Monetary Policy Frameworks: An Index and New Evidence*,**

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Abstract

We provide a multidimensional characterization of monetary policy frameworks across three pillars: Independence and Accountability, Policy and Operational Strategy, and Communications (IAPOC). We construct the IAPOC index by analyzing central banks' laws and websites for 50 advanced economies, emerging markets, and low-income developing countries, from 2007 to 2021. Due to its scope and granularity, our index provides a novel measure that captures the complexity and evolution of monetary policymaking globally, going beyond existing measures of central bank transparency or independence, as well as monetary policy or exchange rate regime classifications. Comparing the IAPOC index across countries and over time, we find that monetary policy frameworks are varied and fast-changing, especially across Policy and Operational Strategy and Communications pillars which relate closely with inflation and inflation expectations.

JEL Classification Codes: E31, E42, E52, E58, F33, O23.

Keywords: Monetary Policy, Monetary Policy Regime, Inflation, Inflation Expectations, Exchange Rate Regime, Central Banks, Central Bank Independence, Central Bank Transparency

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1. Introduction

A monetary policy framework (MPF) comprises the structures in place that enable and guide the conduct of monetary policy. This encompasses both the legal basis—which shapes independence and accountability—and the design, implementation, and communication practices of monetary policy. A monetary policy *framework* is much broader in scope than a monetary policy *regime* which is a specific configuration of select elements within the MPF. For example, an inflation-targeting regime is understood to involve price stability as the primary objective, a numerical inflation target, and the use of a short-term interest rate as the policy tool. However, the MPF within which an inflation-targeting regime operates includes multitude of other (design, implementation, and communication) elements, as well as legal foundations, all of which signficantly influence monetary policymaking and may vary across countries.

The MPF plays a critical role in empowering monetary policymaking for two fundamental reasons. First, a well-established MPF fosters clarity by providing the frame of reference that guides sound and consistent policymaking and safeguards policy continuity. It serves as a useful vehicle for steering policymakers on various issues, from the legality of actions to the appropriate focus of policy discussions or the communication of decisions. Second, clarity about the way the central bank conducts monetary policy aids the public in forming policy expectations, reduces uncertainty, and ultimately makes monetary policy more effective. This is key as the effects of monetary policy on the economy depend not only on current policy actions but also on the public's expectations of how the policy will evolve. A useful approach to managing expectations is for policymakers to be clear about the objectives as well as the plans to progress towards and achieve those objectives.

In this paper, we construct a comprehensive metric and corresponding index that provides a multidimensional characterization of MPFs across countries and over time. We conceptualize the MPF as consisting of three foundational pillars, ollectively referred to as IAPOC: (i) **I**ndependence and **A**ccountability, which provides the foundations of monetary policy; (ii) **P**olicy and **O**perational Strategy, which guides adjustments to the policy stance given the objectives, as well as adjustments to the policy instruments to implement the policy stance; and (iii) **C**ommunications, which convey decisions about the policy stance and rationale to the public.[1] To ensure a thorough assessment of all pillars and their intricate interactions, we develop a detailed set of 225 criteria. Using public information collected manually from central banks' laws and websites, we provide the resulting IAPOC index for a heterogeneous group of 50 countries from 2007 to 2021.

Our approach focuses on transparency, coherence, and consistency as key principles when evaluating MPFs. *Transparency* captures the availability and clarity of information necessary for the public to comprehend the MPF and associated policy

[1]This work owes its origin to the stream of monetary policy-related projects on macroeconomic policy in low-income countries IMF (2021), in particular IMF (2015) and Berg and Portillo (2018).

actions (Blinder et al., 2001). *Coherence*, in turn, captures the extent to which the MPF embodies logical and unequivocally desirable elements that reflect a broad consensus, such as having a forward-looking policy strategy and timely and regular communications. Finally, *consistency* captures the alignment between the Policy and Operational Strategy and Communications pillars. Overall, these principles embody our view that monetary policymaking requires a clear, reasonable, and unified framework where policy design, implementation, and communications are in accord.

Our principle-based approach allows the IAPOC index to be applicable across countries, regardless of the prevailing income level, stage of development, and monetary policy or exchange rate regimes.[2] However, this broad applicability means that some country-specific details of more sophisticated MPFs, particularly relevant for advanced economies (AEs), may not be fully represented. Moreover, as the frontier of modern monetary policymaking continually evolves, capturing the apex of monetary policymaking is difficult, if not impossible. Our work may therefore be regarded as most suited to looking into monetary policymaking in emerging market economies (EMs) and low-income developing countries (LIDCs). That being said, it remains useful to benchmark MPFs in EMs and LIDCs against AEs as we do in this paper.[3]

The IAPOC index provides a comprehensive measure of MPFs across countries and time periods by characterizing all three pillars. As expected, the index and its pillars exhibit a strong correlation with inflation outcomes and expectations. Notably, across EMs and LIDCs, the index captures the significant variation in monetary policymaking, which is mostly driven by the novel Policy and Operational Strategy and Communications pillars. The IAPOC index also demonstrates how MPFs have been evolving in these countries over time and identifies remaining gaps across the pillars (and sub-pillars). This is valuable as less is typically known about MPFs in EMs and LIDCs, where more eclectic and fast-changing approaches are far more common than in their AE counterparts.

The IAPOC index further provides a novel joint account of Independence and Accountability and quantifies both *de facto* and *de jure* scores for this pillar.[4] Interestingly, de jure arrangements are assessed as being stronger than their de facto

[2]The IAPOC metric is applicable to all countries with some room for monetary policy. This excludes individual countries in a monetary union, countries with a hard peg, or countries with no separate legal tender.

[3]Fry et al. (2000a,b) cover some parts of MPFs across countries but do not include several critical aspects (e.g., communications), and rely on survey data rather than public information as opposed to what we do. Similarly, Hammond et al. (2012) provides information on several elements of MPFs such as numerical targets, decision-making processes, announcements of policy decisions and the publication of monetary policy reports for 27 inflation-targeting countries.

[4]In contrast to much of the related literature, we focus on the central bank's monetary policy function as opposed to *all* central bank functions. Central banks in the aftermath of the global financial crisis have been tasked with additional policy functions, such as macroprudential policy or banking supervision, for which the same degree of operational independence or transparency as with monetary policy may not be desirable. Balls et al. (2018), for example, provide an analysis of overall central bank independence.

implementation in EMs and especially in LIDCs, while the reverse holds for AEs. Nevertheless, enhanced practices over time have brought de facto Independence and Accountability closer to the de jure counterpart in LIDCs and have closed the gap between the two in EMs. Indeed, the dynamic and comprehensive nature of our de facto Independence and Accountability adds to the existing de jure central bank independence indices such as Cukierman et al. (1992).[5]

Our work also complements the strand of literature on central bank transparency (Eijffinger and Geraats, 2006; Dincer and Eichengreen, 2008, 2014; Al-Mashat et al., 2018; Dincer et al., 2019) by explicitly incorporating coherence and consistency, in addition to transparency, as underlying principles of our unified IAPOC metric. Standalone scores associated with each principle (IAPOC-transparency, IAPOC-coherence, and IAPOC-consistency) provide additional new insights into MPFs and the differences between country groups. We find that while EMs and LIDCs have made progress in transperancy over the past decade, they still lag sizably behind AEs in terms of coherence and consistency. This reflects continued learning-by-doing by central banks in most LIDCs where the main challenge remains to transition to a sound MPF in good form. They often continue to have a central role for monetary aggregates, a practice that has long disappeared elsewhere. In practice, though, LIDCs in many cases used various tools in search for multiple and sometimes conflicting objectives, including on the exchange rate. Somewhat similarly, and in contrast to AEs, the tools used in practice for some EMs do not match the ex-ante exposition in the Policy and Operational Strategy. Even if they match, it is often not explained how these tools relate to and are jointly balanced. This highlights the importance of looking beyond transparency to have a more accurate view of how monetary policy is conducted, particularly in the presence of multiple objectives and tools.[6]

Relatedly, by shifting focus to MPFs and away from monetary policy or exchange rate regime classifications (IMF's Annual Report on Exchange Arrangements and Exchange Restrictions, AREAER; Calvo and Reinhart, 2002; Reinhart and Rogoff, 2004; Cobham, 2021), we provide a measure of monetary policymaking comparable across countries operating various types of regimes as well as those that do not fit

[5]Most of the existing work on central bank independence relies solely on *de jure* aspects. Cukierman (1992) and Cukierman et al. (1992) suggested the turnover rate of central bank governors as a *de facto* measure of central bank independence. In our approach, the turnover rate of governors is merely one aspect of numerous de facto considerations. Some other studies look at accountability separately (Laurens et al., 2016).

[6]The global financial crisis and ongoing COVID-19 pandemic have emphasized the need to enhance the potency of monetary policy in many parts of the world, especially in EMs that are vulnerable to capital inflow shocks. As a result of this, an increasing number of EMs have moved towards approaches where multiple tools are employed in pursuit of multiple objectives related to financial stability, exchange rate stability, and capital flow management. Borio (2019) describes the move away from standard inflation-targeting regimes in EMs as "the practice that moved ahead of theory". See Gopinath (2019); Boz et al. (2020); Erceg et al. (2020); IMF (2020b) how an "integrated" approach with multiple objectives and tools could be help provide macroeconomic and financial stability in some circumstances.

into any regimes.[7] We find that regime classifications may not informatively reflect on monetary policymaking in EMs and LIDCs in the same way as in AEs. This is because, even across countries that have the same type of monetary policy or exchange rate regime, such as inflation-targeting regime, the variation in MPFs is large and particularly so for EMs and LIDCs.

The rest of this paper is organized as follows. Section II explains the anatomy of MPFs. Section III describes the methodology used to formulate the criteria underlying the IAPOC metric and details the construction of the IAPOC index. Section IV showcases the index and how it changed over time across pillars and sub-pillars. Section V and VI compare the IAPOC index with existing transparency indices and monetary policy and exchange rate classifications. Section VII concludes.

2. What Is A Monetary Policy Framework?

2.1. Definition

We view the MPF as encompassing three pillars—Independence and Accountability, Policy and Operational Strategy, and Communications. The Independence and Accountability pillar covers the central bank's monetary policy mandate and associated goals, together with (de jure and de facto) operational independence and public accountability in pursuit of these goals. Policy and Operational Strategy includes the strategy that guides the formulation and implementation of monetary policy; that is, how the monetary policy stance is set using the tools (based on the objectives and associated numerical targets) and how changes in the tools are implemented. Communications, in turn, captures how the policy stance, and its rationale, are conveyed to the public. In unison, these IAPOC pillars provide a complete description of an MPF.

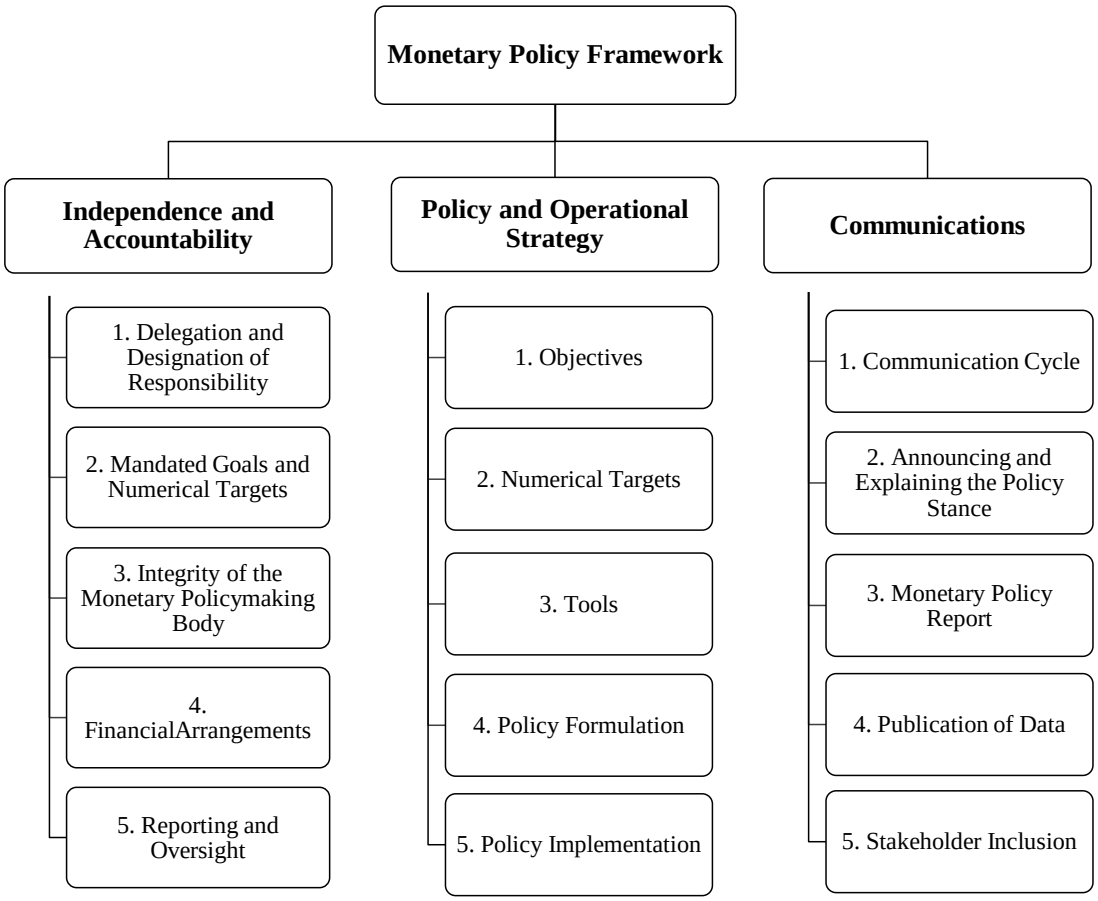
Throughout this paper, monetary policy "mandate" refers to a legislated order to formulate and implement monetary policy directed at certain goals. The "objectives" constitute the practical interpretation of the mandated goals in terms of what monetary policy aims to achieve. The "numerical targets", in turn, capture the operationalization of the monetary policy objectives through the setting of targets, typically with a medium-term horizon (e.g., the inflation target). The "tools" comprise the monetary policy operating targets that are adjusted to attain the objectives and associated numerical targets, including those used to signal the policy stance (e.g., the policy interest rate) and those that have a more supportive role (e.g., asset purchases). Finally, the "instruments" refer to the monetary policy operations and facilities used to implement the changes in the tools (e.g., open market operations).

[7] According to the IMF's AREAER (2021), 11 percent of the EMs and 16 percent of LIDCs in our sample are classified under "other monetary policy regime", which provides limited insight as to how monetary policy is conducted in these countries.

2.2. Scope

We draw on the vast body of related literature to delineate the MPF along its conceptual constituents and allow for the sharpest categorization of information (Figure 1). This further facilitates a clear separation of potential sources of information.

Figure 1: Monetary Policy Framework, Pillars and Sub-Pillars



While several features of MPFs are relevant across pillars, each pillar (and sub-pillar) captures a unique perspective of these features within the IAPOC metric. For example, in terms of the numerical targets, Independence and Accountability (sub-pillar 2) captures the governance arrangements regarding the setting of numerical targets (e.g., who sets them and how frequently), whereas Policy and Operational Strategy (sub-pillars 2 and 4) captures the actual specification of and revisions to numerical targets and how they guide policy formulation. Communications (sub-pillars 2 and 3), in turn, captures how numerical targets feature in monetary policy decision announcements and reports.[8] In what follows we describe in further detail the scope of each pillar and its associated sub-pillars.

[8]Table 1 in Section 3 further details how the IAPOC metric covers numerical targets in the different pillars.

2.2.1. Independence and Accountability

The first pillar of the IAPOC metric comprises (de jure and de facto) Independence and Accountability as the foundation of monetary policymaking. We focus on the notion of *operational* independence of the central bank with respect to *monetary policy*. That is, independence to formulate, decide on and implement monetary policy without unwarranted external influence or direction from any of the branches of government or financial sector.[9] In principle, the central banks' monetary policy decisions are expected to be binding and shielded from various forms of influence, including, for example, from pressures that come with a turnover of personnel or frequent budget review (Tucker, 2019). This independence is envisioned within the context of accountability, meaning that safeguards are in place to provide appropriate control and good governance (BIS (2009)). In short, an elected authority (the legislative branch of government) delegates responsibility for monetary policy to an independent body (the central bank)—both by law and in practice—while ensuring that this body is held accountable in terms of the conduct of monetary policy against clear objectives (IMF (2015)).[10] The rationale behind the widespread acceptance of monetary policy operational independence is severalfold (Blinder, 1999; Fischer, 2017). Most prominently, relating to the work of Rogoff (1985) and as discussed in Fischer (1995a) and Fischer (1995b), delegating monetary policy to an independent body mitigates the inflationary bias that results from discretionary monetary policy (Kydland and Prescott, 1977; Barro and Gordon, 1983a,b). These theoretical arguments, in turn, underpin the longstanding empirical literature aimed at studying the economic benefits of central bank independence (Bade and Parkin, 1980; Grilli et al., 1991; Cukierman, 1992; Cukierman et al., 1992; Alesina and Summers, 1993; Posen, 1995, 1998; Crowe and Meade, 2008; Laurens et al., 2016).[11] Recently, Bernanke (2017) and Posen (2017) argue that the need for monetary policy independence is more about the highly technical and time-sensitive nature of monetary policymaking and the need to ensure policy continuity and coherence over time, which might be more challenging to achieve under external influence.[12]

A critical constituent accompanying independence is accountability (Fischer, 1995a; Goodhart and Lastra, 2018). While central banks remain public institutions, they often fall outside the standard system of checks and balances because of the afforded independence. Ensuring accountability to the legislature and society at large helps to safeguard the proper conduct of monetary policy as well as to ensure the legitimacy

[9]Sometimes known as instrument independence, this is distinct from goal independence under which the central bank determines its own goals (Debelle et al., 1994; Fischer, 1995b).

[10]Monetary policy independence does not preclude interactions with the government, such as coordinating policies in certain situations (Bernanke, 2017); Eggertsson (2013). Moreover, building broad tacit support for monetary policy actions within the government is key in minimizing incentives to undermine monetary policymaking (Archer and Levin (2018)).

[11]The results of this literature have been mixed. More recent studies of central bank independence (Dincer and Eichengreen, 2014; Bodea and Hicks, 2015; Garriga, 2016) primarily focus on revisiting the evidence by updating or expanding the coverage of the existing indices produced by either Grilli et al. (1991) or Cukierman et al. (1992)

[12]See also Blinder (1999) and Alesina and Stella (2010) on this point.

and sustainability of the central bank's power over monetary policy (Tucker, 2019).

We benefit from earlier studies constructing central bank independence indices (notably Grilli et al. (1991), and Cukierman et al. (1992)), but focus specifically on *monetary policy* independence and in the context of accountability. We further complement this literature by systematically accounting for both the legal arrangements (de jure) and the arrangements that exist in reality (de facto).[13] This is important, as tradition, norms, and precedent may complement the legal basis in cases of older laws or in common law systems; or, the rule of law may not be followed or reflected in practice.

We distill the joint Independence and Accountability pillar in the IAPOC metric into the following five sub-pillars:

1. *Delegation and Designation of Responsibility* covering the central bank's statutory monetary policy mandate and the body(ies) responsible for monetary policy within the central bank (such as the Board or a designated Monetary Policy Committee).[14]
2. *Mandated Goals and Numerical Targets* covering the goals assigned to monetary policy in the mandate and the existence and governance of any associated numerical targets.
3. *Integrity of the Monetary Policymaking Body* covering the integrity of the members of the monetary policymaking body, such as their terms of office, external affiliations, grounds and means for dismissal, and turnover rates.
4. *Financial Arrangements* covering governance aspects of the central bank's financial setup, such as lending to the government, profit distribution, and recapitalization arrangements.[15]
5. *Reporting and Oversight* covering the presence of accountability mechanisms, such as testimony to the legislature; and broad oversight, including auditing by an independent external body and periodic external reviews.

Even with all arrangements for Independence and Accountability (both de jure and de facto) in place, however, undesirable interference in monetary policymaking may not be avoided.[16] This is a further reason why the MPF should be assessed not only based on what is technically or seemingly legal but also based on how policy is conducted. This is explicitly captured by the Policy and Operational Strategy and

[13]For an example of the de facto elements within the IAPOC metric, see the criteria on the integrity of the governor—3.1. in Table A1 in Appendix A.

[14]As the literature does not point out superiority of a specific voting procedure (e.g., by consensus, majority, and unanimity) within the decision-making body (Vandenbussche, 2006), the IAPOC metric looks only for transparency; that is, whether the decision-making procedures of the decision-making body(ies) are stated.

[15]Even though our focus is on the central bank's monetary policy function, some considerations in *Financial Arrangements* and *Reporting and Oversight* do pertain to the entire central bank.

[16]This is in line with Posen (1993) who argues that central bank independence requires political backing. Alpanda and Honig (2010) propose a measure of independence based on the extent to which monetary policy easing tracks the electoral cycle and Binder (2021) constructs a dataset of political pressure on central banks.

Communications pillars in the IAPOC metric, which are the focus of the next two sub-sections.

2.2.2. Policy and Operational Strategy

The second pillar of the IAPOC metric encompasses Policy and Operational Strategy which guides both monetary policy formulation—adjusting the tools based on the objectives and associated numerical targets—and implementation—adjusting the instruments in line with the policy stance.

A well-articulated ex-ante policy strategy facilitates policymaking by guiding sensible and consistent policy formulation and communication, and helps with the predictability and understanding of monetary policy (Blinder et al., 2001). Similarly, a clear and effective operational strategy helps to align market conditions with the announced policy stance, fosters market development and functioning, and limits implementation mistakes based on discretion (Bindseil, 2014, 2016).

In conceptualizing what constitutes a comprehensive *policy* strategy we benefit from the literature concerned with the design of monetary policy (Mishkin, 2007, 2011; Levin, 2014; Mishkin, 2017; Bernanke, 2017; Adrian et al., 2018; Al-Mashat et al., 2018; Svensson, 2018). In turn, for characterizing what constitutes a comprehensive operational strategy, we draw on the body of literature that sheds light on the importance and key features of modern operational strategies, such as Bindseil (2014, 2016). We complement these two strands of work with a perspective from EMs and LIDCs, where capacity constraints may be prominent and markets less developed (Batini and Laxton, 2007; Friedman and Kuttner, 2010; IMF, 2015; Berg et al., 2015; Berg and Portillo, 2018; Adam et al., 2018).

We narrow the Policy and Operational Strategy pillar within the IAPOC metric down to the following five sub-pillars:

1. *Objectives* covering the practical interpretation of the mandated goals (and if there are multiple objectives, the potential interactions between them).
2. *Numerical Targets* covering the definition of numerical targets (including an inflation target), how they map into the objectives, the time horizon over which they are to be met, the conditions for their revisions and any actual revisions.[17]
3. *Tools* covering the tools used to set the policy stance and how they are defined, the relationship of these tools with the objectives and numerical targets (and if there are multiple tools, the potential interactions between them).
4. *Policy Formulation* covering the stages of the decision-making process, such as inputs from a quantitative framework and staff analyses, how objectives and numerical targets guide policy formulation (and if there are multiple objectives and numerical targets, how they are balanced), and the extent to which policy formulation is forward-looking.

[17]Having an inflation target does not necessarily imply adopting an inflation-targeting regime.

5. *Policy Implementation* covering the monetary policy instruments, including their mapping to individual outcomes, details of the instruments that foster a predictable and stable interbank market (e.g., standing facilities), and the joint functioning of the instruments.

2.2.3. Communications

Finally, the third pillar of the IAPOC metric captures Communications that convey decisions about the MPF and the policy stance as well as the underlying rationale to the public. Communication enhances the effectiveness of policy by reducing economic and financial uncertainty, shaping and anchoring market expectations, and may even serve as an additional policy lever (Blinder, 1999; Bernanke, 2004; Woodford, 2012; Blinder et al., 2008; Mishkin, 2017; Blinder, 2018). Recent emphasis has further been put on the joint design of communications and policy and operational strategies, given that the strategy anchors communications, while communications enhance the understanding and credibility of the strategy (Levin, 2014; Archer and Levin, 2018).

In devising Communications, in addition to *what* to communicate, *how* and *when* to do so is also key (Blinder et al., 2008). A clear, regular, and timely communication cycle helps the public understand the monetary policy stance and the economic outlook IMF (2015). In line with Policy and Operational Strategy, such communications center around the outlook for the main monetary policy objectives, and also cover the risks to the outlook taken into account in formulating monetary policy.[18]

We delineate the Communications pillar within the IAPOC metric along the following five sub-pillars:

1. *Communication Cycle* covering both the standard communication cycle, including the vehicles used and the frequency and regularity of communications; and the ad-hoc communication of major changes to the MPF (such as changes in objectives, numerical targets, or tools), their justification and, if temporary, the conditions that warrant the exit.
2. *Announcing and Explaining the Policy Stance* covering communication of monetary policy decisions about the policy stance that seek to announce and explain these decisions to the public, such as policy statements and press conferences.
3. *Monetary Policy Report* covering communication through a comprehensive, dedicated report (often called the Inflation Report) that further explains monetary policy decisions and their rationale.
4. *Publication of Data* covering the publication of relevant data—i.e., data related

[18] A related literature employs automated text analysis techniques to assess, for example, the readability, length, or tone of communication vehicles (Apel and Blix Grimaldi, 2012; Schonhardt-Bailey, 2013; Hansen et al., 2018; Benchimol et al., 2020). The IAPOC Communications pillar is concerned with the content and accessibility of communications rather than quantifying the real-time sentiment conveyed or the absolute length and evaluates Communications within the broader MPF.

to the objectives, numerical targets, and tools, including forecasts.

5. *Stakeholder Inclusion* covering the extent to which communications are made accessible to various stakeholders, including through the language(s) in which information is provided, the technicality of language used, and whether research articles are disseminated.

3. The IAPOC Metric for Assessing Monetary Policy Frameworks

Designing the IAPOC metric involves formulating criteria corresponding to all subpillars of each of the three pillars of the MPF as defined in the previous section. These criteria, 225 in total, are presented in Appendix A. The IAPOC index is then constructed as information from countries' central bank laws and websites are assessed against these criteria.

All countries are subject to the same criteria, irrespective of their level of development or income. Moreover, while the criteria can only be reasonably applied to countries with some scope for monetary policy (as mentioned before), no further distinction is made based on the monetary policy or exchange rate regime in place in a country. At the heart of this broad applicability of the IAPOC metric lies our principle-based approach, whereby we focus on the transparency, coherence, and consistency of MPFs.

3.1. Three Principles—Transparency, Coherence, and Consistency

We derive the criteria comprising the IAPOC metric based on three principles: (i) transparency, (ii) coherence, and (iii) consistency. *Transparency* refers to the provision of the information necessary for the public to understand the MPF and associated policy actions (Blinder et al. (2001)).[19] *Coherence* concerns the extent to which the MPF either encapsulates logical features that are unequivocally desirable, such as timely and regular communications; or reflects strong consensus, such as having price stability as (one of) the primary objectives with an associated (medium-term) numerical inflation target and forward-looking policymaking.[20] *Consistency* requires that the (ex-ante) Policy and Operational Strategy and (ex-post) Communications pillars are in accord in terms of the monetary policy objectives, numerical targets, and tools.

[19]There is extensive literature on the importance of central bank transparency (Dincer and Eichengreen, 2008, 2014; Al-Mashat et al., 2018; Dincer et al., 2019; IMF, 2020a) . Transparency is often (mis)used to refer to coherence, consistency, or predictability of monetary policy or, sometimes even regarded synonymously with "good policy".

[20]As discussed in Section 2, broad consensus has prevailed on the desirability of a price (or inflation) stability objective with an associated medium-term numerical target and forward-looking policymaking. Some other (less salient) features derived from the literature and incorporated into the IAPOC metric include the desirability of market-based tools (rather than administrated and/or controlled tools) or making decisions by a committee (rather than an individual). The majority of criteria related to the coherence principle, however, are simply logical features.

Ultimately, the consistency principle is meant to capture whether central banks do "what they say they do". The consistency principle is operationalized in the IAPOC metric by taking as given the objectives and numerical targets from Policy and Operational Strategy and the tools from Communications.[21] Overall, these three principles encapsulate the fact that effective monetary policymaking requires a clear, reasonable, and unified framework, where the policy design, implementation, and communications are in sync.

Table 1 below demonstrates how these three principles underpin the IAPOC metric with, as an example, the criteria on the numerical targets of monetary policy.[22] In the context of this example, the IAPOC metric goes far beyond "checking the box" on whether a country has a numerical target or not. Instead, to determine whether the numerical target is a viable nominal anchor, the metric encapsulates various elements such as how the target is set and by who, the time-horizon, and whether the same target also features in Communications. More specifically, the criteria that capture the availability of information (e.g., whether the body responsible for setting the numerical targets is stated) are related to the transparency principle (T). In turn, the ones that capture desirable policy practices (e.g., the medium-term nature of the numerical target) are related to the coherence principle (CH). Finally, the criteria that capture whether the numerical targets featured in Communications coincide with those identified in Policy and Operational Strategy are related to the consistency principle (CS).

Our principle-based approach makes the IAPOC metric applicable across a wide variety of monetary policy practices, including those do not fit into standard monetary policy regime classifications. As mentioned earlier, more EMs and LIDCs adopt approaches that are more eclectic than standard interest rate setting and floating exchange rates. For instance, continuing with the example of numerical targets, the metric does not preclude countries featuring multiple numerical targets. Instead, the IAPOC metric would require transparency (i.e., disclosing all numerical targets), consistency (i.e., featuring the same numerical targets throughout the MPF), and coherence (i.e., all numerical targets satisfying certain desirable criteria, as well as explaining how they are balanced). The same basic insight applies in the case of multiple objectives or tools. Relatedly, the IAPOC metric does not view the inflation-targeting regime as a panacea and can flexibly accommodate more frontier approaches, such as temporary price-level targeting.

[21] The only exception to this is that we use the IMF's AREAER database as a supplementary source for detecting the presence of an exchange rate-related tool. Unless a country is classified as free-floating or floating, it is deduced that an exchange rate tool is used (in addition to any tools identified through Communications) and hence is required to be featured throughout both Communications and Policy and Operational Strategy.

[22] The options, ordering of criteria, and scoring are discussed in Section 3.2 below.

Table 1: Criteria Related to the Numerical Targets

Criterion	Principle	Options and Scoring
INDEPENDENCE AND ACCOUNTABILITY		
2. Mandated Goals and Numerical targets		
2.2. By law, is it stated that there is a numerical monetary policy target?	**T**	Yes—1 No—0
2.2.1. By law, is it stated which body(s) is responsible for setting the numerical monetary policy target(s)?	**T**	Yes—1 No—0
2.2.1.1. By law, who sets the numerical monetary policy target(s)?	**CH**	The central bank and the government through joint consultations—1 The central bank or government alone—0.5 An individual—0
2.2.2. By law, is it stated how frequently the target(s) may be revised?	**T**	Yes—1 No—0
2.2.2.1. By law, how frequently may the target(s) be revised?	**CH**	At a fixed, low frequency, once every five or more years— 1 More Often—0
POLICY AND OPERATIONAL STRATEGY		
2. Numerical Targets		
2.1. Is it stated what the numerical targets are?	**T**	Yes—1 No—0
2.1.1. Does this include an inflation target?	**CH**	Yes—1 No—0
2.1.1.1. Is it stated which indices/data series define these targets?	**T**	Yes—1 No—0
2.1.1.2. Is it stated over which time horizon these targets should be met?	**T**	Yes—1 No—0
2.1.1.2.1. Is the time horizon for the inflation target the medium-term?	**CH**	Yes— 1 No—0
2.1.1.3. Is it stated under which conditions these targets may be revised?	**T**	Yes—1 No—0
2.1.1.3.1. Under which conditions may these targets be revised?	**CH**	Comprehensive review at a fixed frequency—1 Other—0
2.1.1.4. Have any of these targets been revised?	**CH**	No; or through a comprehensive review—1 Not through a comprehensive review—0
2.1.1.5. Is it explained how the objectives map into these targets?	**CH**	Yes—1 No—0
4. Policy Formulation		
4.2. Is it stated which objectives and numerical targets guide policy formulation?	**T**	Yes—1 No—0
4.2.1. Does policy formulation center around the outlook for the objectives and numerical targets, including an inflation target?	**CH**	Yes—1 No—0
4.2.2. If there are multiple objectives and numerical targets guiding policy formulation, is it explained how these, including an inflation target, are balanced?	**CH**	Yes—1 No—0
COMMUNICATIONS		
2. Announcing and Explaining the Policy Stance		
2.1. Is there a statement of monetary policy decisions?	**T**	Yes—1 No—0
2.1.3. Is there a statement explaining policy decisions?	**T**	Yes—1 No, or only when tools are changed—0
2.1.3.1. Are the objectives and numerical targets in the explanation consistent with Policy and Operational Strategy?	**CS**	Yes—1 No—0
2.1.3.1.1. Is there a discussion of the outlook for the objectives and numerical targets, including an inflation target?	**CH**	Yes—1 No—0
2.1.3.1.2. Is there a discussion of the risks to the outlook for the objectives and numerical targets, including an inflation target?	**CH**	Yes—1 No—0

Note: De facto (in practice) counterparts of de jure (by law) criteria in Independence and Accountability and the criteria on numerical targets for the Monetary Policy Report (sub-pillar 3) for decisions announcements in Communications are not included in this table for brevity. See Appendix A for the full set of criteria in the IAPOC metric. T, CH, and CS indicate whether the criterion is related to the transparency, coherence, and consistency principle, respectively. "Inflation target" refers to an inflation or price-level target.

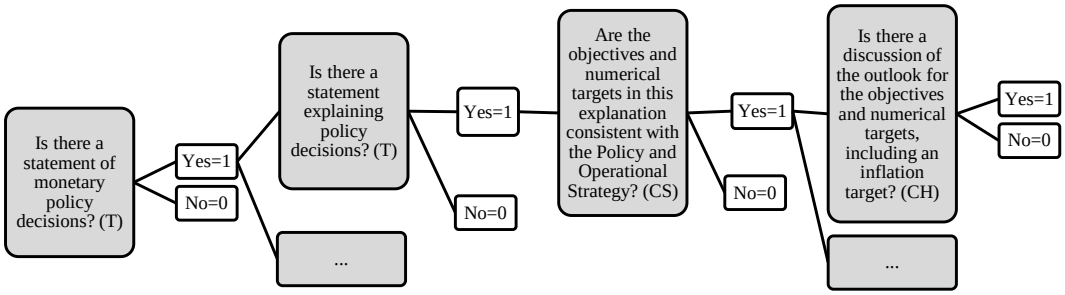
3.2. Constructing the IAPOC Index

A set of possible pre-defined options is assigned to each of the criteria comprising the IAPOC metric (Table 1, as an example). The options are designed to be self-evident and mutually exclusive to facilitate ease of assessment and objectivity. Each option is assigned a value between zero (minimum) and one (maximum), uniformly spread

depending on the number of possible options. In the large majority of cases, simple yes/no or binary options are sufficient thanks to the granularity of the criteria.

Criteria are also purposely ordered to ease assessments. An indented criterion (seen in the multilevel numbering in Table 1 and in Appendix A) may be scored zero or assessed with available information depending on the answer for the base criterion. This typically implies that the most general information, often associated with transparency, is assessed first. In some other cases, if the consistency is violated in the base criterion, the indented criteria are automatically scored zero. For example, in Figure 2, the IAPOC metric asks whether policy decisions in Communications discuss the outlook for the numerical targets, if and only if these are the same numerical targets as in ex-ante Policy and Operational Strategy.

Figure 2: Contingent criteria—Numerical Targets in Communications



Note: This figure uses abbreviated criteria in Table 1 and Appendix A for the IAPOC metric.

For each country, the criteria are assessed by manually extracting the relevant information from the central bank's laws and website. Specifically, for Independence and Accountability, we use the central bank's law (and other applicable laws, such as the Constitution) for the *de jure* assessment, complemented with information from the website and annual report for the *de facto* counterpart. For Policy and Operational Strategy, we rely primarily on monetary policy-related information contained on the central bank's website and, when it exists, dedicated policy strategy and operations documentation. If the annual report contains "ex-ante" strategy, this is also tapped. Similarly, for Communications, we derive information in part from the central bank's website—for ascertaining the communication cycle and the quantity and type of monetary policy-related publications, including data dissemination—and further use the content of all monetary policy press releases, decision announcements and explanations, and monetary policy/inflation reports.

For each country-year observation, a value is assigned to every criterion as described above. A score for each sub-pillar is then calculated as the unweighted average value of the criteria comprising that sub-pillar. Subsequently, a value for each pillar respectively is calculated as the unweighted average of its five constituent sub-pillars. Finally, the IAPOC index is calculated as the unweighted average of the three pil-

lars.[23]

The information is collected, and the index is constructed, as an annual, end-of-period measure of MPFs.[24] For historical assessments we use central banks' archived websites to capture the relevant real-time information.[25]

4. The IAPOC Index

We construct the IAPOC index for 50 countries—13 AEs, 26 EMs, and 11 LIDCs—for 2007, 2010, 2013, 2016, 2018, and 2021 (Table 2).[26]

Table 2: Country Sample

Advanced Economies (AEs)	Emerging Market Economies (EMs)		Low-Income Developing Countries (LIDCs)
Australia	Argentina	Mauritius	Ghana
Canada	Armenia	Mexico	Kenya
Czech Republic	Brazil	Pakistan	Kyrgyz Republic
Euro Area	Chile	Peru	Malawi
Iceland	China	Philippines	Moldova
Israel	Colombia	Poland	Mozambique
Japan	Georgia	Russia	Nigeria
Korea	Hungary	Serbia	Rwanda
New Zealand	India	South Africa	Tanzania
Norway	Indonesia	Thailand	Uganda
Sweden	Jamaica	Turkey	Zambia
United Kingdom	Kazakhstan	Ukraine	
United States	Malaysia	Uruguay	

Note: We follow the IMF World Economic Outlook country groups classification.

By thoroughly characterizing all three pillars of the MPF, the resulting scope and

[23]We follow an unweighted approach to present the data in the clearest form. This also reflects, in our view, that there is no conceptual basis for some sub-pillars or pillars to carry more weight in contributing to the MPF. However, as the number of criteria in each sub-pillar differs, the implicit weights for individual criteria are varied.

[24]There are two exceptions where we do assessments throughout the year as opposed to the end-of-period; monetary policy communication vehicles and communication of the changes in the MPFs.

[25]We obtain archives from the Internet Archive's Wayback Machine, available at: `www.archive.org`.

[26]2007 is the earliest time that this index can be constructed as information availability becomes problematic in earlier years. For Georgia, Indonesia, Kazakhstan, Serbia, Tanzania, and Thailand, 2007 is not available; for Nigeria and Mauritius, 2007 and 2010 are not available; for Malawi and Kyrgyz Republic only 2016, 2018, and 2021 are available. The missing observations are due to the availability of archived central bank websites.

granularity of the IAPOC index enable detecting novel properties of and patterns across MPFs. In particular, we can identify the drivers and changing properties of MPFs over time, and contrast MPFs in EMs and LIDCs versus AEs.

All LIDCs fall a considerable way from zero, but on average have a lower IAPOC index compared to EMs and AEs (Table 3a). However, within the group of EMs and LIDCs discrepancies are often large, with some countries' scores being much closer to the average for AEs while others obtain substantially less than the mean. Moreover, the variation across countries and over time is mainly attributable to the novel Policy and Operational Strategy and Communications pillars (Table 3b-d). The heterogeneity is again particularly large among EMs and LIDCs, reflecting their more dynamic nature of MPFs. In contrary, the Independence and Accountability pillar exhibits much less variation across countries and over time, with a similar distribution across the board. This might be in part due to the generally slow-moving legal and administrative processes that define de jure Independence and Accountability, masking potentially more rapid changes in the de facto counterpart.

Table 3: Summary Statistics of the IAPOC Index and Pillars

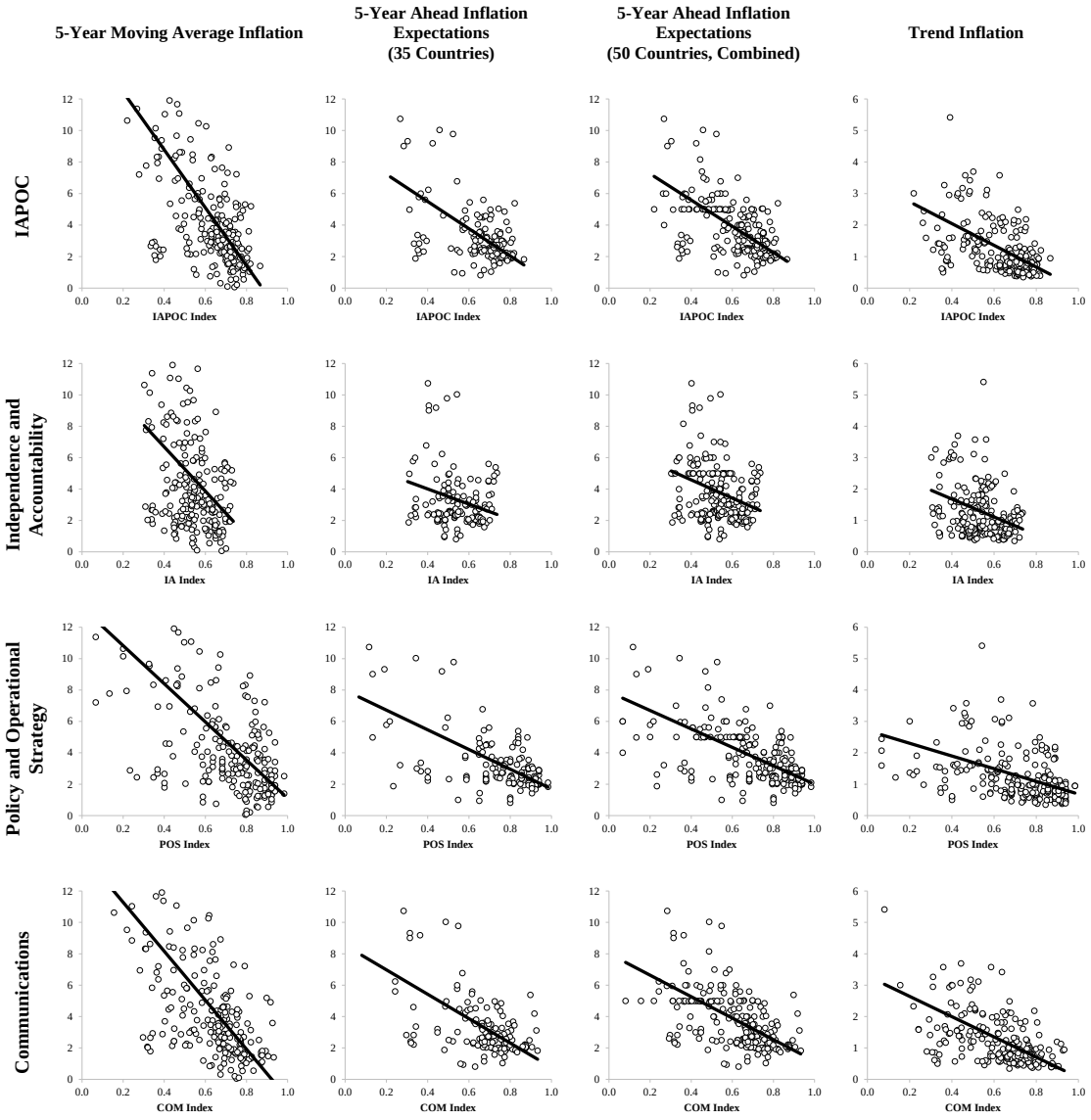
Variable	Mean	Range	Standard deviation		
			Overall	Between	Within
(a) IAPOC Index	0.60	[0.19,0.87]	0.15	0.12	0.08
AEs	0.72	[0.51,0.87]	0.07	0.05	0.05
EMs	0.59	[0.19,0.82]	0.15	0.12	0.09
LIDCs	0.49	[0.22,0.69]	0.10	0.06	0.08
(b) Independence and Accountability	0.53	[0.23,0.74]	0.10	0.09	0.05
AEs	0.56	[0.36,0.70]	0.09	0.08	0.04
EMs	0.53	[0.23,0.74]	0.11	0.10	0.06
LIDCs	0.48	[0.30,0.61]	0.08	0.07	0.03
(c) Policy and Operational Strategy	0.67	[0.07,0.98]	0.22	0.18	0.12
AEs	0.84	[0.55,0.98]	0.10	0.08	0.06
EMs	0.65	[0.07,0.94]	0.23	0.18	0.14
LIDCs	0.52	[0.15,0.84]	0.16	0.10	0.13
(d) Communications	0.61	[0.08,0.96]	0.17	0.14	0.10
AEs	0.74	[0.52,0.96]	0.10	0.07	0.07
EMs	0.60	[0.19,0.93]	0.17	0.13	0.11
LIDCs	0.46	[0.08,0.73]	0.14	0.08	0.11

Note: Data is annual with a total of 284 country-year observations. The panel is unbalanced. The mean, range and "overall" standard deviation are calculated over all countries and years in the sample. "Between" standard deviation provides a measure of the cross-sectional variation and is calculated as the standard deviation across countries in each year, averaged over all years. "Within" standard deviation captures variation over time and is calculated as the standard deviation within each country over time, averaged across all countries. The country groups follow Table 2.

Before looking into the IAPOC index in more detail, we look how the index and its pillars relate to effectiveness of monetary policy in providing macroeconomic stability. The IAPOC index is negatively and significantly correlated with inflation and inflation expectations, and correlations are particularly strong for Policy and

Operational Strategy and Communications pillars (Figure 3 and Table 4).[27]

Figure 3: The IAPOC Index versus Inflation and Inflation Expectations



Source: Consensus Survey, WEO, Authors' calculations.
Note: The figures plot the IAPOC index and its pillars versus different measure of the inflation and inflation expectations. We use Consensus Survey for 5-year ahead inflation expectations which is available for 35 countries in the sample. We complement these series with the IMF's World Economic Outlook (WEO) 5-year ahead inflation projections for the remaining 15 countries. The trend inflation is calculated following Stock and Watson (2007) using quarterly inflation series starting from 2000.

[27]The IAPOC and its pillars are also negatively and significantly correlated with measures of inflation anchoring based on (i) the standard deviation of the shocks to the long-run trend suggested as in Mertens (2016), and (ii) the time varying relation between one-year ahead inflation expectations and the 5-year ahead inflation expectations.

Table 4: Correlation of the IAPOC Index versus Inflation and Inflation Expectations

	Correlations in Levels			
	5-Year Moving Average Inflation	5-Year Ahead Inflation Expectations (35 Countries)	5-Year Ahead Inflation Expectations (50 Countries, Combined)	Trend Inflation
IAPOC	-0.47***	-0.50***	-0.53***	-0.38***
Independence and Accountability	-0.25***	-0.17**	-0.28***	-0.23***
Policy and Operational Strategy	-0.46***	-0.53***	-0.53***	-0.33***
Communications	-0.48***	-0.51***	-0.51***	-0.42***

Source: Consensus Survey, WEO, Authors' calculations.
Note: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. We use Consensus Survey for 5-year ahead inflation expectations which is available for 35 countries in the sample. We complement these series with the IMF's World Economic Outlook (WEO) 5-year ahead inflation projections for the remaining 15 countries. The trend inflation is calculated following Stock and Watson (2007) using quarterly inflation series starting from 2000.

4.1. Evolving Monetary Policy Frameworks in EMs and LIDCs

The dynamic nature of the IAPOC index, driven by its scope and granularity, provides new insights into how MPFs have evolved over time and where remaining gaps exist, particularly in EMs and LIDCs. The IAPOC index shows that, from 2007 to 2021, MPFs were strongly evolving and generally improving in EMs and LIDCs in terms of the Policy and Operational Strategy and Communications pillars (Figure 4).[28] MPFs in AEs also improved during this period, particularly Communications, but by a smaller magnitude, reflecting their high starting point.[29] While the gaps across countries have narrowed down over time, EMs and LIDCs still lag behind the AEs across three IAPOC pillars (Figure 5a-b).

The IAPOC index helps uncover common challenges in improving Policy and Operational Strategy in EMs and LIDCs. For example, they face various remaining challenges with mapping their policy objectives into the numerical targets, which they still tend to revise frequently in the absence of a comprehensive review (in *Numerical Targets*). Most notably, EMs and particularly LIDCs also stand to benefit from enhancing consistency between the tools used in practice versus those declared ex-ante, and in some cases, explaining the potential interaction and tradeoffs among multiple tools (in *Tools and Policy Formulation*), as well as joint functioning of these tools and the associated instruments (in *Policy Implementation*).[30]

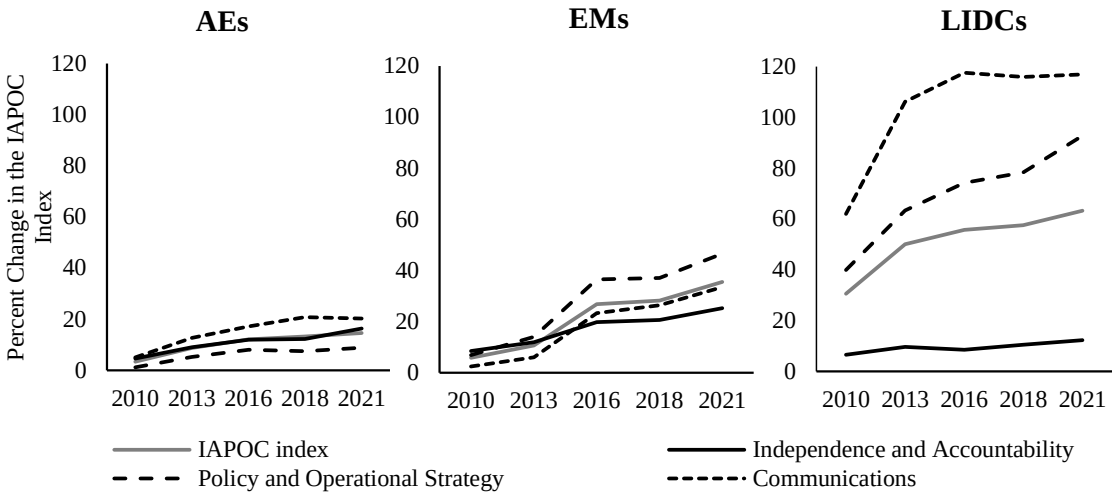
AEs, on the other hand, have further refined Policy and Operational Strategy since 2007 (Figure 6). For example, they started to incorporate future risks and contingency plans in deciding the stance of policy (in *Policy Formulation*), and improved access to standing facilities and adopted a reasonable corridor width (in *Policy Im-*

[28]Note that, in a handful of individual country cases, the IAPOC index detects deteriorations.

[29]The improvements in MPFs have been associated with better monetary policy performance in terms of providing a domestic nominal anchor across countries and over time. The correlation between the IAPOC index and inflation and inflation expectations, as well as their deviations from the numerical targets (when applicable), are around 0.65. Scatter-plots confirm a negative and strongly significant coefficient for the IAPOC index. In future work, we plan to explore further the link between the IAPOC index and monetary policy performance.

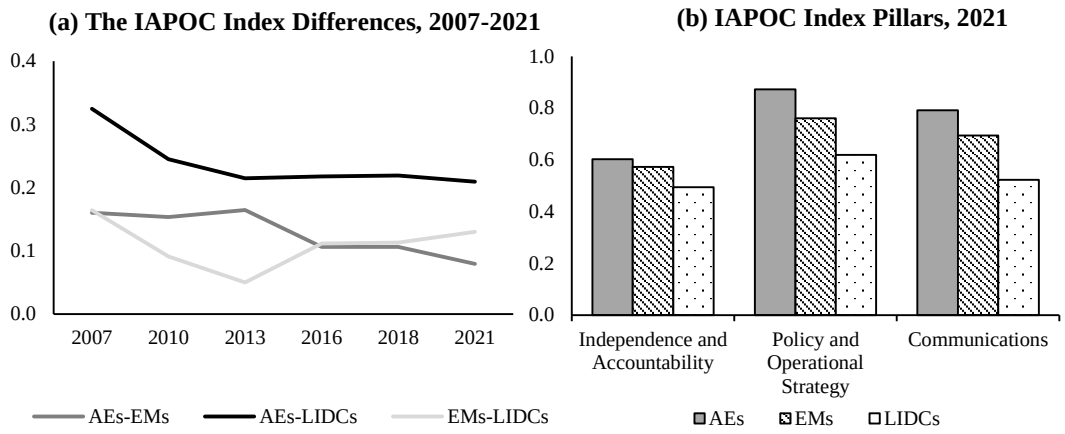
[30]See also Section 5 (and **??**) which provides more details on the contribution of consistency-related criteria to lower IAPOC scores in some EMs and LIDCs.

Figure 4: The Evolution of MPFs relative to 2007



Note: The figures plot the cumulative change in the IAPOC index for each country group, defined as the percent change in the average score of the respective group. The country groups follow Table 2.

Figure 5: The IAPOC Index Differences for EMs and LIDCs with respect to AEs and IAPOC Index Pillars

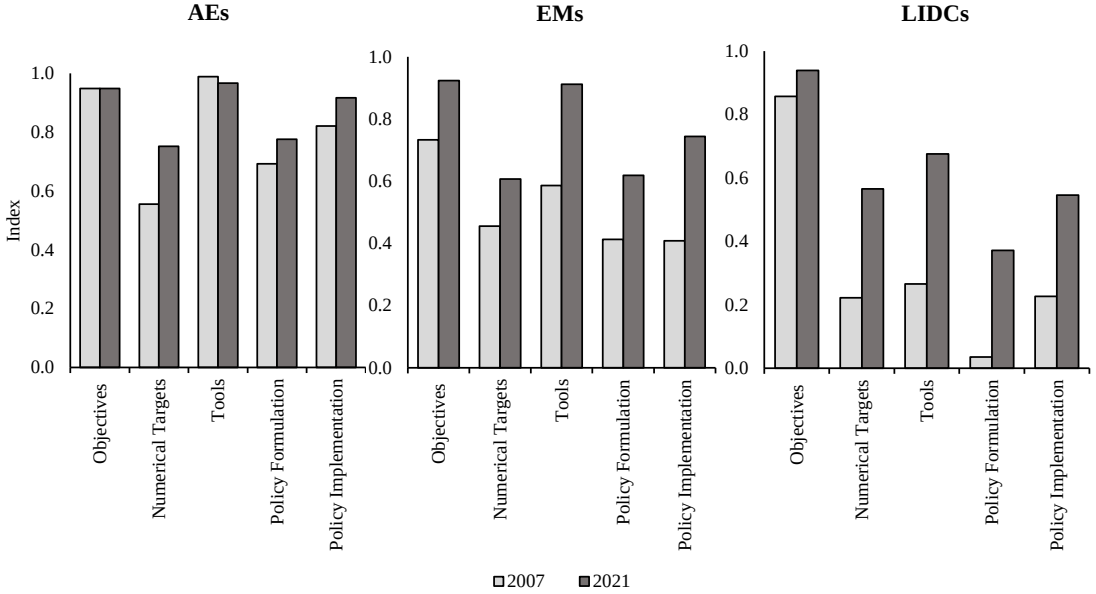


Note: The scores for country groups are unweighted averages. The country groups follow Table 2.

plementation). Interestingly, and somewhat similar to EMs and LIDCs, several AEs adopted additional tools during and after the global financial crisis (e.g., quantitative easing) in their MPFs. By 2021, however, they clearly explain these tools, how they relate to objectives and numerical targets, what they signal about the stance of policy, and how they interact with existing tools (in *Tools*).

In Communications, all countries across the board made forceful progress across all dimensions since 2007 (Figure 7). This is especially the case among LIDCs which in 2007 often lacked some of the most fundamental elements of communications such as policy announcements or a monetary policy report. Most EMs and LIDCs now announce and explain policy decisions promptly (at a pre-set time) after each policy meeting, via a press release and a verbal press conference with questions from the

Figure 6: Policy and Operational Strategy between 2007 and 2021



Note: The scores for country groups are unweighted averages. The country groups follow Table 2.

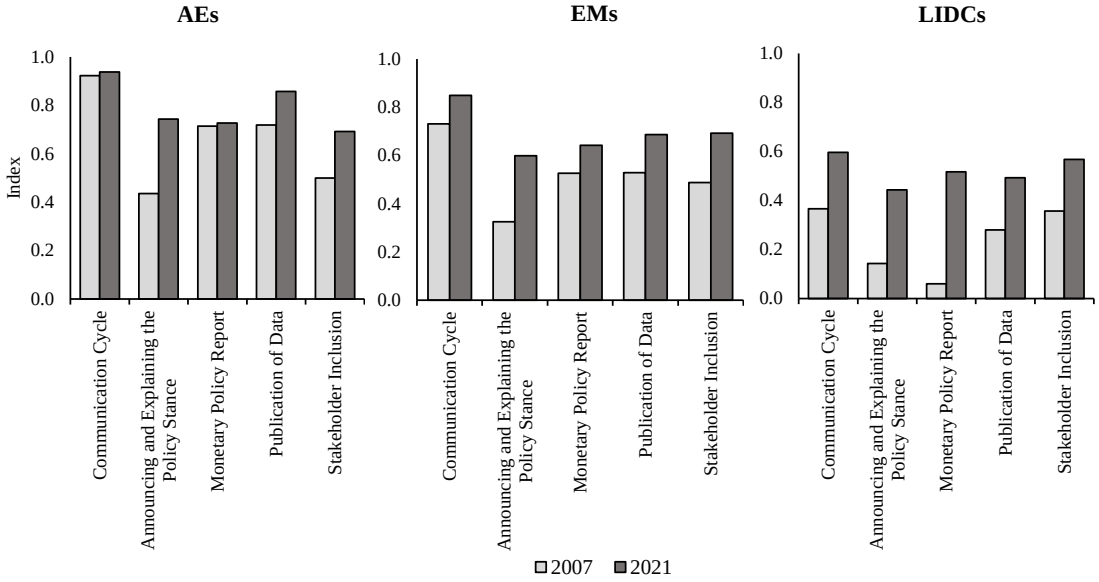
floor (in *Announcing and Explaining the Policy Stance*). They also have a well-defined monetary policy report that elaborates on current and past policy actions (in *Monetary Policy Report*).

However, there is plenty of scope for further improvement of Communications for both EMs and LIDCs. Decision announcements and the monetary policy reports still do not generally provide a forward-looking view. It has been particularly challenging for some LIDCs to establish a regular communication cycle around monetary policy decisions (in *Communication Cycle*) and to ensure consistency among ex-ante objectives and numerical targets and the ones that are announced or reported ex-post. In addition, there are issues with the publication of key data for monetary policymaking (i.e., inflation and inflation expectations) as well as the forecast (in *Publication of Data*). EMs and LIDCs, as well as AEs, could benefit from making their communication more inclusive with simpler language and greater communication with the public (in *Stakeholders Inclusion*).

4.2. De Facto Strengthening of Independence and Accountability

In contrast to the dynamic nature of the Policy and Operational Strategy and Communications pillars, Independence and Accountability within the IAPOC index is relatively persistent across the board. Nevertheless, many countries, especially AEs and EMs, adopted various key changes since 2007 (Figure 8). For example, they clarified the roles, powers, and decision-making procedures of the central bank and the monetary policy decision-making body (in *Delegation and Designation of Responsibility*); and enhanced the role for price stability and numerical targets in defining central banks' goals for monetary policy, including providing more clarity on who sets numerical targets (in *Mandated Goals and Numerical Targets*). They also made

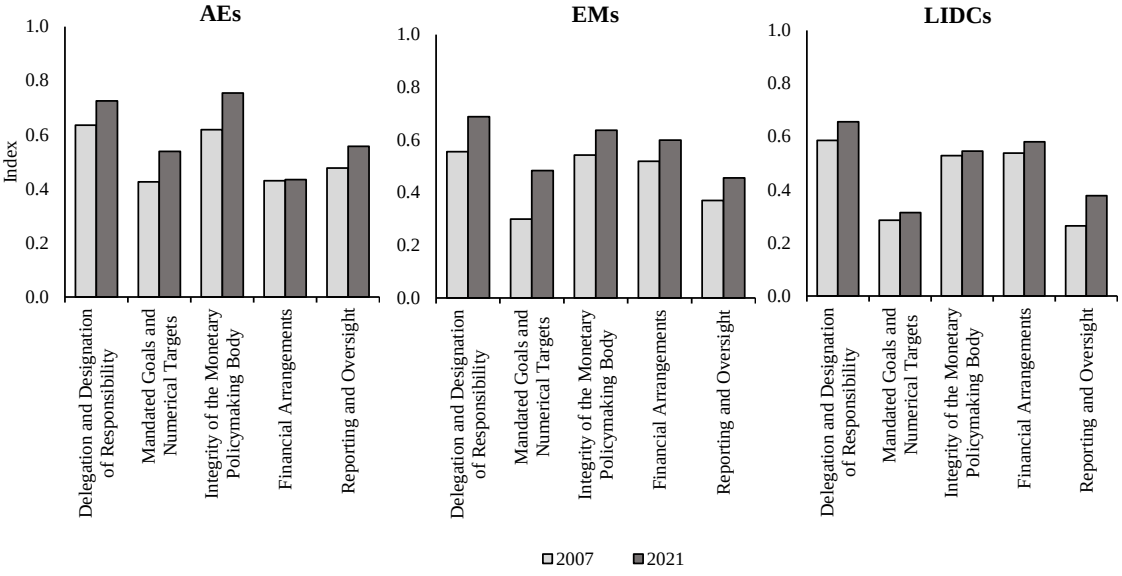
Figure 7: Communications between 2007 and 2021



Note: The scores for country groups are unweighted averages. The country groups follow Table 2.

progress in public disclosure of decisions, meeting minutes, and voting records (in *Reporting and Oversight*).

Figure 8: Independence and Accountability between 2007 and 2021

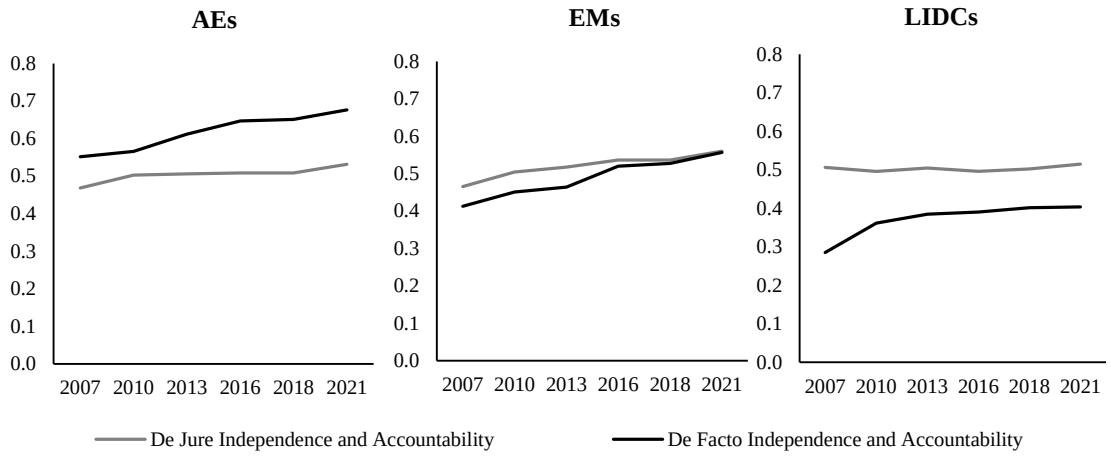


Note: The scores for country groups are unweighted averages. The country groups follow Table 2.

More interestingly, across country groups, these enhancements stem predominantly from changes in de facto rather than de jure arrangements, perhaps reflecting the fact that central bank laws typically cannot be changed or rescinded quickly. Indeed, de jure aspects of Independence and Accountability within the IAPOC index have improved only slightly over time and across countries (Figure 9). In various cases,

however, limited (or lack of) legal backing did not stop countries from adopting more advanced policy practices. For example, one-third of the countries identify the decision-making body specifically responsible for monetary policy in practice, despite the lack of an explicit legal basis for this body. Similarly, while less than half of all countries legally require the publication of monetary policy decisions, most do so in practice. With these improvements, de facto Independence and Accountability have caught up and moved closer to its de jure counterpart in EMs and LIDCs respectively and moved further away from it in AEs. Still, LIDCs can make further progress in terms of de facto decision-making procedures as well as the integrity of the monetary policymaking body.

Figure 9: IAPOC De Jure versus De Facto in Independence and Accountability



Note: De jure and de facto scores are calculated considering only de jure and de facto criteria, respectively. The scores for country groups are unweighted averages. The country groups follow Table 2.

Incorporating de facto elements is therefore key to have a clear and up-to-date picture of Independence and Accountability. Indeed, with both de jure and de facto assessments—in addition to consideration of accountability jointly with independence and the focus on monetary policy (rather than the central bank more broadly)—we complement the existing central bank independence indices. The association between the IAPOC Independence and Accountability index and the commonly used central bank de jure independence index of Cukierman et al. (1992), as constructed in Garriga (2016), seems to be positive and significant, as expected (Table 5a). Still, the correlations across country groups remain limited to around 0.5, in part reflecting the granularity of our approach.[31] Also, when compared with only the IAPOC de facto Independence and Accountability index, the correlations in levels as well in first differences (Table 5b) go down across the board and often become insignificant.[32] More broadly, Indepdence and Accountability could also affect the

[31]Our Independence and Accountability pillar alone has 74 de jure criteria, relative to the 16 criteria of the Cukierman et al. (1992) index.

[32]Cukierman (1992) and Cukierman et al. (1992) suggested the turnover rate of central bank governors as a de facto measure of central bank independence. The IAPOC de facto Independence

soundness of monetary policymaking. Once again, de facto Independence and Accountability seems to be closely related with Policy and Operational Strategy and Communications, with a correlation about 0.8. For the de jure counterpart, however, the correlation is much weaker around 0.2 (Figure 10).

Table 5: IAPOC Independence and Accountability Index versus Cukierman et al. Central Bank Independence Index

	(a) Correlations in Levels			
	Country groups	IAPOC Independence and Accountability	IAPOC De Jure Independence and Accountability	IAPOC De Facto Independence and Accountability
Cukierman et al.	All (131)	0.46***	0.58***	0.22**
Central Bank	AEs (36)	0.52***	0.64***	0.04
Independence Index	EMs and LIDCs (95)	0.55***	0.56***	0.45***
	(b) Correlations in First Differences			
	Country groups	IAPOC Independence and Accountability	IAPOC De Jure Independence and Accountability	IAPOC De Facto Independence and Accountability
Cukierman et al.	All (84)	0.66***	0.85***	0.11
Central Bank	AEs (24)	0.85***	0.98***	0.26
Independence Index	EMs and LIDCs (60)	0.43***	0.64***	0.00

Source: Garriga (2016) and authors' calculations.
Note: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. We use the overlapping sample and time span for the IAPOC and the weighted Cukierman et al. legal CBI index constructed for the period 1970–2012 in Garriga (2016); that is, 2007, 2010 and 2012/13 for 47 countries. The first differences for both indices are calculated for the windows 2007-2010 and 2010-2012 (for Cukierman et al. index) or 2010-2013 (for the IAPOC). Values in brackets after the sample group indicates the number of observations. EMs and LIDCs are considered together as the number of observations for LIDCs in the overlapping sample is small. The country groups follow Table 2.

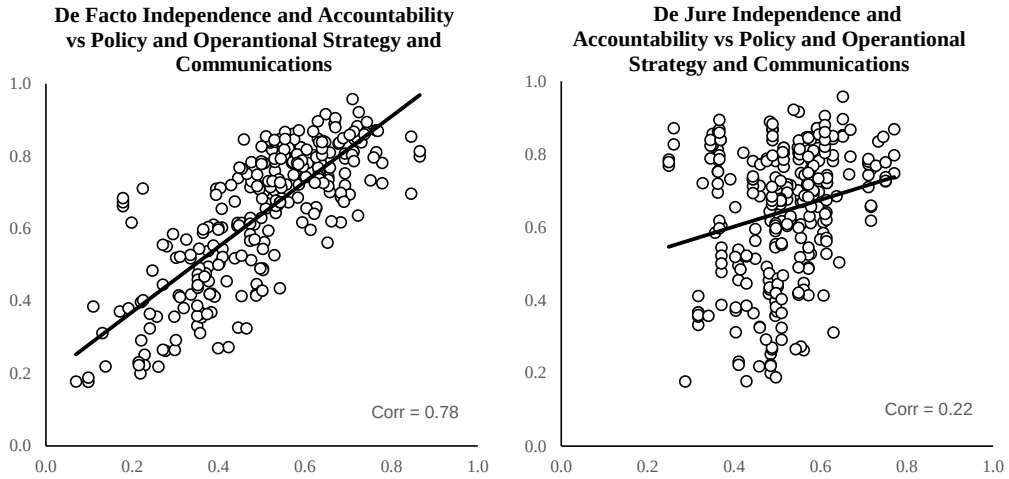
In addition to central bank independence indices, the other commonly used proxies for monetary policymaking are transparency indices and monetary policy and exchange rate regime classifications. We explain how our work compares with and contributes to these strands of the literature in the next two sections.

5. The IAPOC Index versus Transparency Indices

A large and growing literature has focused on constructing central bank, and, more recently, monetary policy transparency indices (Dincer and Eichengreen, 2008, 2014; Al-Mashat et al., 2018; Dincer et al., 2019). These indices, like the IAPOC index, are principle-based, but focus more narrowly on transparency. Explicitly accounting for transparency, coherence, and consistency within a unified metric is a distinct advantage of our work. At the same time, our principle-based approach allows to obtain

and Accountability index has much broader in scope as it looks de facto features along the entire legal base (to the extent relevant and feasible), covering—in addition to turnover rates—various critical aspects, such as the independence of board members and decision structure of the monetary policymaking body. The correlations between IAPOC de facto Independence and Accountability index and the data on the turnover rate of governors in Dreher et al. (2010) are usually zero or, if significant, very small, both in levels and in differences.

Figure 10: De Facto and De Jure Independence and Accountability vs Policy and Operational Strategy and Communications



Note: The figures plot the scores of de facto and de jure Independence and Accountability versus the average score for Policy and Operational Strategy and Communications for each country and year. We have 284 observations in total.

standalone scores associated with each principle within the IAPOC index—IAPOC-transparency, IAPOC-coherence, and IAPOC-consistency.

We compare the IAPOC and IAPOC-transparency indices with the monetary policy transparency index from Dincer et al. (2019). Perhaps not surprisingly, correlations of both the IAPOC and the IAPOC-transparency indices with the Dincer et al. index are high and significant (Table 6a). While transparency is one of the principles of the IAPOC metric, these positive correlations primarily reflect a level effect. Notably, the correlations in first differences are much lower and less significant for all country groups (Table 6b). This reflects the dynamic and comprehensive view of MPFs presented by both the IAPOC index and the IAPOC-transparency index.[33] Indeed, between 2007-2015, the Dincer et al. index registers no change in the index for 60 percent of country-year observations compared to 3 and 23 percent in the IAPOC and IAPOC-transparency indices, respectively.

[33]Our account of transparency is more granular, with 85 transparency criteria as opposed to 15 in the Dincer et al. index. Also, their index captures some elements beyond "Transparency" as defined in our work. For example, they also account for whether an explanation is provided when monetary policy decisions are announced, and they also assess whether the explanation includes an assessment of economic prospects. We regard some of these features as coherence.

Table 6: IAPOC and IAPOC-Transparency versus Dincer et al. Transparency Index

	(a) Correlations in Levels		
	Country groups	IAPOC Index	IAPOC-Transparency
Dincer et al. Transparency Index	All (273)	0.81***	0.74***
	AEs (78)	0.55***	0.36**
	EMs and LIDCs (195)	0.77***	0.71***
	(b) Correlations in First Differences		
	Country groups	Changes in the IAPOC index	Changes in IAPOC-Transparency
Dincer et al. Transparency Index	All (225)	0.23***	0.21***
	AEs (65)	0.28**	0.31**
	EMs and LIDCs (160)	0.23***	0.21***

Source: Dincer et al. (2019) and authors' calculations.
Note: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. We use the overlapping sample and time span for the IAPOC and Dincer et al. transparency index; that is, 48 countries for 2007, 2010, 2013, 2016, 2018 and 2019/21. The changes for both indices are calculated for the windows 2007-2010, 2010-2013, 2013-2016, 2013-2018, and 2018-2019 (for Dincer et al. index) or 2018-2021 (for the IAPOC). Values in brackets after the sample group indicates the number of observations. EMs and LIDCs are considered together as the number of observations for LIDCs in the overlapping sample is small. The country groups follow Table 2.

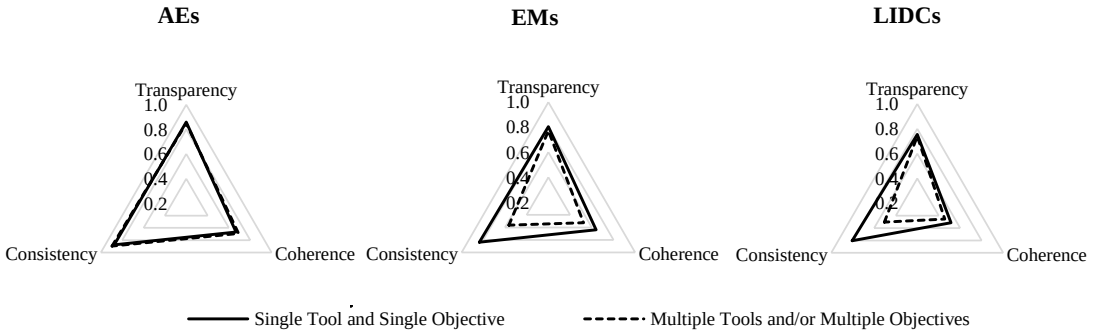
By incorporating all three principles, the IAPOC index provides further novel insights into MPFs and the differences between country groups. The progresses along all three principles in EMs and LIDCs over the past decade has led to a narrowing of the gaps with respect to AEs. Nevertheless, coherence and especially consistency within MPFs still lag quite far behind in EMs and LIDCs. For LIDCs and EMs, one notable reason for this seems to be the way that they move beyond the standard monetary policy orthodoxy towards more eclectic approaches. About half of the countries in our sample (9 AEs, 8 EMs and 10 LIDCs) adopted multiple objectives (such as unemployment- or exchange rate-related objectives, in addition to a price stability-related objective) and relied on employing multiple monetary policy tools (such as asset purchases, foreign exchange interventions, or monetary aggregate targets, in addition to the policy interest rate) during 2021.

We find that such approaches do not necessarily need to jeopardize the integrity of the MPF. In AEs, for example, the IAPOC transparency, coherence and consistency scores are almost identical across countries with a single tool and objective and countries with multiple objectives and/or tools (**??**). However, ensuring consistency across multiple objectives and tools has so far been a challenge for EMs and LIDCs.[34] For example, the tools used in practice sometimes do not match the ex-ante exposition of policy formulation in the Policy and Operational Strategy. Even if they match, it is often not explained how these tools relate to and are jointly balanced within the MPF to achieve the objectives and numerical targets.

This further showcases the importance of a comprehensive metric that enables looking at monetary policymaking across countries, including those that adopted more unorthodox approaches. In this sense, the IAPOC index challenges the conventional wisdom that focuses solely on a few elements to understand how monetary policy is conducted, such as existing monetary and exchange rate regime classifications, which we turn to next.

[34] See also Section 4.1

Figure 11: The IAPOC Principles



Note: The principle-specific indices are calculated in the same way as the IAPOC index, but using criteria related to a single principle only. Of the 225 criteria comprising the IAPOC metric, 85 capture transparency, 125 relate to coherent aspects of MPFs, and 15 capture consistency. The score for each country group is an unweighted average for all the countries in that group. Countries with more than a single tool, are identified as having multiple tools. Similarly, countries with more than a single monetary policy objective, are identified as having multiple objectives. In our sample, 10 LIDCs, 8 EMs and 9 AEs are identified as having multiple tools and/or multiple objectives. The country groups follow Table 2.

6. The IAPOC Index versus Monetary Policy and Exchange Rate Regime Classifications

In addition to central bank independence and transparency indices, monetary and exchange rate regime classifications are commonly utilized as a way of describing monetary policymaking across countries. However, regime classifications do not accurately reflect the heterogeneity or capture the dynamism of MPFs observed across countries in practice. For one, even when operating the same type of regime, countries often adopt diverse approaches to conduct monetary policy. Moreover, since regime classifications comprise a handful of prespecified broad categories, developments in policymaking over time are not sufficiently observable.

The scope and granularity of the IAPOC index, together with its broad applicability, enables a comparison of monetary policymaking both within the same monetary policy or exchange rate regime and across different regimes.[35] To illustrate this point, Figure 12 compares the IAPOC index with three commonly used regime classifications—the monetary policy and exchange rate regime classification in the IMF's AREAER (columns a and b), and the (fine) exchange rate regime classification in Ilzetzki et al. (2019, 2021) (column c).

In terms of monetary policy regimes (Figure 12a), the variation across countries within inflation-targeting or money-targeting regimes is large, with differences up to about 0.36 and 0.15, respectively, in the IAPOC index (in 2021). Even more strikingly, scores for countries in the "other" classification (a residual category) vary more than 0.33, reflecting the considerable differences in terms of the approach to

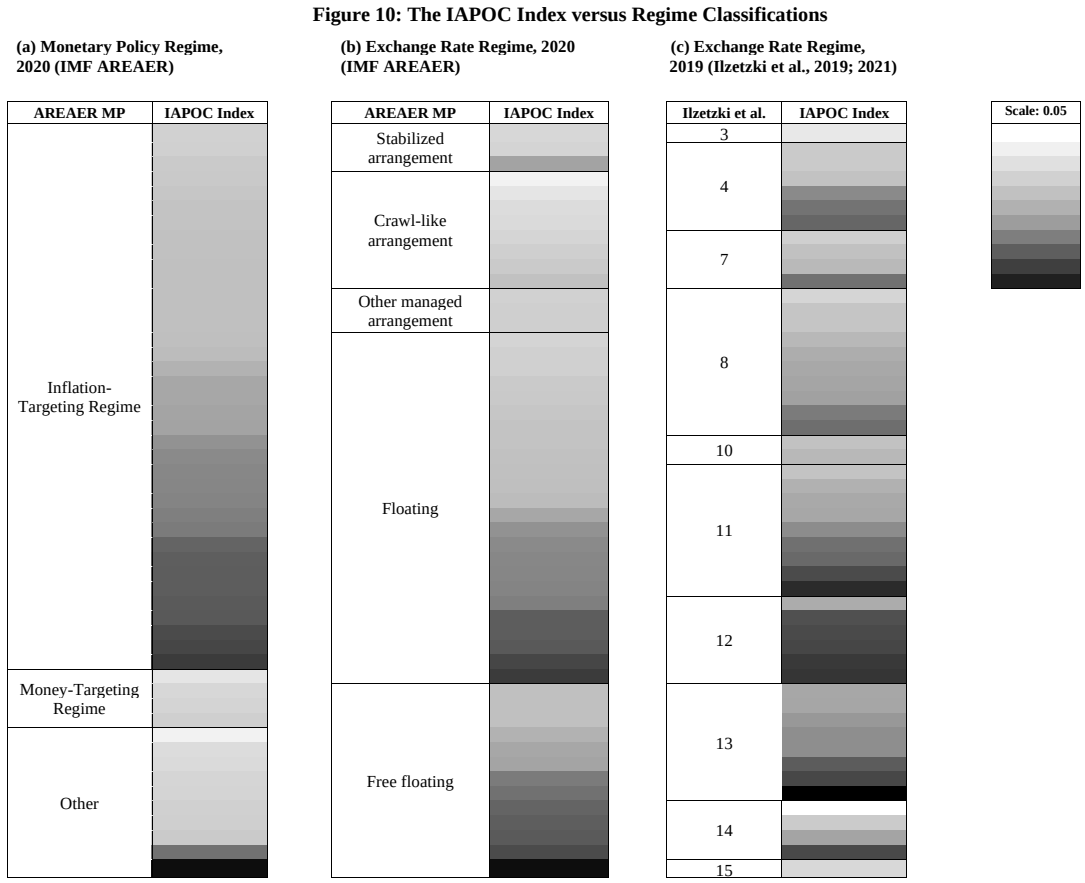
[35] A clarification of the distinction between an MPF and a monetary policy regime is provided in the introduction (Section 1).

monetary policy taken by countries lumped into this category. It is evident that the IAPOC index provides a meaningful refinement of regime classifications, including for those regimes that provide very little information content.

This is not to say that regime classifications do not capture some broad trends. For example, inflation-targeting countries on average obtain higher IAPOC scores than those with any other monetary policy regime (0.7 versus 0.5 in 2021). However, among inflation-targeting countries, AEs are mostly clustered around the upper end of the scale, with all but one country within 0.1 of the maximum score (0.8). In contrast, the scores for EMs and LIDCs vary dramatically across the scale (ranging between 0.4 and 0.8). Therefore, inflation-targeting as a "brand" may not reflect MPFs in EMs and LIDCs in the same way as in AEs.

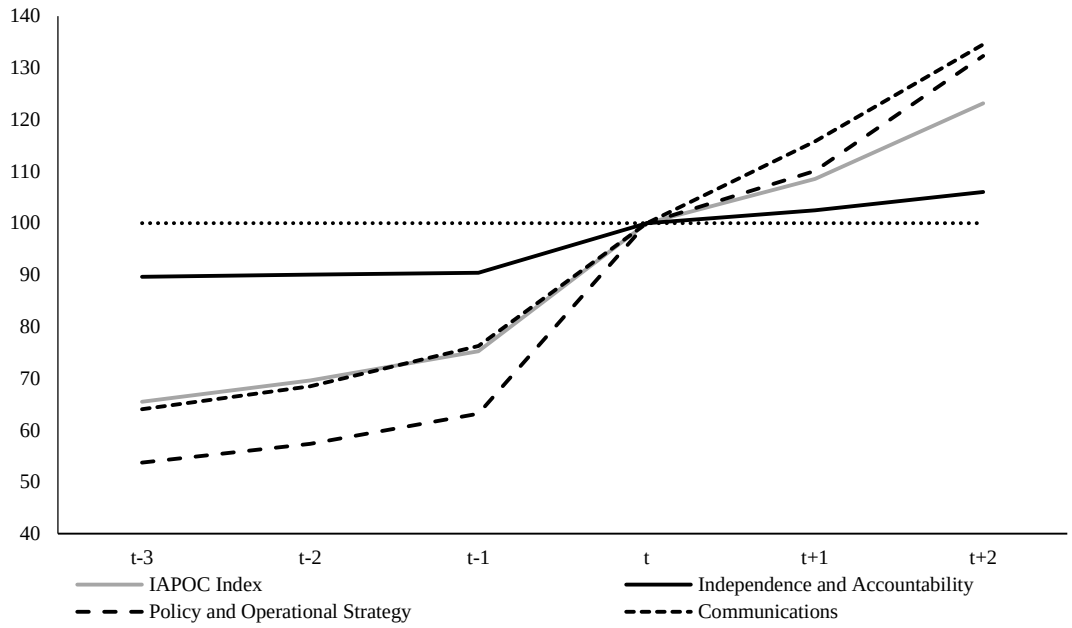
The IAPOC index also reveals that focusing on the regime classification neglects the dynamic variation in MPFs over time. For example, between 2007 and 2021 only 18 countries in the sample underwent any monetary policy regime changes (according to the IMF's AREAER classification), with these changes constituting merely 13 percent of country-year observations. In contrast, the IAPOC index picks up the continual evolution in MPFs seen for all countries in the sample, showing changes in 97 percent of country-year observations.

Figure 12: The IAPOC Index versus Regime Classifications



Source: IMF's AREAER (2021), Ilzetzki et al. (2019, 2021), and authors' calculations.
Note: Each row represents a different country. Each shade represents an increment of 0.05 (a 5 percent change) in the IAPOC index, where the minimum is 0.35. Therefore, darker shades represent a higher IAPOC score. Under the monetary policy regimes, "Other" in IMF AREAER is a residual category used when there is no explicitly stated nominal anchor, when countries monitor various indicators, or no relevant information is available. The fine classification in Ilzetzki et al. (2019, 2021) ranges from 1 (no separate legal tender) to 15 (dual market in which parallel market data is missing). For values in between, higher numbers indicate more flexibility, with 13 "freely floating" and 14 "freely falling". As the fine classification for 2018 onwards in Ilzetzki et al. (2021) is available only at monthly frequency, we take the most frequent classification value over those years. The most recent year with available data from the comparing indicators is used to compare to the last year with 2021 IAPOC data (2020 in IMF's AREAER (2021) and 2019 in Ilzetzki et al. (2019, 2021)).

Figure 13: Changes in the IAPOC Index Around a Regime Switch to an Inflation-Targeting Regime



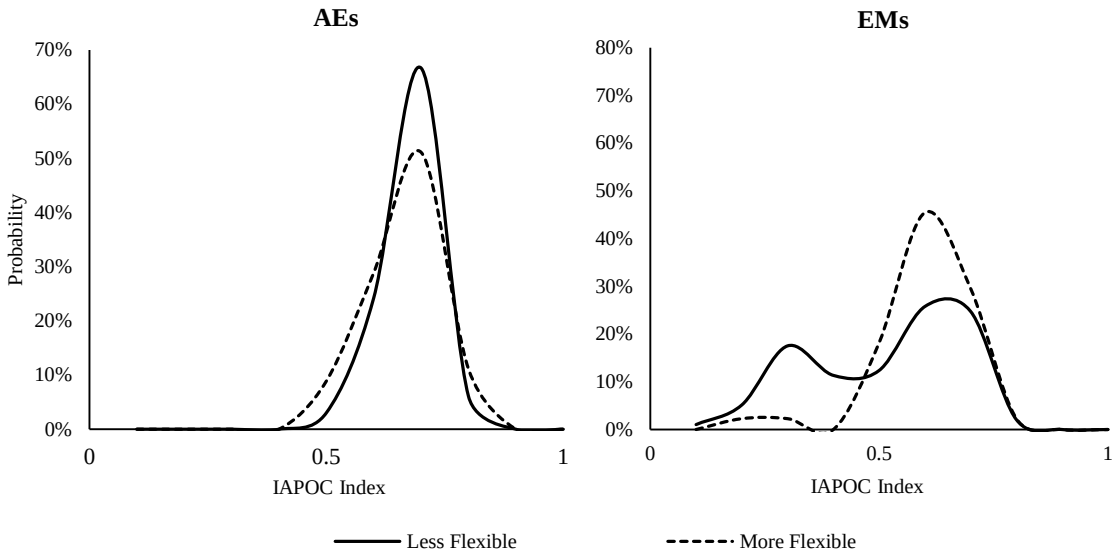
Note: There are 13 countries in our sample that adopted or transitioned towards a form of inflation-targeting regime during the sample period. We use the evaluation year corresponding (or closest) to this regime switch as the base year (t), with the IAPOC index and its pillars at time t set to 100. Increments refer to our evaluation years—for example, if t is 2016 then t-1 is 2013. The change around a regime switch is calculated as the unweighted average change across the 13 countries.

This continual evolution captured by the IAPOC index as well as the index's ability to compare across regimes is further showcased by comparing MPFs before and after countries formally transition between regimes. While the adoption of an inflation-targeting regime is generally associated with a significant concurrent change in the IAPOC index, improvements in MPFs typically precede such a regime switch and also continue afterward (Figure 13). Finally, the IAPOC index provides information on whether changes constitute improvements or deteriorations, which is not necessarily evident based on a switch from one regime to another.

Similar to monetary policy regime classifications, exchange rate regime classifications are not a good proxy for monetary policymaking in EMs and LIDCs either. Figure 12b and 12c show that the IAPOC index varies a lot across countries classified as having similar exchange rate regimes in IMF AREAER or Ilzetzki et al. (2019, 2021).

Interestingly, having a more (less) flexible exchange rate regime does not seem to necessarily imply a better (worse) IAPOC index score. For example, in AEs, the distribution of the IAPOC index for countries with a less flexible exchange rate arrangement is almost identical to that of countries with a more flexible exchange rate (Figure 14). Even in EMs, despite countries with more flexible exchange rates on average obtain a higher score, there is still an overlap in the range of IAPOC scores

Figure 14: Distribution of the IAPOC Index with respect to Exchange Rate Flexibility in AEs and EMs, 2007-2021



Note: The figures plot the probability distribution function of the IAPOC index for different levels of exchange rate flexibility. The area under each graph sums to 1. Exchange rate flexibility is based on the fine classification from Ilzetzki et al. (2019, 2021), which ranges from 1 to 15. The "Less Flexible" country group is classified between 1 (no separate legal tender) and 11 (Moving band that is narrower than or equal to +/-2%), while "More Flexible" country group is classified as either 12 (De facto moving band +/-5%/ managed floating) or 13 (Freely Floating) in Ilzetzki et al. (2019, 2021). Countries classified as 14 (Freely Falling) and as 15 (dual market in which parallel market data is missing) are excluded. As the fine classification for 2018 onwards in Ilzetzki et al. (2021) is available only at monthly frequency, we take the most frequent classification value over those years. The country groups follow Table 2. In our sample there is no LIDC with "More Flexible" classification.

between countries' exchange rate regimes classified as less versus more flexible.[36] These findings quantitatively support Fischer (2001) in that a wide variety of flexible rate arrangements remain possible and it is to be expected that policy in most countries will not be indifferent to exchange rate movements. More recently, Benes et al. (2015), Cavallino (2019), Boz et al. (2020), and Fanelli and Straub (2021), conceptually make the case that, foreign exchange intervention could be a viable and desirable option in certain circumstances and when facing certain shocks.

7. Conclusion

We construct a metric that provides a multidimensional characterization of MPFs, covering Independence and Accountability, Policy and Operational Strategy, and Communications. Employing a principle-based approach, we derive criteria that jointly establish the transparency, coherence, and consistency of MPFs. The result-

[36]This links back to the discussion in **??** that the use of multiple tools does not necessarily imply a compromised MPF.

ing IAPOC index is subsequently constructed for 50 AEs, EMs, and LIDCs from 2007 to 2021, using public information systematically collected from central banks' laws and websites.

The IAPOC index shows that MPFs are rapidly improving in LIDCs and continually changing in EMs. The heterogeneity and dynamism of MPFs are largely driven by the IAPOC index's novel Policy and Operational Strategy and Communications pillars. The Independence and Accountability pillar, in contrast, seems to be relatively persistent across the board, as slow-moving de jure arrangements mask improvements in the de facto counterparts. Overall, EMs and LIDCs on average lag behind AEs across various dimensions of MPFs as they often struggle with achieving coherence and consistency between "what they say they do" and "what they do", particularly in countries with multiple objectives and tools.

All these new insights on MPFs across countries and over time are brought to light by our holistic and dynamic view of monetary policymaking. For example, compared to existing independence indices, we advance the knowledge on the joint account of Independence and Accountability of monetary policy, with both de facto and de jure considerations. We additionally complement transparency indices in the literature, by focusing also on coherence and consistency, which are key to the integrity of MPFs. We further shift the focus away from monetary policy or exchange rate regime classifications by comprehensively covering policy design, implementation, and communications within the MPF. We argue that this progress toward a multidimensional view of MPFs, as captured by the IAPOC index, is more important for EMs and LIDCs, for which the existing indices and classifications fall short of capturing the varied, eclectic, and fast-changing nature of monetary policymaking.

Despite the great care we take in constructing the IAPOC metric and index, some caveats remain. Relying on online and public resources and our reading thereof inevitably introduces some degree of noise and subjectivity into the analysis. This may be more pronounced for countries where translations are required. Though the granularity of criteria is expected to minimize any systematic bias, users of this data may wish also to look at the documented evidence in certain cases.

In future research, we aim to employ this novel index to provide some fresh thinking about MPFs and how they affect monetary policy and, more broadly, macroeconomic performance. For example, the IAPOC index can be used to investigate whether exchange rate flexibility play a role in the presence of a sound MPF in influencing desired monetary policy outcomes. It could also be interesting to look at how different pillars of MPFs interact, e.g., whether a higher degree of independence and accountability leads to better communications. Alternatively, as a measure of the soundness of MPFs, the IAPOC index can be used to study monetary policy credibility.

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Appendix

A. The IAPOC Metric

The IAPOC metric includes a total of 225 criteria together with pre-defined options.

Table A1: Criteria for Independence and Accountability

Criterion	Type		Options and Scoring
INDEPENDENCE AND ACCOUNTABILITY			
1. Delegation and Designation of Responsibility			
1.1. By law, is the central bank empowered to formulate and implement monetary policy?[i]	**De Jure**	**CH**	Yes—1 No—0
1.1.1. By law, is it stated that the central bank is prohibited from taking instructions from any external party when formulating and implementing monetary policy?	**De Jure**	**T**	Yes—1 No—0
1.1.1.1. By law, if the central bank is not prohibited from taking instructions from any external party in formulating and implementing monetary policy, is it explicitly allowed?	**De Jure**	**CH**	No—1 Yes—0
1.1.2. By law, is it stated that government overrule regarding monetary policy is prohibited?	**De Jure**	**T**	Yes—1 No—0
1.1.2.1. By law, if government overrule regarding monetary policy is not prohibited, is it explicitly allowed?	**De Jure**	**T**	No; or yes but it is only possible, subject to listed and demanding formal procedures—1 Yes, under other circumstances—0
1.2. By law, is it stated which body(s) is responsible for formulating monetary policy within the central bank?	**De Jure**	**T**	Yes—1 No—0
1.2.1. By law, is a single body identified?	**De Jure**	**CH**	Yes—1 No—0
1.2.2. By law, is this body(s) responsible solely for formulating monetary policy?	**De Jure**	**CH**	Yes—1 No—0
1.2.3. By law, is this body(s) a committee rather than an individual?	**De Jure**	**CH**	Yes—1 No—0
1.2.3.1. By law, is it stated what the decision-making procedures of this body(s) are?[ii]	**De Jure**	**T**	Yes—1 No—0
1.2.3.1.1. By law, are decisions taken by the committee rather than an individual?	**De Jure**	**CH**	Yes—1 No—0
1.2.3.1.1.1. By law, if decisions are taken through voting, is it stated who has the casting vote?	**De Jure**	**T**	Yes—1 No—0
1.2.3.1.1.1.1. By law, does a government official have the casting vote?	**De Jure**	**CH**	No—1 Yes—0
1.2.3.2. By law, is it stated who the chairperson of this body is?	**De Jure**	**T**	Yes—1 No—0
1.2.3.2.1. By law, is the chairperson a government official?	**De Jure**	**CH**	No—1 Yes—0
1.2.4. By law, is it stated what the frequency of monetary policymaking meetings are?	**De Jure**	**T**	Yes—1 No—0
1.2.4.1. By law, what is the specified frequency?	**De Jure**	**CH**	At least quarterly—1 Less frequently or not at a fixed frequency—0
1.3. In practice, is it stated which body(s) is responsible for formulating monetary policy within the central bank?	**De Facto**	**T**	Yes—1 No—0
1.3.1. In practice, is this a single body?	**De Facto**	**CH**	Yes—1 No—0
1.3.2. In practice, is this body(s) responsible solely for formulating monetary policy?	**De Facto**	**CH**	Yes—1 No—0
1.3.3. In practice, is this body(s) a committee rather than an individual?	**De Facto**	**CH**	Yes—1 No—0
1.3.3.1. In practice, is it stated what the decision-making procedures of this body are?	**De Facto**	**T**	Yes—1 No—0
1.3.3.2. In practice, is it stated who the chairperson of this body is?	**De Facto**	**T**	Yes—1 No—0

[i] Monetary policy formulation comprises devising the appropriate settings for and taking decisions on the tools.
[ii] Decision-making procedures include the quorum and voting rules for monetary policymaking meetings.

Table A1: Criteria for Independence and Accountability (Continued)

Criterion	Type		Options and Scoring
1.3.3.1.1. In practice, are decisions taken by the committee rather than an individual?	**De Facto**	**CH**	Yes—1 No—0
1.3.3.1.1.1. In practice, if decisions are taken through voting, is it stated who has the casting vote?	**De Facto**	**T**	Yes—1 No—0
1.3.3.1.1.1.1. In practice, does a government official have the casting vote?	**De Facto**	**CH**	No—1 Yes—0
1.3.3.2.1. In practice, is the chairperson a government official?	**De Facto**	**CH**	No—1 Yes—0
1.3.4. In practice, is this body(s) the same as the legally responsible monetary policymaking body?	**De Facto**	**CH**	Yes—1 No—1
1.3.5. In practice, is it stated what the frequency of monetary policymaking meetings are?	**De Facto**	**T**	Yes—1 No—0
1.3.5.1. In practice, what is the frequency of monetary policymaking meetings?	**De Facto**	**CH**	At least quarterly—1 Less frequently or not at a fixed frequency—0
2. Mandated Goals and Numerical targets			
2.1. By law, is it stated what the goal(s) of monetary policy is?	**De Jure**	**T**	Yes—1 No—0
2.1.1. By law, is price stability (one of) the goal(s)?	**De Jure**	**CH**	Yes—1 No—0
2.2. By law, is it stated that there is a numerical monetary policy target?	**De Jure**	**T**	Yes—1 No—0
2.2.1. By law, is it stated which body(s) is responsible for setting the numerical monetary policy target(s)?	**De Jure**	**T**	Yes—1 No—0
2.2.1.1. By law, who sets the numerical monetary policy target(s)?	**De Jure**	**CH**	The central bank and the government through joint consultations—1 The central bank or government alone—0.5 An individual—0
2.2.2. By law, is it stated how frequently the target(s) may be revised?	**De Jure**	**T**	Yes—1 No—0
2.2.2.1. By law, how frequently may the target(s) be revised?	**De Jure**	**CH**	At a fixed, low frequency, once every five or more years— 1 More Often—0
2.3. In practice, is it stated that there is a numerical monetary policy target?	**De Facto**	**T**	Yes—1 No—0
2.3.1. In practice, is it stated which body is responsible for setting the numerical monetary policy target(s)?	**De Facto**	**T**	Yes—1 No—0
2.3.1.1. In practice, who sets the numerical monetary policy target(s)?	**De Facto**	**CH**	The central bank and the government through joint consultations—1 The central bank or government alone—0.5 An individual—0
2.3.2. In practice, is it stated how frequently the target(s) may be revised?	**De Facto**	**T**	Yes—1 No—0
2.3.2.1. In practice, how frequently may the target(s) be revised?	**De Facto**	**CH**	At a fixed, low frequency, once every five or more years— 1 More Often—0
3. Integrity of the Monetary Policymaking Body			
3.1. Integrity of the Governor			
3.1.1. By law, is it stated who appoints the governor?	**De Jure**	**T**	Yes—1 No—0
3.1.1.1. By law, is the governor appointed by a group rather than an individual?	**De Jure**	**CH**	Yes—1 No—0
3.1.2. By law, is it stated how long the governor's term of office is?	**De Jure**	**T**	Yes—1 No—0
3.1.2.1. By law, how long is the governor's term of office?	**De Jure**	**CH**	At least 5 years—1 Less than 5 years—0
3.1.2.2. In practice, did the current governor's predecessor fill the full legal term of office?[iii]	**De Facto**	**T**	Yes—1 No—0

[iii] If the current Governor is serving a second or higher term, then he/she is his/her own predecessor.

Table A1: Criteria for Independence and Accountability (Continued)

Criterion	Type		Options and Scoring
3.1.3. By law, is it stated whether the governor may be reappointed?	**De Jure**	**T**	Yes—1 No—0
3.1.3.1. By law, is reappointment of the governor permitted?	**De Jure**	**CH**	No; or at most a single reappointment—1 Yes, more than once—0
3.1.4. By law, is it stated whether the governor may be removed from office?	**De Jure**	**T**	Yes—1 No—0
3.1.4.1. By law, is it stated what the grounds for dismissal are?	**De Jure**	**T**	Yes—1 No—0
3.1.5. By law, is it stated whether the governor may hold potentially conflicting offices outside the central bank?[iv]	**De Jure**	**T**	Yes—1 No—0
3.1.5.1. By law, may the governor hold potentially conflicting positions outside the central bank?	**De Jure**	**CH**	No—1 Yes—0
3.1.6. In practice, is it stated who the current governor is?	**De Facto**	**T**	Yes—1 No—0
3.1.6.1. In practice, is it stated how long the current governor's term of office is?	**De Facto**	**T**	Yes—1 No—1
3.1.6.1.1. In practice, how long is the current governor's term of office?	**De Facto**	**CH**	At least 5 years—1 Less than 5 years—0
3.1.6.1.2. In practice, is the governor's appointment linked to the political cycle?	**De Facto**	**CH**	No—1 Yes—0
3.1.7. In practice, does the current Governor hold (potentially conflicting) offices outside the central bank?	**De Facto**	**CH**	No—1 Yes—0
3.1.8. In practice, how long was the total time in office served by the current governor's predecessor?	**De Jure**	**CH**	At least 5 years—1 Less than 5 or more than 10 years—0
3.1.9. In practice, was the current governor's predecessor removed from office?	**De Facto**	**CH**	No—1 Yes—0
3.1.10. In practice, was the current governor's predecessor reappointed?	**De Facto**	**CH**	No; or at most a single reappointment—1 Yes, more than once—0
3.2. Integrity of Legally Designated Monetary Policymaking Body			
3.2.1. By law, is it stated what the composition of the monetary policymaking body is?	**De Jure**	**T**	Yes—1 No—0
3.2.1.1. By law, is there a requirement to have external members on the policymaking body?[v]	**De Jure**	**CH**	Yes—1 No—0
3.2.2. By law, is it stated how long each member's term of office is?	**De Jure**	**T**	Yes—1 No—0
3.2.2.1. By law, how long is each member's terms of office?	**De Jure**	**CH**	At least 4 years—1 Less than 4 years—0
3.2.3. By law, is it stated whether members may be reappointed?	**De Jure**	**T**	Yes—1 No—0
3.2.3.1. By law, is reappointment of members permitted?	**De Jure**	**CH**	No; or at most a single reappointment—1 Yes, more than once—0
3.2.4. By law, is it stated who appoints members?	**De Jure**	**T**	Yes—1 No—0
3.2.4.1. By law, are members appointed by a group rather than an individual?	**De Jure**	**CH**	Yes—1 No—0
3.2.5. By law, is it stated whether members' may be removed from office?	**De Jure**	**T**	Yes—1 No—0
3.2.5.1. By law, is it stated what the grounds for dismissal are?	**De Jure**	**T**	Yes—1 No—0
3.2.6. By law, is it stated whether there are legal penalties for members of the monetary policymaking body?[vi]	**De Jure**	**T**	Yes—1 No—0
3.2.6.1. By law, under what circumstances are members of the monetary policymaking body legally liable?	**De Jure**	**CH**	In case of serious misconduct, negligence, malfeasance, corruption, neglect of duty and other similar instances-1 Monetary policy performance—0

[iv] Potentially conflicting positions include positions in any of the branches of government or in the financial sector.

[v] "External" members have no executive responsibilities and are selected from outside the central bank.

[vi] These penalties refer to legal recourse distinct from dismissal, such as imprisonment or fines.

Table A1: Criteria for Independence and Accountability (Continued)

Criterion	Type		Options and Scoring
3.2.7. By law, is it stated whether members may hold (potentially conflicting) offices outside the central bank?	**De Jure**	**T**	Yes—1 No—0
3.2.7.1. By law, may members hold (potentially conflicting) offices outside the central bank?	**De Jure**	**CH**	No—1 Yes—0
3.2.8. By law, is it stated whether there is a government official on the monetary policymaking body or that sits in on meetings?	**De Jure**	**T**	Yes—1 No—0
3.2.8.1. By law, is a government official permitted to participate in meetings?	**De Jure**	**CH**	No—1 Yes—0
3.3. Integrity of the De Facto Monetary Policymaking Body			
3.3.1. In practice, is it stated what the composition of the de facto monetary policymaking body is?	**De Facto**	**T**	Yes—1 No—0
3.3.1.1. In practice, are there any external members on the de facto monetary policymaking body?	**De Facto**	**CH**	Yes—1 No—0
3.3.2. In practice, is it stated who the current members of the de facto monetary policymaking body is?	**De Facto**	**T**	Yes—1 No—0
3.3.2.1. In practice, is it stated how long each current member's term of office is?	**De Facto**	**T**	Yes—1 No—0
3.3.2.1.1. In practice, how long is each current member's terms of office?	**De Facto**	**CH**	At least 4 years—1 Less than 4 years—0
3.3.2.1.2. In practice, are the terms of office of the current members linked to the political cycle?	**De Facto**	**CH**	No—1 Yes—0
3.3.2.1.3. In practice, have any of the current members been reappointed?	**De Facto**	**CH**	No; or at most a single reappointment—1 Yes, more than once—0
3.3.2.2. In practice, do any members (other than a government representative) hold potentially conflicting offices outside the central bank?[vii]	**De Facto**	**CH**	No—1 Yes—1
3.3.3. In practice, is it stated who appoints members?	**De Facto**	**T**	Yes—1 No—0
3.3.3.1. In practice, are members appointed by a group rather than an individual?	**De Facto**	**CH**	Yes—1 No—0
3.3.4. In practice, is it stated whether there is any government official on the monetary policymaking body or that sits in on meetings?	**De Facto**	**T**	Yes—1 No—0
3.3.4.1. In practice, is there any government official that participates in meetings?	**De Facto**	**CH**	No—1 Yes—0
4. Financial Arrangements			
4.1. Financing the Government			
4.1.1. By law, is it stated whether the central bank is permitted to buy government securities in the primary market?	**De Jure**	**T**	Yes—1 No—0
4.1.1.1. By law, is the central bank prohibited from buying government securities in the primary market?	**De Jure**	**CH**	Yes—1 No, but there are some limits—0.5 No—0
4.1.2. In practice, does the central bank buy government securities in the primary market?	**De Facto**	**CH**	No—1 Yes—0
4.1.3. By law, is it stated whether the central bank is permitted to extend loans directly to the government?	**De Jure**	**T**	Yes—1 No—0
4.1.3.1. By law, is the central bank prohibited from extending loans directly to the government	**De Jure**	**CH**	Yes—1 No, but there are some limits on the quantity—0.5 No—0
4.1.3.1.1. By law, if direct lending to the government is not prohibited, is there a prescription for the interest rate to be charged on direct loans?	**De Jure**	**CH**	Yes—1 No—0
4.1.3.1.2. By law, if direct lending to the government is not prohibited, is lending beyond a fixed duration prohibited?[viii]	**De Jure**	**CH**	Yes—1 No—0
4.1.3.1.3. By law, if direct lending to the government is not prohibited, is lending to other governmental entities prohibited?[ix]	**De Jure**	**CH**	Yes—1 No—0
4.1.4. In practice, does the central bank extend loans direct to the government?[x]	**De Facto**	**CH**	No—1 Yes—0

[viii] To obtain 1 it needs to be either prohibited by law or explicitly stated that this is not the case in practice.

[ix] In other words, the date of repayment or the maximum duration of loans is specified.

[x] Other governmental entities include public-private entities, quasi-governmental entities, state-owned enterprises, and provincial governments.

Table A1: Criteria for Independence and Accountability (Continued)

Criterion	Type		Options and Scoring
4.2. Central Bank Funding			
4.2.1. By law, is it stated whether profits are distributed?	**De Jure**	**T**	Yes—1 No—0
4.2.1.1. By law, are distributable profits defined?	**De Jure**	**CH**	Yes—1 No—0
4.2.1.2. By law, is there a reserve fund?[xi]	**De Jure**	**CH**	Yes—1 No—0
4.2.1.3. By law, is it stated whether the distribution of profits to the government is prohibited?	**De Jure**	**T**	Yes—1 No—0
4.2.1.3.1. By law, if profit distribution to the government is not prohibited, how is the distribution of profit to the government calculated?	**De Jure**	**CH**	A rule specifying a fixed percentage less than 75%—1 An increasing percentage, depending on the level of reserves.—0.5 Other[xii]—0
4.2.2. In practice, does the central bank distribute profits to the government?[xiii]	**De Facto**	**CH**	No—1 Yes—0
4.2.3. By law, is it stated who bears the central bank's losses?	**De Jure**	**T**	Yes—1 No—0
4.2.4. By law, is automatic recapitalization of the central bank ensured?	**De Jure**	**CH**	Yes—1 No—0
5. Reporting and Oversight			
5.1. By law, is it stated that an annual report is required to be published?	**De Jure**	**T**	Yes—1 No—0
5.1.1. By law, is the annual report required to contain a review of monetary policy?	**De Jure**	**CH**	Yes—1 No—0
5.2. In practice, is an annual report published?	**De Facto**	**T**	Yes—1 No—1
5.2.1. In practice, does the annual report contain a review of monetary policy?	**De Facto**	**CH**	Yes—1 No—0
5.3. By law, is it stated that the central bank is subject to auditing by an external auditing body?	**De Jure**	**T**	Yes—1 No—0
5.4. In practice, are audited financial statements published?	**De Facto**	**T**	Yes—1 No—0
5.5. By law, is it stated that monetary policy decisions are required to be published?	**De Facto**	**CH**	Yes—1 No—0
5.6. In practice, are monetary policy decisions published?	**De Facto**	**T**	Yes—1 No—0
5.7. By law, is it stated that the monetary policymaking body's voting records are required to be published?	**De Jure**	**T**	Yes—1 No—0
5.8. In practice, are the voting records of the monetary policymaking body published?	**De Facto**	**T**	Yes—1 No—0
5.9. By law, is it stated that the minutes of the monetary policymaking meetings are required to be published	**De Jure**	**T**	Yes—1 No—0
5.10. In practice, are the minutes of the de facto monetary policymaking body meetings published?	**De Facto**	**T**	Yes—1 No—0
5.11. By law, is it stated that a monetary policy report is required to be published?	**De Jure**	**T**	Yes—1 No—0
5.12. In practice, is a monetary policy report published?	**De Facto**	**T**	Yes—1 No—0
5.13. By law, are there additional reporting requirements if numerical targets/objectives are not met?	**De Jure**	**T**	Yes—1 No—0
5.14. In practice, are there additional reporting requirements if numerical targets/objectives are not met?	**De Facto**	**T**	Yes—1 No—0
5.15. By law, is the governor or members of the monetary policymaking body required to testify in front of the legislature regarding monetary policy?	**De Jure**	**T**	Yes—1 No—0
5.16. In practice, during the last 12 months, has the governor or members of the monetary policymaking body testified in front of the legislature regarding monetary policy?	**De Facto**	**T**	Yes—1 No—0
5.17. By law, could there be periodic performance reviews of monetary policymaking with inputs from an external, independent body(s)?	**De Jure**	**T**	Yes—1 No—0
5.18. In practice, during the current Governor or the predecessor's term, has there been any review of monetary policymaking with inputs from an external, independent body(s)?	**De Facto**	**T**	Yes—1 No—0

Table A2: Criteria for Policy and Operational Strategy

Criterion	Type		Options and Scoring
POLICY AND OPERATIONAL STRATEGY			
1. Objectives			
1.1. Is it stated what the objectives are?	**De Facto**	**T**	Yes—1 No—0
1.1.1. Is price stability one of the objectives?	**De Facto**	**CH**	Yes—1 No—0
1.1.2. If there are multiple objectives, are the potential interactions between them explained?	**De Facto**	**CH**	Yes—1 No—0
2. Numerical Targets			
2.1. Is it stated what the numerical targets are?	**De Facto**	**T**	Yes—1 No—0
2.1.1. Does this include an inflation target?	**De Facto**	**CH**	Yes—1 No—0
2.1.1.1. Is it stated which indices/data series define these targets?	**De Facto**	**T**	Yes—1 No—0
2.1.1.2. Is it stated over which time horizon these targets should be met?	**De Facto**	**T**	Yes—1 No—0
2.1.1.2.1. Is the time horizon for the inflation target the medium-term?	**De Facto**	**CH**	Yes— 1 No—0
2.1.1.3. Is it stated under which conditions these targets may be revised?	**De Facto**	**T**	Yes—1 No—0
2.1.1.3.1. Under which conditions may these targets be revised?	**De Facto**	**CH**	As part of a comprehensive review of the entire monetary policy framework, at a fixed, low frequency (every 5 or more years)—1 More often and for other reasons—0
2.1.1.4. Have any of these targets been revised?	**De Facto**	**CH**	No; or yes, but as part of a comprehensive review of the entire monetary policy framework—1 Yes, but not as part of a comprehensive review of the entire monetary policy framework—0
2.1.1.5. Is it explained how the objectives map into these targets?	**De Facto**	**CH**	Yes—1 No—0
3. Tools			
3.1. Is it stated what that the tools are?	**De Facto**	**T**	Yes—1 No—0
3.1.1. Are the tools defined as indirect market-based tools?	**De Facto**	**CH**	Yes—1 No—0
3.1.2. Is it stated that the policy stance is signaled through (one of) the tools?	**De Facto**	**T**	Yes—1 No—0
3.1.2.1. Are the signaling tools defined as point targets?	**De Facto**	**T**	Yes—1 No—0
3.1.3. Are these tools consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
3.1.3.1. Is the relationship of the tools with the objectives (and numerical targets) explained?	**De Facto**	**CH**	Yes—1 No—0
3.1.3.2. If there are multiple tools, are the potential interactions between them explained?	**De Facto**	**CH**	Yes—1 No—0
4. Policy Formulation			
4.1. Is it stated what the different stages are in the decision-making process for formulating policy?	**De Facto**	**T**	Yes—1 No—0
4.1.1. Is it explained how the monetary policymakers take staff analyses and judgments into account?	**De Facto**	**CH**	Yes—1 No—0
4.1.2. Is it stated whether a quantitative framework is used as input into policy analysis and formulation?	**De Facto**	**T**	Yes—1 No—0
4.1.2.1. Is it stated which models or quantitative methods are used in policy formulation?	**De Facto**	**T**	Yes—1 No—0
4.1.3. Are the tools relevant to this decision-making process consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
4.2. Is it stated which objectives and numerical targets guide policy formulation?	**De Facto**	**T**	Yes—1 No—0

Table A2: Criteria for Policy and Operational Strategy (Continued)

Criterion	Type		Options and Scoring
4.2.1. Does policy formulation center around the outlook for the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
4.2.2. If there are multiple objectives and numerical targets guiding policy formulation, is it explained how these, including an inflation target, are balanced?[xiv]	**De Facto**	**CH**	Yes—1 No—0
4.2.3. Are the tools covered in this description of policy formulation consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
4.2.3.1. If there are multiple tools, is it explained how these are balanced to achieve the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
4.2.3.2. Is the future path of the policy stance taken into account when formulating policy?	**De Facto**	**CH**	Yes—1 No—0
4.2.3.3. Does policy formulation incorporate an evaluation of future risks and contingency plans?	**De Facto**	**CH**	Yes—1 No—0
5. Policy Implementation			
5.1. Is it stated what are the instruments for policy implementation?	**De Facto**	**T**	Yes—1 No—0
5.1.1. Are these instruments consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
5.1.1.1. Does the central bank map these instruments to individual aims?	**De Facto**	**CH**	Yes—1 No—0
5.1.2. Is there a mechanism in place for the smoothing of daily autonomous factor liquidity shocks?[xv]	**De Facto**	**CH**	Yes—1 No—0
5.1.3. Are there standing facilities for the day-to-day stabilization of short-term interest rates?	**De Facto**	**CH**	Yes—1 No—0
5.1.3.1. Are the standing facilities symmetric?	**De Facto**	**CH**	Yes—1 No—0
5.1.3.2. How wide is the corridor of the standing facilities?[xvi]	**De Facto**	**CH**	Narrow—1 Excessive or unspecified—0
5.1.3.3. Is access to these standing facilities unlimited for market participants against pre-defined collateral?	**De Facto**	**CH**	Yes—1 No—0
5.2. Is it stated how the tools and instruments function jointly?	**De Facto**	**T**	Yes—1 No—0
5.2.1. Is this statement of the joint functioning of the tools and instruments consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
5.2.1.1. Is it explained how the policy stance is to be achieved through the joint use of the instruments?	**De Facto**	**CH**	Yes—1 No—0
5.2.1.2. Are the instruments adjusted automatically to achieve the policy stance?	**De Facto**	**CH**	Yes—1 No—0

[xiv] This may include a discussion of prioritization, objective-specific time-horizons, and how trade-offs are managed.

[xv] For example, by conducting daily open market operations (with no reserve requirements) or less frequent open market operations in the presence of reserve requirements.

[xvi] A corridor is considered excessive if spreads between lending and deposit rates are in excess of 100 basis points.

Table A3: Criteria for Communications

Criterion	Type		Options and Scoring
COMMUNICATIONS			
1. Communication Cycle			
1.1. Is it stated what the main monetary policy communication vehicles are and what purpose they serve?	**De Facto**	**T**	Yes—1 No—0
1.1.1. Is the ordinary communication cycle regular (fixed frequency)?[xvii]	**De Facto**	**CH**	Yes—1 No—0
1.2. Is the schedule for the upcoming ordinary policy meetings published?	**De Facto**	**T**	Yes—1 No—0
1.2.1. Do actual and announced meeting dates coincide?	**De Facto**	**CH**	Yes—1 No—0
1.2.2. Does the ordinary communication cycle center around policy meetings?	**De Facto**	**CH**	Yes—1 No—0
1.3. Is it stated which changes to the monetary policy framework (objectives, numerical targets, and tools) were made?	**De Facto**	**T**	Yes; or no, but none were made—1 No, even though changes were made—0
1.3.1. Is the justification for the changes provided?	**De Facto**	**CH**	Yes, in a stand-alone communication—1 Yes, within pre-existing communications—0.5 No—0
1.3.2. If the changes are temporary, are the conditions that warrant the changes as well as the exit strategies communicated?	**De Facto**	**T**	Yes—1 No—0
2. Announcing and Explaining the Policy Stance			
2.1. Is there a statement of monetary policy decisions?	**De Facto**	**T**	Yes—1 No—0
2.1.1. Are policy decisions announced promptly following the conclusion of policy meetings?	**De Facto**	**CH**	Yes, at a pre-set time—1 Yes, but at varying times—0.5 No—0
2.1.2. How are policy decisions announced?	**De Facto**	**CH**	Via a press release and verbal press conference with a Q&A session—1 Via a press release and (or) verbal press conference without a Q&A session—0.5 Some other way—0
2.1.3. Is there a statement explaining policy decisions?	**De Facto**	**T**	Yes—1 No, or only when tools are changed—0
2.1.3.1. Are the objectives and numerical targets in the explanation consistent with Policy and Operational Strategy?	**De Facto**	**CS**	Yes—1 No—0
2.1.3.1.1. Is there a discussion of the outlook for the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
2.1.3.1.2. Is there a discussion of the risks to the outlook for the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
2.1.3.1.3. Are the tools in this explanation consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
2.1.3.1.3.1. Is an interpretation of the policy stance provided?[xviii]	**De Facto**	**CH**	Yes—1 No—0
2.1.3.1.3.2. Is there a discussion of how the objectives and numerical targets, including an inflation target, are to be achieved through the policy decisions?	**De Facto**	**CS**	Yes—1 No—0
2.1.3.1.3.3. Is reference made to the future trajectory of the policy stance?[xix]	**De Facto**	**CH**	Yes—1 No—0
2.1.3.1.3.3.1. Is there a discussion of how this trajectory is warranted by the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
3. Monetary Policy Report			
3.1. Is a monetary policy report published?	**De Facto**	**T**	Yes—1 There are multiple similar such reports—0.5 No—0

[xvii] Ordinary communication excludes extraordinary publications or meetings.

[xviii] Unified stance of all main tools, e.g., loose, neutral, tight.

[xix] This criterion captures the likely future path for policy, not a policy commitment.

Table A3: Criteria for Communications (Continued)

Criterion	Type		Options and Scoring
3.1.1. When is the report published?	**De Facto**	**CH**	Within 1 month of each ordinary meeting—1 At a lower frequency—0.5 On an ad hoc basis or with 1 month delay—0
3.1.2. Does the governor or other members of the policymaking body present the report?	**De Facto**	**CH**	Yes—1 No—0
3.1.3. Is it stated what the current policy actions and expected outcomes are?	**De Facto**	**CH**	Yes—1 No—0
3.1.3.1. Are the objectives and numerical targets in the statement of expected outcomes consistent with Policy and Operational Strategy?	**De Facto**	**CS**	Yes—1 No—0
3.1.3.1.1. Is there a discussion of the outlook for the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
3.1.3.1.2. Is there a discussion of the risks to the outlook for the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
3.1.3.1.3. Are the tools in the statement of current policy actions consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
3.1.3.1.3.1. Is an interpretation of the policy stance provided?[xx]	**De Facto**	**CH**	Yes—1 No—0
3.1.3.1.3.2. Is there a discussion of how the objectives and numerical targets, including an inflation target, are to be achieved through the current settings of the tools?	**De Facto**	**CH**	Yes—1 No—0
3.1.3.1.3.3. Is reference made to the future trajectory of the policy stance?[xxi]	**De Facto**	**CH**	Yes—1 No—0
3.1.3.1.3.3.1. Is there a discussion of how this trajectory is warranted by the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
3.1.4. Is it stated what past policy actions and outcomes were?	**De Facto**	**T**	Yes—1 No—0
3.1.4.1. Are the objectives and numerical targets in the statement of past outcomes consistent with Policy and Operational Strategy?	**De Facto**	**CS**	Yes—1 No—0
3.1.4.1.1. Is there a discussion of past developments in driving the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
3.1.4.1.2. Is there a discussion of the extent to which the objectives and numerical targets, including an inflation target, have been achieved?	**De Facto**	**CH**	Yes, with explanations of deviations—1 Yes but without explanations of deviations—0.5 No-0
3.1.4.1.3. Are the tools in the statement of past policy actions consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
3.1.4.1.3.1. Is there a discussion of the extent to which the intended past policy stance has been achieved?	**De Facto**	**CH**	Yes, with explanations of deviations—1 Yes but without explanations of deviations—0.5 No—0
3.1.4.1.3.2. Is there a discussion of the contribution of past policy actions in meeting the objectives and numerical targets, including an inflation target?	**De Facto**	**CH**	Yes—1 No—0
4. Publication of Data			
4.1. Is data relevant for monetary policymaking published?[xxii]	**De Facto**	**T**	Yes—1 No—0
4.1.1. Does this include data on the objectives and numerical targets that is consistent with Policy and Operational Strategy, and on the tools that is consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0

[xx] Unified stance of all main tools, e.g., loose, neutral, tight.

[xxi] This may include a discussion of prioritization, objective-specific time-horizons, and how trade-offs are managed.

[xxii] This includes publicly available data on the objectives, numerical targets, tools and instruments.

Table A3: Criteria for Communications (Continued)

Criterion	Type		Options and Scoring
4.1.1.1. Does this include data on inflation and inflation expectations?	**De Facto**	**CH**	Yes—1 No—0
4.1.1.1.1. Is this data available in downloadable format at a quarterly frequency at least?	**De Facto**	**CH**	Yes—1 No—0
4.2. Are forecasts published?	**De Facto**	**T**	Yes, numerical forecasts—1 Yes, graphical forecasts—0.5 No—0
4.2.1. Does this include medium-term forecasts for inflation?	**De Facto**	**CH**	Yes—1 No—0
4.2.1.1. At what frequency are forecasts published?	**De Facto**	**CH**	At least quarterly—1 Less than quarterly—0
4.2.1.2. Is it stated what the assumption about the path for the tools associated with the forecast is?	**De Facto**	**T**	Yes—1 No—0
4.2.1.2.1. Are these tools consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
4.2.1.3. Does the central bank communicate forecast uncertainties?	**De Facto**	**CH**	Yes—1 No—0
4.3. Is it stated how the tools and instruments were used in the past?[xxiii]	**De Facto**	**T**	Yes, at least annually—1 No—0
4.3.1. Are these tools and instruments consistent with the tools used in practice?	**De Facto**	**CS**	Yes—1 No—0
4.3.2. Is the past use of the instruments explained with reference to the policy stance?	**De Facto**	**CH**	Yes—1 No—0
5. Stakeholder Inclusion			
5.1. Is information made available in all major official languages?	**De Facto**	**T**	Yes—1 No—0
5.2. Are there efforts to simplify monetary policy information into accessible language for a wider audience?[xxiv]	**De Facto**	**CH**	Yes—1 No—0
5.3. Are there efforts to disseminate monetary policy information to a wider audience?	**De Facto**	**CH**	Yes—1 No—0
5.4. Are research articles published?	**De Facto**	**T**	Yes—1 No—0

[xxiii] Ex-post reporting, including quantities.

[xxiv] This criterion concerns the main monetary policy communication vehicles, such as decision press-releases and/or the Monetary Policy Report.