessimism and depression (Minsky(1986), Akerlof and Shiller(2009)). These movements regularly but unpredictably create financial crises that shake the system and makes unsafe what many regarded as safe.

Finally, the safe asset proposals of the SBBS-type were formulated at a time Eurobonds were considered to be politically impossible to create. Yet, today in 2020 a political decision has been made to create Eurobonds in the context of the NextGenerationEU stimulus programme. Thus it appears the Eurobonds will exist before safe SBBS-assets. Quite a reversal of fortunes. It also follows that the need for financially engineered safe assets to substitute for the real thing, Eurobonds, has diminished considerably.

***References***


Akerlof, G., and Shiller, R., (2009), *Animal Spirits: How Human Psychology Drives the Economy and Why It Matters for Global Capitalism*, Princeton University Press, 264pp.

Brunnermeier, M. K., Langfield, S., Pagano, M., Reis, R., Van Nieuwerburgh, S., & Vayanos, D. (2017). ESBies: Safety in the Tranches. Economic Policy, 32 (90), 175–219.

Cruces, J. J. & Trebesch, C. (2013). Sovereign Defaults: The Price of Haircuts. *American Economic Journal: Macroeconomics*, *5* (3), 85–117.

De Grauwe, Paul, and Yuemei Ji. "Self-fulfilling crises in the Eurozone: An empirical test." *Journal of International Money and finance* 34 (2013): 15-36.

De Grauwe, P. & Ji, Y. (2019). Making the Eurozone Sustainable by Financial Engineering or Political Union? Journal of Common Market Studies, 57, 40–48.

Hayek, F., (1989), The Pretence of Knowledge, *The American Economic Review;* Dec 1989.

Kahneman, D., and Tversky, A., (1979), An Analysis of Decisions under Risk, *Econometrica*, vol. 37,2, pp.263-291.

Minsky, H., (1986), *Stabilizing an Unstable Economy*, McGraw Hill, 395pp.