

Integrated policy frameworks: The constraints of policy horizons and adjustment frequencies¹



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As policymakers around the globe have deployed a wider array of tools to achieve macroeconomic and financial stability, developing the analytical groundwork for integrated policy frameworks has gained impetus – theory is catching up with practice. The potential gains from leveraging complementarities across tools could be sizeable, but realising them is not straightforward. Among others, the practical constraints associated with the temporal dimension of the various policies and tools raise important challenges. Analytical approaches that do not consider these factors are likely to overestimate the degree of feasible integration and may assign inappropriate or infeasible weights to certain policies in the overall framework.

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Against the backdrop of heightened capital flow volatility and the greater prominence of financial stability risks, policymakers have employed a wider array of tools to achieve macroeconomic and financial stability. In particular, they have complemented monetary policy narrowly defined – interest rates and balance sheet operations in domestic currency assets – with foreign exchange intervention, macroprudential measures and, sometimes, capital flow management measures.

How best to combine these tools remains an open question. This has motivated an active analytical agenda to formulate a so-called “integrated policy framework”.² Much of the extant analysis is based on stylised empirical or theoretical models designed to examine the joint effects of the instruments – often just a subset of them – taking into account interdependencies. By helping to provide a sound intellectual foundation, these models can serve as useful inputs into the overall policy decision-making process.

This note highlights the practical challenges of policy integration by focusing on real-life decision-making. In so doing, it emphasises some conceptual hurdles that modelling efforts need to confront. A critical and often neglected aspect of any integrated framework is the “temporal dimension” of the various policies and corresponding tools. This includes the horizon for their calibration and how often they are adjusted. The feasible degree of integration is constrained by differences in the cyclical properties of the underlying economic processes (in technical terms, the “frequency” of the variable), ranging from fast-moving capital flow fluctuations to more slow-moving credit cycles, as well as in the adjustment costs of the various instruments. These factors also influence differences in the “internalisation burden”, ie the extent to which decisions in one policy domain can be taken into account in the others. The main aim of the note is to highlight the key tensions rather than to provide normative judgments on the optimal use of the tools. That said, the note also identifies the scope for improvement and suggests a broad direction of travel.

Policy horizon and adjustment frequency: general determinants

The essence of policy integration is how best to achieve overall macroeconomic stability when policy tools have overlapping economic effects. At a practical level, an integrated policy framework can be regarded as an overarching ***policy decision-making process*** that helps set all available instruments consistently. The process encompasses a broad set of areas, including the goals assigned to the various policy functions and tools, the characteristics of the deployment of those tools, and governance structures.

The practical usefulness of theoretical/empirical models designed to shed light on integrated frameworks hinges on the degree to which they can capture essential real-world policy-setting features. In particular, the temporal dimension of the instruments is key. This includes: (i) the policy horizon – the time span considered when calibrating the instruments; and (ii) their adjustment frequency. These two key features, in turn, depend on a number of factors. Consider each feature one by one.

² This is, in effect, what the BIS has called for a long time a “macro-financial stability framework”, extended to include also fiscal policy (Borio (2018)). See also BIS (2019), IMF (2020), Borio et al (2021)) and Agénor and Pereira da Silva (2021). For two recent reports describing how central banks in Asia and Latin America well as some other EMEs approach these issues, see BIS (2020, 2021).

The policy horizon

Two factors influence the policy horizon.

The first, and most important, is the *underlying cyclical properties (statistical frequency) of the economic variables* of interest.³ In principle, the policy horizon should cover a time span commensurate with these cyclical properties. Calibration could then take into account the policy's full impact on the corresponding objectives. The time span varies across policy objectives, as the underlying variables evolve at different speeds. For example, it tends to be shorter for inflation and corresponding output stabilisation purposes than for financial stability purposes: financial vulnerabilities evolve more slowly than measures of economic slack (eg output gaps) or the cyclical component of inflation. And it can be even shorter, for example during crises, when the main objective is to stabilise markets or the financial system.

In practice, however, the policy horizon may be shorter than the ideal one, and this can be costly. Policy deliberations focus on the horizon over which *meaningful forecasts* are feasible. When forecast horizons are shorter than the cyclical duration of the relevant economic process, the decision-maker may end up neglecting important consequences of the policy. For example, if financial vulnerabilities build up slowly, forecast horizons of one or two years are not likely to internalise sufficiently the full effects of policy. Here, scenario analysis and early warning indicators can help, at least to some extent.

The second factor influencing the policy horizon is the *lag with which the instruments affect the variables of interest*. The shortest possible horizon is equal to the sum of two lags: the *implementation lag* – the time it takes to prepare and execute a decision; and the *transmission lag* – the time it takes for the execution to have the desired impact. It would make little sense to adopt a policy horizon that is shorter than the sum of these two lags, since the effects of the decisions would materialise beyond it. For instance, if the sum of the lags of a change in capital requirements is one year, having a policy horizon of six months would be futile.

The transmission lag is fundamentally determined by how the economy works. As such, it differs for any instrument-target variable pair. For instance, the impact of a change in the interest rate on the exchange rate is immediate, while that on credit flows takes much longer to materialise. And the corresponding lags will differ from those associated with, say, a change in reserve requirements.

The implementation lag depends on decision-making processes, which in turn reflect a mix of technical, institutional and political economy factors. As such, the lag varies across instruments. For example, the decision-making process may take longer if it involves multiple agencies rather than just one institution. Similarly, instruments that are perceived to have a strong redistributive impact raise issues of legitimacy and may require endorsement by the government or the legislature; those that involve costly modifications to business practices may also call for lengthy phase-in periods.

³ In statistical terms, the dynamic properties of a variable can be characterised by their underlying periodic fluctuations – so-called “frequency domain”. From this perspective, each data series often has a dominant cycle length (“peak spectral density”) corresponding to the periodicity that best captures the underlying fluctuations. Low-frequency variables exhibit dominant cycles that span long time spans (eg eight to 30 years) while high-frequency ones display cycles of much shorter duration.

The adjustment frequency of instruments

The second key temporal dimension is the adjustment frequency of instruments. This reflects two factors.

The first is the same as for the policy horizon – the underlying *cyclical properties of the economic variables of interest*. This affects the speed with which the relevant information unfolds and hence the time span of data required for a substantive assessment. For example, it makes little sense to, say, adjust loan-to-value ratios within an interval of one quarter if no new information has emerged (unless this is part of a pre-announced plan).

The second factor is *reputational costs*. These reflect concerns that the reversal of policy decisions, especially if abrupt, may be perceived as a mistake and undermine credibility. This is especially so if reversals amplify rather than moderate market volatility. Such concerns increase the likelihood that policymakers make successive instrument adjustments in the same direction. But they may also reduce the adjustment frequency close to turning points: policymakers may be more hesitant to adjust the tool for fear of having to reverse the decision soon afterwards.

Policy horizons and instrument adjustment frequency: policy domains

Prevailing policy decision-making frameworks and processes reflect how the factors outlined above influence the policy horizon and the frequency of instrument adjustments. Table 1 provides a stylised summary, with horizons and adjustment frequencies defined in qualitative terms.

Temporal dimensions of policy tools

Table 1

Tools	Underlying determinants				Policy process	
	Cyclicity of economic process	Transmission lags	Implementation lags	Reputation costs	Policy horizon	Frequency of adjustment of tools
Monetary policy	Medium	Medium ¹	Negligible	Moderate	Medium/Long	Frequent
FX intervention	High/Medium ²	Negligible	Negligible	Low	Short/Medium	(Very) Frequent
Macroprudential	Low	Long	Large	High	Long	Infrequent
Capital flow measures	Medium/Low ³	Short/Medium	Medium/Large	High	Short/Medium	Infrequent

¹ Defined with respect to output and inflation objectives. In the case of financial market objectives, such as the exchange rate, the transmission lags would be much shorter, while for financial stability concerns, they would be much longer. ² High in the case of concerns about excessive market volatility; medium in the case of potential exchange rate misalignments. ³ Concerns about the impact of capital flows on financial conditions tend to revolve around their consequence for output, and hence medium cyclicity. Concerns about the impact on financial vulnerabilities are primarily focused on long-duration fluctuations (low cyclicity). That said, at times policy concerns could relate to very short-term developments, such as in the case of forestalling abrupt capital outflows.

Monetary policy focuses on inflation and on closely associated output fluctuations. The cyclicity of these variables is conventionally measured by cycles of up to eight years or so (“medium cyclicity” in the Table) – typically referred to as “business cycle frequencies”. Transmission lags on financial conditions are negligible; they are somewhat longer and variable on expenditures but still consistent with the objectives. Given negligible implementation lags, monetary tools can be adjusted flexibly. The policy horizon is squarely medium-term, with a possibly longer time frame when the impact of more drawn-out fluctuations, such as financial cycles, is taken into consideration. Policy adjustments take place at regular and frequent intervals, but may also be made on an ad hoc basis in response to evolving circumstances.

For FX intervention, policy-relevant fluctuations in exchange rates can occur at both high and medium cyclicity. Excessive exchange rate volatility, driven by self-reinforcing market dynamics, can often pose a concern in the short term; potential misalignments can become worrisome over the medium term. Concerns at medium cyclicity may relate to the impact of the exchange rate on competitiveness (the trade channel) or on domestic financial conditions (the financial channel).⁴ Indeed, empirical evidence indicates that the more relevant fluctuations of global financial conditions (the “global financial cycle”) operate at similar cyclicity as traditional business cycles – the left-hand panel of Graph 1 shows that measures of the global financial cycle tend to move in lockstep with those of business cycles.⁵ Thus, the policy horizon can vary between short and medium length, depending on the nature of the concern. The tool is quite flexible, as it involves negligible implementation lags and little reputational cost associated with reversals, given how quickly market conditions can change. When used to build up macroeconomic resilience, it has a quasi-macroprudential character, without sharing the adjustment costs of those tools.

Macroprudential measures typically have a policy horizon that is *even longer* than that of monetary policy measures targeted to inflation and output. The bulk of interventions address financial vulnerabilities linked to fluctuations in credit and asset prices, most notably real estate prices – the “domestic financial cycle”. Empirical evidence indicates that the fluctuations giving rise to major episodes of financial instability and large macroeconomic costs have a longer duration than business cycle ones, within a typical range of between 14 and 20 years (“low” cyclicity in Table 1). The right-hand panel of Graph 1 illustrates this for the case of the United States (Drehmann et al (2012)). Transmission lags are roughly equivalent to those for monetary policy tools – in fact, they may overlap (eg reserve requirements) and impinge on similar variables, ie those capturing financial conditions. Implementation lags, however, tend to be much longer. Given their regulatory-like character, policy decisions call for adjustments to business practices and have a potentially large impact on specific economic segments. This raises also reputational costs. As a result, not only is the policy horizon very long, but instrument adjustments are few and far-between. Indeed, Borio et al (2021) document that across a sample of 56 advanced and emerging market economies between 1995 and 2000, the average number of macroprudential measures implemented was only one per year.

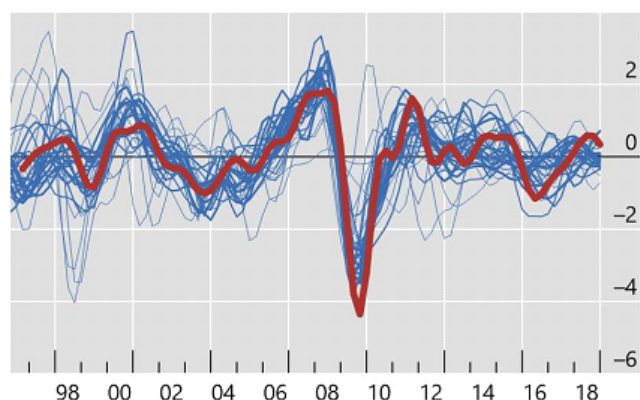
Capital flow management measures share many of the features of macroprudential tools. As regulatory instruments, they tend to involve long implementation lags. The lags can be shorter with respect to adjustments to existing measures or when targeting sudden market dislocations. Transmission lags are also similar to those of macroprudential measures, although the impact of some capital flow measures can be abrupt if they unsettle investors. The policy horizon can vary, depending on whether the primary concern is the impact of capital flows on shorter-term financial conditions, and hence business cycle fluctuations, or on longer-term financial vulnerabilities. In some cases, the measures can also be oriented towards higher-frequency developments, for example to stem sudden capital flight.

⁴ The financial channel can be defined broadly as the extent to which capital flows and exchange rates interact to influence domestic financial conditions. See BIS (2019) and references therein as well as Hofmann et al (2020).

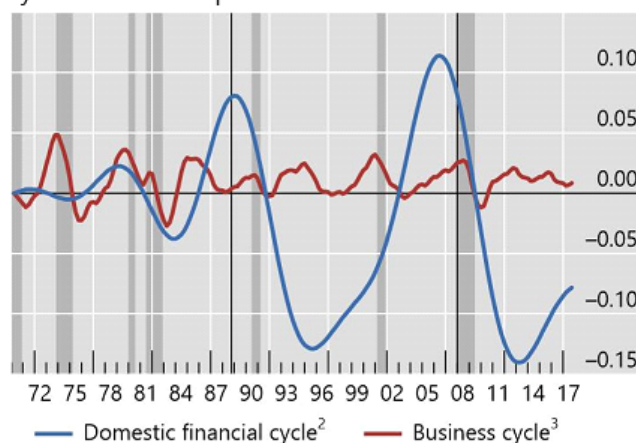
⁵ Aldasoro et al (2020), Cerutti et al (2019) and Rey (2013) investigate salient features of the global financial cycle.

The global financial cycle, domestic financial cycles and business cycles

Graph 1

The global financial cycle moves with business cycles¹

The domestic financial cycle is longer than the business cycle: the US example



¹ The red line is a composite global financial factor from Aldasoro et al (2020) based on a large cross section of asset prices and gross capital flows. The blue lines are individual business cycles of 29 countries. Both are constructed based on a bandpass filter capturing fluctuations over five to 32 quarters. The global financial factor is lagged by two quarters. ² The financial cycle as measured by bandpass filters capturing medium-term cycles in real credit, the credit-to-GDP ratio and real house prices (window from 32 to 120 quarters). ³ The business cycle as measured by a bandpass filter capturing fluctuations in real GDP over five to 32 quarters.

Source: Aldasoro et al (2020).

Implications for integration

Reflecting the features highlighted above, the policy horizon and frequency of policy adjustments have **important implications for the extent to which synergies across instruments can be realised**. Differences in policy horizons limit the economic trade-offs considered in formulating policy; differences in the frequency of instrument adjustments limit the degree to which policies can respond to one another. As a result, the extent to which interdependencies are taken into account differs across tools, with implications for the overall degree and shape of policy integration.

Macroprudential policy can be regarded as a kind of fixed point. Its necessarily long horizon, determined by the objective, coupled with the inflexibility of the instruments, means that other policies will tend to take it as given.⁶ Macroprudential policy can react to the other policies, but these will be regarded as simply operating in the background, as their influence on financial stability takes a long time to play itself out. To be sure, there may be a temptation to use macroprudential policy more actively for business cycle stabilisation purposes. But, not unlike fiscal policy, the set of available instruments is ill suited for this purpose. Moreover, bending the policy to pursue this objective could distract it from the slower-moving build-up of vulnerabilities, which have their own dynamics, thereby impairing its efficacy.

⁶ Even in the context of financial stability objectives, the inflexibility of the instruments may become an issue. One way of addressing this is to rely more on “automatic stabilisers”, as in the case of fiscal policy. For instance, sufficiently conservative loan-to-value ratios reduce the amount of credit that can be granted in response to increases in collateral values, constraining the elasticity of credit to asset price increases, thereby also reducing the amplitude of the financial cycle. In turn, this makes discretionary coordination with other instruments less important.

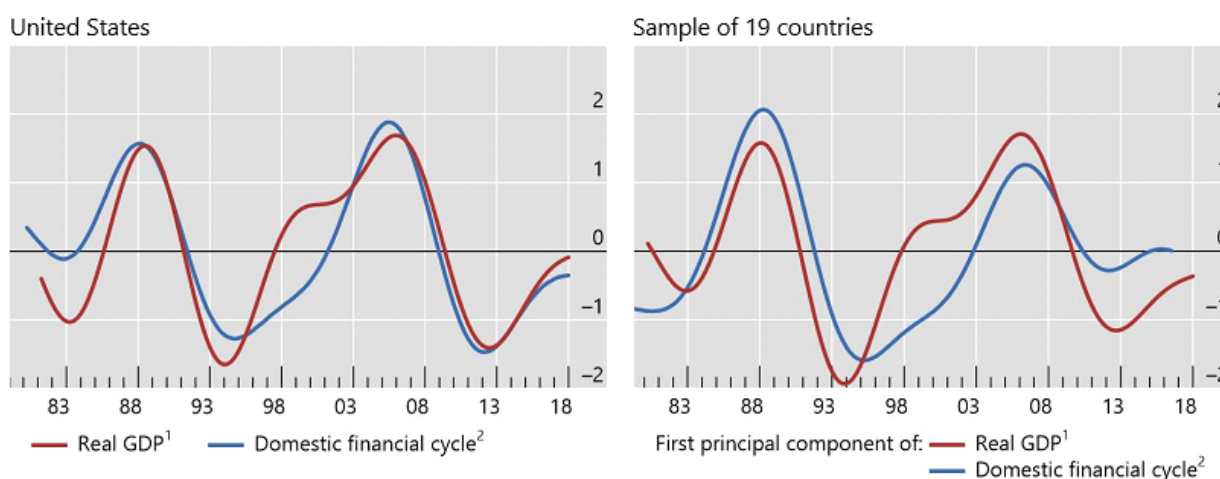
Capital flow management measures raise similar issues. On the one hand, they may have an even more structural character, as when they are set in order to influence the overall environment of capital flows. On the other hand, they may need to be adjusted on a more ad hoc basis when addressing abrupt or intense capital flow waves. Thus, while authorities can use them as a macro-stabilisation tool, more often than not they will tend to do so sparingly. Adjustment costs and unpredictable responses naturally invite such a strategy. That said, for countries with established precedents and implementation systems, capital flow measures may be utilised more readily.

Monetary policy is best placed to internalise the other policies. This is primarily because of the flexibility of the tools at its disposal. And while the policy is overwhelmingly used for inflation and macro-stabilisation at business cycle frequencies, it could also take into consideration the slower-moving, longer-horizon developments that underlie financial stability concerns. Put differently, operationally it could place a **higher weight on longer-duration GDP fluctuations, beyond the standard time spans**.⁷

Such a longer horizon, more attentive to drawn-out output fluctuations, is important. While little appreciated, it would be consistent with empirical evidence indicating that these fluctuations tend to coincide with those of the domestic financial cycle and account for the larger share of the overall GDP variance (Aldasoro et al (2020)). For example, Graph 2 shows the remarkably close synchronisation between the domestic financial cycle and longer-term output cycles in the case of the United States (left-hand panel) – a stylised fact that applies more generally across countries (right-hand panel; for details see Aldasoro et al (2020)). As a kind of “residual policy”, the downside is that monetary policy may end up taking a larger burden of internalising the cross-instrument interdependencies. Thus, it may well have to compensate for other policies if they do not gain sufficient traction or are under-utilised. The reliance on monetary policy to support growth post-Great Financial Crisis is a case in point.

The domestic financial cycle and the longer-term business cycle are highly synchronised

Graph 2



¹ Bandpass filters capturing cycles in log of real GDP (window in the range of 32 to 120 quarters), plotted with a four-period lag; right-hand panel based on 19 countries and summarised via the first principal component. ² Domestic financial cycles are measured by bandpass filters capturing cycles in real credit, the credit-to-GDP ratio and real house prices (same window as for GDP); right-hand panel based on 19 countries and summarised via the first principal component.

Source: Aldasoro et al (2020).

⁷ Comin and Gertler (2006) emphasise the importance of these longer-duration cycles in overall GDP fluctuations, referring to them as “medium-term business cycles”; this is also the terminology used by Aldasoro et al (2020).

These considerations lose some of their relevance in crisis times, in which integration and synchronisation become easier. During such episodes, the active deployment of all instruments, generally operating in the same direction, becomes more natural. Synchronisation is simpler and active coordination more likely. The experience during the Covid-19 crisis is a good example.

Viewed from this perspective, formal analytical models of policy integration are subject to two limitations: (i) they have difficulties capturing the relevance of different horizons; and (ii) they generally treat all instruments uniformly. As a result, they tend to **overestimate the degree of feasible integration** – or at least to misinterpret its character. And they can provide a **misleading picture of the desirable weights** to be assigned to the different policies in pursuing a given set of objectives.

The difficulty in modelling horizons reflects two factors.

For one, it is standard for the models to assume that the horizon is infinite. This is so either explicitly, in the case of optimal policy, or implicitly, in the case of instrument rules (in the sense that the model solution and hence policy settings incorporate all information about the future evolution of the economy). In such a framework, the real-life practice of adopting different horizons is not meaningful.

In addition, most models do not distinguish between the underlying cyclicity of the relevant economic phenomena. In typical dynamic stochastic general equilibrium approaches – characterised by shock/propagation/return-to-steady-state – the shocks and their impact may affect persistence. But the models do not capture the endogenous cycles of different durations that are so important in practice. This is especially relevant for the distinction between financial and business cycles, which has a first-order influence on arrangements.

The uniform treatment of instruments further underestimates integration challenges. In the models, integration means **joint calibration** of tools, with all instruments adjusted simultaneously. This is so regardless of whether their path traces optimal policy or reaction functions. In practice, asynchronous adjustment is the norm and, in many cases, it could not be otherwise, given irreducible implementation lags. While, in and of itself, this need not be a major issue, it becomes more significant once it is recognised that some instruments are simply ill suited for some objectives, owing to the different cyclicity of the underlying economic processes. An important example, noted above, is assigning a role in macro-stabilisation at standard horizons to rather inflexible macroprudential tools.

Finally, the models underestimate the importance of governance arrangements. Some aspects are well appreciated. The key one is the political economy factors that may favour assigning different objectives to different authorities. This would obviously reduce the scope for policy integration. But even in the case where the central bank takes sole responsibility for the objectives under discussion, as many already do, important obstacles remain.

One common but neglected obstacle is precisely the absence of a single model of the economy on which policymakers can agree. Since no single model is able to capture the relevant elements of the workings of the economy, different central bank departments come with their very different perspectives, rather than the unified one needed to best exploit potential synergies. For instance, macroeconomic departments in charge of informing monetary policy tend to focus on aggregate developments, often seen through the lens of stylised structural models that rule out endogenous financial cycles and instability. By contrast, financial stability

departments consider such cycles important, place much more emphasis on detailed sectoral developments and rely for the most part on reduced-form techniques. Bridging the different perspectives is difficult, and it is left to the policy decision-making level to reconcile them. So far, this has proved very hard.

Conclusion

The scope and effectiveness of policy integration rests on key features of the policy decision-making process. This note has highlighted how the *temporal dimensions* of this process affect the extent to which synergies across policy instruments are, or can feasibly be, taken into account in practice. Neglecting these factors can lead to inappropriate or impractical assignment of weights to the various policies in the pursuit of a given set of objectives.

What is the scope for improvement in the practice of integration? The most critical, often neglected, element is probably the treatment of the policy horizon. The horizon largely dictates what does and does not fall in the purview of policymakers charged with controlling a particular set of instruments.

The key challenge is for policies to take into consideration their influence on economic developments *beyond* their immediate operational horizon. Specifically, for instruments that are amenable to adjusting flexibly in response to short- and medium-term fluctuations, making sure that their policy horizon does not become too short could help promote complementarities across instruments.

The potential gains apply, in particular, to FX intervention and monetary policy. This is precisely because they can flexibly accommodate a *range* of horizons. Here, consistency in the deployment of the tools is key. In the case of FX intervention, day-to-day operational objectives – such as targets around technical support levels for the exchange rate – should remain sufficiently anchored to high-level monetary policy objectives. For monetary policy, taking into consideration its impact on longer-term macroeconomic stability through its influence on the domestic financial cycle should help to take some of the load off macroprudential policy. In both cases, adjustments to institutional setups matter. They would involve adjustments to the make-up of policy committees, to the types of policy inputs as well as to analytical frameworks. The adjustments would help better capture the relevant trade-offs, which are often intertemporal in nature. ■

References

Agénor, P and L Pereira da Silva (2021): “Macroeconomic policy under a managed float: a simple integrated framework”, *mimeo*.

Aldasoro, I, S Avdjiev, C Borio and P Disyatat (2020): “Global and domestic financial cycles: variations on a theme”, *BIS Working Papers*, no 864.

Bank for International Settlements (2019): “Monetary policy frameworks in EMEs: inflation targeting, the exchange rate and financial stability”, *Annual Economic Report 2019*, Chapter II, June.

——— (2020): *Capital flows, exchange rates and policy frameworks in emerging Asia*, a report by a Working Group established by the Asian Consultative Council of the Bank for International Settlements, 27 November.

——— (2021): *Capital flows, exchange rates and monetary policy frameworks in Latin American and other economies*, a report by a group of central banks including members of the Consultative Council for the Americas and the central banks of South Africa and Turkey, 15 April.

continued

Borio, C (2018): “Macprudential frameworks: experience, prospects and a way forward”, speech at the BIS Annual General Meeting, Basel, 24 June.

Borio, C, I Shim and H S Shin (2021): “Macro-financial stability frameworks: experiences and challenges,” *mimeo*.

Cerutti, E, S Claessens and A Rose (2019): “How important is the global financial cycle? Evidence from capital flows”, *IMF Economic Review*, vol 67, pp 24–60.

Comin, D and M Gertler (2006): “Medium-term business cycles”, *American Economic Review*, no 96, pp 523–51.

Drehmann, M, C Borio and K Tsatsaronis (2012): “Characterising the financial cycle: don’t lose sight of the medium term!”, *BIS Working Papers*, no 380, June.

Hofmann, B, Ilhyock S and H S Shin (2020): “Bond risk premia and the exchange rate”, *BIS Working Papers*, no 775, April.

International Monetary Fund (2020): “Toward an integrated policy framework”, *IMF Policy Paper*, October.

Rey, H (2013): “Dilemma not trilemma: the global financial cycle and monetary policy independence”, paper presented at the Federal Reserve of Kansas City Economic Policy Symposium “Global dimensions of unconventional monetary policy”, Jackson Hole, 22–24 August.

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