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On the stance of macroprudential policy

by
Stephen G. Cecchetti and Javier Suarez

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5 Challenges in the implementation of macroprudential policy

Policy design is an inherently empirical exercise. While we need conceptual models to discipline our thinking and ensure logical consistency, most policy actions involve quantities. Monetary policymakers set policy rates at certain levels, decide on the size and composition of their balance sheet, and so on. Prudential authorities are no different. Microprudential regulators set rules that establish minimal or maximal values for key ratios associated with the operation of individual financial intermediaries. Similarly, the macroprudential policy toolkit contains many quantitative instruments. Determining the appropriate stance requires measurement, evaluation and the calculation of an optimal policy response.

To see how we can proceed with measuring stance, take the case of the European Central Bank's (ECB's) monetary policy framework as a guide. As of May 2021, the ECB states its objective as price stability, which is defined as inflation (as measured by the year-on-year increase in the Harmonised Index of Consumer Prices for the euro area) of below but close to 2% over the medium term.[21] This involves three essential elements: an index for measuring inflation, a horizon over which to measure it, and a specific number for the target itself. Once these are established, the Governing Council then assesses the policy stance based on whether its tools are set at levels most likely to meet the objective.

Applying this logic to the specific macroprudential policy framework we proposed in the previous sections of this report, there are three categories of input feeding into the construction of the optimal target distance between mean growth and downside risk that provides the benchmark for measuring stance. These are:

(i) the index, horizon, and degree of time averaging;

(ii) the threshold lower quantile and the choice of growth-at-risk or growth-given-stress;

(iii) the effectiveness of policy, i.e. the impact of policy on the lower tail of output growth relative to mean growth (γ_q/γ).

We now consider the three categories of necessary inputs from both a conceptual and an empirical perspective. That means we discuss what we *should* measure as well as what we *can* measure.

i) The index, the horizon, and the degree of time-averaging

Starting with the index, we should choose an indicator that is closely tied to the general welfare of the society in question. In practice this means focusing on (the growth of) GDP, consumption or employment. The work done so far focuses primarily on the first of these, but we should not rule out alternatives.

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21 At the time of writing the ECB is conducting a review of its monetary policy strategy, so this may change.

Turning to the horizons, we can justify looking forward four, eight, twelve or even sixteen quarters ahead. The choice depends in part on the lag with which policy influences financial risks. For example, changes in the countercyclical capital buffer (CCyB) may have to be announced with a lead time of four quarters and may take an additional four quarters to have any impact. In such a case it makes no sense for the objective to be at a shorter horizon than that required to implement the policy and for it to have any impact. In practical terms, the choice of horizon depends on the precision with which we can measure the impact of other required inputs on the target.

Regarding the degree of time-averaging, policymakers should decide whether to frame their objective in terms of a one-year growth rate h years ahead or the average growth rate over the next h years. In our view, the latter would be more natural.[22] The rationale for this choice is that average growth takes account of the fact that the costs and benefits of macroprudential policies are almost certainly spread differently over time. To illustrate this point, consider a policy of tightening the maximum loan-to-value ratio requirement for residential mortgages. This could reduce expected growth one and two years out while reducing downside risks three and four years out. In such a case it makes sense to choose an objective based on average growth over the next three or four years. Importantly, such a measure implies less focus on short-lived fluctuations and more on low-frequency, persistent risks.

ii) The threshold lower quantile and the choice between growth-at-risk and growth-given-stress

Next, consider the choice of quantile and the characterisation of the lower tail of the growth distribution. Starting with the former, should macroprudential policy focus on the 5th percentile of the distribution or, possibly, the 10th or the 15th? At a conceptual level it is reasonable to consider lower quantiles. The Laeven and Valencia (2018) database implies an unconditional probability of a crisis of roughly 4.5% per year, suggesting that we should focus on the 5th percentile of the growth distribution. However, this seems too low for two reasons. First, financial factors play a role in most downturns – even downturns that are not accompanied by financial crises. Second, we suspect that there are significant barriers to measuring low quantiles with precision. As the quantile declines from the tenth to the fifth to the first, observations around the true quantile are very likely to become increasingly sparse, so the accuracy with which the quantile (and its determinants) can be estimated inevitably declines. In all, this is an argument for preferring the 10th quantile to the 5th (and also to the 15th, which might less clearly reflect the implications of financial stress).

Turning to the measure of the lower tail of growth outcomes: which option is best, growth-at-risk or growth-given-stress? The discussion in Section 3 of this report, as well as the example in Figure 4, suggests that choosing the latter might make more sense. Since growth-given-stress can vary substantially for a fixed growth-at-risk, and our concern is with extremely negative growth outcomes, it would be logical to focus on the expected shortfall, i.e. the growth conditional on the

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[22] For the sake of simplicity and ease of presentation, the framework we describe here abstracts from dynamics within the specified policy horizon and uses aggregation over such a horizon as a substitute for being explicit about the higher frequency path of the relevant state variables. Detailed articulation of the framework could instead rely on quantile vector auto-regressive models that explicitly capture such dynamics. Such a further evolution of the framework could also take account of (properly discounted) intertemporal trade-offs over the policy horizon (e.g. balancing short-term costs against what may be the medium-term benefits of a policy tool).

system being under stress.[23] However, there is a strong empirical case for choosing growth-at-risk. Computing growth-given-stress requires us to estimate the area under the entire lower tail, and the absence of data to pin down the density at very low quantiles would make this extremely difficult to do with any degree of precision. We cannot measure the frequency or the severity of events we very rarely see. So, much as we might prefer growth-given-stress as a measure of welfare, it seems prudent for policymakers to pay more attention to growth-at-risk.

iii) The relative effectiveness of policy

The final input into the computation of the macroprudential target is the impact of policy on the lower tail of the growth distribution relative to its impact on mean growth, (γ_q/γ). This requires policymakers to estimate the elasticity of average growth for the chosen low quantile in respect of the array of macroprudential tools over the preferred horizon. Several complex issues arise in this regard. First, the accuracy of these estimates will almost certainly depend on the horizon. This means we will be able to estimate the impact of policy on growth more precisely at some horizons than at others – a fact that will play a role in the choice of the horizon itself. Second, we have more experience of some tools than others. For example, changes in maximum loan-to-value ratios for residential mortgages have historically been more common than adjustments to the CCyB or changes in bank asset concentration limits. If a tool shows no variation this means that available data will be silent on its effectiveness. Third, as we discussed in and around Box D in the previous section, there is a possibility that this trade-off may not apply to all settings of each policy tool. Finally, there is the issue of the endogeneity of policy tools. An appropriate treatment of macroprudential instruments' endogeneity is essential if estimates of (γ_p/γ) are to capture the causal effect of policy on the relevant moments of the growth distribution rather than the mere historical correlation between tools and growth outcomes.[24]

These inputs, combined with society's aversion to severely adverse events (the coefficient of relative risk aversion ρ in the analysis in the previous section), provide a measure of the optimal target distance that is the basis for a macroprudential target. Comparing this optimal target with the distance implied by current policy settings yields a measure of stance. When the current estimate of the distance exceeds the optimal target, policy is too accommodative; when the current estimate of the distance is smaller than the optimal target, policy is too restrictive.

Before we conclude, we note several additional challenges that macroprudential policymakers face during implementation. First, there is the sheer number of tools available. Alam et al. (2019) tabulate 17 separate categories of macroprudential tools. Ideally, we would determine which tools are substitutes and which are complements, so that we can employ such tools in the best possible

[23] To see why this is the case, consider computing utility, conditional on it being in the tail of the distribution. Assuming we can approximate the utility function as a finite-order polynomial, then expected utility (conditional on $y < y^R$) is a function of the moments of the distribution describing the lower tail of growth outcomes. For the special case of the Pareto distribution shown in Figure 4, these are all functions of a single parameter that determines the shape of the tail. In other words, there is a class of utility functions and a distribution of growth outcomes for which welfare could be expressed as a function of growth-given-stress but not as a function of growth-at-risk.

[24] Addressing this issue may require moving beyond standard reduced-form quantile regressions by adopting either an instrumental-variables approach or a structural approach that explicitly models policy as an endogenous variable in a multi-equational system.

combinations, equating their marginal effectiveness.[25] Second, as always, policymakers need to avoid reacting to “noise”. Given how underdeveloped data systems are for some parts of the financial system (especially non-bank intermediaries), this is a particular risk. A related call for caution emerges when we recognise the potential for misspecification and estimation error that could plague the empirical models underpinning the kind of policy calculations envisaged above.[26] Third, as should be clear from our discussion, the policy target is likely to differ across jurisdictions. Attitudes to risk (or society’s aversion to financial instability) will diverge, as will financial structure and the effectiveness of different policy instruments. So, in a multijurisdictional area such as the European Union, providing a cross-country assessment of policy stance will involve the challenge of treating or accommodating country heterogeneity along some of the dimensions identified above (risk attitudes, effectiveness of available policy tools, etc.).

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[25] See Suarez (2021), Section 5.4 for a general discussion of this problem.

[26] Such problems plague many aspects of both public and private decision-making. See, for example, Svensson and Woodford (2003) for a general discussion, Orphanides (2001 and 2003) for an examination of the impact of “noisy” information on monetary policy, and Jorion (1985) for a study of the problem in the context of international portfolio diversification.

6 Concluding remarks

The role of macroprudential policymakers is to ensure that the probability and severity of a crisis is at a level that is consistent with the preferences of the citizens they serve. To fulfil this task successfully they require a measurable objective, a set of tools that can influence their target, and a model linking the two. The problem is analogous to that faced by monetary policymakers as they strive to achieve price stability. Using this as a guide, this report presents an example of a framework in which optimal macroprudential policy requires policymakers to target the distance between average growth and a low quantile of growth. This distance depends on society's aversion to crisis and the degree to which tools can influence the mean and the lower tail of the growth distribution. Our example yields a normative measure of stance, which tells us whether macroprudential policy is excessively accommodative or restrictive.

Before we conclude it is important that we provide a few warnings. First and foremost, the purpose of this report is to provide a perspective on the problems faced by macroprudential policymakers. We discuss the necessary elements of a theoretical and empirical framework that could form a basis for constructing a measure of policy stance. We present stylised examples based on a simple model. There is no guarantee that the conclusions we draw will lead to more complex, better articulated models of the economic and financial system. However, it seems likely that a fully articulated macroprudential policy framework will include a horizon for the target, a measure of the lower quantiles of a suitable aggregate indicator of economic wellbeing (possibly GDP growth), and an estimate of the causal effect of the relevant policy tools on that distribution. A combination of data sparsity and the difficulty faced by policymakers in identifying the causal impact of macroprudential tools on their target makes this a challenging task.

Second, our simplified treatment of macroprudential policy abstracts from a well-known danger that plagues all stabilisation policy. When the authorities reduce the likelihood of severely adverse outcomes, people change their attitudes toward risk taking in ways that could ultimately make the system less resilient. Ironically, policies aimed at mitigating financial stress could sow the seeds of future crises. Some elements of crisis management, in which authorities rescue financial markets and institutions, may further aggravate this problem. Our treatment of the impact of macroprudential policy on systemic risk (proxied by its impact on the low tail of the growth distribution in our example) does not account for this form of moral hazard. That said, if the moral hazard effects were dominant in practice, a suitably estimated measure of the causal impact of policy actions on the relevant low tail of the growth distribution would reflect this by showing an overall negative, rather than positive, effect of crisis mitigation policies on tail outcomes, and the framework envisaged in this report would advise against such policy actions.

To conclude, the goal of this report is to begin a discussion, outlining the challenges that researchers and practitioners face as they set out to construct a macroprudential policy framework. In our view, making progress on the road ahead will take time and will require contributions from various fields, but there is every reason to believe that these efforts will help to improve the assessment, design and communication of macroprudential policy.

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Stephen G. Cecchetti is Professor and Rosen Family Chair in International Finance at the Brandeis International Business School, Research Associate at the NBER, Research Fellow at the CEPR, and Vice Chair of the ESRB Advisory Scientific Committee; Javier Suarez is Professor of Finance at CEMFI, Research Fellow at the CEPR, Research Associate at the ECGI, and Chair of the ESRB Advisory Scientific Committee. We thank all our ESRB Advisory Scientific Committee colleagues for detailed comments and suggestions; as well as the broader ESRB community, including Michal Dvořák, Stephan Fahr, Philipp Hartmann, Tuomas Peltonen, and especially Antonio Sánchez Serrano, for their assistance and support in the preparation of this report. All views expressed here are those of the authors.

Stephen G. Cecchetti
Brandeis International Business School; e-mail: **cecchetti@brandeis.edu**

Javier Suarez
CEMFI; e-mail: **suarez@cemfi.es**

Postal address	60640 Frankfurt am Main, Germany
Telephone	+49 69 1344 0
Website	**www.esrb.europa.eu**

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