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PRUDENT RISK MANAGEMENT APPROACH TO MONETARY POLICY

Theory & Practice of
FPAS Mark II at the
Central Bank of Armenia

Edited by Douglas Laxton,
Martin Galstyan, and
Vahe Avagyan

PRUDENT RISK MANAGEMENT APPROACH TO PRICE STABILITY:

THEORY AND PRACTICE OF FPAS MARK II AT THE CENTRAL BANK OF ARMENIA

Douglas Laxton, Martin Galstyan, and Vahe Avagyan,
Editors

Authors: Vahe Avagyan, Hayk Avetisyan, Martin Galstyan, Hasmik Ghahramanyan, Narek Ghazaryan, Haykaz Igityan, Hayk Karapetyan, Hovhannes Khachatryan, Asya Kostanyan, Douglas Laxton, Jared Laxton, Artak Manukyan, Davit Nahapetyan, Armen Nurbekyan, Anzhela Papikyan, and Levon Sahakyan.

CENTRAL BANK OF ARMENIA

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Acknowledgments

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policy. Robert Tetlow and Lars Svensson refer to it as “optimal policy”—we treat our EndoCred model as helping us to draw sensible lines for policy rate-consistent paths under many different types off scenarios that can involve nonlinearities and potential dark corners, such as when long-term inflation expectations might ratchet upwards or the economy might get stuck in a low interest rate/low inflation trap, such as was the concern between the GFC and the Covid-19 pandemic.

Our analytical work, including the development of Non-Traded Sticky Price inflation measures, draws upon the seminal work of Rudiger Dornbusch, particularly his influential paper 'Expectations and Exchange Rate Dynamics', commonly known as the 'overshooting sticky-price Dornbusch model'. The concepts of 'sticky-prices' and their 'flexible-price' counterparts are integral to our practical implementation and analysis within New Open Economy Macroeconomics (NOEM). Furthermore, the work of Maurice Obstfeld and Kenneth Rogoff and their development of NOEM, especially by incorporating better microfoundations, are instrumental to our approach. These advancements have real-world applications, such as the Global Economy Model developed by the IMF's research department, which drew inspiration from Obstfeld and Rogoff's path-breaking research.

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Introduction

The Central Bank of Armenia has, as its constitutional mandate, the objectives of price stability and financial stability. In service of its price stability objective, the Central Bank of Armenia practices inflation targeting, whereby it seeks to achieve the numerical target point target for inflation that is consistent with price stability, on average, in the medium-term. Since 2006, the Central Bank of Armenia has practiced a full-fledged inflation-targeting regime, which it operationalized within a structured policymaking framework known as the "Forecasting and Policy Analysis System Mark I," known as "FPAS Mark I" or simply as "FPAS." In doing so, the CBA leveraged key institutional arrangements and operational practices from other FPAS central banks.

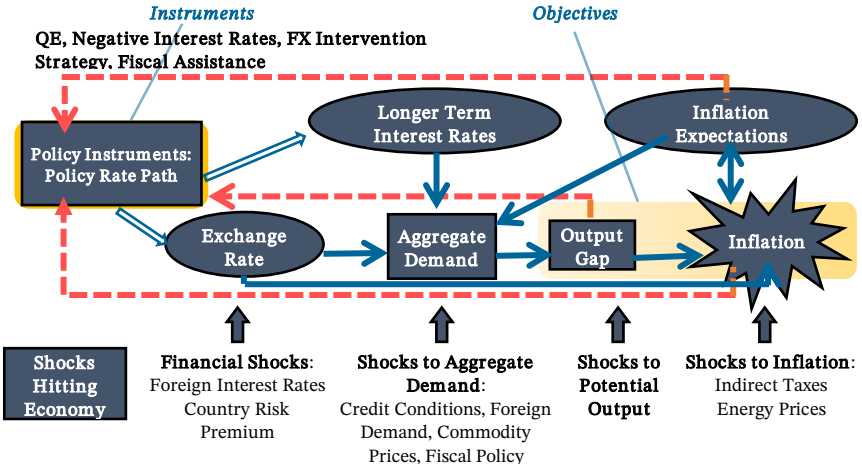
Beginning on January 1, 2024, the Central Bank of Armenia will be utilizing the "Forecasting and Policy Analysis System Mark II," or "FPAS Mark II," monetary policy framework to achieve its price stability objective. FPAS Mark II represents a holistic policymaking and institutional setup that evolves several aspects of the original FPAS Mark I, while introducing novel features. FPAS Mark II was developed at the Central Bank of Armenia, in collaboration with colleagues from leading institutions around the world.

FPAS Mark II represents the next generation of the Forecasting and Policy Analysis System (FPAS), which was first developed at the Reserve Bank of New Zealand and the Bank of Canada in the 1990s. The FPAS represents a systematic, structured and forward-looking approach to policymaking that fully embodies the fundamental principles of inflation targeting. The FPAS Mark II framework builds on the existing FPAS framework by placing increased emphasis on uncertainties in monetary policymaking. It introduces a structured and systematic approach to thinking of monetary policy as a risk management exercise along with a framework for implementing policies of least regrets. The explicit acknowledgement of uncertainties in the policymaking process, coupled with a fundamental

shift in the perception of monetary policymaking as an exercise in "expert forecasting" to one of "risk management," are among the key foundations of the new framework.

In prior FPAS Mark I frameworks, emphasis was placed on providing the best possible forecasts of the "most likely future" through a baseline scenario. However, recent experiences have shown that this approach is not without its problems. Casting the role of the central bank as that of an expert forecaster and relying on a baseline scenario to make and communicate policy minimizes the uncertainty that is inherent to making monetary policy. Having a baseline can communicate a false sense of assurance to financial markets and the public, and often unintentionally gloss over the significant uncertainty in the economic analysis and forecast. Most importantly, using baseline scenarios in communications unnecessarily constrains policy agility and the ability of policymakers to change course in a credible way when new information arises or when shocks hit. The following figure provides a stylized representation of the monetary policy transmission mechanism.

Figure 1. The Monetary Policy Transmission Mechanism



Source: Clinton and others (2015)

Under FPAS Mark II, the macroeconomic narrative is constructed around case scenarios (Case A, Case B and Case X/Y scenarios), which are illustrative in nature and are designed to explicitly describe and address risk and uncertainty. These illustrative case scenarios are built to reflect on the following essential questions:

- Where is the economy now?
- What are the driving forces?
- What policy actions need to be done to reach policy objectives?

This scenario-based approach is intended to provide much more flexibility and agility to respond to new information and continuous improvements in assessments of economic conditions and drivers. We develop and analyze two or more illustrative scenarios that would imply a higher or lower path for interest rates than is currently priced in financial markets.

- **Market Reference** is the expected path of the policy rate that is currently priced in financial markets.
- **Case A** reflects a scenario that incorporates economic and financial developments that would require a higher interest rate path than what is currently priced in financial markets that is consistent with guiding the economy back to its long-run equilibrium.
- **Case B** reflects a scenario that incorporates economic and financial developments that would require a lower interest rate path than what is currently priced in financial markets that is consistent with guiding the economy back to its long-run equilibrium.

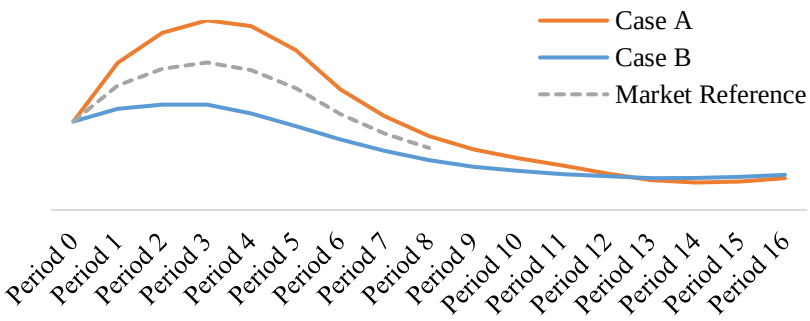
As described in the CBA's Statement of Long-Run Monetary Policy Objectives, the fundamental role of monetary policy is to provide an anchor for inflation and inflation expectations. The CBA believes that a four percent inflation target for CPI inflation is consistent with its price stability mandate. Although CPI inflation is the best measure of the cost of living,

the overall CPI basket of goods and services includes several items that are subject to seasonal fluctuations and global economic developments, which are not directly influenced by monetary policy. We therefore consider alternative measures of inflation, such as the prices for non-traded goods, as better indicators of underlying inflation. The motivation for Non-Traded Sticky Prices is based on the seminal contributions of Rudi Dornbusch (Sticky Price-Exchange Rate Overshooting)[1] and the development of New Open Economy Macro (NOEM), which was based to a large extent on the pioneering work of Maurice Obstfeld and Ken Rogoff.[2] Of course, effective monetary policy improves welfare by anchoring long-term inflation expectations and reducing the volatility of output and unemployment. Avoiding excessive volatility in the economy can result in substantial improvements in welfare by reducing the average levels of unemployment and raising the productive capacity of the Armenian economy.

An illustrative example of the scenario structure is presented in Figure 2. The Non-Traded Sticky Price Inflation measure, with shaded bands reflecting Blanchard's "dark corners" of high and volatile inflation and deflation, is shown in Figure 3.[3]

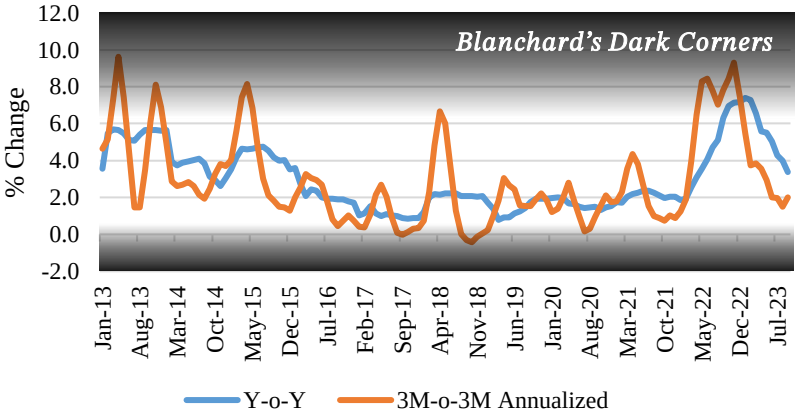
[1] See Dornbusch (1976).
[2] While possible references are many, we offer as starting points Obstfeld and Rogoff's seminal papers titled "Exchange rate dynamics redux" (1995), "New directions for stochastic open economy models" (2000), "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?" (2001), and "Global Implications of Self-Oriented National Monetary Rules" (2002).
[3] The term "dark corners"—referring to "situations in which the economy could badly malfunction"—was first coined by Olivier Blanchard in a September 2014 IMF blog post titled "Where Danger Lurks."

Figure 2. Illustrative Example of Alternative Path of the Policy Rate



Source: Central Bank of Armenia

Figure 3. Non-Traded Sticky Price Inflation in Armenia, 2013-2023



Source: Central Bank of Armenia using CPI data from the Statistical Committee of the Republic of Armenia

Of course, a comprehensive, holistic policymaking framework goes well beyond how scenarios are structured. FPAS Mark II entails the following evolution and key changes to the existing framework:

- **Robust Analytical Framework & Suite of Models**: best-in-class analytical models, including the quarterly projection model incorporating crucial nonlinearities such as endogenous policy credibility, are an important foundation of a good policymaking framework. We continue to emphasize the role of models as tools that help policymakers and economists think better. We thus make appropriate investments to develop and evolve our robust analytical framework.
- **Investments in Human Capital**: Effective monetary policymaking requires making significant investments in staff, including comprehensive training within a dynamic learning environment, developing a culture of continuous feedback-sharing, eliminating unproductive hierarchies, among others. A well-trained staff with an explicit commitment to excellence and a sense of mission-driven purpose is the cornerstone of a best-in-class central bank.
- **The Highest Degree of Transparency & Accountability**: As a socially responsible public institution, we strongly advocate for transparency and accountability as foundational and guiding principles. We firmly believe that clear and effective communications are the principal means through which the central bank can achieve transparency in its policymaking. Moreover, transparency serves as a cornerstone for central bank accountability. Together, transparency and accountability serve as important means for assuring general public's confidence and trust in CBA's monetary policymaking process, and incentivizing the institution's staff and leadership to do the right thing. The FPAS Mark II framework emphasizes the highest degree of transparency in its analytics, communications, and deliberations.
    - Under the FPAS Mark II framework, we try to avoid errors brought on by groupthink and foster a culture that prioritizes diverse perspectives and "adversarial

collaboration" among the members of the Board. By having individual vote submissions (explanation of the rationale for each Board member's vote) attributed to each Board member, we seek to encourage individual Board members to take ownership of their decision and foster open and lively deliberations.

    - Transparent communications with the public also means being open about the data and analysis that support policy discussions and decisions. To this end, with each monetary policy report, we publish the relevant analytical models and datasets used in our policy analysis. This includes timely and comprehensive data on different economic indicators, financial markets data, data on the developments of our key trading partners and other relevant statistical data used in our analysis. To provide maximum transparency and accessibility, we rely on open source software, including DynareJulia. This is intended to provide outside users with the opportunity to replicate the central bank's analysis and models, without any publication delays.
    - The CBA relies on a number of communications tools to explain monetary policy to the public. These include a combination of written reports, media briefings, interviews, and other channels. Some of these communications devices are more complex and are oriented toward technical audiences, while others are intended to be accessible and easily understandable by the general public. Even though monetary policy is highly complex, it is important for all stakeholders to have a clear understanding of it.

- **Society-Level Capacity Building**: FPAS Mark II emphasizes the importance of improving financial and economic literacy at all

levels of society—from primary education to media to financial markets.

The purpose of this book is to lay out the conceptual and operational elements of the new FPAS Mark II framework. Volume I provides an overview of the motivation behind the framework, and key conceptual issues that must be addressed within a holistic policymaking framework. These include shortcomings with FPAS Mark I; the theory behind FPAS Mark II; and considerations about how institutional, analytical, human capital, and communications frameworks are being operationalized within a formal institutional setup. Volume II—known as the Monetary Policy Handbook—presents a practical guide to specific FPAS Mark II operational procedures and practices at the Central Bank of Armenia. This includes a description of monetary policy principles and objectives; principles for Board deliberations; the decision-making process; organizational structure; the CBA's monetary policy strategy; the Charter; the Code of Conduct; and the Statement of Long-Run Monetary Policy Objectives.

Volume I:
The FPAS Mark II Framework

I. History of Monetary Policy at the CBA[4]

Hayk Avetisyan and Hasmik Ghahramanyan

A. Independence and Introduction of the National Currency

On September 21, 1991, the Republic of Armenia declared independence, establishing itself as a sovereign and independent state. Despite the collapse of the Soviet Union and its breakup into 15 independent states, the newly-formed Armenian republic was not economically independent, which expressed itself most obviously in the continued official use of the Soviet and later the Russian Rubles. Thus, in the immediate wake of its independence, the Republic of Armenia did not make its own monetary policy, but rather, was subject to the consequences of monetary policy decisions made elsewhere. This matter was further complicated by the immense economic and geopolitical challenges brought on by the dissolution of the Soviet Union: the collapse in output and productivity; high inflation verging on hyperinflation; political instability; civil and military conflicts within and between neighboring states; and, in tandem with all this, a severe lack of public trust and credibility in the state, which continued to deepen.

The beginnings of economic stability in the newly-independent Republic of Armenia can be traced to the introduction of a national currency, more than two years after independence. The national currency, known as the Armenian Dram,[5] was introduced relatively late, on November 23, 1993,

[4] This section includes passages from the book *Forecasting and Policy Analysis System at the Central Bank of Armenia*, published in 2010.

[5] The Armenian word "dram" is cognate with the Greek "drachma," and has a long history in ancient and medieval Armenian coinage. The earliest attested Armenian coins date back to the 3rd century B.C., and were issued by the Orontid Dynasty of

after most other Soviet republics had already begun circulating their own national currencies. In this period, when other post-Soviet countries had begun using their own currencies and no longer accepted the Ruble, the inflow of the Ruble to Armenia contributed to a rapid growth in prices commensurate with hyperinflation. In 1993 alone, the CPI stood at 11000%.

Several factors contributed to this hyperinflation. After the liberalization of prices in 1992, there were sharp, one-time increases in prices of strategic projects still subject to administrative regulation (e.g. bread, utilities, energy, gas, transport fees, etc.). Other contributing factors included the effects of inflation "inertia" from the final years of the USSR that spilled over into the 1990s; the disorderly developments of foreign exchange market mechanisms; and, accordingly, the process by which domestic prices could converge to international prices. This contributed to upward pressure on the prices for tradable goods, which was followed by slow increases in the prices of non-tradable products. The prices for imported goods (in particular, long-term durable goods) frequently exceeded their international prices by a far greater margin than would could be explained by high transportation costs.

Although at this point the CBA had adopted a tougher monetary policy stance, several factors stood in the way of regaining stability in prices. In particular, the government was understandably engaged in structural reforms, which, at the time, was accompanied with continuous direct lending to the government by the CBA and rendered the effectiveness of the monetary policy. At the same time, inflation expectations among the public continued to sharply rise, driven by the sobering experience of hyperinflation in preceding years and the expectation that this would

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the Kingdom of Armenia. Beginning in the Hellenistic period and throughout antiquity, successive Armenian kingdoms issued "drachms" and "tetradrachms." The first usage of the term "dram" as such can be traced to the medieval Armenian Kingdom of Cilicia, which minted silver coins between 1080 and 1375 that were variously known as "dram" and "tagvorin." See, for reference, Bedoukian (1979) and Musheghyan (1983).

continue. This was reflected behaviorally in households' bulk accumulation of goods and basic necessities, in import-exporters' continuous price mark-ups, and so on, all of which contributed to a worsening of the inflationary spiral. Geopolitical problems, in their turn, accelerated declines in money supply and the worsening of inflation and economic decline.

Clearly, the hyperinflation experienced in the earliest days of the fledgling Republic of Armenia had structural causes, which required significant time and resources to adequately address. The introduction of the dram—a critical first step—was followed by the fundamental restructuring of the Central Bank. In early 1994, the CBA for the first time developed an independent monetary policy strategy, marking the beginning of monetary policy at the CBA.

B. 1994-2005: Monetary Targeting

In 1994, the Central Bank of Armenia adopted monetary aggregate targeting as its monetary policy strategy.[6] This was solidified in 1996 with the adoption of the "Law on the Central Bank of Armenia (1996)," which established low and stable inflation (i.e. price stability) as the primary objective of the CBA.[7] The law strictly limited CBA loans to the government and explicitly stated that monetary policy would be implemented solely through indirect instruments. In addition, the 1996 law set up the foundational role of central bank independence in the effective design and implementation of the monetary policy.

To achieve the price stability objective, broad money and the monetary base were defined as intermediate and operational targets for monetary policy. The monetary base includes cash in circulation outside of the central bank

[6] The full-fledged adoption of monetary aggregate targeting can be considered to have begun in 1996, when the Dram was established as a free-floating currency.
[7] Prior to this, the primary objective of the CBA was maintaining domestic and external currency stability.

and commercial banks' correspondent accounts in the CBA. Broad money includes cash in circulation outside of the banking system and residents' deposits held by commercial banks. The CBA managed the monetary base by impacting banking system liquidity and financial instrument investments by banks. The tools for monetary policy in this context included liquidity-injecting Lombard loans, repo, and open market and FX purchase operations; and liquidity-reducing deposit auctions, repo, and open market and FX sale operations. By managing the process for financial instrument investments, the CB would secure changes in broad monetary aggregates in line with its plans, in order to reach the desired level of inflation.

The implementation of monetary aggregate targeting allowed the CBA to achieve macroeconomic stability by reducing and stabilizing inflation. Inflation became manageable in the second half of 1994, although year-on-year inflation at year-end stood at 1761%. 1995 was a turning point: economic activity accelerated to a positive 5.7% after the prior years' extreme declines, and inflation stood at 32.2%. Between 1995 and 1998, inflation gradually stabilized after some volatility, and the Armenian economy at last entered a low inflation environment. Low inflation was accompanied with high economic growth (and beginning in 2003, double-digit economic growth), which lasted until the Global Financial Crisis in 2008.

While monetary aggregate targeting succeeded in achieving its most pressing objective—stabilizing the economy after the economic collapse and hyperinflation that followed the disintegration of the USSR—it was not without its challenges and complications, especially with respect to the ability to manage the nominal anchor.[8]

[8] Freedman and Laxton (2009) note the following about the nominal anchor: "In their pursuit of low inflation as the best contribution that monetary policy can make to a well-functioning economy, central banks have typically relied upon a nominal anchor as the basis for their monetary policy. A nominal anchor is considered useful

Until 1998, broad money (M2X) served as the nominal anchor, and it included cash in circulation outside of the banking system and residents' deposits held by commercial banks. Beginning in July 1998, the CBA began targeting monetary aggregates in the national currency as well. This became necessary in the wake of the continuous and relatively fast-paced growth in the share of foreign currency deposits, which primarily served as savings for households and businesses. In this context, maintaining the planned level of broad money would limit the desired growth in the demand-generating local currency portion of broad money, leading to a curtailment of aggregate demand and deflation.

This new policy, however, did not eliminate the discrepancy between the operational objective and the nominal anchor. This type of volatility would continuously impact the efficacy of the monetary aggregate targeting strategy, in turn threatening the credibility of monetary policy strategies and the standing of the central bank among the public.

In the absence of a stable relationship between inflation and monetary aggregates, as well as unstable relationships between the monetary base and broad money, other issues emerged that placed the efficacy of the monetary targeting regime in doubt. The CBA increasingly found it difficult, if not impossible, to fully manage monetary aggregates. The CBA was successfully managing the monetary base indicator, but imperfections in the monetary transmission mechanism created difficulties for managing

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to central banks in conducting monetary policy in a number of dimensions. It helps clarify both within the central bank and to the general public the (intermediate or final) objective of the central bank in carrying out policy. Thus, in the internal deliberations of the central bank, it helps to focus attention on the central objective, and prevents situations in which the members of the monetary policy decision-making body are aiming at very different objectives. A publicly announced policy anchor also helps the central bank to communicate externally both its policy goals and the reasons for changes in its policy instrument. Finally, a credible nominal anchor helps focus the expectations of the public on the policy goal, and thereby facilitates the achievement of the goal."

broad money. These included the lack of sophistication of financial markets that were just beginning to develop, the significant shadow circulation of the US dollar, and robust growth in external flows to Armenia beginning in the year 2000. These phenomena were reflected in the robust increase in demand for loans and deposits as well as fundamental changes in the structure of broad money, the level of dollarization, and the velocity of money. Demand for money was subject to real volatility, which reduced its predictability. Due to both the weakening of the monetary base-broad money relationship and the instability of the broad money-inflation connection, broad money continuously deviated from its target level. In this context, because greater priority was given to the primary objective (stable inflation rate) over the nominal anchor, the CBA, at its discretion, would regularly revise the target level for monetary aggregate indicators. Although the CBA would provide explanations to the public and other stakeholders, this would nonetheless create challenges both in managing the nominal anchor and in the public's understanding of the nominal anchor.

Table I.1.1. Target and Actual Inflation and Broad Money in Armenia, 1996-2005

		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Inflation, End of Year, %	Target	14.0	10.5	10.0	8.0	5.0	3.0	3.5	3	3	3
	Actual	5.7	21.9	-1.3	2.0	0.4	2.9	2.0	8.6	2	-0.2
Broad Money Growth Rate, End of Year, %	Target	-	17.0	14.6	14.0	13.8	16.9	8.7	12.7	12.2	18.5
	Actual	35.1	29.2	36.0	13.6	38.7	4.5	28.8	15.1	22.3	28.2

Source: Statistical Committee of the Republic of Armenia; Central Bank of Armenia

Thus, if the monetary aggregate targeting strategy implied that the target inflation level could be reached by achieving the target level for monetary aggregates, the data proved otherwise. In Armenia, it had become

exceedingly difficult to simultaneously achieve target levels for both inflation and monetary aggregates.

The absence of a stable relationship between monetary aggregates and inflation, as well as the volatility of money demand, were not the only reasons for reviewing monetary aggregate targets. Additional considerations included external shocks and, in particular, the impact of non-monetary factors on inflation.

In this environment, monetary aggregates (and in particular broad money) were not serving as a credible nominal anchor. Given the importance of the price stability objective, the CBA clearly had to select a new nominal anchor for the economy, which would be either exchange rate or inflation targeting.

C. 2006-2023: Flexible Inflation Targeting & FPAS Mark I

1. Adoption of Inflation Targeting at the CBA

Around the time that Armenia and other countries were coming face to face with the shortcomings of monetary targeting as a credible nominal anchor for policy, others were confronting their unfavorable experiences with exchange rate targeting.[9] A number of market issues with exchange rate targeting—including the growing mobility of capital, as well as impacts that asymmetric shocks could have in economies with fixed exchange rates—were casting doubt on the legitimacy of the exchange rate target as a nominal anchor. For the case of Armenia, at the time when the need to adopt a new nominal anchor for monetary policy had arisen, opting for an

[9] Several contemporary examples include the United Kingdom, Sweden, and Finland in the first half of the 1990s, as well as Argentina in 2001 (following the 1999 Brazilian crisis and the 1999-2000 depreciation of the Euro).

exchange rate targeting strategy seemed to be out of the question. In addition to the market considerations noted previously, there simply was no obvious choice for which currency to peg the Armenian dram (since no single country simultaneously dominated bilateral trade, had free flows of labor and capital, and was subject to the same types of external shocks). Clearly, neither monetary aggregates nor the fixed exchange rates could serve as a credible anchor for policy.

Beginning in the late 1980s, several countries (most prominently New Zealand and Canada) had adopted a different approach to achieving price stability, known as inflation targeting.[10] Under inflation targeting, the explicit commitment to a long-term inflation target was seen as a mechanism that could provide a nominal anchor for the economy and help the central bank achieve and maintain low and stable inflation.

Freedman and Laxton (2008) identify six essential characteristics of inflation targeting regimes:

1. The primary role of monetary policy is to provide a nominal anchor for the economy and placing weights on other objectives must not be inconsistent with providing an anchor for inflation and inflation expectations.
2. An effective inflation-targeting regime will have beneficial first-order effects on welfare by reducing uncertainty, anchoring inflation expectations and reducing the incidence and severity of boom-bust cycles.

[10] The Bank of Canada learned early on that monetary aggregates were not controllable or necessarily informative for inflation. The language that was used to describe this was that "monetary aggregates abandoned them, instead of them abandoning monetary aggregates." They also stopped using the term "money supply" and referred to monetary aggregates, in recognition that, under inflation targeting, the central bank targets a short-term policy rate in the near term and accommodates any movement in the demand for money.

3. The success of an IT regime depends on other policies that make the task of monetary policy easier and more credible.
4. Because of the lags in the monetary transmission mechanism, and because of the concern with both the deviation of inflation from its target and the deviation of output from potential, it is neither possible nor desirable to keep inflation exactly on target and in practice inflation targeting becomes inflation-forecast targeting.
5. Given the possibility of conflict between inflation targets and other objectives, central bankers must have reasonably clear objectives and sufficient independence from the political process to achieve these objectives.
6. There must be effective monitoring and accountability mechanisms to ensure that central bankers are behaving in a manner consistent with the announced underlying objectives and that monetary policy is being based on sound practices.

As early as 2003, against the growing concerns with monetary targeting and the infeasibility of exchange rate targeting, the CBA set out a vision for achieving price stability that involved better management of inflation in times of high economic volatility as well as broader institutional changes that would make monetary policy more transparent, accountable, and understandable to the public.[11] This vision went hand-in-hand with the foundational principles of inflation targeting, and served as the basis for the new approach to monetary policy at the CBA.

The relative youth of both the CBA (as an institution with well-established credibility) and the Armenian economy (in market form) appeared to pose challenges to the adoption of inflation targeting. Traditionally, inflation targeting had primarily been utilized by more advanced countries with well-developed financial markets and sophisticated transmission mechanisms. However, some developing countries had already begun to

[11] See "Vision for CBA Development," approved by CBA Board Decision N. 240, 15 July 2003.

experiment with "lite" versions of inflation targeting. Inflation targeting-lite seemed more appropriate for countries that were less economically developed; had underdeveloped financial markets; experienced a high frequency of external and domestic economic shocks; had low capacity for dealing with these shocks; did not have developed financial markets; experienced high levels of dollarization; and so on. Under inflation targeting-lite, inflation targeting coexisted with either monetary aggregate targeting or exchange rate targeting (the latter is the case of Israel and Chile). This lite institutional arrangement was intended to allow the central bank to gradually transition to a full-fledged inflation targeting regime while it worked on developing the necessary institutional, operational, and market-related foundations. To that end, inflation targeting-lite was adopted as an interim solution at the CBA, until the appropriate institutional and operational foundations could be laid for shifting to full inflation targeting. This included work towards the development and adoption of a comprehensive policymaking framework (the first iteration of the Forecasting and Policy Analysis System, or FPAS Mark I); the development of human capital, technical, and analytical capabilities to run the operational and communicational elements of inflation targeting; further investments in research and training; along with further development of the overall macroeconomic environment, including fiscal policy, financial market sophistication, and so on.

Beginning in January of 2006, the CBA transitioned to a full-fledged inflation-targeting regime. In the early phases of the transition, the CBA would announce its nominal inflation target, publish the 12 month-ahead projected path of inflation (conditional on a constant interest rate), and provide qualitative guidance on how policy could move in the future, but would not publish quantitative projections for the policy rate. The adoption of full-fledged inflation targeting was not without challenges. As noted previously, the low level of economic and financial development in the country created a number of issues, most of which were fundamental and long-term in nature, and outside of the direct scope of the CBA's influence.

But what was within the CBA's scope to address—in order to make the new inflation targeting regime more effective and viable—was the institutional and operational setup for conducting policy analysis and making and communicating policy decisions.

2. Adoption of the Forecasting and Policy Analysis System (FPAS Mark I) at the CBA

The inflation targeting strategy and regime required an entirely new institutional and operational setup at the Central Bank of Armenia for monetary policymaking. To this end, since 2006, the CBA began investing in a comprehensive monetary policymaking framework, known as the Forecasting and Policy Analysis System (FPAS Mark I), and introduced the first macro model (QPM) in 2007. In implementing FPAS Mark I, the CBA drew upon the experience of a number of institutions that had successfully utilized the FPAS, while modifying the institutional and operational arrangements to reflect the specific characteristics of the Armenian economy.[12]

FPAS Mark I emerged as a systematic framework to support forward-looking decision-making, forecasting, and policy analysis in countries that had adopted inflation targeting regimes. The best-known element of the FPAS Mark I framework was the introduction of a macroeconomic-consistent, baseline forecast, published every quarter, covering key elements of the economy and including specific projections for inflation, output, and (sometimes) the endogenous policy rate path. For this projection exercise to be useful in helping the central bank make forward-looking policy, it needed to exist within a broader framework that emphasized transparent communications and regular monitoring and

[12] This includes the Reserve Bank of New Zealand and the Bank of Canada—the pioneers of inflation targeting and FPAS Mark I—as well as other central banks like the Czech National Bank that had demonstrated the framework's usefulness in transition economies.

analysis of the economy. The specific operational practices that needed to be developed at the CBA as part of the adoption of FPAS Mark I included the following:[13]

1. Developing a system for reporting, databases, and near-term forecasting, containing the most relevant set of macroeconomic variables, to ensure that all staff and board members involved in forecasting and policymaking have equal access to the same information.
2. Implementing processes for regularly updating and sharing new information on a weekly basis, at fixed meetings, with members of the Board, in order for staff and the Board to understand how the new information would affect near- and medium-term forecasts.[14]
3. Developing a quarterly projection model (QPM) of the medium-term economy, reflecting the Board's views about the monetary policy transmission mechanism and the structure of the economy. The QPM would include a policy reaction function and impulse response functions. A dedicated projection team would be responsible for developing, maintaining, and running the models.
4. Producing macro-consistent forecasts on a quarterly basis, including ex-post assessments of risks to the previous baseline that motivate the revised forecast.
5. Providing measures of uncertainty in the forecast, including confidence intervals and fan charts, which can be used to communicate the extent of this uncertainty both internally and to the public.

[13] While not a comprehensive list, these operational elements of FPAS Mark I at the CBA are consistent with the general principles for FPAS Mark I outlined in Laxton, Rose, and Scott (2009).

[14] A formal process for weekly information-sharing, known as Weekly Monitoring Meetings, was instituted in 2020.

6. Analyzing specific risks embodied in the baseline forecast and having contingency plans for reacting to new information that arises between quarterly projections.
7. Aspiring for high standards of transparency and accountability through clear and effective communications. This includes the publication of: a quarterly inflation report with forecasts for key variables; minutes of Board deliberations; and a press release at the time of each decision.[15]

The gradual adoption of these FPAS Mark I institutional and operational practices helped support the inflation-targeting regime at the CBA. Of course, this transition did not happen instantaneously, nor did the framework achieve perfect credibility and legitimacy at once. Investing in the FPAS meant making a commitment to continuously invest in institutional development (including human capital, analytical, and procedural improvements) over time. This would be critical both for enhancing the CBA's institutional capacity to deal with risks and shocks facing the economy, as well as for strengthening the credibility of the monetary policymaking regime and framework. A significant review of the policymaking framework took place in 2011-2012, when, in addition to a number of other reforms, the CBA changed the policy and forecasting horizon from one to three years, began publishing projections based on an endogenous interest rate, introduced a new Core model, and initiated a substantial enhancement of the FPAS.

3. The Armenian Economy since the Adoption of Inflation Targeting

Since the adoption of inflation targeting in 2006 and the gradual incorporation of FPAS Mark I, the CBA has dealt with a continuous

[15] This was expanded in 2020 to include a Governor-led press conference following each decision.

succession of macroeconomic and geopolitical crises that required swift policy action. These crises posed real challenges to macroeconomic, price, and financial stability in Armenia. At the same time, in navigating these crises, the CBA took this as an opportunity to build the legitimacy of the policymaking framework. The periods of heightened risk and uncertainty are described in Table I.1.2 below.

Table I.1.2. Global and Regional Policy-Relevant Crises since the Adoption of Inflation Targeting in 2006

Period	Crisis
2008-2009	Global Financial Crisis
2009-2012	European Debt Crisis
2014-2015	Russian Financial Crisis
2020-2022	Covid-19 Crisis
2020	Second Nagorno-Karabakh War
2021-present	Russia-Ukraine Conflict
2023	Ethnic Cleansing of Nagorno-Karabakh

When the CBA instituted inflation targeting in 2006, both the global and the Armenian economies were in a highly expansionary period, with growth in the double-digits in Armenia through 2007. Oil prices and all commodity prices were high around the world, contributing to the expansion of inflation in Armenia, as the imported part of CPI was quite large. As with other developing economies, Armenia experienced substantial capital flows and foreign investments, resulting in a significant appreciation of the currency of approximately 50% and booming non-tradeable and construction sectors. During the second half of the 2000s, Armenia experienced a major real estate boom, with for-sale home prices growing dramatically (by over 250% between January 2003 and September 2007), and with the construction sector representing a significant 25 percent share of GDP. Along with strong domestic demand conditions in this expansionary period, Armenia was also subject to high imported

inflationary pressures, in part driven by high global commodity prices and the high share of imported goods in the CPI. In the context of robust demand conditions, high inflation, and a new policy regime, inflation expectations ratcheted upwards as well. The main challenge for monetary policy in the pre-Global Financial Crisis period was to appropriately respond to domestic demand expansion, given capital flows and currency appreciation, and to re-anchor medium and long-term inflation expectations to the 4% target.

Armenia was significantly impacted by the global demand contraction caused by the Global Financial Crisis. As with other emerging economies, Armenia faced a significant reappraisal of the country risk premium, resulting in a sudden stop in capital flows and consequent contractions in demand. The sharply negative (double-digit) economic contraction of 2009 was followed by a period of slow recovery. Due to the significant accumulation of public and private debt in order to support the growth that appeared to suffer from structural problems, the sustainability of debt levels became a key question, reflected in a persistently high risk-premium.

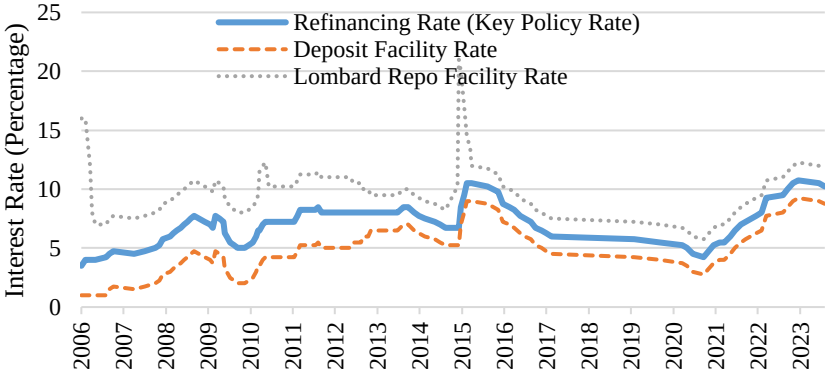
After a slow recovery marred by the European Debt Crisis and numerous supply shocks, the end of 2014 brought a new wave of challenges. Geopolitical conflicts in Crimea and the Donbas, along with the global oil price shock of 2014, resulted in a worsening outlook for the Russian economy. The resulting sharp depreciation in the ruble spilled over to other regional currencies, including the Armenian dram. Depreciation pressures in the domestic currency market, coupled with the speed at which prices of certain goods grew on the back of a depreciating local currency, caused inflation expectations to destabilize. This led to a sharp increase in demand for goods and foreign currency, amplifying inflationary pressures and jeopardizing policy credibility. The monetary policy response was immediate and sharp, with substantial tightening of financial conditions (more than 12 percentage points on impact increase in the effective

operational policy rate since the end of 2014), which helped to contain inflationary pressures and stabilize financial markets.

Given the high degree of uncertainty, inflation expectations and risks for destabilization continued to remain high. Even though headline inflation had begun to decline, and the period beginning in 2015 was, on its own, deflationary, the CBA remained concerned about inflation expectations potentially remaining high and above target levels. As a result, the central bank adopted an opportunistic disinflation stance beginning in 2015, leading to inflation expectations decelerating significantly. This process was essential in building public trust and credibility in the policymaking regime and framework. It also demonstrated the CBA's commitment to acting preemptively and opportunistically to enhance its credibility and bring about price stability. This strengthening of trust and legitimacy in the framework over the second half of the 2010s would prove essential for navigating the immense challenges, risks, and shocks facing the Armenian economy in the early 2020s.

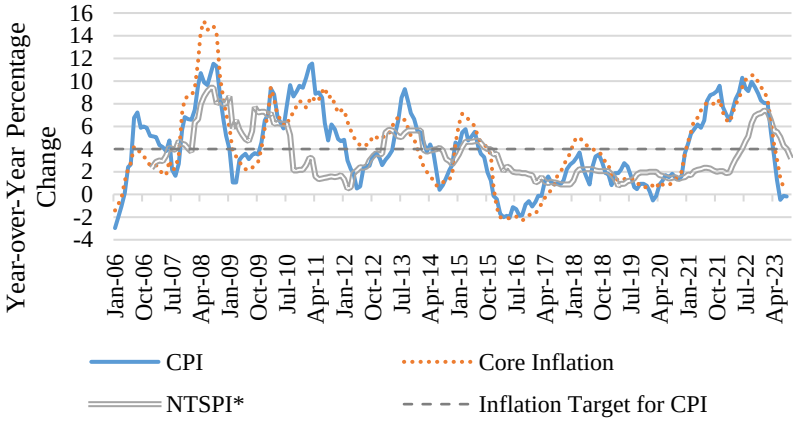
Figure I.1.1. Development of the Armenian Economy since the Adoption of Inflation Targeting in 2006

Panel A. Central Bank Policy Rates



Source: Central Bank of Armenia

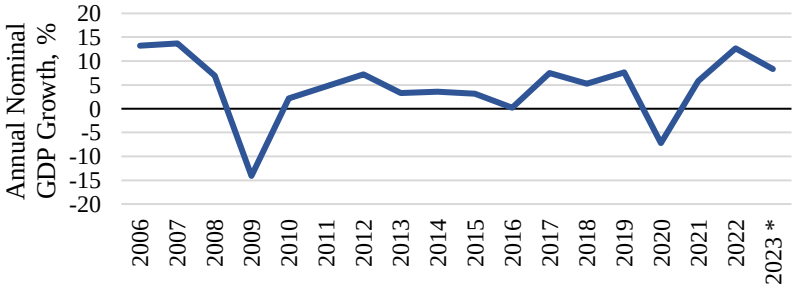
Panel B. Inflation in Armenia, Year-over-Year



** NTSPI refers to Non-Traded Sticky Price Inflation, an alternative measure of inflation developed at the CBA. Refer to Chapter V, section B.2.*

Source: Statistical Committee of the Republic of Armenia; Central Bank of Armenia

Panel C. Annual Nominal GDP Growth, Year-over-Year[16]



Source: Statistical Committee of the Republic of Armenia; Central Bank of Armenia

[16] Data for 2006 to 2022 based on Statistical Committee of the Republic of Armenia (SCRA). The SCRA provides the following note: "Since 2015 the GDP is compiled by Statistical Committee of RA according to System of national accounts 2008 (SNA 2008) international standard. GDP indicators for the period 2012-2014 also have been revised according to SNA 2008 which are not comparable with the GDP indicators in this [dataset] for the period 1990-2011 which had compiled according to System of national accounts 1993 (SNA 1993) standard." 2023 data is unofficial and is based on the Q4 2023 CBA projection.

The early 2020s brought about an unprecedented succession of crises. The Covid-19 pandemic generated incredible disruptions to global supply chains, which, coupled with social distancing requirements for workers, represented major supply shocks. At the same time, the crisis generated parallel demand shocks, with consumers demonstrating hesitation to maintain pre-Covid levels of spending in the face of the public health crisis and restrictions on their free movement. These shocks were further compounded by Azerbaijan's war of aggression against Nagorno-Karabakh in the autumn of 2020, in the midst of the pandemic. The war resulted in over 3,800 combat deaths and hundreds of civilian casualties in Armenia alone, as well as the forced displacement of tens of thousands of civilians. The combination of war and pandemic created a sharp drop in demand for goods and services, leading to a decline in the prices of certain items in the CPI basket. While the double shock also affected the supply side of the economy and damaged some part of potential, the demand deficiency dominated in the initial phase, and general consumer price inflation actually slowed down following similar trends at the global level between March 2020 and March 2021.

At the end of 2020, the CBA was growing concerned about the prospect of a quicker-than-anticipated recovery of pent-up demand and the resulting potential increase in inflation expectations. The CBA thus acted in a proactive and forward-looking manner—as one of the first central banks in the world—to raise interest rates, by one percentage point in December 2020 when inflation was still below the 4% target. The CBA made clear that maintaining its credibility and commitment to price stability were of paramount importance, and that it stood ready to act prudently (and even preemptively) to mitigate any risk that threatened this. The continued tightening of policy helped to control inflation and contain expectations. Thus, by February 2022, inflation in Armenia stood at 6.5%, down from its peak of around 10% and was gradually drifting down to the target, while in most countries inflation continued to accelerate.

Just as inflation was beginning to come under control, the sharp escalation of the Russia-Ukraine conflict in February 2022 created new challenges for monetary policy and the economy at large. At that point, there existed significant uncertainty about the economic consequences for Armenia, with vastly different implications for policy. The traditional view (based on a backward-looking comparison to other shocks emanating from Russia) was that this would result in a negative external shock to Armenia, given the close economic ties with Russia and the experience of the 2014 crisis. On the other hand, an alternative view held that some of the spillover effects would create positive growth opportunities for Armenia, given the potential for new flows of capital, people, entrepreneurship, tourism, and so on. In this period—just as in the preceding crises—policy decisions would have to be made amidst high uncertainty, with no obvious answer as to which interpretation would prove to be correct. The CBA adopted a cautious stance, clearly communicating to markets the level of uncertainty and potential for divergent outcomes, but at the same time conveying a steadfast commitment to acting prudently to maintain stability in the event that either scenario materialized. As the events unfolded, it quickly became apparent that the alternative interpretation better aligned with what was actually occurring. Over the course of 2022 and extending into 2023, Armenia experienced a significant inflow of international visitors and capital. This represented a broad external demand shock that drove growth in services, construction, and exports and significantly accelerated the development of the information technology sphere, while also generating new inflationary pressures and overheating in the labor market. In these robust growth conditions (where growth comprised 12.6% in 2022), domestic demand conditions expanded as well, spurred by high consumption sustained by growing wages, spending of excess savings accumulated during the Covid period, and to a lesser extent expansion in consumer loans. These developments required a continued aggressive tightening of the policy stance. In total, since the first policy rate increase in December 2020, the CBA increased the policy rate by 650 basis points, to a peak of 10.75% in December 2022.

In 2023, as global commodity prices continued to cool, global demand conditions began to slacken amidst risk of global economic slowdown and weakening financial conditions in many of Armenia's key trading partners, and as the restrictive effects of the CBA's policy began to be felt, headline inflation began to decline in the spring, dipping below target levels and even into negative territory by mid-2023. While being cautious of underlying inflation (as reflected in non-traded sticky price inflation remaining above headline numbers), the Board of the CBA began to very gradually and conservatively lower the policy rate, maintaining a less restrictive but still relatively tight policy stance through the end of 2023.

II. The Need to Evolve the Framework

Martin Galstyan, Douglas Laxton, and Armen Nurbekyan

As described in the prior chapter, Armenia faced a successive layering of crises in the early 2020s, from the global Covid-19 pandemic, to the 2020 Nagorno-Karabakh war, to the spillover effects of the Russia-Ukraine conflict, to the ethnic cleansing of Nagorno-Karabakh by Azerbaijan and subsequent flow of over 100,000 refugees to Armenia. Of course, some of these crises were local in nature and specific to Armenia, while others were global phenomena with implications for virtually every country and economy. These crises were all, to varying degrees, unprecedented, in the sense that policymakers could not simply look back to prior events to gauge the appropriate policy response. Fraught with significant uncertainty and a multiplicity of varying interpretations of these events that would have vastly different implications for policy, the CBA had to appropriately manage the balance of risks without underselling how much uncertainty actually existed about how the economy would develop.

From the perspective of monetary policy, these successive crises exacerbated two types of challenges that monetary policymakers always face. First, the macroeconomic and other environments are fraught with significant risks, which the central bank must manage and mitigate in service of its price stability objective. Second, monetary policy decisions are always made amidst high uncertainty, and the central bank—like any other market agent—cannot, with any degree of certainty, anticipate how the future will unfold. In particularly turbulent times, when the latent risks pose greater dangers to near- and long-term stability, this uncertainty is obvious and easily understood. But even in relatively "normal" times, uncertainty about current economic developments, their drivers, and where they might be headed—including various interpretations of historical and current phenomena—remains pervasive.

The experiences of the early 2020s, along with this fundamental worldview that views risk and uncertainty as essential and pervasive phenomena, spurred us to ask very fundamental questions about the nature of what constitutes good policymaking and good policymaking frameworks in this new period of greater risk and uncertainty:

- Is it possible, or desirable, to center our policymaking and communications around a single interpretation of what is happening, and attempt to precisely forecast that future with any degree of legitimacy?
- What type of communications would effectively convey the richness and complexity of our policy discussions, without minimizing the uncertainty we face or limiting our policy agility when new information arises?
- How can the policymaking process and framework be structured to effectively manage the high degree of risk and uncertainty that is always at the core of policymaking?

Motivated by these essential questions, this chapter explores limitations of the existing, "best-in-class" flexible inflation targeting frameworks known as the Forecasting and Policy Analysis System, or FPAS Mark I. The issues with the existing frameworks have served as an important motivation for the development of FPAS Mark II at the Central Bank of Armenia.

A. Baseline Scenario Trap

1. Introduction: Assessing the Purpose and Usefulness of Baseline Scenarios

Central banks that practice inflation targeting and the Forecasting and Policy Analysis System seek to make monetary policy decisions in a "systematic, forward-looking fashion, informed by economic data and

analysis." [17] The ultimate goal of monetary policy under such a framework is to soberly assess current and underlying economic conditions (including identifying key risks and areas of uncertainty) and consequently take the appropriate policy stance to stabilize the economy and bring inflation back to target. For most inflation-targeting central banks, the baseline scenario has historically served as the primary vehicle for communicating this forward-looking policy and analysis. The baseline forecast is designed as a comprehensive macroeconomic forecast for central variables including inflation, output, and an endogenous policy rate.[18] In service of supporting effective monetary policymaking, the specific purpose of the baseline scenario, as described by the IMF and many central banks that publish baselines, is generally defined to be to:

1. Provide a macro-consistent narrative that embodies the institutional view on current and underlying economic conditions;
2. Indicate the direction that policy is going to be headed in order to bring inflation back to target levels over the medium-term forecasting horizon.

Given these aims, several questions naturally arise: does the baseline forecast succeed in achieving this objective? Are there inherent limitations to the baseline that stand in the way of reaching this objective? If so, is there a better approach to reaching this objective? This section explores these questions in detail.

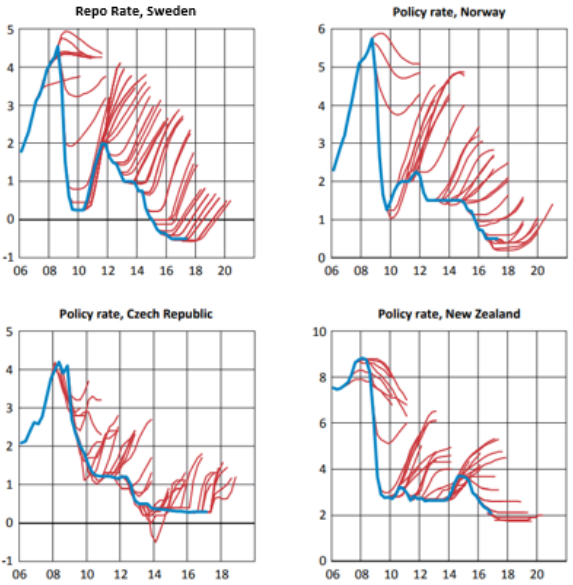
2. The Problem Posed by Forecast Errors and Attempts to Circumvent Them

Evidence has been accumulating of serially correlated forecast errors associated with the slow updating of central banks' understanding of

[17] Laxton, Rose, and Scott (2009).
[18] See Mæhle et al. (2021).

prevailing system dynamics. Figure I.2.1 presents a comparison, from Alsterlind (2017), between policy rate forecasts and the actual rate cross four central banks (Sweden, Norway, Czech Republic, and New Zealand).[19] These central banks, despite differences across time/geography/economic conditions, consistently overestimated the actual policy rate in similar ways; earlier, unpublished records similarly show a consistent tendency to underestimate the policy rate when economic activity and inflation pressures are above target and calibrated "normal" levels.

Figure I.2.1. Policy Rates vs. Forecasts; Selected Countries, 2006-2021



Source: Alsterlind (2017)

[19] We note that these central banks are frequently considered to be among the best FPAS Mark I institutions in the world. In presenting examples of their forecast errors, we do not seek to single these institutions out or imply that this is a unique problem for these central banks alone. Rather, this shows that this issue is almost universal and inherent to the act of forecasting for policy, and even the best central banks are not immune. Interestingly, as Alsterlind points out, forecasts systematically overstated what actually happened for virtually the entire post-GFC perio.

In response to this issue of accuracy, a common defense of the baseline forecast is that forecasters know well—and seek to explicitly communicate—that forecasts are going to be wrong. The IMF explicitly acknowledges that "forecasts are wrong most of the time…accordingly, forecast accuracy […] is a poor metric for usefulness…"[20] This counterargument, offered by proponents of the baseline, holds that the value-add of the baseline forecast does not lie in its ability to serve as an accurate forecast, but instead, should lie in the "knowledge obtained during the forecasting process and the ex post forecast evaluation [that] may be as important as the numerical forecasts themselves."[21] In other words, the output of the forecast, on its own, is of little value, but the process of making the forecast (which requires thinking critically about the economy and policy responses to various types of risks and shocks) and reviewing the reasons for its inevitable inaccuracies (understanding the causes of unforeseen risks, issues with expert judgment, and so on) is the greatest source of usefulness for the baseline forecast.[22] Given this realistic assessment of the value-add of forecasting, it is difficult to justify the excessive cost that the baseline scenario imposes on the effectiveness of monetary policymaking and its communications.

Specifically, this nuanced understanding of the benefits and limitations of forecasting—that the forecast is almost always wrong, but the means justify the ends—is generally lost on the key stakeholders of monetary policy communications, whether they be financial markets or the general public. Audiences tend to view the baseline as containing a degree of certainty, as representing the authoritative experts' view on how the future is going to unfold. This provides a false degree of assurance to the public about future economic developments and minimizes the level of uncertainty in the forecast, even if the authorities caution against this and do not intend for

[20] See Mæhle et al. (2021).
[21] Ibid.
[22] Ibid.

the forecast to be interpreted in this way. Anecdotal evidence from monetary authorities' interactions with the public, government, and other stakeholders who are not involved in the forecasting process, further support this claim. As a result, the central bank is seen as being an "export forecaster," one that can identify the "most likely" future with a degree of confidence. Not only does this mischaracterize the fundamental purpose of the central bank in making monetary policy, it also unnecessarily ties the central bank's credibility to its ability to make precise forecasts.

Relying on a baseline scenario as the chief communications vehicle also minimizes the uncertainty that is inherent to making monetary policy. This includes uncertainty about the state of the economy and current economic conditions, including those caused by incomplete or oft-revised data; uncertainty about unobservable variables that are essential for setting policy, such as potential output, the natural rate of unemployment, and so on; uncertainty about the structure of the economy and the transmission mechanism; uncertainty about the sources, magnitude, and danger of various potential risks and shocks, including unforeseen ones; uncertainty about the behavior of outside actors (both domestic and foreign) that have implications for monetary policy; and so on.[23] Not only is the future essentially unknowable, many things about the present are also far from being perfectly clear.[24] When the central bank publishes a baseline forecast, it relies on a single set of assumptions, interpretations, and judgments about these fundamental areas of uncertainty. Taking such a simplistic and singular view about a multitude of unknowable facets of the economy unintentionally masks this fundamental uncertainty, and conveys to markets a far greater degree of assurance in this interpretation than policymakers themselves have. As the following section shows, this

[23] See Issing (2002).

[24] In addition to the sources of uncertainty noted here, William White (former Economic Adviser and Head of the Monetary and Economic Department at the Bank for International Settlements) frequently emphasizes that the fundamental source of uncertainty is that the economy is a complex, adaptive system (CAS) nested within other CAS (political, environmental, etc.).

minimization of uncertainty can have negative impacts on policy agility and delay appropriate policy actions, creating avoidable negative welfare outcomes for the general population.

Further, there is little disagreement with the argument that the benefits of forecasting derive from the information learned during the process of forecasting, rather than the accuracy of the numerical projection. With a baseline approach, undue and often unintended emphasis is placed on that portion of the forecasting exercise that is least useful (the numerical outputs), when far greater attention should be paid to the former. The qualitative portion of monetary policy communications and forward guidance—including narrative-based discussions around economic conditions, uncertainties, and risk—need to embody precisely this approach, and ought to receive greater emphasis in all communications. They must strive to convey the dynamic nature of policymaking and economic analysis, and communicate how the central bank is thinking about key uncertainties and what implications they may have on the economy. This should not be an exclusively internal affair or part of an ex-post assessment, but should be an inherent part of transparent communications with the public. The quantitative portion (e.g. the scenarios), meanwhile, should be constructed and communicated so as to illustratively and quantitatively convey these key messages and narratives. Scenarios should not exist "in spite of" narratives and self-reflection—as is the case with the baseline forecast—but as illustrative and quantitative representations of them.

3. Limiting Policy Agility in the Face of Great Uncertainty

As the prior section described, there exists fundamental uncertainty (about current economic developments, about unobservable variables, about latent risks and their potential developments, and so on) that is always at the core of making monetary policy. The baseline forecast, for the reasons

mentioned previously, can mask this fundamental uncertainty by providing an overly simplistic, singular projection of the future that embodies only one interpretation of each core area of uncertainty. The result is the communication of a false sense of assurance around the baseline's interpretation of current and future economic developments, which will inevitably prove to be false.

But the core flaw of the baseline projection goes beyond mere theoretical considerations—it can have real, adverse impacts on the central bank's policy agility and its ability to make the appropriate policy decision. As noted extensively, when relying on a baseline forecast, the central bank communicates a single, inherently flawed interpretation of current and future economic developments. This can be highly problematic when the policy-relevant future is unknowable, particularly when the economy inevitably evolves in a different direction than what the central bank had been describing in its baseline projection.

The fundamental essence of good monetary policy within a robust framework is responding appropriately and sufficiently aggressively to developments in the economy that threaten to destabilize the macroeconomic environment and impede achievement of the price stability objective. Achieving this objective requires policy to be agile and able to appropriately respond to anything that threatens price stability. When the central bank relies on a singular baseline, it commits itself to a narrow interpretation of the economy that makes it much more difficult to respond to new information or developments in the economy that run counter to this narrative. In this sense, policymakers' hands are tied by their previous communications. If new information emerges that requires a different interpretation of current or past economic developments than what was communicated in the baseline, the central bank has to risk contradicting itself, admitting fundamental errors in its original interpretation, and taking a policy stance that is sometimes drastically different than what was previously communicated. This is the most significant problem with the

baseline: it amplifies uncertainty about policy itself, limits policy agility, and unnecessarily places central bank credibility at stake.

The experience of many advanced economy central banks during the inflationary period of the Covid-19 crisis makes this point clear. When inflationary pressures first began to emerge in 2021, there existed significant uncertainty and wide-ranging interpretations about what was driving the increase in inflation, with dramatically different implications for policy. Without oversimplifying the diversity of viewpoints held by experts (including central bankers, academics, pundits, and so on), these varying interpretations can be roughly classified into two schools of thought.

- **Group A: Inflation is Persistent:** In the context of the large fiscal stimulus bill in early 2021, many experts, chief among them Lawrence Summers, argued that the combined fiscal and monetary stimulus was excessively large. In particular, the primary concern that this camp voiced was that inflation not only was being driven by temporary supply-side factors related to pandemic-related disruptions, but also, was caused by a robust expansion of aggregate demand that was beginning to push up against aggregate supply, and thus translating into higher inflation. This interpretation, which emphasized the expansionary demand conditions as a key driver of inflation that was not going to dissipate on its own, would necessitate aggressive policy action by monetary authorities to prevent inflation expectations from de-anchoring from the target.
- **Group B: Inflation is Transitory:** Others argued that supply-side factors connected to the COVID-era economy of supply-chain disruptions were the main contributor to the rise in inflation. Therefore, given what was assumed to be the temporary nature of these supply-chain disruptions, inflation was expected to peter out over the coming months. Thus, the policy rate path could

> normalize in line with a still-recovering labor market. Additionally, some policymakers' preference for this scenario at the time may also have reflected their reasonable fear that a pre-emptive tightening of monetary policy to get ahead of inflation could have easily thrown a still recovering and fragile economy back into a deflationary environment—precisely the type of situation that policymakers had spent over a decade trying to escape.

Clearly, there existed significant uncertainty about the causes of inflation and the appropriate policy response, both among "expert" pundits and within monetary authorities' decision-making bodies. However, this nuance and the extent of this uncertainty was not emphasized in central bank communications. Believing in the Group B interpretation, advanced economy monetary policymakers spent much of the early inflationary period telling the public and markets that inflation was a transitory phenomenon largely driven by supply-side factors. They communicated that interest rates would not need to rise dramatically to curb inflation. This approach encapsulates how policy is made and communicated in a "baseline" world: to pick a single interpretation about what was happening, and communicate that with a degree of confidence and assurance to markets.[25]

Throughout the rest of 2021, it became increasingly clear to policymakers that this initial (Group B) interpretation of inflation as transitory were proving to be false. New data and information about the economy was more supportive of the viewpoint of Group A, that inflation was more persistent and driven by demand-side factors. As policymakers progressively warmed to this interpretation, they found themselves in a major communications bind. After spending months talking about inflation being transitory and not requiring a sharp policy response, how could central banks now admit

[25] The issue with baseline communications was further compounded by unconventional forward guidance about future short rates.

their error and signal that policy rates would need to rise sharply to curb persistent inflationary pressures? Of course, having to reverse course came at great welfare cost. The difficulty in switching messaging so dramatically without causing undue stress to markets caused the policy response to be delayed, meaning that many advanced economies fell "behind the curve" in aggressively raising interest rates to curb inflation. This allowed inflation to persist for longer than needed, and more importantly, allowed medium- and long-term inflation expectations to rise.[26] This represented a meaningful loss in credibility for advanced economy central banks that had long assumed credibility to be a "given."[27]

This self-imposed communication challenge would not have existed if policymakers did not go out of their way to minimize the amount of uncertainty they face when making decisions, as they do when relying on the baseline projection.[28] Rather, by being transparent about this core

[26] Delaying the rise in rates also meant that the policy response arguably needed to be more aggressive than if the central banks had acted earlier or even pre-emptively.
[27] Refer to Kostanyan et al (2022c).
[28] Of course, central banks attempt to address this issue through two approaches. First, through measures of uncertainty (known as fan charts) that visually represent the assumed range of variability in outcomes. Second, by providing alternative scenarios for specific assumed shocks. See Al-Mashat in *Advancing the Frontiers of Monetary Policy Transparency (2018).* While these approaches may nominally serve to limit the risk of providing false assurances about future developments, they are not sufficient. The first approach is problematic because fan charts do not necessarily provide a narrative or conceptual link that clearly ties together what types of risks/shocks/developments would need to unfold for a given outcome to materialize. In this sense, it functions best as a visual, albeit superficial, representation of uncertainty, but this is hardly sufficient. See Goodhart and Pradhan (2023) for a lengthy critique of the insufficiency of fan charts to accurately reflect volatility in outcomes. The second approach—providing alternative scenarios—raises similar concerns about the baseline, in that it is simply another version of the baseline projection that embodies a different set of assumptions, which are equally narrow and just as likely to prove false. Moreover, because of how these scenarios are presented ("baseline" versus "alternative"), audiences are less likely to place meaningful emphasis on the alternative scenarios, viewing them as carrying less weight than the baseline in the minds of policymakers.

uncertainty, and communicating monetary policy analysis and decisions in a way that does not provide a false sense of security or confidence when planning, policymakers would find it easier to quickly respond to new economic developments that require swift action. Prudent monetary policy decisions would not be unnecessarily impeded or delayed by the need to backtrack prior communications or risk taking hits to credibility. Instead, policy could be more agile, and could be used to meet objectives at less cost and welfare burden to the public.

B. Limitations of Linear Model Dependency

1. Rudimentary Approach to Nonlinearities

A major drawback of FPAS Mark I was a rudimentary handling of non-linear dynamics in models and analysis. Important nonlinearities associated with monetary policy (for example, those related to the Effective Lower Bound (ELB) on policy interest rates, the presence of rationally inattentive agents, and endogenous policy credibility) were not attended to. Instead, a simple open economy gap model closed by an endogenous monetary policy reaction function (BKL, 2006a, b) was the preferred workhorse model. It captured the major elements and principles of monetary policy needed for the task of regaining nominal stability; these elements remained suitable for the Great Moderation that followed. Inflation was successfully brought to low levels and kept low without notable additional challenges. Issues around the ELB subsequently became a major topic of discussion, but greater attention was paid to financial stability implications than nominal stability ones. Modeling innovations focused on adopting DSGE methods and on proxying the policy effect of QE as an instrument in some way, such as via the term premium on long-term bonds.

A more fundamental issue arises with the policy implications of assuming linear relationships for processes like the relationship between inflation

and output (e.g. Phillips curve) and credibility (e.g. endogenous versus exogenous), particularly in terms of how the welfare implications are understood. Policy in a linear world—where the relationship between inflation and output is assumed to be linear, and where policy credibility is exogenously perfect—appears to be a rather simple task, where the consequences of policy errors are not very costly, and the welfare implications are only second order. In instances where central banks make policy errors that result in an adverse inflation-output tradeoff (e.g. unemployment rises higher and is more persistent than it otherwise would have been), policymakers can simply blame "bad luck" or shocks instead of their own flawed policy choices. In reality, however, policy errors can be extremely costly in terms of their first order welfare implications, and these processes unfold in nonlinear ways.[29]

Both analytical research and experience have demonstrated the nonlinear relationship between output and inflation. This nonlinearity is particularly stark when excess demand pressures are higher; as the output gap gets closer to the maximum possible excess demand pressures of the economy, the slope of the Phillips curve gets steeper and steeper.[30] From a real-world, policy perspective, understanding this nonlinearity and incorporating it within analytical toolkits is critical. If policymakers allow inflation to persistently remain high and spiral out of control, and allow inflation expectations to become de-anchored from the target, policy would need to be tighter into the future, and the average level of unemployment would be higher into the future as well. In other words, the convexity of the Phillips curve would mean that the first-order welfare implications of not acting

[29] This idea is explored in depth in Isard and Laxton (1996).
[30] Refer to Kostanyan and others (2022b) and (2022c). This follows the logic of the relationship between output gap and unemployment gap set forth by Okun's Law, in that a very high output gap would result in an unsustainably low unemployment gap.

sufficiently aggressively with policy in response to high inflation, in terms of a higher average level of unemployment, would be meaningful.[31]

The other crucial nonlinearity that most linear approaches ignore, with adverse first order welfare implications, is policy credibility. Credibility is equivalent to the reputation that the central bank has developed by specifying a numerical objective for long-term inflation, and by whether or not it has been able to achieve that target on average over time.[32] The public will obviously be skeptical if the performance of the central bank has allowed periods of high and variable inflation. It is therefore important to think of credibility as a stock, in the sense that it depends on the accumulated performance of the central bank over time.

Standard linear models presume perfect levels of central bank credibility, but as periods of high or persistent inflation demonstrate, central bank credibility is often, if not always, imperfect. This observation is critical to understand because the concept of central bank credibility depends on how well medium- and long-term inflation expectations are anchored. If the former is allowed to deviate persistently from the target, this will eventually result in a loss of credibility, where long-term inflation expectations ratchet upwards and the expectational process that governs wage- and price-setting

[31] The nonlinearity of the Phillips curve is forcefully presented in Debelle and Laxton (1997). Further research demonstrates issues with how linear models and prefiltering affect how the Phillips curve is understood. Laxton, Rose, and Tambackis (1999) show that when researchers pre-filter data with any measure of central tendency (e.g. time trends, HP filter, or any univariate filter), this will always bias against finding asymmetry. Asymmetry implies that the actual gaps will not be symmetric (i.e. MP will have to generate excess supply to offset inflationary effects of excess demand).

[32] The term “on average” is simply meant to represent that many measures of inflation contain significant noise in the data, and even if a central bank was behaving perfectly, inflation will not be equal to the target on a period-by-period basis.

behavior starts to reflect higher medium-term inflation expectations.[33] In the limit, a central bank can face dollarization, when inflation uncertainty is so high that it is no longer rational for agents to price important goods and services (e.g. housing, cars, and durable goods) in the domestic currency.

Because linear models (and many policymakers that rely on them) assume that credibility is exogenous and perfect, they ignore the reality that credibility can be lost if policy does not act sufficiently aggressively to avoid inflation from becoming high and persistent. This results in a systematic underestimating of the extent of the policy response needed to bring inflation down and anchor medium- and long-term inflation expectations to the target. Assuming perfect credibility tricks policymakers into ignoring the linkages between their policy actions and inflation and expectational outcomes, which means that there is little incentive to act aggressively to bring inflation back to the target, because there is no hit to credibility if inflation is allowed to be high and persistent, and there is no price to be paid later on.

Due to the crucial nonlinearity in the credibility generation process, once credibility is lost, it is very difficult to regain, and the re-accumulation of credibility occurs only gradually. The central bank has to eventually pay for the higher inflation that it allowed to persist, particularly because of the flawed assumption that inflation expectations are always going to be anchored to the target. The delay of necessary policy action ends up

[33] It can be dangerous to assume that inflation expectations are always forward-looking, as the empirical evidence suggests that they are clearly backward-looking in many environments. In general, inflation expectations are better thought of as having a combination of both forward- and backward-looking components. To make an imperfect analogy, the process by which inflation expectations are formed is not dissimilar to the process of firms fixing prices for a period of time (e.g. one year). Just as firms would look out one year and back one year to understand where to set prices, a similar ex post and ex ante logic follows how inflation expectations are formed. Rudd (2021) makes the case for thinking critically and sensibly about the expectations channel rather than "adhering to it uncritically."

resulting in a greater cumulative output loss and first order welfare implications for later inflation stabilization.[34]

Taken together, models with local approximations that assume that the Phillips curve is linear fail and that credibility is exogenously perfect fail to appreciate that in areas of excess demand, particularly as the economy nears its maximum potential output, the convexity of the Phillips curve means that the inflationary consequences are going to be greater and greater—and this relationship is not linear. Linear models that do not take this crucial characteristic into account fail to communicate to policymakers the importance of acting quickly and aggressively to reach their policy objectives. This is a recipe for severely mismanaging the inflation-output and inflation-unemployment tradeoff.

The welfare implications of these lines of thinking cannot be overstated. This belief in perfect credibility and thinking in a linear world creates complacency about assessments of the relative lower output and inflationary costs of a given shock. As a result, there can be an undershooting of the policy response in the magnitude of necessary rate increases, resulting in a failure to lower inflation and allowing medium- and long-term inflation expectations to ratchet significantly upwards. This would have serious welfare impacts in the long run as well, as in reality, it would require the central bank to eventually make a much more drastic rate increase at a later point in the future in order to overcome inflation,

[34] This, in many ways, is akin to what took place in advanced economies such as the US during the Great Inflation of the 1970s, when policymakers believed they had perfect credibility, ignored crucial nonlinearities in their thinking and analytical tools, delayed the necessary policy response, and thus allowed inflation to become entrenched and a stagflationary environment to emerge. Inflation was only broken by Volcker's extremely aggressive increase of the policy rate to 20 percentage points and a fairly severe recession. Even still, credibility (i.e. long-term inflation expectations) took over a decade to become well-anchored to the point target. Worryingly, echoes of this were seen in the macroeconomic situation in advanced economies during the Covid era, which is explored further in Kostanyan and others (2022c).

which would result in a far worse inflation-output tradeoff and potentially lead to stagflation.

2. Modeling as the End, not the Means

Economic models can be incredibly useful tools for policymakers and economists to study the economy, test hypotheses, run simulations of specific scenarios, and so on. The advent of advanced modeling techniques over the past several decades, including DSGE models and various filtering techniques, have continued to push the boundaries of what can be simulated and to what degree of complexity and specificity. These are certainly welcome developments; advanced modeling tools play an important role in helping quantify economic narratives and providing policymakers with useful reference points for discussion and deliberation. This is equally true under FPAS Mark II, where an important innovation is the use of analytical tools that include nonlinearities.

At the same time, concurrent with the continued advancement and proliferation of models, there has been a tendency by economists of all walks—from policymakers to academics to macroeconomists in central banks—to mischaracterize the value and applications of these models and their outputs. On the academic front, advanced quantitative techniques have been employed in attempts to obfuscate the "social" roots of economics as a social science. This, of course, has minimized the amount of attention that is paid to arguably the most important considerations for economic analysis: thinking critically about behavioral, psychological, social, and other considerations. Economists must have views and hypotheses about these factors that are rooted in sensible, qualitative analysis; quantification cannot provide an easy escape from this.

Second, and in tandem with the first phenomenon, many institutions have placed undue emphasis on what can be accomplished using models and how their outputs can be applied. Rather than being realistic about what

models actually are (vastly oversimplified representations of a hypothetical reality that embody a multitude of assumptions and judgments) and how they ought to be used (as one of several tools and reference points that economists use to make judgments about the economy and implications for policy), policymakers and economists alike tend to overstate the accuracy and applicability of models and their outputs. At many central banks, common responses by economists and policymakers to complex economic questions might begin with expressions such as "the model says …, therefore …" or "the Kalman filter says …" In this context, models have become a substitute for critical economic thinking. Excessive emphasis is placed to how models are constructed and what their outputs are, but not enough attention is paid to the underlying economics. This can be particularly dangerous for new recruits and more junior staff, who fail to properly contextualize the value of their quantitative work.

III. Monetary Policy as Risk Management: The Theory behind FPAS Mark II

Hayk Avetisyan, Martin Galstyan, Douglas Laxton, and Armen Nurbekyan

A. The Theory of Monetary Policy as Risk Management

In an important speech to the economics community in 2004, then Chair of the Federal Reserve Alan Greenspan argued for a risk management approach to monetary policy. Rather than configuring policymaking as an optimization exercise, "the risk management framework emphasizes understanding as much as possible the many sources of risk and uncertainty that policymakers face, quantifying those risks when possible, and assessing the costs associated with each of the risks."

Monetary policy as risk management may have started as early as February 1994, when the Fed took preemptive actions to raise rates before clear signs of rising inflation had emerged. Goodfriend (2010) considered this to have been only the second time that the Fed had taken preemptive action of this nature. In Greenspan's telling, waiting to raise rates until there was clear evidence for rising inflation would allow inflation expectations to ratchet upwards; this provided a justification for raising rates earlier. These increased inflation expectations would then require much higher interest rates and larger (cumulative) unemployment costs to bring inflation back to levels consistent with objectives. If, on the other hand, inflation were to not rise even though unemployment fell below the 6 percent estimated non-accelerating inflation rate of unemployment (NAIRU), interest rates could

be cut and objectives could be met without a nonlinear rise in unemployment costs.[35]

The Great Moderation seemed to render MPRM unnecessary. Policy gradualism, designed to introduce history dependence in the policy process, was considered an efficient way of harnessing private expectations to amplify the power of policy impulses (through the impact on long rates) without causing costly short rate volatility (Woodford 2003). Policy inertia increased, possibly spurred by the growing tendency to project the future of policy (forward guidance) and the associated potential for markets to perceive excessive commitment to the advertised policy rate path. This created taper-tantrum risks that make central banks more hesitant to respond to unexpected realizations (Bernanke 2022).[36]

However, subsequent shocks, along with revelations of the limitations to central bank understanding of current economic dynamics, brought MPRM back into the lexicon of central banking. A brief selection of quotes from a rapidly growing body of references to MPRM illustrate that central bankers are increasingly aware of the challenges caused by uncertainty, including for the use of policy forecasts and forward guidance as tools.

Poloz, former Governor of the Bank of Canada, *Monetary policy in unknowable times,* May 25, 2020[37]:

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[35] Underlying this cost-benefit analysis was a particular view of the Phillips Curve with convexity and endogenous policy credibility, a view challenged by Stiglitz, who argued that the Phillips Curve was concave (meaning there might be benefits from experimenting with lower levels of unemployment)—see Isard and Laxton (1999).
[36] Policy inertia is unlikely to be a function only of "optimal" gradualism and lock-in associated with forward guidance. Bordo and Levy (2022) document a history of Fed inertia around exits from periods of easy policy. An, Jalles and Loungani (2018) document a strong tendency for official sector and private forecasts to miss turning points towards recessions; recognition lags are likely to be a feature of slow policy response.
[37] See Poloz (2020)

> Moving monetary policy from the theoretical, or formulaic, space into a problem of risk management acknowledges and accepts the uncertainties inherent in policy making. This does not mean rejecting the use of models in decision making. In fact, the Bank's various models provide the base case that serves as the starting point for deliberations. They are also used to simulate alternative scenarios, which is an excellent means of reaching a fuller understanding of the risks we face. The essence of risk management is identifying the most important risks and uncertainties around the outlook. We examine the probabilities that the risks will be realized, consider alternative futures related to uncertainties and think about the potential consequences of making a policy error. We then choose a policy course that weighs these risks and uncertainties in order to best manage them…
>
> …Given all the uncertainties and risks, it does not make sense to think a single, optimal path for our policy interest rate will be consistent with achieving our inflation target. It makes no sense to try to engineer such a path with precision.

Jerome Powell, Chair of the Federal Reserve, Monetary Policy and Risk Management at a Time of Low Inflation and Low Unemployment, October 2, 2018:[38]

> The Committee takes a risk management approach, which has three important parts: monitoring risks; balancing risks, both upside and downside; and contingency planning for surprises…
>
> …From the standpoint of contingency planning, our course is clear: Resolutely conduct policy consistent with the FOMC's symmetric 2 percent inflation objective, and stand ready to act with authority if expectations drift materially up or down…

[38] See Powell (2018)

Christian Hawkesby, Assistant Governor of the Reserve Bank of New Zealand (RBNZ), *Policy of Least Regrets*:[39]

> It involves identifying the most likely ways that the economy could evolve differently than in our central view, and what our mandate implies about our "regret" if these risks eventuate. The language of least regrets – the mirror of maximizing our chances of success – conveys our humility about being able to accurately predict the future.
>
> It's important to emphasize our least regrets approach is not designed to be applied in a rigid or formulaic way. Rather, it is where the science of macroeconomics meets the art of policy decision making.

However, as articulated by Greenspan, and as currently described by central bankers, MPRM is difficult to distinguish from unconstrained discretion. The hallmarks of current descriptions of MPRM are references to data dependency, the absence of even general forward guidance, eschewing pre-emptive policy, and extensive use of assurances that the central bank will "do the right thing" when the time comes. Only the RBNZ has articulated a decision-making framework for MPRM—as a "policy of least regrets"—but it too has found it difficult to communicate the content of that policy in a way that allows either private agents to anticipate the central bank's actions or the political process to perform accountability.

From the perspective of political legitimacy, this conception of MPRM is seriously inadequate. It fails to formulate the link between policy objectives and likely policy behavior, a link that is critical both for political accountability and for allowing markets to anticipate likely policy responses to events. Clearly articulating the policy strategy—the link between

[39] See Hawkesby (2021)

objectives and policy behavior—is crucial because outcomes of policy regimes are detectable only over time (and then only weakly so) by observing policy choices across a range of circumstances. To address these anticipation and accountability gaps, several central banks that use Flexible Inflation Targeting (FIT) began providing projections based on policy-consistent instrument paths. This FPAS approach demonstrated the benefits of analyzing and describing policy choices in terms of a systematic strategy, with quantification. These benefits are nowhere emulated by MPRM as typically described.

Nonetheless, the notion of MPRM is an entirely appropriate response to uncertainty. Uncertainty is only irrelevant when the world is benign, where simple linear rules can effectively run monetary policy in a mechanical way. Yet Mark I versions of the FPAS, which are currently used extensively in even seasoned FIT central banks, are also vulnerable to precisely the same uncertainty that motivates MPRM thinking. Deciding and communicating policy actions based on baseline forecasts and local approximations—as FPAS Mark I does—can be highly problematic when the policy-relevant future is unknowable. Draping such projections in the clothes of assurance and confidence has the potential to mislead both policymakers and economic agents by providing a false sense of security when planning. In turn, having been misled, policymakers may choose actions that amplify projection and policy errors. The mismatch between baseline projections and what actually materializes can have impacts on credibility, particularly given the language and style through which monetary policy is communicated to the public.

The FPAS Mark II framework builds on the idea that MPRM is indeed the appropriate way of conceptualizing forward-looking monetary policy in situations of significant uncertainty. But MPRM need not be synonymous with full discretion. An adaptation of FPAS provides a practical policy strategy that allows MPRM to be consistent with political legitimacy and efficient policy signaling. The essence of the innovation is to avoid baseline

forecasts and instead focus on policy projections that describe the necessary policy responses to the main risks, should they materialize. Using scenarios to describe policy responses to the realization of risks harnesses the power of FPAS to create clear policy narratives that illuminate a consistent policy strategy. The key distinction between FPAS Mark I and Mark II narratives is that the former uses a singular "most likely" instrument path to concretize the policy strategy, whereas the latter, by providing more than one instrument path's response to different-but-similarly plausible situations, shifts attention to the workings of the policy strategy itself.

Reinforcing the proposal is an argument that dealing successfully with situations of significant uncertainty is the essence of good policy. Such situations have orders of magnitude greater welfare implications[40] than those characterized by more normal additive noise. Due to the interaction of uncertainty and nonlinearity, the former situations can give rise to "Dark Corners" (in Olivier Blanchard's terminology)—policy traps that require extraordinary policy action, and costs to welfare, to escape from. State-contingent degrees of policy activism are required, because once a slide towards a dark corner becomes a notable risk, immediate and assertive policy action becomes the priority, something not available from simple linear mechanical rules. In contrast, substantial and state-contingent policy activism has limited payoffs in the normal business cycles described in textbooks.[41] In the context of these textbook business cycles, a weak understanding of the transmission mechanism, coupled with recognition and policy lags around cyclical turning points, reduces the efficiency of activist policies relative to their simple linear mechanical rule alternative. Estimates of welfare gains are small relative to their confidence intervals.

[40] Throughout this book, we refer to welfare implications from an economic perspective (e.g. low unemployment, output gaps, etc.) rather than in its colloquial sense of "social" welfare.
[41] Refer to papers by Avagyan et al (2022b) and (2023d).

Accordingly, the sought-after MPRM strategy would specifically gear policymaking towards spotting the risk of slippage towards a dark corner and enable an assertive policy response. To assist market understanding of such strategies and anticipation of likely policy actions, and to provide a basis for effective accountability, risk scenarios that provide clear policy narratives should move to the front of the stage, pushing off stage unreasonably confident forecasts.

B. Institutionalizing Monetary Policy as Risk Management in a Systematic Policymaking Framework

Despite the growing discussion of MPRM (e.g. Bullard 2021, Weidmann 2022, in addition to Hawkesby, Poloz and Powell, cited earlier), little has been done to implement such a policy strategy within a transparent analytical framework. What follows are specific operational components of such a strategy. We wish to develop an analytical framework that addresses important issues related to uncertainty and nonlinearities.

Prior to the clarification of price stability as the primary objective of monetary policy and the development of FPAS, monetary policy was largely discretionary in character. The initial FPAS frameworks built by early Inflation Targeting adopters centered on: (1) a clear target to direct policy; (2) forecasts with objective-consistent *path*s for policy, to address its forward-looking nature; and (3) systematic and transparent communication of that path. However, by placing forecasts at the center of analysis and communications, these frameworks remain vulnerable to knowledge gaps concerning current macroeconomic dynamics—especially those directly involved in policy transmission—in addition to generalized uncertainty about future shocks. Over the past two decades at least, central banks in advanced economies have been confronted with un-forecasted low- and high-inflation environments, during which forecasts of appropriate policy

paths consistently underestimated the policy action required. Central bank expertise, despite being guided by clearer targets, has delivered policy that is excessively inertial. This entrapment pattern is harmful to society, and to the credibility of the institutions involved.

A modification of FPAS, referred to as FPAS Mark II, sets out to achieve three interrelated objectives:

1. To elevate attention to uncertainty in monetary policymaking by implementing MPRM with a particular emphasis on avoiding Dark Corners;
2. To shift the policymaking focus from optimizing the policy path for the most likely future to ensuring policy agility, in order to reduce the risk of sliding into Dark Corners;
3. To remove (self-imposed) restrictions on sharp adjustments of the policy stance (tighter and looser) when needed to prevent slides into Dark Corners.

The analytical and institutional modifications needed for FPAS Mark II are described in the following sections.

IV. Institutional Framework

Hayk Avetisyan, Douglas Laxton, and Anzhela Papikyan

A. Core Principles of the FPAS Mark II Process

Under FPAS Mark II, the illustrative scenarios represent policy responses that would be needed should the main currently-relevant risks materialize. Evaluating hypothetical—but realistic—scenarios allows attention to shift away from low-value efforts aimed at identifying the optimal policy for scenarios that are only marginally different. Instead, focus shifts to preparing policy for sufficiently aggressive movements, in the event that significantly different scenarios materialize.

This section provides a general overview of the process for making policy decisions under FPAS Mark II. The specific institutional and operational arrangement at the CBA, following these principles, is presented in detail in Volume II, Chapter III.

At a high level, the FPAS Mark II policymaking cycle should proceed along the following steps, each of which have specific outcomes:

- **Step 1: Sketch Ingredients**: The first step would engage decision-makers in an open process, which enables them to sketch the broad ingredients of their individual scenarios, reflecting their unique perspectives and concerns.[42] After this meeting, decision-makers would have the necessary ingredients to formulate (non-quantitative) narratives for upside, downside or (sufficiently relevant) tail risk cases.

[42] The chief decision-making body of the CBA on matters of monetary policy is the Board, comprised of the Governor, two Deputy Governors, and five Board members.

- **Step 2: Select Ingredients**: With the outlines of these scenarios in place, the next step involves selecting the main ingredients for a small number of reference scenarios (upside, downside, and tail risk). In this step, it is especially important for the decision-making body—with an institutional basis—to define a specific process for selecting the ingredients to build the scenarios, such as the one we present in Section B. It is worth emphasizing that this process is not a simple mechanical aggregation process. Rather, it is a dynamic process that is meant to capture the richness of decision-makers' ideas, and use a lively culture of debate and discussion to spur rigorous thinking about these ingredients. At the same time, it would take maximum advantage of the professionalism of a highly-trained staff that would produce the modeling, analysis, and communications at world-class standards.
- **Step 3: Build and Quantify Scenarios and Narratives:** Staff (led by, e.g., a Chief Economist or Projection Coordinator) would then use these selected ingredients to construct the actual quantitative scenarios and provide the basis for evaluation (e.g. by using a loss function). Staff would also develop non-technical narratives that describe the scenarios and their implications.
- **Step 4: Decision-making & Communication**: At the policy decision meeting, decision-makers would use their normal decision protocols to set the policy instrument that would best minimize regret. Given the richness of scenarios discussed in the early stages of the process, as well as the quantified reference scenarios with endogenous policy paths, decision-makers will have the basis for making a well-informed, least-regrets policy decision, as well as for formulating the narrative accompanying the decision, to be communicated with the public.

The four steps roughly outlined above have specific outcomes, each of which are essential for operationalizing FPAS Mark II for different institutional, organizational and legal settings.

B. Structure and Characteristics of Scenarios

1. The Three R's of Illustrative Case Scenarios

Candidate scenarios should be:

- **Related to the current data**: Be relevant to the current policy situation, in the sense of being connected to the current conjuncture as described by the data (and reasonable interpretations thereof). Initial and underlying conditions of the economy are subject to a wide range of interpretation; the uncertainty associated with this range of interpretation is a key reason for constructing scenarios.
- **Realistic**: Be realistic, in that "it could happen," even if does not have the highest likelihood. The key is to have relevant (see below) and realistic reference points for the risk analysis that describe the potential range of behavioral responses to the current situation—in other words, possibilities worth thinking though in advance of them being realized. This approach would replace the misguided search for exact and detailed forecasts around which specific plans are made.
- **Relevant for Policy**: Reflect policymakers' fears about what policy might be confronted with over the next few years. Where the risk of sliding towards a dark corner has become a notable concern, a scenario describing such an evolution would be consistent with risk minimization on a least regrets or other basis.

In order to conduct MPRM in a structured and communicable way, we propose creating a standard set of scenarios labeled as Case A, Case B, and Case X (Y) type scenarios:

- **Case A**: scenarios where the policy rate path would need to be higher than what the market currently expects.
- **Case B**: scenarios where the policy rate path would need to be lower than what the market currently expects.
- **Case X(Y)**: tail risk scenarios as well as scenarios that incorporate avoiding the Dark Corners of monetary policy; high and variable inflation, or a low inflation trap.

2. Market Reference Scenario

Treating monetary policy as a risk management process under FPAS Mark II requires a different approach to the scenario-building process. Rather than treating its own central projections as the best piece of information and forcing market participants to coalesce around this singular view of unfolding economic conditions, the CBA instead utilizes market expectations for the central bank policy rate as a starting point for policy deliberations. Market expectations, by design, contain significant information about market views on current economic developments and possible behavior of monetary policy in the future economic environment.

Before the development of state-of-the-art, flexible inflation targeting approaches that were based on a forward-looking FPAS framework, monetary policy communication predominantly focused on direct actions like the setting of short-term policy rates. Rates such as the one-week repo are not particularly relevant for most people. Longer-term interest rates tend to hold greater significance as these are the types of maturities that households and businesses typically borrow and lend. The two principal components that make up longer-term rates are the term and risk premiums and the expected path of the policy rate.

Of these two components, it is the expected policy rate that matters most. In the days preceding inflation targeting and FPAS, central banks embraced a "say little, let actions speak" philosophy. This approach translated to mere

announcements of short-term policy rates, often without shedding light on the broader economic or policy frameworks underpinning these decisions. As inflation targeting regimes were adopted, transparency in communicating a central bank's perspective and rationale became a necessary precondition for the regimes' efficacy. As central banks enhance their clarity, financial markets gain the agility to recalibrate efficiently between policy decisions. During these dates, policymakers do not merely finalize the current policy rate; they also provide insights into their monetary policy decisions, as well as provide a trajectory of the policy rate based on different assumptions.

In advanced economies with well-developed financial markets (including secondary bond markets), gleaning market expectations of the future path of the policy rate is a relatively straightforward task. The AtlantaFed Market Probability Tracker presents one such approach, whereby researchers use Eurodollar futures and options on futures (which are highly liquid markets) to infer market expectations of future FOMC decisions.[43]

For countries with less developed financial markets that lack options markets, such as Armenia, the task is less straightforward. Researchers here should be careful to avoid a common pitfall of attempting to make up for the absence of an options market by "over-modeling," which can ascribe a false degree of precision that is based on unreliable or incomplete information. What we propose instead is a synthesis of two approaches. First, we take as a starting point information from the spot market for shorter-term bonds and perfect foresight-based inferences about the term structure. This market-based information is then augmented with information from modal projections of the future path of the policy rate regularly provided by financial market participants (including commercial banks) to the central bank in survey format. Through a synthesis of the two approaches that blends art and science, we are able to develop sensible

[43] Refer to Fisher and Robertson (2016) and Fisher (2016).

assessments of market expectations for the future path of the policy rate, at least through a one-year horizon.

This approach provides what is termed a "market reference scenario" or "MRS" which embodies market participants' best estimations (both behavioral and judgmental) about their most likely scenario for the future path of the policy rate. The illustrative case scenarios, which are used to frame and communicate relevant narratives for policy, are constructed relative to this market reference scenario (with Case A being above this path, and Case B being below).

This market reference scenario, in many ways, serves a similar purpose as a traditional baseline scenario under FPAS Mark I, in the sense that it represents the market's rough estimation of the "most likely future," given the information available to market participants at a particular point in time. In the absence of official baseline projections from the central bank, the MRS can serve as a substitute for the baseline for those external stakeholders (e.g. IFIs, fiscal authorities, and others) who rely on exogenously-provided projections when making their own planning decisions. At the same time, this approach helps avoid the issues with baseline forecasting mentioned throughout this book, since it is not "owned" by the central bank, does not represent an official baseline forecast from the central bank, and is not intended to represent the views of monetary authorities about the most likely future for policy. By stripping away direct linkages with policy actions and commitments to future policy actions, the market reference scenario can serve as a useful public good for external stakeholders who are reliant on such projections, without the central bank falling into the traps associated with an official baseline scenario.[44]

[44] Of course, external stakeholders may be wont to refer to the market reference scenario as a baseline or central projection. While we cannot police verbiage, we certainly caution against treating the market reference scenario as an official

C. Conceptual Considerations

It is useful to note that the structural change of FPAS Mark II is not simply doubling the number of scenarios and slightly changing the vocabulary or branding. In other words, we are not simply replacing the current Mark I task of getting the Board to reach a consensus on one "baseline" scenario with reaching a consensus on two "case" scenarios. The proposed shift to incorporate MPRM thinking in policymaking, aided by a scenario-based approach, represents a paradigm shift in the mindset of how monetary policy is made.

1. Scenario-Based Approach

The proposed approach shifts the focus from forecasting an unpredictable future to exploring the policy implications of different possible futures, using multiple reference scenarios that are chosen for their relevance to the current situation and its risks. Most importantly, however, it does away with the folly of trying to reach a consensus among members of the Board. While only a small handful of central banks explicitly target consensus as an operational objective, the concept of "baseline scenario" inherently requires boards of central banks to reach a consensus in order to determine the *optimal policy path for the most-likely future*. This consensus-based decision-making approach is inimical to the mission of monetary policymaking. The inbuilt drive towards a singular institutional view sets up a dynamic that presumes that a singular best outcome can be reached with some certainty, diverting attention from, or shutting out, reasonable alternative perspectives. Undesirable group dynamics, especially those associated with groups operating in situations of uncertainty but feeling

baseline in order to avoid the baggage and folly typically associated with an official central projection.

compelled to act with certainty, may be encouraged. Creative and independent thinking could be completely stifled.

FPAS Mark II's shift to a scenario-based approach transforms this decision-making structure. Because the Case A and B scenarios are not prescriptive forecasts of the future, but rather, tools for illustrating risk management, the need to reach a consensus is reduced significantly. As a result, the emphasis is placed on fostering a culture of lively debate and discussion. Board members who buy into this approach to FPAS Mark II take as a given that not all of their ingredients—perhaps none of them—will make it into the Case A and B scenarios, but this fact does not diminish their role in the decision-making process. Those ingredients that aren't part of the two scenarios remain critical to the process, as they continue to be key drivers of debate and discussion. In this context, board members are not tied down to any one scenario, and the flexibility and transparency that this approach provides ensures that the chances for groupthink are meaningfully lessened. The ultimate objective is to create a safe zone for Board members with different backgrounds to express the main concerns and risks they have in mind.

2. Policymaking Round

The 29-day policymaking round has the potential to reshape not just how policy is made, but also, how central banks hire and train staff. Typically, central banks spend two months in each quarter engaged in the policymaking round, meaning that eight months of the year are spent in a high-stress setting that demands a near total commitment of time and resources by the staff. While this has come to be accepted as "par for the course" in central banking, this approach tends to place enormous burdens on monetary policy staff, consistently requiring long hours and high degrees of stress, making work-life balance difficult, if not impossible, to achieve for most of the year. As a result, individuals who may be extremely well qualified for these roles but who value work-life balance—in

particular, those who want to start families or raise children—are essentially excluded from the field of monetary policy. Condensing these policymaking rounds to 29-day cycles reduces the intensive period of the process to four months, and the greater efficiency and flexibility in workflow that this process enables reduces some of the unnecessary stress of the process. This enables a greater emphasis on work-life balance within monetary policy teams, without an attendant reduction in standards, team quality, or level of commitment. On the contrary, as the following subsection illustrates, the FPAS Mark II setup will be characterized by a dramatic investment in human capital and building the technical and critical thinking abilities of the *entire* team. With a larger (and potentially smarter) pool of candidates to draw from, and with an institutional approach to training and dynamic learning in place, this system could meaningfully improve the quality of monetary policy teams. These ideas are explored further in Chapter 8.

V. Analytical Framework

Haykaz Igityan, Hayk Karapetyan, Douglas Laxton, and Anzhela Papikyan

A. Introduction

The Central Bank of Armenia is mandated to ensure price stability and financial stability. In the design of the FPAS Mark II framework, the main focus was on price stability. Nonetheless, the framework also recognizes the inherent uncertainties in economic forecasting and policymaking. By acknowledging these uncertainties, FPAS Mark II is designed to aid policymakers in effectively navigating these complexities, rather than providing guaranteed forecast accuracy, which is often impractical due to the unpredictable nature of the economic and financial system.

Although primarily centered on monetary policy, the FPAS Mark II framework extends its utility to the domain of macroprudential policies. The methodologies and tools developed for assessing monetary policy risks and creating scenarios are adaptable, making them valuable for understanding and shaping macroprudential policies. This adaptability highlights the versatile application of the FPAS Mark II framework in addressing various aspects of economic policy.

A pivotal aspect of the FPAS Mark II framework is the focus on developing economic models, a process central to the staff development at the Central Bank of Armenia. This emphasis enhances the analytical skills and capabilities of the staff, fostering deep comprehension of complex economic systems and the agility to adapt to changing economic conditions. The value of this developmental process extends beyond the models themselves, signifying the importance of continuous learning and improvement in economic analysis and policy formulation.

At the core of FPAS Mark II lies the concept of Flexible Inflation Targeting (FIT). This approach broadens monetary policy's scope beyond controlling inflation, involving a comprehensive understanding of the monetary transmission mechanism's impact on market interest rates and the exchange rate. FIT is adept at addressing the complexities and uncertainties of economic dynamics, enabling the Central Bank to implement a responsive and adaptive monetary policy.

The FPAS Mark II framework is adept at distinguishing between output gaps relevant for monetary policy and those significant for financial cycles. This capability is crucial for tailoring policy responses to different economic conditions, considering the involved uncertainties and complexities. Understanding these diverse output gaps allows the Central Bank to make informed decisions that align with the economy's specific needs.

The development of critical concepts like Non-Traded Sticky Price Inflation (NTSPI) is a significant emphasis within the FPAS Mark II framework. NTSPI offers a more nuanced inflation measure, focusing on prices less influenced by exchange rate fluctuations and more reflective of underlying economic trends. This concept is crucial for a comprehensive understanding of inflation dynamics in monetary policy.

Scenario planning is integral to FPAS Mark II, acknowledging the limitations of forecast accuracy. This approach involves preparing for various economic conditions, enabling policymakers to manage uncertainty effectively. By anticipating diverse economic scenarios, the Central Bank is better positioned to formulate timely and appropriate responses.

In conclusion, FPAS Mark II represents a comprehensive approach to economic policy-making, primarily focusing on refining monetary policy while also providing insights for macroprudential policy. The framework's commitment to FIT, integration of concepts like NTSPI, scenario planning

emphasis, and dedication to staff development collectively underscore its effectiveness in navigating the challenges of monetary policy in an uncertain economic environment.

B. Mandates for Price Stability and Financial Stability

The "Law on the Central Bank of Armenia" in 1996 established price stability as the primary objective of the CBA. Beginning in 2018, the CBA's primary objective was expanded to include price stability as well as financial stability.

1. Price Stability in Armenia

The mandate of the central bank has price stability as the overriding objective; therefore, it must define an operational objective, which entails specifying the rate of increase in consumer prices deemed to be consistent with price stability.

Summers (1991), in a contribution that preceded the widespread adoption of inflation targets, lays out the main considerations for what the numerical target should be. High rates of inflation—in the double digits or higher—impose significant costs on the economy through reduced growth, allocative inefficiencies, distortions to the tax system, inequitable redistributions of income, and labor market strife (see, for example, Sarel 1995).

Conceptually, a zero percent inflation target would be the closest to a numerical target consistent with a price stability objective. However, a zero rate of increase in consumer prices over the long term has its drawbacks. Although not impossible, its implementation would be difficult and perhaps undesirable mainly given the measurement error that tends to

produce an upward bias in consumer prices, such that a zero target would effectively mean long-term deflation, rather than price stability (Boskin and others 1996). Given this concern, a very low positive CPI target—less than 1 percent—would be more consistent with literal price stability, but it would imply that the economy undergo deflation almost half the time. And deflation in advanced economies has often (although not always) been associated with bad outcomes for employment and growth. However, the Czech National Bank has proven that deflation risks in small open economies such as Armenia can be rather easily overcome, as evidenced in their successful implementation of an FX intervention strategy to avoid deflation. Most advanced economies have settled on a long-term official target rate of 2 percent.

Developing countries experience larger inflation rate shocks than advanced economies because of the larger proportion of fresh food and energy in the consumer basket. Prices of these staples are subject to volatility resulting from developments in international markets, from year-to-year variations in harvests, and in some situations from changes in government controls. Divergences between sticky price inflation (which excludes tradeables) and headline inflation are wider than in advanced economies. This might justify a somewhat higher target for headline inflation; however, the CBA explicitly has this dichotomy of sticky and flexible prices in its analytical framework to better address this issue.

Given the above, the CBA's numerical point target for average inflation in the medium-term is 4%. This is consistent with the average level of inflation observed since the adoption of inflation targeting in 2006. From time to time, the CBA may revisit and adjust the inflation target to best reflect the level in prices that is consistent with price stability and that best aligns with the structure and development of the economy.

2. Measurement Proxies for Price Stability

How should we decompose the CPI to better help monetary policymakers make better decisions and communicate policy more effectively? This question is at the core of our research for Non-Traded Sticky Price Inflation, where we present a decomposition of the CPI that we believe helps execute and communicate the analysis around the modern monetary policy transmission mechanism.[45] We search for a decomposition of inflation that aligns with the two most prominent aspects of the transmission mechanism: the expected short-term interest rate path and exchange rate implications. Special attention is given to the latter when considering the best decomposition for different price measures. This approach is informed by the work of Rudiger Dornbusch, particularly his influential paper 'Expectations and Exchange Rate Dynamics', commonly known as the 'overshooting sticky-price Dornbusch model'. The concepts of 'sticky-prices' and their 'flexible-price' counterparts are integral to our practical implementation and analysis within New Open Economy Macroeconomics (NOEM). Furthermore, the work of Maurice Obstfeld and Kenneth Rogoff and their development of NOEM, especially by incorporating better microfoundations, are instrumental to our approach. These advancements have real-world applications, such as the Global Economy Model developed by the IMF's research department which drew inspiration from Obstfeld and Rogoff's path-breaking research. We recognize the distinction between academic research models and those models that are more directly applicable to policy analysis. Our work, while drawing upon these important insights, selectively employs models based on dynamic optimization theory, depending on the specific questions and issues we are addressing.

[45] Refer to Papikyan et al (2023f). This section includes selected excerpts from the aforementioned paper.

Traditional 'sticky' price measures like core, median, or trimmed mean are often approached statistically, focusing on eliminating volatile items without deeply considering the economic rationale behind categorizing items into different buckets for analytical clarity. NOEM provides a conceptual framework for differentiating these price buckets: prices sensitive to exchange rate fluctuations (flexible) and those less sensitive (sticky), which are crucial for evaluating the effectiveness of short-term interest rates over time. In the Dornbusch overshooting sticky-price model, fast-moving asset markets contrast with the more sluggish segments of the goods market, producing exchange rate overshooting dynamics. Internationally traded goods, directly impacted by the exchange rate, are categorized as flexible prices, while non-traded items, such as most services, fall under sticky prices.

The exchange rate, though influenced by monetary policy, is not a direct target of central banks. It is the outcome of various economic factors, including policy rate decisions and market expectations. Distinguishing between traded goods prices, affected by the exchange rate, and non-traded goods prices is crucial. For instance, sticky prices is important because they respond more slowly to market changes than flexible prices, offering unique insights into inflation dynamics and expectations." Meanwhile, flexible prices are influenced by unique, or idiosyncratic, shocks, and can adjust quickly to market conditions and offer early warnings about inflationary trends. If monetary policy fails to adequately respond to these signals, particularly under conditions of generalized excess demand affecting these markets, there is a risk that this inflationary pressure will spread into stickier segments of the economy, like wages and non-traded sticky prices. If these pressures take hold, then a much more aggressive policy adjustment might be required, resulting in unnecessary harm for the real economy.

The core of the problem lies in the nature of price indices, which aggregate the prices from a variety of unique markets whereby excess demand

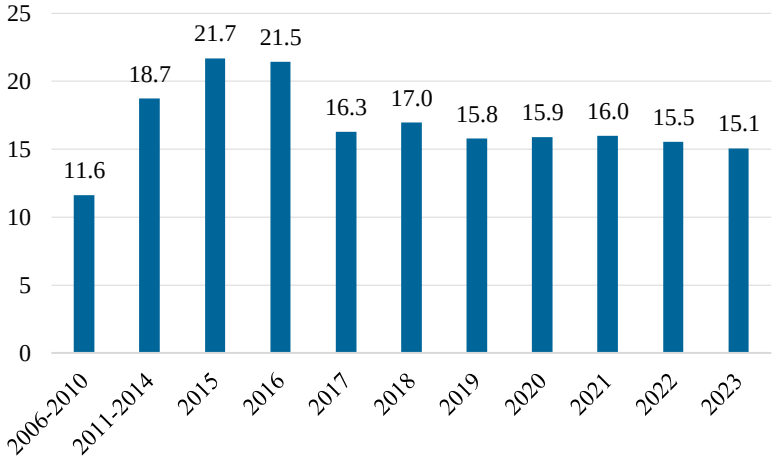
pressures are indicated not by isolated market behavior but when many of these markets collectively experience a state of excess demand. Recognizing and responding to these signals accurately is key to ensuring that monetary policy remains effective in stabilizing prices without unnecessarily reacting to transient or market-specific fluctuations.

This issue of correctly interpreting market signals and responding with appropriate monetary policy was particularly evident in 2021. Many believe that the challenges faced that year stemmed from a failure to address generalized excess demand pressures in a timely manner. Admittedly, opinions are still divided on this matter. While some argue that it is still possible to achieve a 'soft landing'—a scenario where inflation is controlled without causing a significant increase in unemployment—others are skeptical. This ongoing debate highlights the delicate balance central banks must maintain in their policy decisions, ensuring they react adequately to economic signals without overcorrecting and causing undue hardship to the real economy. This balance is vital to manage inflation effectively while maintaining overall economic stability, a challenge that continues to define the evolving landscape of central banking.

a. Composition of Armenian Non-Traded Sticky Price Index (NTSPI) Basket

The NTSPI basket for Armenia is composed of goods and services that are not traded internationally, such as housing, healthcare, education, and other services. In addition, the basket includes items such as utilities, transportation, and communication services. As of 2023, the non-traded goods and services account for approximately 15% of the Armenian CPI basket as of 2023. Historically, between 2006 and 2023, the non-traded component has composed between 12 and 22 percent of the overall CPI basket.

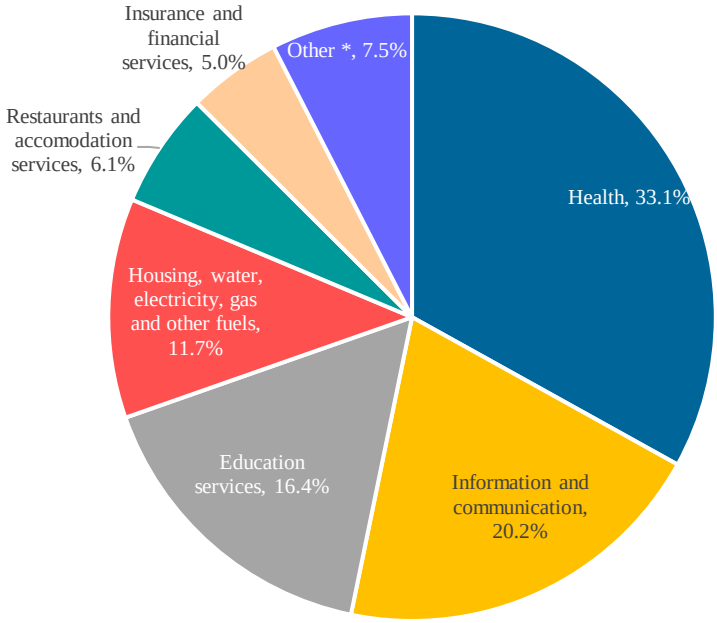
Figure I.5.1. Non-Traded Goods and Services Share of Armenian CPI Basket



Source: Author calculations, based on raw data from National Statistical Service of Armenia

As shown in Figure I.5.2, the greatest contributors to the non-traded goods and services basket includes health (primarily services such as dentistry, imaging, and so on), which comprises 33% of the basket; information and communication (including phone/internet/television subscription services, repair services, etc.), which make up 20% of the basket; and education services (including tuition), at 16% of the basket. The remainder of the basket includes categories such as housing, water, electricity, gas, and other fuels (including residential rent, home repair/maintenance, etc.); restaurants and accommodation services (e.g. fast food); insurance and financial services (including bank fees, legal fees, and so on), as well as a small number of goods and services in other categories such as transport; recreation, sport, and culture; and personal care, among others, which collectively make up 8% of the basket. The basket is entirely composed of goods and services (with services very heavily dominating) that are non-traded in nature. Refer to the appendix for a detailed listing of the goods and services that make up the Armenian basket.

Figure I.5.2. Distribution of NTSPI Basket



Source: Author calculations, based on raw data from National Statistical Service of Armenia and item classification from the Classification of Individual Consumption According to Purpose (COICOP)

b. Calculation Methodology

The methodology used to calculate the non-traded sticky price index follows the same methodology as is used to construct the official CPI in Armenia by the National Statistical Service. The methodology was developed by the NSS jointly with the IMF, we provide a summary of the

methodology, but refer the reader to the official methodological note published by the NSS for further detail.[46]

The CPI (and NTSPI) are calculated monthly using the Laspeyres formula with fixed weights. Indicators required for the formation of the weights of the CPI basket of goods and services are obtained based on the data on monetary expenditures made by households, based on results from the Integrated Household Living Conditions Survey (IHLCS). The previous year is taken as the base period for indices and weights for the calculation of the price index, but the household survey upon which the weights are based on has a two-year lag. (e.g. 2023 CPI weights are based on the 2021 IHLCS). The weights for the items in the NTSPI basket are provided in the appendix.

c. Using NTSPI to Calculate Central Bank Credibility

Under FPAS Mark II, we emphasize the value of analytical frameworks that treat monetary policy credibility as endogenous—in other words, the understanding that central bank credibility is not fixed and unchanging, but rather, that the central bank's policy actions may have implications on its credibility. When policymakers (and models) do not think of credibility as endogenous, policy responses can be delayed or be insufficiently aggressive. The workhorse model used in FPAS Mark II, known as EndoCred, is designed to address the issue of credibility in monetary policy decision-making.

Credibility is equivalent to the reputation that the central bank has developed by first specifying a numerical objective for long-term inflation, and second by whether or not it has been able to achieve that target on average over time. The term "on average" is simply meant to represent that many measures of inflation contain significant noise in the data, and even if a central bank was behaving perfectly, inflation will not be equal to the

[46] Refer to Statistical Committee of the Republic of Armenia (2020) and (2021).

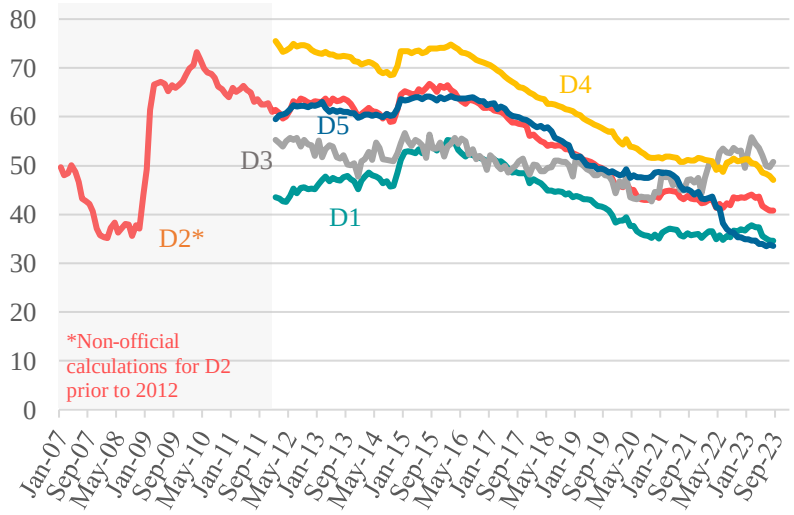
target on a period-by-period basis. However, the public will obviously be skeptical if the performance of the central bank has allowed periods of high and variable inflation. We therefore think of credibility as a stock, in the sense that it depends on the accumulated performance of the central bank over time. When inflation is allowed to deviate from target and inflation expectations start to de-anchor from the target, credibility can be lost very quickly. Once lost, the process to regain credibility is a slow and gradual one. The loss of credibility becomes costly, because if the public loses trust in policymakers' ability to achieve their policy objectives, then the central bank has to adjust its policy rate much more aggressively, implying larger cumulative output and unemployment costs to reduce inflation. This logic reflects an underlying principle that delaying policy actions in response to different types of shocks (such as overheating, or upward shifts in the equilibrium real interest rate) is costly.

To measure central bank performance, we take two approaches. First, which is a "standard" approach for evaluating performance for inflation-targeting regimes, we evaluate the deviation of NTSPI from high levels (defined as 10%, corresponding to a high and unstable inflation regime) and its target level (judged to be 2%). The NTSPI index is a perfect candidate in the credibility context, because by design it reflects the slower moving and long-run drivers of inflation, namely monetary policy relevant inflation expectations. The latter is the key criteria for estimating and monitoring the central bank credibility.

Second, we take another measure of central bank performance that evaluates levels of excessive dollarization. This is based on the idea that excessive dollarization reflects the low levels of trust in the domestic currency or in the macroeconomic environment, and can be seen as another proxy for central bank performance. This second performance measure utilizes the D2 measure of dollarization (see Figure I.5.3), which represents the share of residents' foreign currency deposits and advances in residents' total deposits and advances. Similar to the NTSPI measure of

performance, the dollarization approach evaluates the deviation of dollarization from high levels (defined as 80%, representing an economy with high and excessive dollarization) and low levels (judged to be 30%, consistent with an estimate for non-excessive “optimal” level of dollarization for Armenia).

Figure I.5.3. Historical Levels of Dollarization in Armenia



D1-D5 are compiled based on the indicators of the Central Bank of Armenia, commercial banks and credit organizations.

D1 is the share of residents' foreign currency deposits and advances in money supply

D2 is the share of residents' foreign currency deposits and advances in residents’ total deposits and advances

D3 is the share of resident natural/physical persons' foreign currency demand deposits and advances in total demand deposits and advances of resident natural persons

D4 is the share of resident/natural/physical persons' foreign currency time deposits and advances in total time deposits and advances of resident natural persons

D5 is the share of foreign currency loans to residents in total loans

Source: Central Bank of Armenia; Author calculations

CBA Performance Indicator:

NTSPI Approach:

$$CBPI_t^{NTSPI} = \frac{(NTSPI_t - 10)^2}{(NTSPI_t - 10)^2 + (NTSPI_t - 2.0)^2}$$

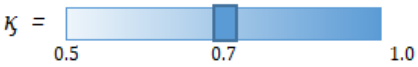
Dollarization Approach:

$$CBPI_t^{Dollarization} = \frac{(D2_t - 80\%)^2}{(D2_t - 80\%)^2 + (D2_t - 30\%)^2}$$

We then take a weighted average of the two approaches to arrive at a single performance indicator. We assume weights of 70% for the NTSPI approach and 30% for the dollarization approach but recognizing that there is uncertainty and room for judgment to adjust these depending on different economic factors and behavioral characteristics at any given period, we provide slider scales for plausible ranges for these weights.

Weighted Average Performance Indicator:

$$CBPI_t = \kappa * CBPI_t^{NTSPI} + (1 - \kappa) * CBPI_t^{Dollarization}$$



Credibility is then calculated using the weighted average performance indicator. It is defined as a stock that depends on the accumulated performance of the central bank over time. Credibility is thus calculated as a function of the lag of central bank's credibility (as it is a stock that can be lost very quickly and gained only gradually over time) and its current performance.

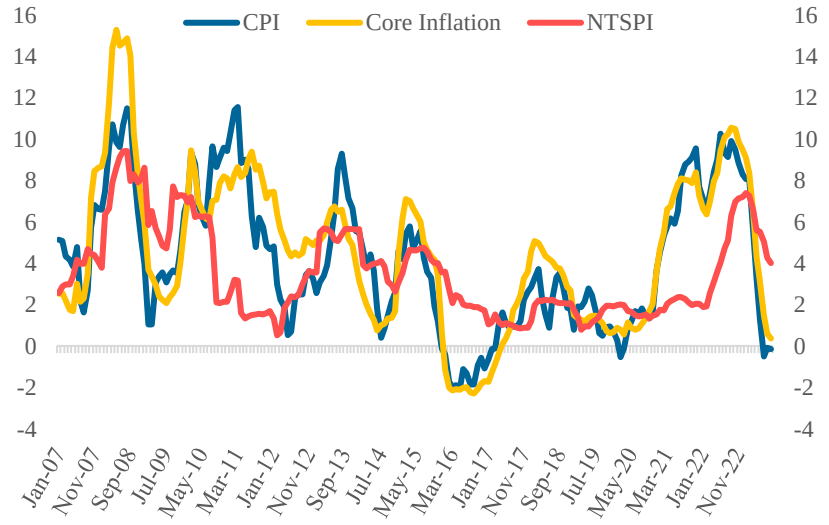
CBA Credibility:

$$CRED_t = 0.1 * CBPI_t + 0.9 * CRED_{t-1}$$

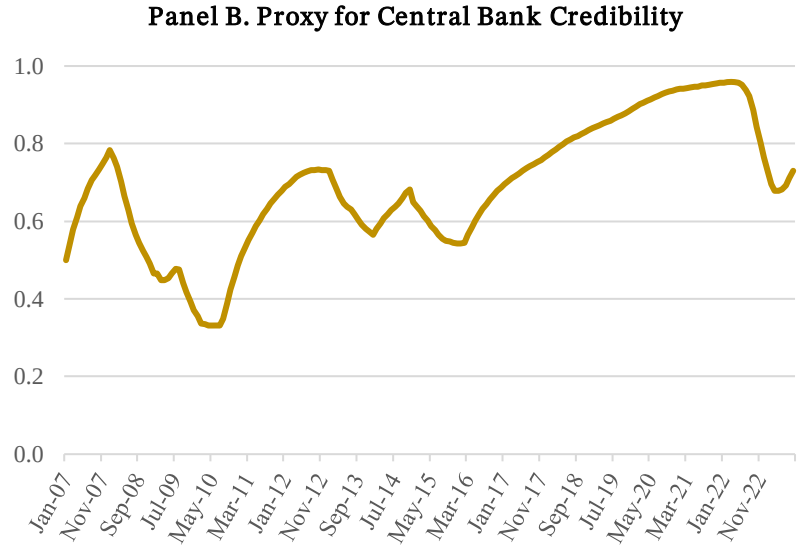
We present the results of the Non-Traded Sticky Price Inflation for Armenia and how it compares with headline CPI and Core inflation measures and highlighting the power of NTSPI in the context of price stability, particularly in times of economic risk and uncertainty. We also present the historical calculation of CBA credibility that has been built up over the past two decades.

Figure I.5.4. Measures of Inflation and Credibility for Armenia

Panel A. CPI, Core, and Non-Traded Sticky Price Inflation for Armenia, Year-over-Year, January 2007-September 2023



Source: National Statistical Service of Armenia; Central Bank of Armenia; Author calculations



Source: National Statistical Service of Armenia; Central Bank of Armenia; Author calculations

3. The Role of Financial Stability

What is a financial cycle? This is a central question for macroeconomic policymakers, which, however, does not have a very clear answer. The notion of a financial cycle is generally understood as an excessive expansion in credit and asset prices, which is associated with a higher probability of a financial crisis. While the empirical literature about the characteristics of financial cycles has developed quite rapidly after the GFC (see, for example, Claessens, Kose and Terrones, 2011), the theoretical understanding of financial cycles and their relationship with business cycles, has evolved more slowly and has provided little practical advice for policymakers responsible for monetary and macroprudential policies.[47]

[47] While financial cycle analysis gained particular traction after the Global Financial Crisis, it of course predates the GFC. See the work of Alexander Lamafalussy in the 1970s and William White beginning in the 1990s.

Therefore, a precondition to incorporate financial stability into a central bank's analytical framework is to make a clear distinction between concepts of the output gap that are relevant for price and financial stability. This distinction is highly relevant for policy making and is closely related to the "leaning against the wind" ("LAW") debate. The proponents of LAW argue that monetary policy should be focused on financial stability and should systematically react to the financial cycle to avoid costly crises (see, for example, Filardo and others, 2016; Juselius and others, 2016 and Borio, 2016). According to this logic, rather than cutting interest rates aggressively in response to contractionary shocks, central banks should be more flexible and plan to bring inflation back to their targets only gradually over time. There are two problems with the LAW argument. First, such a policy is inconsistent with central bank objectives of eliminating wasteful economic slack in the economy and efficiently managing the short-run unemployment-inflation tradeoff.[48] Secondly, and more importantly, such a policy can be counterproductive, because it may result in long-term inflation expectations ratcheting downwards and generate higher risks of getting stuck in a low inflation trap with a more prolonged period of very low interest rates.[49] The LAW argument is based on a "lucky-fool" strategy, where policymakers hope that the economy will strengthen without monetary or fiscal policy action, and dismiss the possibility that more

[48] Saunders and Tulip (2019) and Svensson (2017) argue that such a policy would have insignificant benefits in terms of reducing the probability of a financial crisis.
[49] The analytical framework pushed by LAW proponents is based on an incorrect assumption that central banks can simply control real market interest rates and that higher interest rates would be successful in containing risks to financial stability. Central banks in the real world set a very short-term interest rate to influence long-term market interest rates and asset prices. In the standard framework for monetary policy the primary role of the central bank is to adjust this short-term interest rate to provide a nominal anchor for the economy and placing weights on other objectives must not be inconsistent with this objective (see Adrian, Laxton and Obstfeld, 2018). Real interest rates and asset prices are determined by the interactions of central banks and financial markets. For models with policies designed to deal with excessive credit expansions and asset prices see Benes, Kumhof and Laxton (2014a, b) and Benes, Laxton and Mongardini (2016).

contractionary shocks will arrive in the future that could potentially push economies into deflationary spirals with debt deflation. Recent historical experience supports this view. In the case of the GFC, LAW with higher rates immediately before the onset of the crisis in September 2008 would have meant a weaker economy and lower inflation, leading to a situation where the policy stance would have been at the effective lower bound for even longer during the recovery. More recently, during the period of Covid and post-Covid, the liberal use of QE and unconventional forward guidance caused a significant underpricing of risk and contributed to the emergence of a widespread asset price bubble.

The monetary policy-relevant output gap is conceptually and quantitatively different from the financial cycle. Failure to make this distinction can lead to misguided policies that result in central banks allowing long-term inflation expectations to ratchet downwards and potentially getting stuck in low interest-rate traps. We emphasize that it is critical to find the right set of policies to effectively deal with the risks and costs of financial instability rather than overburdening and risking the hard-fought credibility of existing monetary policy frameworks. Misguided policies based on weak analytical frameworks are potentially dangerous, as demonstrated by the ample warnings before the GFC without providing sensible solutions. We argue that we rather need to focus on policies that have demonstrated to be successful in reducing the risks and costs of financial crises.

The monetary-policy output gap is constructed from the core projection model (Section X). To construct the measures of the output gap relevant for financial-stability assessments, we intend to develop a simple model of the financial cycle. This involves specifying a model that includes a cyclical and trend decomposition for output that uses information on real property price growth and real credit growth to help measure the lower-frequency cyclical component in GDP. We use the term trend output to distinguish it clearly

from the concept of potential output, which is based on the notion of imbalances between aggregate demand and supply in the goods market.[50]

In addition to the importance for monetary and macroprudential policies, measures of sustainable output also have important implications for fiscal policy. Information about the sustainable or trend level of output is important to obtain measures of the medium-term sustainable tax base, a key input for fiscal policy.

4. Flexible Inflation Targeting

Flexible Inflation Targeting (FIT) is a term used to dispel the misconception that central banks are only narrowly concerned about inflation. A FIT regime maintains that the central bank pursues its primary objective of low and stable inflation while also taking into consideration other objectives such as output and employment, and that these and any other objectives remain consistent with the primary objective.

A draft version of the CBA's Statement of Long-Run Policy Objectives, presented in Volume II, Chapter VIII, embodies the core message of a FIT regime. FIT regimes are characterized by six core principles:

1. The primary role of monetary policy is to provide a nominal anchor for the economy. Placing weights on other objectives must not be inconsistent with providing an anchor for inflation and inflation expectations.
2. An effective inflation-targeting regime will have beneficial first-order effects on welfare by reducing uncertainty, anchoring

[50] As part of its analytical toolkit, the CBA has developed approaches for thinking about financial-cycle-relevant output gaps as well as credit gaps, which differ substantively from the standard HP filter-based approaches used in many institutions. Refer to Avagyan et al (2023c) and Avagyan et al (2023d).

inflation expectations, and reducing the incidence and severity of boom-bust cycles.

3. The success of an FIT regime depends on other policies that make the task of monetary policy easier and more credible.
4. Because of the lags in the monetary transmission mechanism, and because of the concern with both the deviation of inflation from its target and the deviation of output from potential, it is neither possible nor desirable to keep inflation exactly on target. In practice, inflation targeting resembles inflation-forecast targeting.
5. Given the possibility of conflict between inflation targets and other objectives, central bankers must have reasonably clear objectives and sufficient independence from the political process to achieve these objectives.
6. There must be effective monitoring and accountability mechanisms to ensure that central bankers are behaving in a manner consistent with the announced underlying objectives and that monetary policy is based on sound practices.

To operationalize a FIT regime, Lars Svensson (1997) developed the concept of inflation-forecast targeting, which provides a systematic way to implement FIT. Svensson points out that the central bank's inflation forecast represents an ideal conditional intermediate target because it takes account of all available information, including the preferences of the policymakers and their views on how the economy works. Practitioners have come to view inflation-forecast targeting as an efficient and systematic way to make FIT operational.

The "flexible" component of FIT also refers to the need to have an analytical framework that works in different environments, depending on the situation, which is summarized in our taxonomy of scenarios. In particular, the framework should be sufficiently flexible to handle stagflationary shocks, considering the difficulty this presents for the central bank to communicate policy that remains consistent with the principles of

FIT, namely the welfare principle. Furthermore, we believe the future is likely to be wrought with stagflationary forces emanating from climate-related issues and policies and energy availability (i.e. peak conventional oil production). Therefore, the operational guide that is the centerpiece of our analytical framework is designed to address this future, and we believe EndoCred (see Volume V, Chapter B) strikes the right balance for marshalling analytical and communication resources of the CBA to effectively handle these types of situations.

EndoCred modifies the conventional model in three ways: an endogenous policy credibility process, by which monetary policy can gain or lose credibility over time; nonlinearities in the inflation equation and in the credibility generating process; and an explicit loss function. The standard response to unfavorable supply shocks involves an interest rate increase, some loss of output, and a period of increased inflation. A delayed response can result in a prolonged period of stagflation if credibility is threatened where the only way back to the inflation target is a more punitive loss than otherwise would have been needed. We believe these additional components help support a better monetary policy decision making and communication apparatus.

C. Monetary Policy Transmission in Armenia

1. Introduction

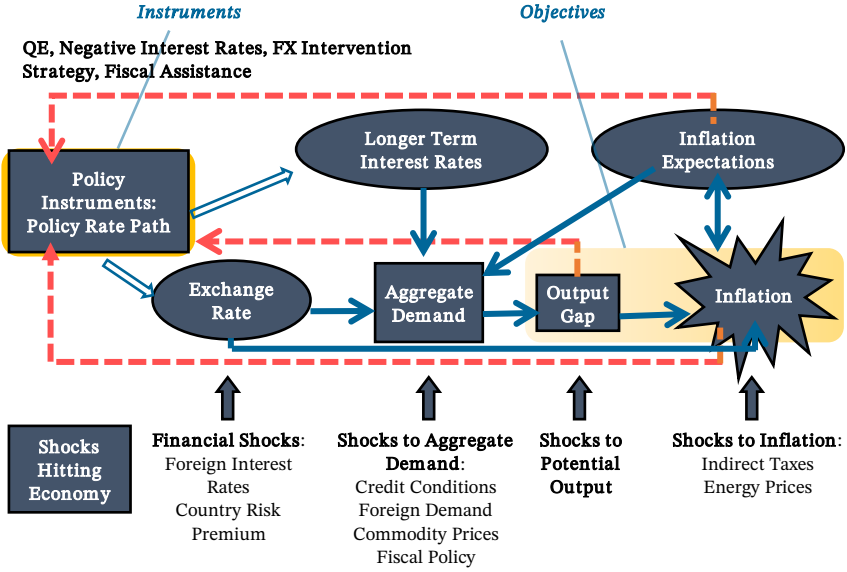
There are many reasons to think that the transmission mechanism in Armenia may be different than in more advanced economies. As a developing economy, Armenia has relatively underdeveloped financial markets, meaning that changes in financial conditions brought about by monetary policy may directly affect only a smaller share of the population. Monetary policy transmission in developing countries may be affected by external factors, such as uncompetitive banking systems or information asymmetries leading to segmented money markets. Certainly, some have

argued that the relative weakness and uncertainty of monetary transmission in developing countries which would caution against trying to fine-tune monetary policy through inflation targeting. However, this point can easily be overemphasized. First, uncertainty about the transmission mechanism is not unique to Armenia but rather is a general characteristic, perhaps especially of countries implementing new policy frameworks, often in the face of rapid structural change. Second, this does not justify inaction or seeking alternatives to inflation targeting (such as monetary aggregate or exchange rate targeting). Finally, the transmission mechanism-monetary framework relationship is a two-way street: the appropriate design, communication, and conduct of monetary operations are prerequisites for effective policy transmission.

2. Monetary Policy Transmission Mechanism

The credibility of the long-term inflation target underpins inflation-forecast targeting. Everything pivots around the anchor provided by the firm public expectation that monetary policy will keep inflation stable and near the official target rate. This in turn requires that policy responds systematically to the requirements of this objective. Figure I.5.5 depicts a model of the process. With a forward-looking policy, the expected path of the policy interest rate is adjusted when unanticipated disturbances hit the economy in an attempt to bring inflation back to the target while keeping disruptions to output to a minimum. This policy feedback, through an endogenous short-term interest rate, is represented by the red dashed arrows and ensure that the nominal anchor holds.

Figure I.5.5. The Monetary Policy Transmission Mechanism



Source: Clinton (2015)

The core model captures the main aspects of the complex transmission mechanism, from the policy interest rate to output and inflation, and takes account of a myriad of other factors that might influence these goal variables, using judgmental input from sectoral experts. An essential feature is an endogenous policy interest rate, such that following a disturbance, the interest rate systematically responds to bring inflation back to the target within a medium-term horizon.

One may distinguish several transmission channels for the effects on domestic output and core inflation in such a model. The real interest rate affects the output gap, with a lag, both directly (the internal channel) and through its impact on the exchange rate (the external channel). The exchange rate channel in the model has three distinct aspects: (1) direct, through imported goods in the consumer price index basket; (2) indirect, through prices of intermediate imported goods; and (3) expenditure

switching, where the real exchange rate redirects spending toward, or away from, domestic production and therefore affects the output gap. In turn, changes in the output gap imply medium-term variations in the core rate of inflation.

Expectations of future policy rate movements over the short to medium term play a crucial role in the transmission mechanism, as depicted by the blue arrows pointing at the ovals labelled Longer-term interest rates and Exchange rate. The cost of borrowing for businesses and households is not directly influenced by the short-term rate controlled by the central bank. They borrow at longer terms and therefore, it is the expected policy path in the future, and hence the level of the whole yield curve, than through the current policy rate itself that influences the cost of borrowing.

Since its establishment, the CBA has made significant progress in refining its framework and subsequently the transmission of monetary policy and macroeconomic stability in Armenia. Considering Armenia's orientation as a small open economy in a historically precarious corner of the world, the challenges, however, always seem to be getting tougher. Perhaps foremost is the difficult global economic environment since the Covid pandemic, which have put extreme stress on central banks' frameworks to adjust to a host of shocks and keep expectations anchored. Most of the shocks are real rather than monetary: commodity prices, resource output, foreign direct investment flows, foreign demand, and fiscal policy. However, in our view, the agenda for monetary policy outlined in this book can play a critical supporting role. Central banks can work to implement clear forward-looking policy regimes that respond coherently to the full range of shocks. This will help avoid macroeconomic and financial crises, allow exchange rate flexibility to avoid persistent misalignments due to commodity price shocks, and keep inflation expectations anchored while avoiding unnecessary swings in interest rates, inflation, exchange rates, and output. All this can keep bad times from exploding into vicious circles of

macroeconomic disarray and allow policymakers time to address the full range of challenges.

D. Analytical and Modeling Toolkit

A major drawback of FPAS Mark I was a rudimentary handling of non-linear dynamics in models and analysis. Important non-linearities associated with monetary policy (for example, those related to the Effective Lower Bound (ELB) on policy interest rates, the presence of rationally inattentive agents, and endogenous policy credibility) were not attended to. Instead, a simple open economy gap model closed by an endogenous monetary policy reaction function (BKL, 2006a, b) was the preferred workhorse model. It captured the major elements and principles of monetary policy needed for the task of regaining nominal stability; these elements remained suitable for the Great Moderation that followed. Inflation was successfully brought to low levels and kept low without notable additional challenges. Issues around the ELB subsequently became a major topic of discussion, but greater attention was paid to financial stability implications than nominal stability ones. Modeling innovations focused on adopting DSGE methods and on proxying the policy effect of QE as an instrument in some way, such as via the term premium on long-term bonds.[51]

The adaptations needed for FPAS Mark II seek to avoid the limitations of FPAS Mark I models, in particular the core workhorse model, as described in the following sections. The FPAS Mark II framework integrates a comprehensive array of models, crucial for robust economic analysis and projection. This suite includes core models like the EndoCred model and a standard linear model, along with supplementary models such as MPmod and FCmod, each addressing distinct economic phenomena and implications.

[51] Refer to Engen, Laubach and Reifschneider (2015).

The EndoCred model and the standard linear model form the core of the FPAS Mark II's quarterly projection capabilities. The EndoCred model is distinguished by its dynamic approach to policy credibility, making it particularly effective in scenarios of economic uncertainty, often seen in small open economies. The standard linear model, prevalent in FPAS Mark I frameworks, offers a more traditional approach with its stable policy credibility assumption. These models require expert analysis for developing realistic and comprehensive economic projections.

DSGE models in FPAS Mark II, including those detailed in our recent paper, provide a rigorous theoretical foundation for understanding complex economic dynamics. Specifically, we utilize a closed economy version of a DSGE model to analyze the effects of increases in world government debt on global real interest rates. This approach allows us to examine the direct impact of heightened government borrowing on key economic indicators, isolating the effects within a closed economy framework. This model offers vital insights into how large-scale fiscal policies can influence fundamental economic variables on a global scale, shaping the trajectory of interest rates and overall economic stability.

The output gap concept is pivotal in FPAS Mark II, especially in relation to monetary and financial stability policies. MPmod examines the output gap from a monetary policy perspective, focusing on the divergence between actual and potential economic output and its implications for inflation and monetary stability. FCmod, conversely, evaluates the output gap in the context of financial cycles, offering insights into how fluctuations in financial variables like credit growth and asset prices can impact the economy’s overall output and stability.

Looking ahead, the FPAS Mark II framework aims to develop monthly versions of its projection models, enhancing the frequency and detail of economic analysis. Concurrently, there is a strong emphasis on advancing research in DSGE economics, crucial for deepening the theoretical

understanding and practical application of these models. These forward-looking objectives are key to ensuring the framework's ongoing relevance and effectiveness in a rapidly evolving global economic landscape.

VI. Communications and Transparency Framework

Vahe Avagyan, Jared Laxton, Asya Kostanyan, and Anzhela Papikyan

A. History of Monetary Policy Communications and Transparency

1. Prehistory: The Perceived Importance of Confidentiality pre-Inflation Targeting

For most of its history, central bank monetary policy tended to be a highly secretive practice. Institutions did not clearly explain their monetary policy objectives and strategies to the public. This prioritization of confidentiality over transparency kept markets and the public guessing about the actual setting of policy instruments and where policy might be headed. In the event of a crisis or meaningful uncertainty about the future, there would be virtually no transparent, factual basis for key stakeholders to understand how monetary policy would be likely to respond.[52] In the case of the United States, during Volcker's response to the Great Inflation, congressional or public oversight of the Fed's strategy to break the back of inflation was "only theoretical, because few members of Congress clearly understood what the Fed was doing."[53]

The reasons for this secretive approach offered by central bankers historically centered on the need to maintain central bank independence. For example, in advanced economies such as the United States during the

[52] Refer to Mishkin (2004).
[53] See Blustein (1984).

period of the Great Inflation of the 1970s, the Fed's credibility was at perhaps historical lows after years of persistently low growth and very high inflation in the United States. As the Wall Street Journal noted, "in the 1970s…the public had lost faith in the government's ability to restore price stability." Under Volcker, the Fed finally responded aggressively to the Great Inflation and was successful at bringing an end to persistently high inflation, but this came at great cost to short-run output and unemployment. The political and public outcry that emerged in response to this chaotic period—years of stagflation followed by the worst recession since the Great Depression that finally ended inflation—unsurprisingly centered around whether the Fed should remain so independent and secretive. Republican Representative Jack Kemp of New York, for example, complained that "an elitist Federal Reserve is determining the course of the American and world economy." A top White House official stated that the Fed's independence "ought to be one of the great debates of the late 1980s."

As one Fed official explained, the Fed defended its secrecy during this period by maintaining that "secrecy is designed to shield the Fed from political oversight." Indeed, one of the major risks facing central banks—as the public and political outcry to the Fed in the 1980s lays bare—is that politicians frequently seek to manipulate central banks to exploit the short-run inflation-output tradeoff. For congressmen who face elections every two years, their time horizon is certainly much shorter than that which is needed for making effective monetary policy. Without adequate central bank independence, the central bank could face political interference and pressure that could lead to an exploitation of the short-run inflation-output tradeoff that would be good for elections in the short term, but incredibly damaging to anchoring inflations and inflation expectations in the medium and long term.

These intense public debates in the 1980s, as well as the trials and tribulations of central banking in the 1970s and 1980s (not acting sufficiently aggressively in the 1970s to curb inflation, thus forcing much

costlier welfare outcomes in order to bring an end to persistent inflation in the 1980s), forced many policymakers to fundamentally rethink how monetary policy was made and communicated. Would it be possible to develop a more structured and systematic approach to monetary policymaking, with clearly defined objectives and frameworks for achieving the objective, which could ensure that monetary policy would be transparent and accountable without sacrificing central bank independence?

2. Introduction of Inflation Targeting and FPAS Mark I

The introduction of inflation-targeting regimes sought to solve this very problem. Under inflation targeting, the central bank would clearly define its policy objectives in terms of a numerical target for inflation, with the short-term policy rate serving as the primary policy tool for achieving the long-run target. As Bernanke and others (1997) describe, inflation targeting—by design—offered significantly improved policy transparency, by making explicit the central bank's policy intentions in a way that should improve private-sector planning, enhancing the possibility of public debate about the direction of monetary policy, and increasing central bank accountability.

The 1990s were the time of the inflation-targeting pioneers. At the beginning of 1990s, the Bank of Canada began to develop solution methods for solving a class of useful nonlinear models with plausible representations of the monetary policy transmission mechanism. The methods were incorporated in the Bank's Quarterly Projection Model (QPM). At that time that Canada had developed these methods, the Reserve Bank of New Zealand began thinking of ways to develop a more robust policymaking *framework* for achieving full-fledged inflation targeting. What emerged was the first iteration of the Forecasting and Policy Analysis System (referred to as "FPAS Mark I" or simply "FPAS"), characterized by publicly-disclosed

forecasts used to inform and explain decisions taken in pursuit of clear policy targets, which quickly emerged as the gold standard for transparent and effective monetary policymaking.

The key innovation of the original Mark I iteration of the FPAS was to develop a robust organizational, analytical, and decision-making system by which central banks could achieve a full-fledged flexible-inflation-targeting regime. Flexible-inflation-targeting central banks are those whose monetary policy has an explicit long-run numerical objective of low inflation. For most FIT central banks, the key policy instrument for achieving the long-run inflation target and managing the short-run output-inflation tradeoff would be the expected path for the policy rate, under normal circumstances.

Achieving this requires FPAS Mark I central banks to have coherent policy frameworks that provide for both internal and external transparency. Internally, this transparency takes the form of providing assessments of both the state of the economy and risks that could get in the way of achieving the inflation target. Externally, this transparency would allow for the central bank's performance to be monitored and evaluated. To support this, FPAS Mark I provides a structured, systematic approach to policymaking that is built upon the regular and transparent communication of macroeconomic information between economists, modelers, forecasters, decision-makers, financial market analysts, and the general public.

Policy communications under FPAS Mark I are centered around a baseline forecast, which is a consistent macroeconomic forecast for the policy rate and other endogenous variables. The "essential ingredients" that must be answered (and communicated) in order to develop a baseline scenario include the following:

1. Where is the economy now?
2. What are the underlying economic forces?

3. What do policy instruments need to do to achieve the basic policy objective? What are the implications of not adjusting policy instruments sufficiently aggressively to meet these objectives?

Developing the baseline forecast analytically requires a core quarterly projection model, which contains either a policy reaction or loss function, which attempts to represent the essential components of the transmission mechanism. The baseline scenario that is developed provides an endogenous forecast path for the short-term policy rate, the inflation rate, and other key macroeconomic variables. Under this approach, additional alternative scenarios provide risk assessments reflecting differing assumptions for the economy, such as shocks or differing takes on the structure of the economy that are different than what is assumed in the baseline. Considering these characteristics of FPAS Mark I, it is clear that a transparent communications and accountability framework plays an essential role within the framework. By design, FPAS Mark I central banks must prioritize clear communications of the policy decision, the economic thinking that led to the decision, the analytical tools that were used in the process, and so on.

3. Communications and Transparency under Uncertainty

The instrumentalization of communications, however, has run into the problem of uncertainty that is at the core of this book. The generalized indications of policy direction and bias that became commonplace during the 1990s and early 2000s also came to dominate central bank communications. Almost all central banks have placed discussion of the policy outlook at the center of their communications, even if few central banks went as far as to emphasize quantitative policy projections (routine forward guidance). But, as noted extensively in Section II, this growing tendency to project the future of policy has led to increased inertia regarding not only indications of policy direction, but also, central banks'

understanding of policy needs. Recognition lags and inaction biases have been transmitted through words as well as actions, with policy setting errors (quantitatively or qualitatively) amplified by projecting wrong policy paths forward over the years ahead. In the process, the instrumentalization of communications morphed into forms of forward guidance that placed increasing stress on knowledge of the (singular) most likely future, knowledge that central banks do not possess.

The beginnings of a reversal in the trend towards greater openness and the instrumentalization of communications can be seen with a downplaying of policy's forward-lookingness. This is best exemplified by the Fed's dismissal of policy pre-emptiveness, instead adopting "data dependency" as the prime characterization of policymaking.[54] In the absence of clear statements of policy strategy, however, "data dependency" is not very different from discretionary policy. Despite the fact that objectives have been stated (albeit with only some elements having been given quantitative form), without there being a quantified strategy or "contingency plan" (Taylor 2017), there is little basis on which the public can judge the intended use of the policy discretion that is delegated to the central bank, or assess its performance. The legitimacy purpose of communications is thus undermined.

B. Principles for Communications, Transparency, and Accountability

Any proposal for treating uncertainty more seriously in monetary policymaking must therefore address both the instrumental and legitimacy needs of communications, in the context of central bank independence. Under FPAS Mark II, the framework for communications, transparency, and accountability is driven by six fundamental principles:

[54] See Powell (2022)

- **Clarity of Objectives**: The Central Bank has a constitutional mandate to ensure the stability of prices in Armenia, and it achieves this mandate through well-defined operational objectives. This includes the numerical point target for inflation; the time horizon over which this target should be reached; what policy tools are used to manage inflation; what trade-offs might exist in bringing inflation to target levels; why inflation is not targeted on a period-by-period basis; and so on. Clearly articulating the CBA's monetary policy objectives and goals is the most important and foundational component of effective communications. It allows the public to understand the objectives and purpose of monetary policy, and helps clarify and contextualize the decisions made by the central bank, including when it has to make difficult trade-offs. This is the basis for transparency in communications and institutional accountability.
- **Decision-Making Transparency**: At its core, the purpose of central bank communications is to clearly convey: (1) how the central bank is thinking about current and underlying economic conditions; (2) what it deems to be the most relevant risks and sources of uncertainty; and (3), given this, why the central bank has made a certain decision about how to use its policy instruments, and how this will help the central bank reach its objectives. By conceiving of communications in this manner, the central bank has a duty to structure its communications to answer these questions and provide transparency about how and why the central bank made a certain monetary policy decision.
    - When the central bank relies on a baseline scenario as the central communications device, it is able to answer the first question quite robustly (as the baseline scenario is calibrated to reflect one particular assessment of current and underlying economic conditions), but it is unable to effectively address the second question about where the most relevant risks and uncertainties lie. In projecting a

single forecast of the future that derives from this narrow assessment of the economy, the baseline masks the fundamental uncertainty that policymakers face when they both develop the forecasts and make their policy decision. Whether intentional or not, the baseline serves to convey a false sense of confidence and assurance in the central bank's assessment of the latent risks and uncertainties. These fundamental uncertainties around current and underlying economic conditions and how the risks may play out, in fact, play an essential role in decision-makers' deliberations in the lead up to a decision. The central bank thus fails to appropriately convey the amount of richness and robustness that go into the analysis and discussions that support the decision when it centers the communications on the baseline. Without a robust communication of this second point, the answer to the third question—how and why the central bank made its policy decision—becomes exceedingly difficult to communicate. Decision-makers do not make their decision based on how a baseline scenario is calibrated, but rather, as a result of these colorful discussions about economic conditions, risks, and uncertainties. Central bank communications in a transparent and accountable system must clearly convey this process.

- **Policy Agility:** As noted extensively, central banks face incredible uncertainty when making decisions—uncertainty around current economic conditions, near-term historical data, underlying drivers of economic developments, the essence and significance of potential risks, and much more. Focusing communications on a baseline scenario that embodies a *single* interpretation of these issues creates an unnecessary, self-imposed bind for policymakers. In the event that new information emerges that inevitably runs counter to this singular baseline interpretation—particularly in

times of heightened uncertainty—the central bank can find it unnecessarily costly and difficult to change the course and messaging of their communications. Policy agility is unnecessarily reduced with a baseline scenario, delaying needed policy actions and limiting the policy tools available at the bank's disposal. On the other hand, when the central bank is transparent about these uncertainties and risks in its communications, and does not pretend to find value in a singular and inevitably false interpretation of current and future conditions, it has far greater policy agility and flexibility to respond to changing economic conditions. This communications framework enables a non-prescriptive discussion of potential significantly-changed policy settings, which helps to reduce the type of hesitancy to modifying policy that is caused by a lack of forewarning or will to contradict past messaging.

- **Qualitative and Quantitative Forward Guidance:** Good forward guidance must include a combination of qualitative and quantitative elements. The policy strategy would be presented through the publication of scenario-consistent policy paths. Most importantly, these policy paths would be supported by accompanying *narratives* that highlight the connections between the macroeconomic stability risks present in scenarios, as well as their policy imperatives. Revealing the strategy through quantified and narrated examples, rather than via the algebra of policy reaction or loss functions, provides concreteness and improves accessibility. This is especially relevant for those non-expert agents that are important to both price setting and endorsing the continuation of existing institutional arrangements.
- **Credibility:** By being more suited to a world characterized by significant policy uncertainty, a communications approach that drops the focus on a "most likely" future in favor of recognition of an uncertain one might, counter-intuitively perhaps, facilitate the retention of credibility. While the public undoubtedly has a

preference for certainty and assurance, prescriptively focusing on a "most likely" future can only provide a false sense of certainty and assurance. Moreover, protected public officials who make unrealistic claims of expertise may serve to threaten the valuable institutional structures created to depoliticize policymaking. At the same time, this false signaling to financial markets about the most probable paths of market-relevant policy variables risks crowding out private information, and may create the false impression that the central bank is guiding markets.

- **Analytical Transparency:** Communications frameworks also require transparency on the analytics that lie behind the policy discussion that occurs at the policy board and that is shared with the public. In spite of the additional complexities associated with MPRM mainly related to nonlinearities, the availability of open source software such as DynareJulia provides the possibility for high levels of transparency and accountability in this regard. Building upon the original FPAS, Mark II mandates real-time and online model documentation. This would allow outside users to replicate the central bank's analysis and models, and also eliminate the issue of enormous publication lags, where model documentation in many cases can fall years behind changes in the modelling assumptions.

C. Monetary Policy Communications Strategy

The essential purpose of monetary policy communications is to clearly convey: (1) how the central bank is thinking about current and underlying economic conditions; (2) what it deems to be the most relevant risks and sources of uncertainty; and (3), given this, what decision the central bank has made about how to use its policy instruments, how it has reached this decision, and how this policy action will help the central bank reach its objectives. Formulated in this manner, central bank communications must

be structured to answer these questions and provide transparency about the process and thinking that led to each decision.

Conceptually speaking, the strategy for monetary policy communications under FPAS Mark II at the Central Bank of Armenia is designed to support the six complementary goals, principles, and outcomes described in the preceding section:[55]

1. Provide clarity on monetary policy objectives;
2. Offer transparency about the decision-making process;
3. Ensure policy agility in the face of risk, uncertainty, and dynamically evolving economic conditions;
4. Provide markets and stakeholders with a combination of qualitative and quantitative forward guidance;
5. Support and strengthen central bank credibility;
6. Provide full transparency about the analytical and data toolkit the central bank uses to conduct analysis in support of its decisions.

In support of these principles, the Central Bank utilizes a suite of communication tools, which, separately and collectively, serve to communicate the essence of monetary policy to the key target audiences. The followings sections chapter describes these target groups and communications vehicles in detail. Section D outlines the key stakeholders for CBA monetary policy communications. Section E describes the key communications vehicles that are used to achieve the communications objectives. Section F explores specific tools for ensuring the highest standards for transparency and accountability in monetary policy communications. Section G describes the publicly available analytical tools, documentation, and data used to conduct monetary policy analysis.

[55] These principles are discussed in detail in Volume I, Chapter VII of this book. This chapter focuses on the specific strategy for monetary policy communications at the CBA.

D. Target Audiences for Monetary Policy Communications

As Volume I, Chapter VII has noted, the traditional mantra of central bank communications over much of the twentieth century was to "say as little as possible and say it cryptically."[56] With the advent of inflation targeting and FPAS regimes to support this novel approach to monetary policy, transparency in monetary policy communications came to play a central role. By design, the effectiveness of inflation targeting frameworks depended in no small part on the ability to clearly and explicitly communicate the central bank's policy intentions and manage expectations. In this context, the target audiences for monetary policy communications were considered to primarily comprise a very narrow subset of financial markets and expert audiences such as analysts and academics.

The crises of the past two decades—beginning with the Global Financial Crisis and continuing with the Covid-19 pandemic and rising geopolitical tensions in the 2020s—have made explicitly clear that the efficacy of central bank communications requires paying greater attention to a wider set of audiences than experts alone, especially the general public. Even in advanced economies with relatively high economic literacy, most households are largely unaware of the objectives, methods, or key decision-makers of monetary policy. Moreover, household expectations of inflation and general macroeconomic conditions are frequently inconsistent with the messaging or policy actions of the central bank.[57] Clearly, non-expert households and firms play a pivotal role in expectations channels, and the central bank thus cannot ignore direct communications to the public. At the same time, the central bank cannot entirely depend on the news media to transmit its messaging to the public. Coibion et al. (2019) show how

[56] See Blinder et al (2008).
[57] See, for example, Blinder (2009), Blinder (2018), Carvalho and Nechio (2014), Drager et al. (2016), and Coibion et al. (2019).

monetary policy-relevant messages transmitted through the media can be dampened and lose their efficacy. At the same time, there is a risk that key monetary policy communications can be misinterpreted or misconstrued by the media, whether due to a tendency to over-simplify or in service of a specific political or ideological agenda. These factors underscore the need for the central bank to develop specific, tailored strategies for communicating its monetary policy to both expert and non-expert groups.

Additionally, the Central Bank of Armenia holds as a fundamental principle the need to be accountable to the public, whom the Board is appointed to serve. Clear and effective communications are the principal means through which the central bank can achieve transparency in its policymaking, and transparency in its turn is the most important foundation for the Central Bank and its leadership to be held publicly accountable. Accountability is a cornerstone of good governance, and is a virtuous incentive for the institutional staff and leadership to make the right decisions.

Against this context, the key audiences for monetary policy communications include:

- **General Public**: everyday citizens, including households and business owners, who play an important role in the expectations channel and who directly experience the benefits of price and macroeconomic stability (and the hardships imposed by their absence). Communicating with the general public about a highly complex topic such as monetary policy requires striking a perfect balance between, on the one hand, crafting messages to be easy to understand, and on the other hand, avoiding oversimplification that carelessly oversimplifies the nuance and complexity of monetary policy.
- **Media**: traditional and non-traditional news organizations (print, television, and online) that participate in CBA press conferences

and transmit key CBA communications to the public. While media cannot be relied upon as the sole conduit of information to the public, efforts must be made to improve collaboration with the media, including with economic literacy initiatives, to improve the efficacy of media reporting about monetary policy.

- **Financial Markets**: the traditional target audience for monetary policy communications. Clear and effective communications by the central bank helps market participants form better expectations by nudging their expectations in the appropriate direction and by reducing uncertainty about how policy is likely to behave in the event that any type of risk materializes. Key stakeholders within this group include domestic commercial banks, domestic and foreign asset managers, institutional investors, and so on.
- **Academia**: researchers who study monetary economics are a traditional expert audience. We also emphasize the importance of outreach and communications with academics whose primary purpose is lecturing and teaching, since this can have very positive impacts on long-term economic literacy in the country.
- **Government**: the government at large, and various ministries including the Ministry of Finance, are another traditional stakeholder for monetary policy communications, particularly as it relates to the development of fiscal and other policies that have meaningful interplay with monetary policy.
- **International Organizations**: these include International Financial Institutions (e.g. International Monetary Fund, Asian Development Bank, World Bank, etc.) with whom the CBA and Government of Armenia regularly interact for long-term capacity development, funding, and development projects.

The target audiences for monetary policy communications are diverse and wide-ranging. They differ meaningfully in their level of economic literacy, interest in the minutiae of monetary economics or technical analytics, and preferred mode of receiving information, among many other factors.

Nevertheless, as an accountable institution that prioritizes transparent communications as a foundational principle for good governance, the central bank has a duty to craft its communications strategy and tactics in such a way so as to overcome these barriers. In other words, monetary policy must be made clear and accessible to all of these target audiences, and the communications tactics (including the type of medium, messaging, and level of complexity) must be thoughtfully tailored to each audience. These communications vehicles and tactics are explored in the rest of this chapter.

E. Key Communications Vehicles

The primary communications vehicles through which the CBA hopes to execute the communications strategy outlined in section A and reach the target audiences listed in section B are detailed below. These include a mix of written, oral, and online communications vehicles, each of which is tailored to be accessible to and understandable by overlapping elements of the key target audiences. We reiterate that each mode of communication, regardless of its target audience or density, is designed to serve the six principles of effective policy communications described in Section A.

1. Monetary Policy Report

The Monetary Policy Report ("MPR") serves as the chief communications vehicle for the Central Bank of Armenia, and is published on a quarterly basis. The MPR is intended to present, in some detail, the CBA's implementation of the policymaking framework described in this book. It begins with an assessment of the first two ingredients essential for economic analysis: where is the economy now, and what are the underlying forces driving the economy. The MPR frames this analysis within a discussion about how the CBA is managing current risks through a framework of least regrets. This includes a taxonomy of different types of shocks that may be relevant in the current policy round, reflecting a

summary of the universe of major issues the Board and Staff of the CBA, as well as external stakeholders, are concerned about.[58] Against this context, the MPR presents two or more illustrative case scenarios representing what the CBA will do with its policy instruments in order to reach its objectives. The MPR also contains a statistical appendix, which contains charts and tables for relevant economic variables, as well as a chart pack providing key projections from the illustrative case scenarios.

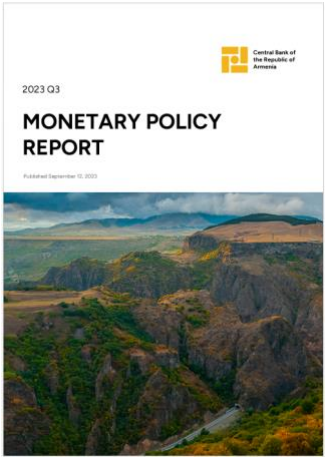
Importantly, the MPR of the CBA is published on the same day as the policy decision is made by the Board of the CBA. This is intended to provide the public with sufficient detail and narratives that describe the framework and analysis that led to the decision in a near-real-time manner.

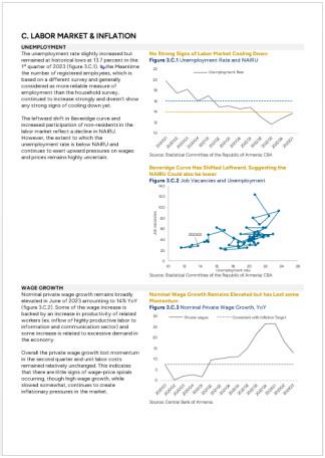
As a self-contained communications document that communicates the CBA's key monetary policy messaging each quarter, the MPR is intended to be a user-friendly document that covers all relevant issues but remains accessible to technical and non-technical audiences alike. For technical, "expert" readers, the MPR provides robust textual and graphical narrative descriptions of the key policy-relevant macroeconomic issues for Armenia. For less technical audiences, the report is formatted such that a read through the brief executive summary and a scan through the charts and headlines (organized on the right side of each page) would suffice for a

[58] The purpose of this taxonomy is to provide a structured assessment of the different types of risks and shocks that can affect the Armenian economy and describe their impact on inflation and economic environment in Armenia, as well as loosely illustrate appropriate monetary policy reactions by CBA. Having a structured framework for classifying these risks allows the reader to more effectively understand the wide range of information, ideas, and opinions that are held by various stakeholders, from the Board and Staff of the CBA to financial markets and the public. To allow the diversity of viewpoints among these various groups to flourish and to facilitate the development and communication of better policy decisions, it is imperative to structure these views within a cohesive structure. The taxonomy is intended to provide a concise summary of the Staff's views about the totality of all the policy-relevant risks held by various stakeholders, which are most policy-relevant for Armenia.

high-level summary of the current and underlying economic environment, latent risks and uncertainties, and how the Board arrived at and supports its decision.

Figure I.6.1. Sample Monetary Policy Report

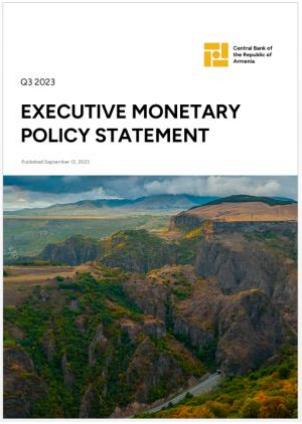




2. Executive Monetary Policy Statement

The press release, communicating to the public the monetary policy decision made by the Board of the CBA, is known as the Executive Monetary Policy Statement ("EMPS"). The EMPS contains two parts: a statement by the Board of the CBA stating the decision made and explaining the institutional rationale for the decision; and a brief Staff assessment of current and underlying economic conditions. The EMPS is issued during each of the eight decision dates per year. On interim decision dates when the MPR is not published (four of the eight decision dates per year), the EMPS serves as the main written communications device, ensuring continuity in communications around the key macroeconomic issues between MPRs.

Figure I.6.2. Sample Executive Monetary Policy Statement



II. STAFF SUMMARY OF ECONOMIC CONDITIONS & UNDERLYING FORCES

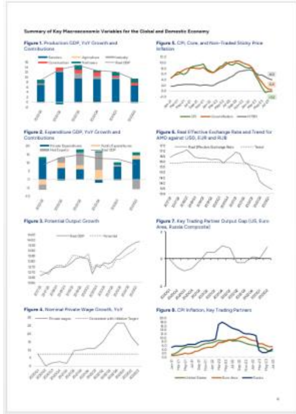
GLOBAL ECONOMY

INFLATION

MONETARY POLICY

DOMESTIC OUTPUT

LABOR MARKET



3. Press Conference

On each decision day, the Governor of the CBA hosts a press conference for members of the media. The press conference is live-streamed on the CBA's various online platforms (e.g. YouTube, Facebook, etc.) and can be freely viewed by the public in real time. The purpose of the Press Conference is for the Governor to communicate the Board's monetary policy decision; provide a clear explanation of the Board's thinking around the key macroeconomic risks, uncertainties, and issues (structured around questions of "where is the economy now? what are the underlying forces? and what is the Board doing with its policy instruments to achieve its objective, in line with this reading of the key issues?"); and offer a platform for journalists to ask questions related to the CBA's monetary policy decision, strategy, risk assessments, and so on. During the press conference, the Governor solely presents the institutional view of the Board of the CBA. The Head of the Monetary Policy Department also participates in the press conference as support to the Governor.

The press conference serves as one of the most important means of communicating with the general public. This can occur in several ways. First, thanks to its live-streamed nature (and its availability on the CBA

website and online platform afterwards), the press conference allows the Governor to communicate CBA policy and other key policy-relevant issues directly with the public. Second, the press conference allows members of the media to more robustly understand the CBA's policy decision and thinking around the key issues, which supports higher-quality and more extensive reporting around monetary policy decisions.

4. Technical Briefing with Analysts

On a quarterly basis, following the Board's monetary policy decision, a technical briefing is held with analysts and other experts. The technical briefing provides a platform for expert audiences (including financial market participants, commercial bankers, institutional investors, academics, and others) to ask technical questions about the CBA's economic analysis, modeling tools, and so on. The Head of the Monetary Policy Department and members of the staff leading the projection round lead this meeting. A non-executive CBA Board member also participates, solely to respond to questions that relate to matters of policy.

This approach allows the central bank to continue to communicate the technical complexities of economic analysis and policy with expert audiences, without sacrificing accessibility to the general public. Because this technical platform is available and open to experts, many of the primary communications tools (e.g. the press conference) can remain more high-level, easily understood, and accessible by the public. Thus, the central bank does not have to choose between accessibility and complexity in its communications; it can speak in both tones, depending on the audience.

5. Media Interviews

Following each decision, one Board member, on a rotational basis, participates in an interview with the media. This would likely take on the form of a televised interview. The purpose of the interview is to elaborate

on the key issues presented in the MPR and the press conference. While the content of the interview would in many cases be redundant with the press conference, the purpose of having additional media interviews is to extend the reach of central bank communications, particularly as a far greater share of the general population watches news (whether on television, online, or on social media) than views the CBA's press conferences.

During media interviews, in all discussions around the policy decision itself, the Board member should present the institutional view. In more abstract discussions about specific risks or issues, the Board member may present their personal view, given that clear disclaimers are made. In general, Board members should seek to devote the vast majority (as an illustrative figure, approximately 80%) of their communications to the institutional view, and allot the remaining share to their personal view, providing clear disclaimers when they do present their individual view.

6. Social Media

Social media can serve as an important means for the CBA to communicate directly with the general public, without the intermediation of media and journalists. Effective social media use (including, for example, Facebook, Instagram, Twitter, and LinkedIn) can serve two purposes for MP. First, it can help promote economic literacy through the use of educational posts and infographics about the purpose of monetary policy, key elements of the framework, what the inflation target is, how the price stability objective is achieved, and so on. Second, social media can serve as another method for communicating the CBA's monetary policy decisions and what it is thinking about the economy.

F. Decision-Making Transparency and Accountability

The key communications document supporting decision-making transparency and accountability is known as the "Board Transparency Report," which contains the Minutes of Board Deliberations and the Policy Decision Rationale. These documents are described in detail below.

1. Minutes of Board Deliberations

The Central Bank of Armenia publishes minutes of the Board deliberations for each policy decision. These minutes provide a concise summary of the main discussion items by Board members and material presented by the Staff. As an added measure of transparency and accountability, the minutes summarize the key arguments made by members of the Board (attributed to each Board member), allowing the public to understand the scope of deliberations that led to each decision.

2. Policy Decision Rationale

When casting their vote, Board members provide a succinct, one paragraph summary of the rationale supporting their proposed decision. These explanatory notes, known as "Policy Decision Rationales," may be published on decision day, at some point in the future. Publishing the rationales would allow the public to have further insight into the often diverse viewpoints held by the Board, and understand the different perspectives that Board members may have about the most pressing issues.

G. Analytical Transparency

1. Model Documentation

Following the best practices for analytical transparency, the CBA plans to publish the full model documentation used in the quarterly projection process. This approach allows the public (primarily oriented toward expert audiences of analysts, commercial bankers, and academics, but also students of economics and aspiring practitioners) to replicate or modify the central bank's analysis in their own risk management exercises. The CBA plans to take this approach a step further than what is considered best practice today by using open-source DynareJulia software, in order to increase the accessibility of the model and analytics. To this end, the staff of the CBA, collaborating with from the Better Policy Project, have published an extensive user guide for DynareJulia, known as the Space Shuttle.[59]

2. MPR Chart Pack

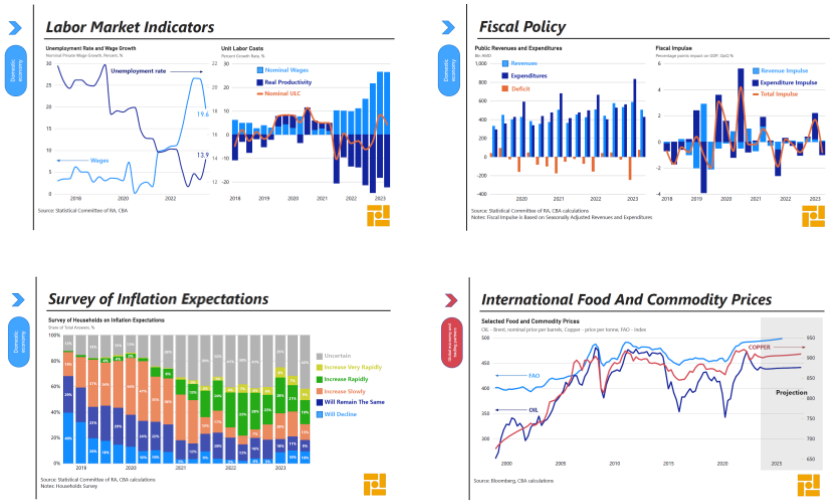
Because the MPR follows a more streamlined and narrative-based approach, not all economic variables are presented in the report itself. This is natural—the MPD staff works with hundreds of data series at a time, not all of which are equally relevant for policy or analysis. Rather than making the mistake of "filling the bathtub" in the MPR with the universe of available information,[60] the CBA instead publishes this data (in the form of accessible charts and tables) in the MPR Chart Pack. This document is

[59] Please refer to www.thebetterpolicyproject.org for access to the Space Shuttle. We thank Anzhela Papikyan of the CBA for coining the title and for laying the foundation for the user guide. We also thank Haykaz Igityan of the CBA and Asya Kostanyan of the BPP for their tireless work in developing and refining both the analytical toolkit and the DynareJulia user guide.

[60] We refer to the term in the context of its usage by Eric Leeper in his seminal "An Inflation Reports Report" (2003). Leeper's paper was an important inspiration for the streamlined and narrative-based approach of the CBA's new MPR.

published concurrently with the MPR. Selected pages from a sample MPR Chart Pack are shown in Figure I.6.3.

Figure I.6.3. Selected Pages from Sample MPR Chart Pack



VII. Human Capital Framework

Vahe Avagyan, Hayk Avetisyan, Douglas Laxton, and Anzhela Papikyan

A. Introduction

"I'd rather have Bob Solow than an econometric model, but I'd rather have Bob Solow with an econometric model than without one."
–Paul Samuelson via Stan Fischer

With the development of new approaches to monetary policy decision-making in FPAS Mark II, a unique opportunity emerges to rethink not only how monetary policymaking is conducted and communicated, but also, what role human capital ought to play in this revitalized system. In developing teams that are responsible for carrying out world-class monetary policy modeling, research, and decision-making support under the Forecasting and Policy Analysis System (FPAS) Mark II, the primary challenge lies in developing organizational structures that support, rather than hinder, economists' productivity, collaboration, and development. The typical institutional and bureaucratic barriers inherent to many central banks and MPD's can have dangerous consequences, and often, they do more to circumscribe individuals' growth than to support efficiency or productivity. The introduction of FPAS Mark II provides the chance to fundamentally rethink how monetary policy departments are organized; how staff are trained; how teams are structured; what type of culture is created; what values are cultivated and rewarded, and what undesirable traits are not tolerated; and what degree of work-life balance is encouraged. In addition, it is worth mentioning that the development of the human capital framework under Mark II is inspired by large evidence about some of the issues faced by FPAS Mark I CBs—as well as leading private sector

institutions globally—with respect to the productivity of individual experts and the creation of collaborative environments for teamwork.

Under FPAS Mark II, the development of human capital is a fundamental priority of the CBA. The proposed human capital framework is built on the assumption that there are, in fact, practical and real ways to prioritize and support the near- and long-term growth and wellbeing of staff in the monetary policy department (MPD). Developing institutions and policymaking frameworks where human capital is truly at the forefront is admittedly not an easy task. However, the opportunity costs of not doing so—of neglecting human capital and retaining unproductive hierarchies and bureaucratic approaches—are far greater in the long-term than the resources and effort required to make this change. The vision for having a human-capital-first organizational approach is to develop a truly world-class organizational culture among the staff: high and rapidly-growing productivity; efficient processes and resource-allocation that minimize bureaucratic hierarchies; a collegiate culture of collaboration that incentivizes staff to learn and grow; greater dynamism and flexibility in how teams are staffed and how staff allocate their time; among others. Perhaps most importantly, all of this seeks to minimize the stress and inefficiencies that can often lead to burnout and hurt work-life balance.

B. Existing Human Capital Problems at Most Central Banks: Excessive Hierarchy and Rigidity

All teams and institutions require organizational structure. Whether that structure be positive—supporting staff to carry out their work more efficiently and productively, and incentivizing them to consistently grow and develop—or whether it be negative—creating inefficient bureaucracy and unnecessary hierarchies that stifle long-term growth, creativity, and learning—is not predetermined. Unfortunately, the vast majority of MPD's in central banks around the world (and, indeed, virtually all sufficiently large pubic- and private-sector organizations), adopt the latter approach.

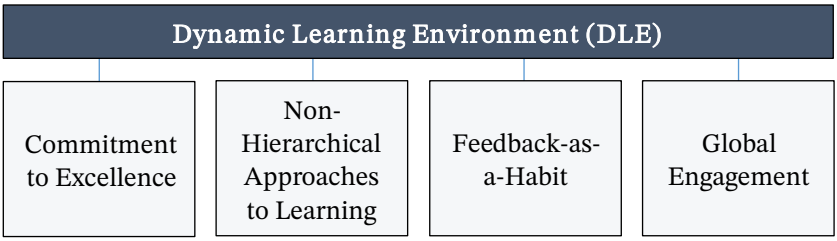
These inefficient and hierarchical organizational structures can be extremely problematic, for several reasons. First, excessive hierarchy and rigid divisions between teams run the risk of cordoning people into silos, where individuals become extremely specialized in narrow tasks but have little knowledge of other relevant fields. In this context, individuals only have incentives to grow in one narrow arena, but even then, they may hit growth ceilings, and could instead adopt a "good enough" approach to getting tasks done. The end result is often a department with groups of "task doers" rather than well-rounded economists who are incentivized to become exceptional. Worse still, when such specialized "task doers" leave the central bank, their roles become difficult and costly to replace. Second, such rigidity discourages collaboration and knowledge-sharing across teams. Not only are there few incentives for this type of collaboration, but even when it does take place, it often occurs in excessively formal ways (e.g. a division head reaches out to another and asks for support or knowledge-sharing from the latter's team, who then determines if his or her staff has enough time to devote to helping another team, limiting opportunities for natural collaboration). Such an approach hardly qualifies as learning, which needs to occur organically and dynamically to have maximum effect. Third, such rigidities present challenges for efficient resource allocation that maximizes each individual's potential contribution. As team members enter into specialized silos, they may become highly adept at fulfilling that specific role, but this may be different from their actual interests, or may significantly underutilize their potential. The end result is that individuals, teams, and the central bank at large, can suffer from low morale, inefficiency, and low productivity—problems that can be largely avoided with a better organizational approach to human capital.

C. Training and Development: Dynamic Learning Environment

Solving these problems requires organizational as well as cultural changes. Under FPAS Mark II, we attempt to address these issues by developing the type of organizational culture that fosters continuous learning and development, specifically in the monetary policy department but beyond as well. We characterize this as a Dynamic Learning Environment (DLE). DLE is defined as an intensive, rigorous, and highly collaborative environment that seeks to develop exceptional thinkers and macroeconomists. The idea is to shift away from overly hierarchical and bureaucratic models and towards a collaborative system where economists immerse themselves in thinking critically, learning at lightning speeds, sharing knowledge, and giving and receiving constructive feedback as a habit.

The foundational pillars of the human capital framework under FPAS Mark II include the following:

Figure I.7.1. Pillars of the Dynamic Learning Environment



1. Commitment to Excellence

Creating a dynamic learning environment requires members of the team to make a commitment to excellence. In other words, team members would need to have a strong innate desire to become and be among the best

macroeconomists in the world, and be willing to put in the resources and effort necessary to do so. As such, team members would need to possess the following "soft" characteristics that are defining features of exceptional professionals, not only in macroeconomics, but in virtually every field, from the business world to athletics:

- Innate drive and motivation
- Internal locus of control: ask "what can I do better?" not "why am I so unlucky?"
- High sense of personal responsibility and accountability, with little tolerance for excuses
- Team player who invests in those around them
- Willingness to make mistakes and fail

These characteristics represent essential features of all team members who join the FPAS Mark II MPD, and are the foundation that allows them to truly benefit from the features of a Dynamic Learning Environment to grow and develop at lightning speeds. These characteristics are non-negotiable. If individuals who lack these essential characteristics are allowed to be part of the team, not only would they be unable to achieve the high degrees of productivity and quick learning required in a DLE, but also, and perhaps far worse, would diminish the overall culture of collegiality, enthusiasm, and continuous development. This undesirable culture would infiltrate into the rest of the team, with the potential to inhibit the growth and attitudes of even the best performers.

2. Non-Hierarchical Approaches to Learning

In order to develop world-class teams of macroeconomists quickly and efficiently, it is necessary to eschew overly-rigid hierarchical models of learning, where strict student-teacher or boss-employee dynamics dominate. Rather, we emphasize the importance of non-hierarchical approaches to learning that leverage the individual strengths of team

members to *both learn and teach*. Through this approach, knowledge and skills can be shared organically, dynamically, and informally. To facilitate this process, the following two organizational elements are recommended:

a. Training, Coaching, and Collaboration

Training: Staff are provided with training material and services on specific topics that are interesting to the staff and relevant for the MPD. Training can be both formal- and informal-style lectures. Staff should also be given courses ranging from introductory to advanced levels concerning monetary policy and central bank activities, depending on the level of staff.

Coaching: In addition to a formal buddy system (see the next subsection), staff should be continuously coached by more senior staff, managers, board members, and leadership. This would include both project-based, task-specific coaching as well as on-the-fly coaching that arises informally.

Collaboration: As individual staff members and teams are trained and coached on specific topics, there must be a culture of continuous knowledge-sharing and teaching among peers. Amidst this culture, the process of generating work output—in the form of the projection round, research papers, presentations, and so on—would become significantly more productive and seamless, as all of the necessary skills, knowledge, and ingredients for successful output among the team would be in place.

b. The Buddy System

To facilitate the process of coaching and knowledge-sharing in a way that is formally defined while also being an organic and natural process, a buddy system should be implemented. More junior members of the team should be paired with more experienced staff, who could serve as a readily-available resource for learning new skills, answering key questions, and developing best practices. At the same time, we emphasize that the buddy

would not simply share technical expertise, but also, and more importantly, would provide career guidance and impart wisdom on how to manage difficult situations, progress in their career, cultivate relationships, and so on. Staff would be paired with one another depending on their interests, skill levels, and so on, but there could also be opportunities to pair staff across teams in order to encourage even greater collaboration. Moreover, senior leadership from outside the MPD could also participate in the buddy system, coaching the most experienced staff on how to develop the leadership and management skills needed to lead departments and even the bank at large.

3. Feedback-as-a-Habit

An important element of the Dynamic Learning Environment is creating a culture of constant feedback that is given and received by habit. In most institutions, the process by which feedback is given is highly artificial and forced, occurring only once or twice a year during performance reviews. As a result, the feedback that is given tends to be superficial at best, failing to reflect the true scope of a team member's contributions, growth areas, and so on. This type of feedback serves little value other than checking a box—it does not give the team member tangible insight into what they are doing well and where they need to improve. Moreover, for feedback to serve as a helpful tool, it needs to be provided regularly and in real-time, rather than several months apart. In this context, it is not difficult to understand why employees in most institutions tend to view the notion of feedback with skepticism or aversion.

The Dynamic Learning Environment seeks to change this understanding of feedback-sharing as a rigid and artificial process. Instead, it calls for creating a *culture* of dynamic feedback-sharing, where asking for and giving feedback—both constructive and positive—is a regular aspect of day-to-day work. To facilitate the emergence of this process, the MPD has instituted "Feedback Fridays," where team members give and receive feedback on the

week's performance. This would not be a supervision or performance assessment system, but rather, a way for employees to understand in real-time how their performance has been, receive positive reinforcement, and most importantly, understand what their most pressing areas of growth are. Through this approach, team members would have the incentives to prioritize their personal growth and development at all times, and not delegate this important question to the "back burner," where it is only thought about during annual performance reviews. In Appendix A, we present an example of what this prioritization of feedback would look like in practice. Team members would be expected to prepare one-pagers based on their feedback, which would both highlight their key strengths and emphasize the areas in which they need to grow and develop further. Rather than shying away from the constructive feedback they receive or attempting to gloss over their shortcomings, team members would be expected to emphasize their weaknesses and growth areas and communicate this with the rest of the team, serving as a further tool for development and accountability. This would also assist in creating a culture of feedback-sharing, with the hope and expectation being that team members would, over time, organically solicit and provide feedback in informal settings as well, such as during/after working sessions, rendering the existence of formal "Fridays" unnecessary. The key value needed for this feedback culture to take hold is respect towards the ideas and contributions from teammates and colleagues. At the same time, respect plays a significant role in creating an open feedback-sharing environment, where each member of the team takes responsibility to support the growth of mates through constructive and positive feedback, while remaining open and respectful to others' comments and feedback.

4. Global Engagement

Good monetary policymakers and macroeconomists, of course, maintain global perspectives and always seek to engage with the best and freshest thinkers, ideas, and experience around the world. For senior leadership at

central banks, maintaining such a global mindset is a part of the job, and is relatively easy to accomplish given their network, the events they are expected to participate in, constant traveling, and so on. For more junior staff, however, engaging with global thought leaders can often be a challenge, and as a result, staff run the risk of developing insular perspectives and ideas about work—both from a technical and administrative point of view—that damage their near- and long-term growth prospects.

For this reason, the DLE emphasizes the need to create environments where junior staff are constantly engaging with thought leaders from around the world, from leading macroeconomic thinkers and policymakers to more junior colleagues in peer institutions in other countries. This requires platforms for constant engagement with these individuals, such as through regularly-scheduled seminars and workshops. Moreover, the working environment within the FPAS Mark II MPD would be expected to include experienced international advisers, professional domestic and international macroeconomists, interns/exchange students from abroad, and so on, all of which would inject the team with fresh global perspectives and avoid an insular approach.

D. Standards for Macroeconomists in the Monetary Policy Department

1. Minimum Level of Fundamental Knowledge and Skills

In order to join the team as a FPAS Mark II macroeconomist, team members must be able to expertly execute work in the following four areas:

- **Current Analysis**: Conduct deep, comprehensive, and data-driven analysis of different sectors of the economy (real, external,

financial, fiscal, etc.) in relation to their historical developments, current situation, and short-term developments; highlight and describe trending and temporary factors of current developments.

- **Scenario-Building and Policy Analysis**: Construct medium-term macroeconomic scenarios under the "New Keynesian" paradigm and perform coherent policy analysis. Describe risk profiles around scenarios.
- **Communication**: Prepare and contribute to the production of high-quality policy and communication documents to a wide variety of audiences, such as policy notes, presentations, monetary policy reports, and other communication documents.
- **Modern Macroeconomics**: Have a profound knowledge in modern macroeconomic (and, to a lesser extent, microeconomic) theory. Carry out theoretical and empirical research on specific topics of interest for monetary policy.

As an important foundation for being able to execute work in the above arenas, team members would be expected to maintain bilingual fluency (in both Armenian and English), possess an excellent command of advanced mathematics (as a foundation for carrying out empirical analysis), and have at least working knowledge of coding languages (e.g. R/Python, Matlab/Julia, etc.).

2. Certification Process

The process by which team members' skills and aptitude in these areas is tested and qualified must be rigorous, transparent, and equitable. In order to establish a level playing field that gives all team members the opportunity to develop these competencies, the Central Bank of Armenia has established the Global Forecasting School (GFS), which is modeled as a world-class economics institute to provide staff with a formal training and learning system. The GFS is intended to provide a combination of theoretical and practical approaches to help emerging economists learn

how to think critically about macroeconomics; understand and develop world-class, nonlinear analytical frameworks; and study the policy implications of nonlinearities and uncertainty. Staff are allocated at least one hour per day to participate in training and/or certification.

Team members who proceed through the GFS training courses would concurrently be tested for their progress on the core competencies. The certification process would be highly dynamic, evaluating economists for both their ability to develop knowledge and put skills into practice, and more importantly, their ability to communicate these ideas clearly and coherently across a variety of mediums. Certification tests would take on the form of ten writing assignments (in the form of a policy memo to the central bank governor), ten presentations (to a professional, expert audience), and ten video recordings (in the form of a well-seasoned teacher's lecture or an interview with an expert economist). Structuring the certification tests in this way pushes team members to develop their oral and written communication skills, which are especially important in FPAS Mark II, where communications and transparency are fundamental to the central bank's ability to make good policy and maintain credibility. In order to reach the next GFS level, team members need to complete the total thirty tests (ten interviews, ten essays, and ten presentations) within one year. From a practical perspective, team members would need to receive two to three passing grades on average per month to be on track to successfully reach the next GFS level within the one-year deadline.

An important component supporting team members' successful completion of the testing process is the buddy system, as described in subsection III.B.2. Buddies would support one another in filling in key knowledge/skill gaps. For example, a team member who is a poor verbal communicator but an excellent economic theorist could be paired with someone possessing the opposite skills. This would allow team members to dynamically train one another and transfer skills and knowledge throughout the process.

3. Certification Levels for Macroeconomists

Each team member within the FPAS Mark II MPD would be expected to progress through the six qualification levels of the Global Forecasting School. These qualification levels reflect the level of skills, knowledge, and expertise each team member possesses, which would be assessed via the process described in subsection C.2. Team members in the first three levels would need to pass to the next level via this testing process each year, and those in the upper three levels would be given up to two years to pass to the next level. Those who fail to move up a level within the prescribed timeframe would not be considered sufficiently competitive or qualified to be part of the team, and would need to seek out new opportunities ("up or out"). Moreover, this approach means that no team member could stay in the MPD for longer than six to nine years. This ensures that the pool of talent within the MPD always remains fresh, that new ideas and approaches are always circulating, and that people are not allowed to stagnate. This also has downstream effects for the country's broader economy as well, as these extremely well-trained, critical thinking macroeconomists would then be employed by private and public sector organizations around the country (and beyond) (or in other areas at the Central Bank). This would serve to have large multiplier effects, as not only would these team members bring with them a culture of extremely high productivity and efficiency, but also, would expect to create a culture of collaboration and dynamic learning wherever they go.

The six Professional (GFS) certification levels and their corresponding responsibilities are as follows:

Table I.7.1. Certification Levels and Responsibilities

		Certification Level						
	Responsibility	**1**	**2**	**3**	**4**	**5**	**6**	*Pre-GFS; Research Assistant*
FPAS Production	Conduct current macroeconomic and risk analysis (including nowcasting and short-term forecasting) *(using and developing necessary tools, databases and models)*	25%	20%	10%	5%	0%	0%	70%
	Design macroeconomic scenarios and conduct policy analysis *(using Semi-structural or DSGE-type (structural) models)*	25%	20%	15%	5%	5%	0%	5%
Modeling/ Research	Build, develop and improve macro/micro-economic models (econometric, structural (DSGE-type), semi-structural); conduct model estimations and model-based policy simulations; study economic and monetary policy theories and develop frameworks	15%	15%	15%	10%	5%	5%	5%
Commu-nication	Produce polished policy notes, discussion (working, research) papers, presentations and draft sections of Monetary Policy Reports	20%	20%	15%	10%	5%	5%	20%
	Communicate monetary and economic policy to the external (analysts, investors, professional economists, the Government, media, etc.) and internal (Board, CBA staff) audience	5%	10%	15%	20%	20%	15%	0%
Coaching & Capacity Development	Mentor and train young professionals on basic FPAS Mark II modules; transfer knowledge and expertise on macroeconomic modeling, analysis and policy to peers.	5%	10%	15%	20%	15%	15%	0%
Leadership & Management	Lead and coordinate FPAS rounds, scenario building and policy analysis process; Lead, take ownership and/or manage projects related to the development of the framework and/or relevant for policy.	5%	5%	10%	20%	20%	20%	0%
	Act as an international expert, provide consulting and expert-advice to external institutions; lead an establishment and design of a fully functional FPAS Mark II framework within a given institution	0%	0%	0%	5%	15%	25%	0%
	Perform executive management of the staff, including setting and overseeing standards, designing development plans, budgets, KPIs, OKRs, performing APRs etc.	0%	0%	5%	5%	15%	15%	0%

E. Work-Life Balance Issues

The CBA places an explicit emphasis on the importance of maintaining true work-life balance for its team members. The proposed structure for teams during the projection rounds throughout the year, as detailed in the Monetary Policy Handbook, is intended to support this goal. Of course, this approach could only work if the staff is highly trained and qualified to the very highest level of standards, as the preceding subsections suggest.

The streamlined decision-making process minimizes the amount of unnecessary time and resources MPD staff allocate to projection rounds. This would allow a meaningful reduction in stress and fatigue for the remaining members of the team, and allow for greater "burden-sharing" among MPD team members throughout the year. Rather than spending eight months of the year in a high-stress, high-time-burden environment, MPD staff would instead spend one month of the year leading the projection round, one month supporting the lead projection team, and could spend the remaining ten months of the year carrying out important research, current analysis, analytical tool development, and other relevant projects that boost institutional capacity development. This approach represents a meaningful positive change to the work-life balance structure of the MPD, where team members do not have to make heroic sacrifices—in terms of personal life, time dedicated to raising children or caring for families—in order to make meaningful contributions to monetary policymaking.

Volume II:
Monetary Policy Handbook

Foreword to the Handbook

"Understanding how to communicate economic uncertainty is the frontier of communications policy."

- IMF's Technical Assistance Handbook on Monetary Policy Frameworks: Central Bank Communications

On 1 January 2024, the Central Bank of Armenia will officially adopt a new monetary policy framework. The new framework will maintain—and reaffirm—a steadfast commitment to the CBA's long-standing objective of price stability and remain consistent with the Central Bank of Armenia Law. This handbook[61] serves to articulate how the CBA intends to execute its overarching purpose, which is to promote the prosperity and well-being of Armenians and contribute to a sustainable and productive economy.

The new framework aims to address the frontiers of monetary policy and communications by providing a new systematic approach for dealing with economic uncertainty and building credibility of the central bank.[62] We view the new framework as the logical evolution of the Forecasting and Policy Analysis System (FPAS) Mark I, developed and executed proficiently by the Reserve Bank of New Zealand and Czech National Bank. Without their contributions to develop the initial analytical frameworks, this would not have been possible.

This Handbook has been prepared by members of the CBA's Monetary Policy Department, in collaboration with the CBA Board. The Handbook is intended to support the modernization of Armenia's monetary policy

[61] The Reserve Bank of New Zealand's Handbook (2019) has served as a source of inspiration for the structure of this Handbook. To a large extent, this Handbook represents the CBA's perspective of the important issues first presented in the RBNZ Handbook, which central banks have a duty to address.
[62] Our judgment of the frontiers is, in part, based on our interpretation of the IMF's Central Bank Communications Handbook (2022).

framework, which embraces transparency as a foundational principle for good policymaking. This transition provides the CBA with an opportunity to educate, and set forth key assumptions, about how the economy operates, the contribution of monetary policy to the Armenian economy, and how to best design processes to optimize the policy formulation by the Board.

The Handbook contains seven chapters covering monetary policy in Armenia. Chapter 1 provides a description of the framework, paying particularly close attention to important elements needed for effective policy deliberation: The Objectives of the Board, the Charter, and the Code of Conduct. Chapter 2 suggests some underlying principles for deliberation by the Board, and Chapter 3 describes a monetary policy process that best upholds these underlying principles. Chapter 4 contains a historical perspective of how the objectives of the CBA have evolved to reflect the economic and political circumstances of the time and discusses the costs of high inflation. Chapters 5 and 6 set out our current understanding of how the Armenian economy and monetary policy operate, respectively, providing descriptions of key data and our core macroeconomic model. Finally, Chapter 7 discusses how the Board might wish to consider setting monetary policy strategy, which is about much more than simply deciding the level of the official policy rate.

In setting out core principles, the intent is not to provide a singular view of the world to which all Board members should adhere. Rather, the aim is to clearly communicate the core principles that the CBA values as an institution, in order to support effective and targeted deliberations, and best utilize the diverse perspectives within the Board. We have named it a handbook—instead of a briefing or a guide—because we hope that the Board will use and continuously adapt it to document their shared understanding of monetary policy in Armenia, as it evolves.

I. Monetary Policy Principles, Objectives, and the Duties of the Board

Vahe Avagyan, Hayk Avetisyan, Jared Laxton, and Anzhela Papikyan

A. Introduction

This document serves as an explanation of the CBA's monetary policy framework that covers the Objectives, the Charter, and Code of Conduct that are consistent with the Central Bank of Armenia (CBA) Law (1996).

As a transparent and accountable central bank, the overall vision of the CBA is to promote the prosperity and well-being of Armenians and contribute to a sustainable and productive economy. The Board is responsible for formulating monetary policy towards achieving the objectives laid out in the Article 4 of the CBA Law:

- Price stability and financial stability.
- To accomplish the objective of price stability, the Central Bank shall develop, approve, and implement monetary policy programs.
- If the other objectives of the Central Bank contradict the primary objectives of the Central Bank, the Central Bank shall give priority to the primary objectives and shall be governed by the necessity of accomplishing them.

In formulating monetary policy, the Board is required to meet the operational objectives contained in the Budget law, and act in accordance with the Charter and Code of Conduct presented in this Handbook and consistent with the CBA Law.

The three essential elements of monetary policy each serve a distinct purpose and are set in different ways (summary provided in Table II.1.1).

Table II.1.1. The Three Essential Elements of Monetary Policy

	Purpose	Process to Set & Approve
Objectives	Sets operational objectives (inflation target)	Budget Law / National Assembly every budget year following nonbinding public advice from the CBA
Charter	Sets additional analytical, transparency and accountability requirements, and guidance on decision-making procedures	Prepared by the CBA, approved by the Board
Code of Conduct	Sets minimum standards of conduct for Board members	CBA Law and additional elements prepared by the CBA, approved by the Board

B. Principles of Flexible Inflation Targeting

The experience of best-in-class flexible inflation-targeting central banks over the past two decades has demonstrated that effective flexible inflation-targeting frameworks abide by several fundamental principles. These are principles that are useful in designing and evaluating the performance of the framework, which is used to promote high levels of operational transparency and accountability.

1. The primary role of monetary policy is to provide a nominal anchor for the economy, and placing weights on other objectives must not be inconsistent with providing an anchor for inflation and inflation expectations.
2. An effective inflation-targeting regime will have beneficial first-order effects on welfare by reducing uncertainty, anchoring inflation expectations and reducing the incidence and severity of boom-bust cycles.
3. The success of an IT regime depends on other policies that make the task of monetary policy easier and more credible.
4. Because of the lags in the monetary transmission mechanism, and because of the concern with both the deviation of inflation from its target and the deviation of output from potential, it is neither possible nor desirable to keep inflation exactly on target and in practice inflation targeting becomes inflation-forecast targeting.
5. Given the possibility of conflict between inflation targets and other objectives, central bankers must have reasonably clear objectives and sufficient independence from the political process to achieve these objectives.
6. There must be effective monitoring and accountability mechanisms to ensure that central bankers are behaving in a manner consistent with the announced underlying objectives and that monetary policy is based on sound practices.

C. Monetary Policy Objectives

The CBA Law provides the Board with its high-level objectives of price stability and financial stability. The operational objective of price stability (the numerical inflation target) is defined by Parliament at the start of every budget year with consultation of the CBA. Entrusted with achieving the primary objective of price stability, the Board must consider the practical realities associated with carrying out its objectives.

1. Operational Objectives

The Budget Law defines the Board's operational objectives in the following way:

- The Central Bank, within the scope of the powers prescribed by law, should be guided by the target indicator of 12-month inflation within the permissible range of 4 +/-1.5 percentage points when making monetary policy decisions.

Although the inflation target is set every budget year, the CBA commits to achieving this target and setting policy with a medium-term perspective, not in a one-year timeframe. Otherwise, attempting to achieve the target in a short-term timeframe would result in generating unnecessary volatility in output that would jeopardize the overarching purpose of the CBA to improve the well-being of Armenians in a sustainable manner. The inflation target is defined in terms of the total Consumer Price Index, as published by Statistical Committee of the Republic of Armenia.

While the operational objective for price stability is well-defined in terms of the numerical inflation target and measure, there is some room for interpretation regarding 'medium term.' Historically, the CBA has interpreted the medium term as the second half of a three-year forecast horizon. This interpretation reflects the understanding that monetary policy affects the real economy and inflation with a lag. The use of the more open-ended phrase "medium term," rather than a defined period of time, reflects that this lag can change over time, depending on the structure of the economy and the need to effectively manage the short-run output-inflation tradeoff.

2. Important Considerations

When the Board pursues the operational objective, they must consider a range of important factors that reflect the reality of achieving this objective:

- have regard to financial stability;
- seek to avoid unnecessary instability in interest rates and exchange rate;
- seek to avoid unnecessary instability in output and to support maximum sustainable output;
- consider alternative measures of underlying inflation in addition to headline inflation;
- and set policy with a medium-term orientation.

Furthermore, these considerations feature prominently in the analytical infrastructure of the CBA; namely, the models that the Bank uses to support its decision-making. The models are not used to derive an outright answer or to dictate decisions by policymakers, but rather, to provide a helpful analytical structure that can help the Board engage directly with these complex considerations and evaluate alternative assumptions that undergird the economy.

a. Have Regard to Financial Stability

Article 4 of the CBA law clearly defines the second primary objective of the CBA as financial stability, which is further elaborated in Article 5. In addition to this legal mandate, which the CBA achieves primarily through macroprudential tools, the CBA naturally and prudently considers financial stability issues when conducting monetary policy. Of course, economic performance and macroeconomic stability benefits enormously from a safe and efficient financial system, as events such as the Global Financial Crisis have made clear. The CBA's regulation of the financial system is an essential component of maintaining macroeconomic stability. Prudential

regulation includes macro-prudential policies (e.g. capital buffers), which target risks that change slowly over time.

Monetary policy and macro-prudential policy have separate objectives, but can interact because they are both time varying and work through the macro-economy. The desired level of coordination between these types of policies remains an open question, in Armenia and globally; Volume I, Chapter V briefly discusses how monetary policy could have regard to the efficiency and soundness of the financial system.

b. Seek to Avoid Unnecessary Instability in Interest Rates, and Exchange Rates

Instability in interest rates and exchange rates refers to the volatility of each factor listed, but the extent to which volatility is 'unnecessary' is subject to interpretation. There are no rules or simple mechanical calculations to enable precise differentiation between necessary and unnecessary volatility across all circumstances, but the CBA clearly understands that the harmful consequences of this unnecessary instability on the social wellbeing of Armenians must be avoided. The Strategy discusses how the Bank interprets this consideration, and what implications it has for the setting of monetary policy strategy.

Interest rates refer to both the Refinancing Rate itself, and the effects of the future path of the Refinancing Rate on market interest rates. The exchange rate in a floating exchange rate regime is allowed to be relatively volatile in order to act as a shock absorber, allowing economic adjustments to be buffered through exchange rate appreciations or depreciations.

c. Seek to Avoid Unnecessary Instability in Output and Support Maximum Sustainable Output

In achieving its goal of price stability, the CBA recognizes that it is responsible for effectively managing the short-run output-inflation tradeoff, and thus in achieving its objectives in a way that avoids unnecessary instability in output. Effective management of this tradeoff implicitly means supporting maximum sustainable output, even though the latter is not an explicit mandate for the CBA.

The CBA defines maximum sustainable output as the highest utilization of resources that can be maintained over time without generating an acceleration in inflation, commonly referred to as potential output or aggregate supply. The Board should consider a broad range of macroeconomic indicators to form a view of where output is relative to its maximum sustainable level, considering the fact that the level of maximum sustainable output is: (1) largely determined by non-monetary factors that affect the structure and dynamics of the labor market; and (2) is not directly measurable and therefore highly uncertain.

This fundamental uncertainty around potential output should not prevent the CBA from undertaking serious analysis around the topic. The stance on the level of potential is an important component of analyzing the current and underlying state of the economy, and prudent and effective decision-making requires the Board and Staff to make a judgment on this. In many ways, the uncertainty around the potential output is one aspect of the uncertainty inherent in all monetary policy decisions whether it is admitted or not.

d. Focus on Alternative Measures of Underlying Inflation

Conceptually, we define underlying inflation as inflation that persists without further economic slack being generated. Therefore, alternative measures of inflation that seek to distill "underlying" inflation from other types of price changes can provide important signals that are relevant for monetary policy. Appropriately and aggressively responding to upward drifts in underlying inflation is critical for preventing medium- and long-term inflation expectations from ratcheting upwards and becoming de-anchored from target levels.

The CBA has conducted research to produce different measures of underlying inflation using various methodologies to develop a measure that best represents, conceptually, the idea of underlying inflation. Of course, the CBA recognizes that no measure of inflation can provide an easy or comprehensive answer to policymakers. Rather, sound measures of underlying inflation can serve as one of several tools that helps policymakers make better-informed decisions and help distill "signals" from the "noise" of data. In this context, having such a measure would help the Board be better able to assess underlying inflationary conditions. This is particularly useful in the context of situations when underlying inflation is beginning to drift upwards, and there emerges a risk of inflation expectations ratcheting upwards. Aggressive and pre-emptive policymaking could help mitigate this upward drift and avoid dangerous loss of credibility, which would, of course, require a much costlier policy response in the future to regain this credibility.

e. Setting Policy with a Medium-Term Orientation

The CBA should set policy with a medium-term perspective, given that monetary policy affects the real economy and inflation with a lag (monetary policy transmission is discussed in Volume I, Chapter V). The use of the

phrase ‘medium term’ rather than a defined period of time, reflects that this lag can change over time depending on the structure of the economy.

Shocks will regularly hit the economy and, as a result, move inflation away from the target. However, it is important that the CBA is steadfast in its commitment to provide a macroeconomic consistent medium-term path back to the target that will support anchoring inflation expectations. To support this objective, the CBA has a transparent analytical framework for how it plans to deal with different types of shocks (e.g. demand, supply, stagflationary, etc.).

The Long-run Statement of Monetary Policy Objectives can be found in Chapter VIII, which embodies the considerations laid out in the Objectives and Principles sections.

D. The Charter

The CBA Law sets various requirements for the Board with regards to transparency, accountability and decision-making. Beyond what is legally mandated, the Charter sets additional requirements regarding these elements, and is divided into three parts: decision-making; transparency and accountability; and external communication. The Charter is included in full in Chapter VI.

The Charter aims to facilitate effective decision-making by the Board and ensure best-in-class transparency of these decisions and the decision-making process. This is to aid the effectiveness of monetary policy and enable the public to hold the Board accountable—the two interlinked goals of the CBA’s monetary policy communication.

1. First Communication Goal: Plausible Policy and Contingency Planning

In order to provide effective monetary policy communications, the central bank must explicitly acknowledge the fundamental uncertainty that is involved in monetary policy analysis and decision-making. Rather than shying away from this inherent uncertainty and providing false assurances about a most-likely future, the central bank must be explicit about the conditionality built into any quantitative or qualitative forward guidance. In other words, policy must be communicated in such a way that emphasizes the underlying uncertainties; builds clear narratives about the risks and assumptions in each scenario; and clearly conveys the framework for analysis and decision-making in a way that helps markets more realistically adjust their expectations changing conditions. This approach, while recognizing inherent uncertainty about future economic conditions, helps eliminate uncertainty about *policy* itself.

Effective communication in this framework means that financial market participants, economic analysts, the government, the public, and other stakeholders understand how the central bank is likely to respond to the different forces that could change the trajectory of the economy and require an alternative policy path than what is currently priced in financial markets. This type of communication helps support the credibility of the Board and improves the ability of the CBA to meet its policy objectives.

In general, there are three broad audiences for monetary policy communication. The Board's communication must be accessible to each group in both its writing style and distribution.

1. Monetary policy announcements aim to influence the behavior of the financial market. This refers to the traders and allocators of capital in financial markets who have direct influence on short-

and long-term interest rates, as well as other asset classes in the economy.

2. The Monetary Policy Report (MPR) and Technical Meeting with Analysts are intended to provide a transparent look into how the CBA is analyzing the current macroeconomic situation and underlying forces. They also serve to educate economic analysts and others who are providing advice to traders in the financial market on recent developments and expectations for future economic developments.
3. The announcement of the monetary policy decision, press conference and visual summary of the MPR are intended to communicate the Board's high-level outlook for policy, inflation and employment to businesses, journalists, government and the general public.

2. Second Communication Goal: Enable Public Accountability

To maintain public trust, it is crucial to communicate the information and data that were utilized to inform policy decisions. Additionally, sharing the perspectives discussed during deliberations and explaining how these decisions were made allows both the public and financial markets to assess the credibility of policy decisions beforehand. Furthermore, by providing insights into the institution's processes, such as how key assumptions are updated in response to new information, accountability is further strengthened.

By adhering to these principles of open and transparent communication, the monetary policy institution demonstrates its commitment to professionalism and economic soundness. This fosters trust and confidence among the public and financial markets, ultimately promoting a favorable economic environment."

Monetary policy communication plays a vital role in ensuring public accountability and enhancing the public legitimacy of monetary policy. The transparency and accountability requirements for the Board's publications are clearly outlined in section 2 of the Charter.

Clear and transparent communications requires conveying, among other things: what information and data are used to inform policy; what perspectives are shared in the deliberations; the process through which decisions are made; how key assumptions are updated as new information arises; and what framework is used to analyze economic conditions, risks, and shocks. Having a transparent and systematic framework for these processes helps minimize policy uncertainty, and thus enables the public and financial markets to assess the credibility of policy decisions *ex-ante*. This clear window into the procedural, analytical, and decision-making framework also enables the public and markets to assess the credibility of the institution's processes *ex-post*.

Article 21(3) of the CBA Law requires the Board to reach decisions by majority vote. Public accountability of the decision is at the discretion of the CBA itself: it can be at the group level, individual level, or both. The CBA has chosen to emphasize the accountability of individual members of the Board, which provides an additional level of accountability. To support this, the Charter requires that CBA communications of the policy decision and discussions include a summary of the minutes, supplemented by final submissions attributed to individual Board members containing brief macroeconomic risk assessments that supported their individual vote.

3. Third Communication Goal: Consideration and Publication of Alternative Views

The CBA Law specifies that the Board will seek to reach decisions by majority vote, rather than a single consensus. Majority vote-based decision-making allows individual Board members the freedom to dissent, and seeks

to ensure that all policy-relevant views are openly discussed and considered during the decision-making process. This approach also eliminates the pressure for the Board and Staff to maintain a single, consensus view on all issues. The Staff play a critical role in preparing the MPR (which is meant to serve as purely an analytical document), illustrative scenarios (representing a range of plausible alternative policy paths under different assumptions that are relevant to the Board and public), and daily monitoring of the economy. Chapter 2 of this Handbook sets out how the Board and Staff should interact that best supports this type of decision-making.

Under this decision-making framework, the extent to which internal deliberations and diverging views among Board members should be made accessible to the public is a serious consideration. A natural tension can arise between the two goals of (1) clear public communication and (2) allowing for diversity of views among policymakers. One commonly-cited risk is that providing greater transparency of differing views on monetary policy trade-offs and the preferred policy strategy could reduce the clarity of policy to the market and increase policy uncertainty. However, the goal of policy in most circumstances is to influence the risk profile of the policy path that is priced in financial markets. Moreover, the two goals are not inherently contradictory, and under a clear communications framework, can serve to decrease policy uncertainty. Any decision by a group of individuals—whether under a consensus or majority system—is reached as a result of a lengthy process of deliberations, the sharing of often conflicting views, and a healthy and open exchange of ideas. Of course, in making its decision, the Board acts and speaks as one body, and remains steadfast in its commitment to, and communication of, the policy decision. However, fundamental aspects of transparency of the decision and the framework are lost when the central bank's communications attempt to artificially minimize the range of Board members' opinions and views that led to the decision. Providing a window into this diversity could thus increase the public's understanding of the final Board decision and the thinking that led

to it, increase the public legitimacy of policy, and improve the market's assessment of how the balance of views of the Board is developing. Finally, publicly communicating the range of views behind the policy decision could also prevent groupthink (whether perceived or real) among the Board during deliberations, and most importantly, incentivize Board members to air alternative opinions that would result in richer policy discussions and better-grounded decisions.

Sections 2(a), 2(c), 3(a), 3(c), 3(d), 3(e) of the Charter direct how the Board should balance the expression of alternative views with the two primary goals of monetary policy communication. It specifies that:

- The decision announcement will be accompanied by a summary of the minutes (unattributed) of the Board meetings, which will include a description of material differences of view and judgement discussed.
- Board members will prepare and submit brief macroeconomic assessments ("Final Submissions") that summarize their high level of assessment of recent economic developments, underlying forces, and risks, which they use to justify their vote.
- Remarks by Board members are to draw primarily on information published in the MPR, and non-public remarks should not provide, or appear to provide, any new information to a narrow subset of individuals.

The Charter requires Board members, in public appearances, to present the majority view on the policy decision. At the same time, the Charter permits Board members to publicly communicate their individual views on the various *risks* they see as the most relevant and the *economic outlook* regarding the policy strategy. Members should do so with respect for other Board members and for the Board as a whole, and should largely draw upon the Final Submissions and minutes in the MPR.

4. Summary of Key Communications Vehicles

The Charter requires the Board to publish each monetary policy decision "promptly" on the CBA's website (in practice, "promptly" is expected to be on the same day that the decision is made – discussed further in chapter VI). The Charter reiterates the requirement in the Law that a record of each Board meeting be published. The Charter gives additional requirements that these summary records of meetings are to meet. They are to include:

- An overview of the economic outlook;
- The risks and policy options discussed;
- Any material differences in view or judgement.
- A record of any vote taken.

On a quarterly basis, and based on the annual decision day calendar published in advance on the CBA website, the announced decision is also to be accompanied by a MPR. Article 6 of the Law requires every report to include:

1. The forecasts of inflation;
2. The directions of monetary policy; and
3. Other provisions stipulated by the Board of the Central Bank for accomplishing the objectives

The additional requirements for these regular reports are contained in section 2(b) of the Charter. Each report must also:

- Provide forecasts for real GDP, potential output, and the exchange rate.
- Publish at least two macroeconomic-consistent scenarios for all variables specified, which achieve the inflation objective in 2-3 years.

- Describe the underlying forces and assumptions that feed into each scenario, and explain why they were chosen for the candidate scenarios for the Board to discuss.
- Explain why inflation outcomes, and/or expected inflation outcomes, are outside of the target range (when applicable); and
- Explain how the current monetary policy decisions contribute to supporting maximum sustainable output within the economy.

E. The Code of Conduct

The Code of Conduct sets minimum standards of ethical and professional conduct for the Board and is included in full in the appendix. The CBA Law covers all aspects of conflict of interest. The Code of Conduct covers key additional elements which include requirements for Board members to:

- Carry out their responsibilities in an efficient and competent manner and to a high standard of performance.
- Contribute actively and constructively to the Board meetings, treat others' contributions with respect at all times, and exchange ideas freely to promote excellence in the Board's deliberations.
- Develop, enhance, and maintain expertise in the subject matter of the Board.
- Continually seek to improve the effectiveness of their contribution.
- Be adequately prepared to participate in meetings, including by reading any meeting papers supplied and participating in all weekly monitoring meetings before and during each projection round.
- Respect the time and effort of the staff to incorporate the views and opinions of the Board into the analytical process, namely timeliness of the one-page macroeconomic narrative submissions that serve as one of several important inputs into the Staff's scenario-building process.

F. Evaluating Monetary Policy and the Board

The performance-related responsibility of the Board is to formulate monetary policy in accordance with the Budget Law and the Charter. Specifically, this means ensuring future annual inflation of 4 percent over the medium-term. Assessing whether the Board has performed this critical task requires both *ex-ante* and *ex-post* approaches.

1. Ex-Ante Assessment of Monetary Policy

Monetary policy affects the real economy and inflation with a lag. This means that monetary policy must be set today in order to achieve price stability in the future. A fair evaluation of current and recent monetary policy decisions can therefore be based only on the information that was available to the Board at the time.

Ex-ante assessment of monetary policy refers to the evaluation and analysis of the potential impact and effectiveness of the monetary policy action before it is implemented. A fair evaluation of current and recent monetary policy decisions can only be based on the information that was available to the Board at the time.

In the context of achieving the inflation target, a comprehensive *ex-ante* assessment of monetary policy in Armenia might ensure that the following criteria have been met:

- **Alignment of the proposed policy action with achieving the inflation target.** Any projection scenario for inflation should settle within the target band and near the 4 percent midpoint over the medium term, and the outlook for the labor market is consistent with efficiently managing the short-run inflation-output tradeoff;

- **Credible and reasonable scenario projections, especially for inflation and the labor market.** To ensure credibility, these projections rely on accurate assumptions and employ robust methodologies that are aligned with historical data, economic trends, and the overall policy-consistent narrative about the economy.
- **The monetary policy decision and projected policy path are consistent with delivering these projection scenarios.** While the projections are illustrative in nature, maintaining this alignment can help mitigate policy uncertainty.
- The monetary policy decision and projected policy path avoid unnecessary instability in output, interest rates and the exchange rates, relative to other policy paths that would also ensure the operational objectives are met. This approach prioritizes stability and seeks to minimize unnecessary volatility and inefficient boom-bust cycles that could negatively impact the welfare of the population. By selecting a policy path that balances the achievement of operational objectives with stability, policymakers can safeguard against undue volatility and promote sustained growth.

2. Ex-Post Assessment of Monetary Policy

Given that monetary policy affects the real economy and inflation with a lag, it must rely on projections of future developments to determine how policy should be set today. It cannot be expected that the Board will be—or should be—able to predict the future perfectly. *Ex-post* assessment of monetary policy plays a crucial role in evaluating the effectiveness and impact of past policy decisions. Through this evaluation process, policymakers can learn from past experiences and refine their approach to monetary policy, ensuring that it remains responsive to evolving economic realities. Performance criteria for *ex-post* assessment can be grouped into the following directions:

- **Did the Board respond reasonably to new information?** One of the key aspects of effective monetary policy is the ability of the Board to respond to new information in a sensible and agile way that aligns with its objectives.
- **Did the Board capture the key risks to monetary policy?** This assessment would examine whether the Board proactively identified and addressed key risks that could potentially disrupt the effectiveness of monetary policy, communicated and/or implemented necessary measures to mitigate them, and adjusted policy sufficiently aggressively.
- **Were the risks communicated effectively so that financial markets were sufficiently prepared to adjust in the future?** This assessment would consider whether the Board's communication clearly and effectively guided market participants, allowing them to make informed decisions and adjust their strategies based on the communicated risks.
- Was the credibility of the monetary policy framework maintained? Are the medium to long-term projections for inflation and measures of inflation expectations near the target? Maintaining credibility through well-anchored inflation expectations is a fundamental aspect of successful monetary policy and minimizes the costliness of policy decisions.

II. Principles for Board Deliberations

Vahe Avagyan, Hayk Avetisyan, Jared Laxton, and Anzhela Papikyan

A. Introduction

Principles provide a useful guide to deliberations on decisions that are not straightforward, such as monetary policy. Broadly, monetary policy decisions are strategic decisions and encompass much more than a single decision about the level of the official policy rate.

Personal preferences, a priori beliefs can dictate the way we assess situations, instead of facts and logical analysis. In a group of people, dynamics such as freeriding and groupthink (conformity to group norms or decisions) can drive decisions, instead of rigorous debate, questioning and analysis. To overcome these decision-making hurdles, committees and boards often define and agree to an explicit set of decision-making principles in order to guide more effective conversations that can easily devolve into chaotic noise.

The key innovation of the new monetary policy framework is shifting the focus to a scenario-based approach to analysis and communication. These scenarios represent policy responses that would be needed should relevant risks at the time of deliberations materialize. Evaluating hypothetical—but realistic—scenarios allow attention to shift away from low-value efforts aimed at identifying the optimal policy for scenarios that are only marginally different. Instead, focus shifts to preparing policy for sufficiently aggressive movements, in the event that significantly different scenarios materialize.

How monetary policy strategy is formed in Armenia will depend on the full breadth of the discussion of the Board and guided by the principle of monetary policy as a risk management exercise.

Table II.2.1. Principles of Board Deliberations for Monetary Policy

Clear Objectives	• The Board understands and is committed to the objectives of monetary policy. • Board meetings have clear objectives and formal protocols to ensure efficient use of time, expertise and collective commitment.
Encourage Alternative Views	• The Board is diverse in personal characteristics, skills, and thought. • Multiple scenarios are encouraged to develop a better understanding of the inherent risks in the economy. Especially, scenarios that address avoiding the dark corners of monetary policy (deflation and high and entrenched inflation) • Multiple scenarios represent
Engage with the Analytical Process	• Engagement with the staff occur in four steps: o Step 1: Sketch ingredients (Board and staff) o Step 2: Select ingredients (staff only) o Step 3: Build and quantify scenarios and narratives (staff only) o Step 4: Final submission of one-page macroeconomic assessments (Board and staff) • Staff work with the Board members when specified. The analytical process is meant to be a collaborative process as opposed to hierarchical.
Decorum in Meetings	• Policy meetings are chaired by the Governor to ensure all views are aired and dissent is normalized. • Members come prepared to engage in open and constructive deliberations. • Decisions are made by majority, but the analysis of the Board goes far beyond than the majority vote and Board members have an opportunity to express their personal views.

Underlying flexible inflation-forecast targeting is the principle that, given a long-term objective for the rate of inflation, the central bank's own scenarios of inflation are an optimal, conditional, intermediate target. This is because the scenario analysis, in principle, embodies all the relevant information available to the central bank, including knowledge of the policymakers' preferences about the trade-off between deviations of inflation from target and output from potential and the bank's view of the monetary policy transmission mechanism. The basic features of inflation-forecast targeting are:

- Monetary policy uses the instruments (typically the policy interest rate) to achieve an official low-inflation target over the medium term (within 2-3 years).
- The central bank's economic forecast contains a path to the official target that is an ideal intermediate target for managing the short-term output inflation trade-off.
- The staff forecast is a key input into the decision of the Board but is only one input among others—Board members need not agree with the scenarios and can incorporate other information into their decision-making.
- The staff uses a core model, with a combination of standard (linear) macroeconomic properties as well as important non-linear relationships, to generate the scenarios. The model-based scenarios provide a basis both for policy decisions and for explaining the economic logic underlying these decisions in public communications. (The forecast path for the short-term interest rate is endogenous in the model, with the rate varying to achieve the long-term inflation target and to eliminate any output gap).

B. Clear Objectives

In any Board meeting, there is an optimal time to spend deliberating and making decisions before participants lose focus and energy. Clear objectives

harness the collective focus of the group and direct it to the Board's overall purpose and each meeting's objectives.

1. Clear Objectives for the Board

The Board's objectives are set by the CBA Law, Objectives, and the Charter. It is crucial that the Board understand and is committed to these objectives to ensure the collective focus of the Board.

2. Clear Objectives for Each Board Meeting

Each formal Board meeting must have clear objectives to use the Board's time and expertise effectively. Clarity can be facilitated by setting clear agendas and ensuring meetings run to time. Previously, the Board followed a high-level agenda for the monetary policy meetings. This high-level agenda is now broken down into more detailed agendas for each of the Board's meetings which allow the staff to get closure on certain topics and can begin preparing the MPR concurrently with the policy cycle.

C. Encouraging Alternative Views

Alternative views are beneficial for robust deliberations for the Board and can reduce the likelihood of biased decisions as well as the perception by the public that the central bank is dogmatic in its approach. Furthermore, creating a monetary policy framework that enshrines alternative viewpoints provides an outlet for disagreement and is meant to improve the efficiency of analytical conversations within the Board as well as between the Board and the staff.

The reasons why diverse committees might make better decisions is because they have access to a greater pool of knowledge and are less likely

to suffer from groupthink. These characteristics help contribute towards unbiased decisions.

- Knowledge pooling can lead to better analysis and decisions in an uncertain environment.
- The presence of diverse views reduces the likelihood of groupthink. Groupthink occurs when group members adhere to the general trend of thought within a group without engaging in a robust debate. The principle of diversity does not require members to remove their individual perspectives to make unbiased decisions. Rather, it advocates for each individual to contribute his or her interpretation of data, events, risks and trade-offs so that collective decisions are unbiased.

Normalizing dissent also encourages the group to be open to alternative evidence and views, rather than discounting them. Blinder's (2006) analysis suggests that the level of dissent accepted within the committee could be a key indicator of whether a collegial committee makes decisions collectively or by following the preferences of the chairperson. Lastly, normalizing dissent during deliberations enables individuals to take ownership of the shared decision. This reduces the likelihood of members "freeriding" on other members of the Board.

We believe that the multiple-scenario approach that considers a path for policy that is lower (Dove) and higher (Hawk) than what is currently priced in financial markets as well as the individual one-page macroeconomic narratives are a formal way of putting structure around open deliberations in the most constructive way possible. The framework is specifically designed to test the status quo, include all relevant information for the public to understand the analysis that went into the decision and provide enough transparency to evaluate and allow for individual accountability among the Board.

The transparency of alternative viewpoints serves the core analytical reality that there is always inherent uncertainty in the macroeconomic situation that could push monetary policy in very different directions simply based on a different interpretation of the data ex-ante. Embracing this reality with structured alternative scenarios at each Board decision means that there is an outlet for individual Board members to get their views reflected in the analysis of the Bank without needlessly impeding the analytical process of the staff by trying to get the range of views of the Board members into a single baseline projection.

D. Engaging the Analytical Process

The CBA has long-held practices to ensure that all information relating to policy decisions is absorbed and understood before decisions are made. Therefore, it is appropriate that the new framework maintains this standard. It follows that prior to Board meetings that the individual Board members prepare one-page macroeconomic narratives that are submitted by each Board member during the Sketch Ingredients stage and a final one-pager prior to the vote and decision. The final one-pager is meant to specifically address the key data points or arguments that swayed or changed their views during policy deliberations.

As well as ensuring information is presented before decisions are made, monetary policy deliberations should be designed to ensure all relevant expertise and advice is included in discussions. Broader governance literature recognizes that not all members on governance boards are experts in all operations. Therefore, although it is likely that Board members are experts in their field, this does not necessarily equate to expertise in monetary policy. Therefore, an essential element of the new framework is to assign individual Board members with dedicated staff to act as advisors for the Board members and work with the Board members on their one-page macroeconomic narratives that is less hierarchical and more collaborative.

Some inflation-targeting central banks place a greater value on the independence of staff projections from the Board to prevent staff from being unduly influenced by the preferences of the Board. This premium on independence is afforded as most Board members at these central banks are experts in monetary policy or have access to dedicated research staff. For example, governors in the European Central Bank's (ECB) governing committee and in the Federal Reserve System's Federal Open Market Committee (FOMC) each have a regional bank providing background policy analysis and support. Conversely, the CBA is significantly smaller and reflecting on these resource constraints, the CBA places greater value on the presence of monetary policy analysts in discussions.

Finally, allowing CBA staff to interact with Board members boosts the quality of Board input in the process. By directly presenting material and answering Board members' questions, staff economists can better understand how Board members use information and interpret the analytical output by the staff. This interaction empowers CBA economists to provide information to the Board in the most direct and effective manner.

E. Decorum in Meetings

The presence of alternative views in the risk management framework does not guarantee unbiased and rigorous decision making. Effective conduct during meetings is crucial. Board members should be allowed to air their views freely and be open to considering other viewpoints. One challenge to effective conduct could be unacknowledged differences in decision-making styles among diverse members, which could side-track discussions and result in unproductive meetings. Therefore, it is good practice to appoint a chairperson to ensure effective conduct during Board meetings.

The chairperson has a pivotal influence on the culture of decision-making boards by stimulating debate, fostering a respectful culture, limiting overly verbose members, drawing out contributions from reticent members, and guiding discussions so that all views are aired, and dissent is normalized. The chairperson also has a role to see that decisions are reached. In the Board, the chairperson should encourage open debate and guide the discussion that best reflects the key sources of uncertainty that will affect the decision, analysis and public communication. The CBA Law states that the Governor will be the chairperson of the Board.

The principle of alternative viewpoints implies that a chairperson should not be overly dominant. A dominant chairperson can overpower the views of members of the Board and reduce the degree of deliberation, which can lead to groupthink and conformity in the Board.

Instating a chairperson is not the only way to encourage open deliberation. Another group decision-making convention to reduce the influence of dominant personalities on a Board is to take turns putting forward the initial policy proposal for the decision. Furthermore, to ensure all views are included in the deliberation, committee members should come to Board meetings prepared to engage in rigorous and open deliberations, and to be both persuasive and open to being persuaded.

III. Monetary Policy Decision-Making Process

Hayk Avetisyan, Douglas Laxton, and Armen Nurbekyan

A. Introduction

Good decisions come from good processes. This chapter lays out processes that will support the Board in being well informed and making good policy decisions. Processes that uphold the principles of chapter 2 contribute to a culture and environment of genuine policy deliberation, leading to decision making that is unbiased and evidence based.

B. Policymaking Cycle

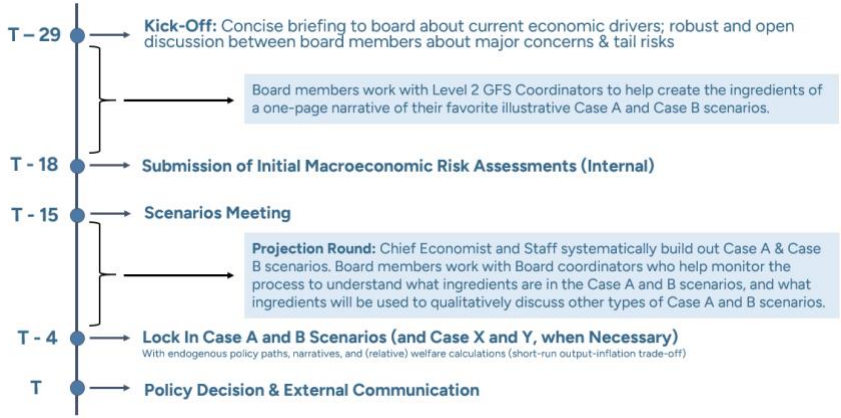
The Central Bank of Armenia has eight fixed-action policy decision dates throughout each year. These dates are released on the CBA website at the end of the preceding year. On an alternating basis, four of the eight decisions (one per quarter) follow a full projection round. These are known as "quarterly decisions," the details of which are presented in subsection 1 below. The remaining four decisions, referred to as "interim decisions," follow a more streamlined process, described in subsection 2.[63]

1. Quarterly Decisions

The monetary policy process is a continuous cycle of analysis, policy advice, and decision making. Within this broad cycle, details such as the timing, length, and purpose of meetings have been designed to uphold the principles described in Volume I, Chapter 4. The broad shape of each cycle is set out in figure II.3.1.

[63] The Board may also decide to make emergency decisions outside of this decision calendar (in the event that extreme circumstances require it), per CBA law.

Figure II.3.1. The 29-Day Policymaking Round for Quarterly Decisions



The policymaking sequence proceeds as a 29-day process that is intended to be collaborative and iterative, and result in greater efficiencies from a resource allocation and time perspective. Below, we provide a general outline of the policymaking process. However, having a clear sequence of events does not imply that the process proceeds mechanically or by rote. Quite the opposite—the 28- day policymaking round is a dynamic process that prioritizes a lively culture of debate and discussion, capitalizes on the unique attributes and critical thinking of each Board and staff member, and provides important flexibility and agility to the Board.

- **Kick-Off Meeting**: To begin the policymaking round, the Board meets in a general meeting intended to spur robust discussion about the major tail risks and uncertainties that represent causes of concern. The meeting begins with a brief staff presentation on major economic drivers, statistics, and trends, which will help to inform the discussion. The purpose of the discussion is to fuel deep thinking about tail-risk scenarios and other concerns the Board

may have (e.g., a looming financial crisis, underpricing of risk, high- and low-inflation traps, etc.), rather than being driven by specific numbers or projections. Ideally, the Board and the staff would spend most of the meeting on discussing their concerns and risks in mind rather than on the recent data, because most central banks have weekly monitoring meetings, which are dedicated to the discussion of current data and near-term outlook. In extraordinary force majeure instances, the meeting can also be used to recalibrate the Board's approach and work plan in the round.

- **Develop Ingredients of Relevant Scenarios**: Following the kick-off meeting, the Board members each outline the essential ingredients that would be used to build Case A and Case B scenarios, according to their own thought processes. Case A would be a scenario where the policy rate path has to be higher than market expectations (hawkish scenario) to bring inflation back to the target, and Case B would be the scenario where the policy rate path has to be lower than market expectations (dovish scenario). The Board would not be tasked with creating these scenarios themselves, but rather, would focus on developing the key ideas that would serve as important inputs to the scenarios. These ideas would be described in their "Initial Macroeconomic Risk Assessments," (also referred to as "one-pagers") which provide succinct one-page narratives outlining the high-level ingredients and assumptions related to what they would include in their preferred Case A and Case B scenarios. We emphasize that these One-Pagers are not pre-deterministic, and Board members are not in any way tied down to the ideas they express in this preliminary stage. Rather, the hope and expectation is that when Board members arrive at Decision Day, they feel completely comfortable about changing their initial viewpoints, particularly in light of the debates and discussions of the preceding weeks. This is a feature—not a bug—of FPAS Mark II.

- **Process for Drafting One-Pagers:** The process for drafting the one-pagers lasts approximately ten working days, beginning on T-29 (Kick-Off) and continuing until the deadline for submissions (T-18). Board members are allocated two well-trained staff members (known as Board Coordinators) to aid them in this process. Refer to Chapter IV, Section C for greater detail about Board Coordinator responsibilities. The process proceeds as follows:
    - **Initial Brainstorming Session (1 Hour)**: During the first week of this process, the Board Coordinators meet individually with each Board member for a brief brainstorming session. Board members arrive to this meeting prepared with a list of initial bullet points about their key risks and issues. In this session, the role of the Board Coordinators is to facilitate discussion with Board members, ensure that the issues align with the Three-R principles, ask questions to spur dialogue, and provide clarifying information about what was covered in the Kick-Off meeting.
    - **Initial Drafting (2-4 Hours)**: The Board Coordinators then spend two to three days preparing first drafts of the Initial Macro Risk Assessments for each Board member, based on the items that were discussed in the initial brainstorming session.
    - **Draft Iterations (1-2 Hours)**: After sending the initial drafts to each Board member, they then spend the second week of the process iterating on the draft (primarily over email) for both content and style.
    - **Submission to Chief Economist/Head of MPD**: Once the Board member is satisfied with

the quality, content, and style of their one-pager, he or she is required to submit it to the Chief Economist for the official record by 13:00 on T-18 (three days in advance of the Scenarios Meeting). The Chief Economist bears responsibility for approving the one-pagers and assuring that the content embodied in them meets the Three-R guidelines.

- **Scenarios Meeting**: Approximately two weeks before the decision day, a Scenarios Meeting is held between the Board and the Projection Coordinator. After having the big picture of Board concerns, under the authority of the Governor, the Projection Coordinator formulates Case A and Case B scenarios, which would ultimately be used for communication purposes. Some of the ingredients that the Board Members presented would be used as input to construct the two Case A and Case B scenarios. It is important to note that the Board members' ingredients that are not used to build the Case A and Case B scenarios would not be dismissed or ignored. Rather, these ingredients would serve as rich topics for debate and discussion in the decision-making process and would also provide helpful inputs to formulating other types of Case A and Case B scenarios as well as tail risks, which we call Case X/Y scenarios.
    - Having these tail-risk ingredients as a source of discussion throughout this entire process would provide Board members with important flexibility and agility in making their policy decision and revising their thinking and approach throughout the process. In addition, the Case A and Case B scenarios, which are constructed by the Projection Coordinator, should not be a mechanical aggregation of individual Board members' scenarios, rendering the whole process to be mechanical and defying the very objective of eliminating the folly in scenarios.

    - The Board's main role would be to contribute to the process through buy-in and support, rather than focus on formulating the specific assumptions. The Board would leave the meeting with a solid mental picture about how the scenarios will be fleshed out, and place trust in their staff for producing the scenarios and the Monetary Policy Report.
- **Projection Round**: The Projection Coordinator leads daily quarterly projection meetings with the staff. Through a collaborative and iterative process, the Projections Coordinator systematically and clearly builds out the Case A and Case B scenarios, quantifying the scenarios through semi-structural core quarterly production models and satellite models, where feasible. Particular attention would be paid to their policy implications (in terms of the forward paths for instruments needed to achieve convergence on objectives) as well as their welfare metrics. Board members' advisors can participate on a voluntary basis in these meetings, to monitor the process and understand what ingredients are being included or excluded.
    - It is worth emphasizing that the Projection Coordinator's selection of Case A and Case B scenarios would not be prescriptive, and would not tie down Board members to a predetermined position. The Projection Coordinator's formulation and elaboration of these scenarios are intended to serve a purely illustrative purpose and provide reference points to evaluate the urgency of protecting against drifts or slides towards Dark Corners. These scenarios would then aid the Projection Coordinator in building a clear narrative, communicating policy, and producing a first-rate policy report.
- **Submission of Final Case A B Scenarios**: The Projection Coordinator submits final Case A and Case B scenarios to the Board three days in advance of the Policy Decision. Once these

scenarios have been submitted as final, they will not be subject to any further changes.

- **Submission of Final Vote Explanations:** the individual Board members will submit their final vote explanations that may or may not be published in the transparency report.
- **Policy Decision**: Against the backdrop of the prior 28 days' lively discussions and debates of the ingredients, along with the submission of the final Case A and Case B scenarios, Board members would take a vote on the policy decision. The Board's decision would be announced in tandem with issuance of the Monetary Policy Report, which would clearly communicate through a narrative approach the Board's decision with reference to the scenarios and ingredients considered by policymakers to be most relevant to the current situation and its uncertainties. As part of the decision-making process, board members would make submissions that include: the policy action they propose; how that action connects to what they believe may happen in the future and its ensuing policy implications; and their commitment to changing course if new information arises. The decision communication and its key vehicles are discussed in Chapter VI of the previous volume.

On decision day, the CBA communications follows the timetable outlined in Table II.3.1.

Table II.3.1. Communications Timetable on Decision Day

GMT+4	Communications Vehicle
12:00	Monetary Policy Decision Published with Executive Monetary Policy Statement (Press Release)
12:00	Quarterly: Monetary Policy Report Published
15:30	Press Conference
18:00	Board Transparency Report Published

Following the decision and its announcement, a reassessment of the most relevant risk scenarios would be made, to continue the process.

2. Interim Decisions

The decision that follows the quarterly decision is known as an interim decision, as it does not follow the full projection round and is not accompanied with the publication of a monetary policy report. Rather, the interim decision follows a more streamlined process, leveraging many of the analytics prepared during the preceding round (including the illustrative case scenarios).

The process for interim decisions follows the following approach:

Figure II.3.2. The Policymaking Cycle for Interim Decisions

Similar to the process leading up to the quarterly decision, the policymaking cycle during the interim decisions is intended to follow a dynamic approach.

The analytical process and discussions among Board members and between Board and Staff primarily take place during the weekly monitoring meetings. During each weekly monitoring meeting, the Staff provides the Board with an update on new developments in the economy, including new data and information that have been released since the prior meeting.

Importantly, the weekly monitoring meetings are not intended to be a simple information-sharing exercise. Rather, they are structured to follow a narrative-based format, where the new information is discussed as part of the broader narrative about economic developments, risks, and uncertainties. In this sense, they provide continuity with the narratives that were deliberated upon during the meetings of the preceding quarterly round. Thus, the new information or developments that have emerged each week are analyzed and presented in the context of the "taxonomy of scenarios," which contains a snapshot of the multitude of policy-relevant risks that the Board, Staff, and outside experts are considering at that point in time.[64]

The decision meeting follows the same approach as the final deliberations of the quarterly decision round, as summarized in subsection 1 above.

The interim decision is announced to the public via the Executive Monetary Policy Statement, which contains a brief description of the Board's decision and its rationale, as well as a concise summary of economic conditions by the Staff. This is followed by the Governor-led press conference with members of the media, which is live-streamed to the public. For greater detail about the communications process, refer to Volume I, Chapter VI. The timetable for communications follows the approach outlined in Table II.3.1, except that the MPR would not be published.

C. Research, Surveillance, and Analysis

In addition to the processes related to the eight fixed-action dates and their accompanying projection cycles, the Monetary Policy Department is continuously engaged in conducting high-quality research and monitoring the economy as a part of current analysis. The organizational structure

[64] The purpose and structure of the Taxonomy of Scenarios is described in greater detail in Chapter VI, Section C of this volume.

described in the following chapter (where only one to two teams are engaged in the projection round each quarter, freeing the other two teams to work on research and analysis) plays an important role in supporting the continuity of research and analysis, even during projection rounds.

1. Monetary Policy-Relevant Research

The CBA prioritizes high-quality research as an important component of good monetary policymaking. Rather than treating research as a "nice to have" component of the staff's responsibilities that is done during downtime, research is embedded into staff responsibilities as an essential function. This is consistent with the continued development of the Dilijan Research and Training Center (where the MPD is located) as a high-quality regional and global hub for economic research.

Under the FPAS Mark II organizational structure, staff spend approximately half of the year engaged in research, with the other half devoted (to varying degrees of intensity) to the projection rounds. Staff are expected to conduct research on topics that are relevant for monetary policy. These include, but certainly are not limited to, issues including:

- Fundamental economics questions (long-term equilibrium real interest rates; unobservable variables such as NAIRU and potential output; alternative measures of inflation; and so on)
- "Hot Topics" that are contemporaneously relevant (specific research topics arising from projection rounds, including the implications of potential risks or shocks)
- Global economics research (including research on other countries and economies, case studies of other countries' experiences, and so on, which may not be directly relevant for policymaking in Armenia but provide a solid foundation for development and training)
- Model development and improvement

In this capacity, MPD staff are encouraged to collaborate with members of the CBA's Research Department, also based in Dilijan.[65]

High-quality research at the CBA follows HEAT principles:

- **Historical Narrative**: good research strives to tell a macro-consistent story using the historical narrative approach.[66] Arguments and findings must be appropriately contextualized, and equal attention should be paid to qualitative research.
- **Economics**: research must be based on solid and critical economic thinking, rather than merely relying on over-modeling or references to authority or literature to argue a point.
- **Accountability**: research methods and data must be continuously documented and be made readily available to other staff members. This ensures institutional knowledge-building and continuity over time, including the ability to build upon research completed well in the past.
- **Technical Expertise**: while models and technical skills cannot serve as a crutch, good research nonetheless utilizes best-in-class technical tools and reflects the very best in technical expertise.

2. Weekly Monitoring and Current Analysis

As noted previously, Weekly Monitoring meetings (WMM) provide a platform for the Staff to brief the Board on current economic developments, analysis, and research on a regular basis. Importantly, these Weekly Monitoring meetings are not limited to interim rounds; they occur every

[65] The Research Department covers broad topics in economics that may or may not be relevant for monetary policy. There is naturally overlap between some of the topics explored by the RD and MPD, which provides excellent opportunities for collaboration between teams.
[66] The historical narrative approach was notably popularized by Romer and Romer.

week throughout the year, except in rare instances when there are conflicts with fixed meetings during the quarterly rounds.

The Weekly Monitoring meetings serve several purposes. These include the following:

- **Monitoring the Economy**: as new information and data is released, and as new economic developments emerge, the Staff presents this information to the Board during WMMs in the context of *ingredients* for the case scenarios. The focus of this new information is big-picture questions and macro-consistent narratives. The narrative-based approach ensures continuity with the structure and approach of meetings during the projection rounds, and ensures that these meetings are not simple information-sharing exercises. Importantly, the monitoring is intended to provide information that generates thinking and discussions among the Board, rather than to necessarily provide answers about uncertain issues or "lead the witness" in a certain direction.
- **Surveillance Chart Pack**: In advance of each WMM, a weekly-updated chart pack is shared with members of the Board. This document presents, in table and chart form, the full suite of most current economic variables that the Staff uses to conduct its analysis. This ensures uniform access to data and information for all Board members, ensuring that there are no information asymmetries within the Board and between the Board and Staff. Selected pages from a sample chart pack are presented on the following page.
- **Smooth Transition to Projection Rounds**: By framing the discussions in a narrative-based format and thinking of new data as serving as potential ingredients for case scenarios, the WMMs provide a seamless transition to the Projection Rounds. This also helps limit the amount of time that is spent during projection

rounds updating the Board on the current state of the economy, as the WMMs cover this content each week.

- **Exploring Special Topics**: On an ad-hoc basis, special research conducted by the Staff is presented to the Board during WMMs. This helps improve institutional knowledge and builds expertise among Board members. It also provides a valuable tool for junior team members to gain experience presenting to high-level officials.
- **Maintaining Robust Communication Link between Board and Staff**: Having regularly-scheduled touch points between the Board and Staff helps improve working relationships and foster a collegial atmosphere. WMMs provide a platform for the Board and Staff to continuously interact on key issues outside of projection rounds.
- **Engaging with Other Departments**: Beyond the MPD, other departments (including financial stability, financial markets, and others) also provide updates to the Board and MPD staff during the WMMs. This is an important platform for cross-departmental collaboration, including to help adopt FPAS Mark II principles across the bank.

Figure II.3.3. Selected Pages from Sample Surveillance Chart Pack

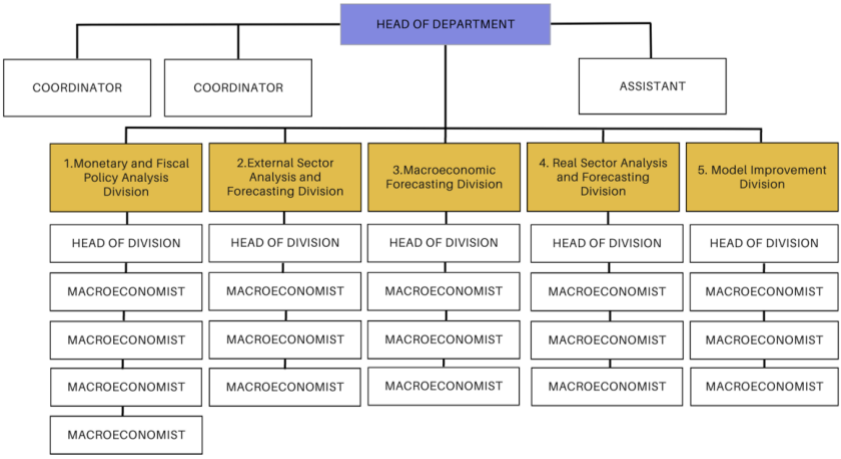
IV. Organizational Structure

Hayk Avetisyan, Douglas Laxton, and Armen Nurbekyan

A. Staff Organizational Structure

As noted in Volume I, Chapter VII, monetary policy departments in most central banks suffer from problems that are arguably inherent to large institutions: excessive rigidity and hierarchy. Figure IV.A.1 below presents the previous organizational structure in the CBA monetary policy department *before* the adoption of FPAS Mark I. While there are likely to be some differences across countries, we find that most small- to medium-sized country central banks have similar organizational structures.

Figure II.4.1. Previous Monetary Policy Department Organizational Structure under FPAS Mark I

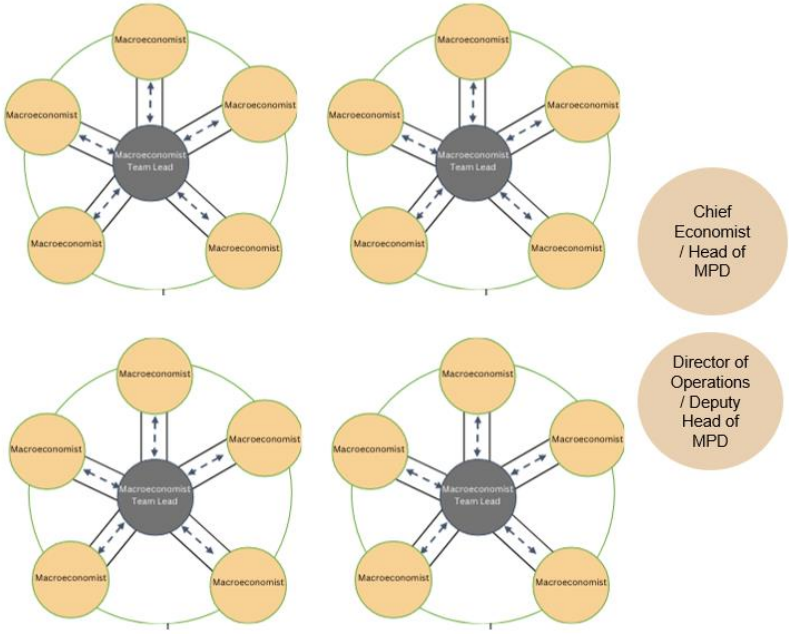


This (relatively standard) organizational structure is rigid and hierarchical. Teams are divided based on specialization (one team handles monetary and

fiscal policy, another the external sector, while another works solely on modeling, and so on). Division heads serve as "gatekeepers" for their respective divisions, and manage the flow of resources, knowledge, and skills not just within teams, but across them as well.

In an attempt to address these issues, the FPAS Mark II framework proposes an alternative approach to structuring the team and department. This approach seeks to diminish unnecessary hierarchies, rigid divisions between teams, and silos, instead proposing a relatively flat, flexible, and dynamic organizational structure that is better equipped to support, rather than hinder, team members' growth, learning, and development into world-class macroeconomists. The most notable change is that specialized divisions are replaced by teams of generalist macroeconomists.

Figure II.4.2. Organizational Structure of the Monetary Policy Department under FPAS Mark II



The department would include four teams of six economists each, headed by a "team lead." The teams would shuffle on an annual basis, such that staff would have the opportunity to work with different colleagues each year. This is intended to spur greater collaboration and knowledge-sharing among team members. Moreover, the absence of knowledge-specialized teams in favor of generalist teams encourages staff to become better-rounded, rather than being narrow experts in one specific field. Having team leads (who are colleagues) instead of traditional division chiefs (who are superiors) also eliminates unnecessary hierarchy, while still ensuring that there is an appropriate level of structure to ensure that work processes remain effective and manageable).The roles and responsibilities are detailed on the following pages.

B. Roles and Responsibilities

1. Head of Monetary Policy Department/Chief Economist

The Chief Economist serves as the head of the Monetary Policy Department (MPD), and would be responsible for ensuring that all of the central bank's resources are used efficiently to support FPAS Mark II. The Chief Economist leads all the projects and processes in the department; on a rotational basis, coordinates and leads one of the quarterly projections rounds; serves as an important liaison between the Board and the staff; gives direction to the Director of Operations/Deputy Head of MPD and team managers on administrative/human capital matters; and so on. In this role, the Chief Economist would need to possess both an unquestionable level of macroeconomic skills and knowledge—serving as the key thought leader for monetary policy at the central bank—but also, and perhaps equally importantly, a natural aptitude for managing, leading, and inspiring his or her staff.

2. Deputy Head of Monetary Policy Department/Director of Operations

The Director of Operations (DO), or Deputy Head of MPD, would be a skilled macroeconomist who is also responsible for managing the operational elements of the MPD. This would include: managing the team's assets (models, documentation, data, etc.); overseeing organizational aspects of human capital (resource allocation, testing, feedback, etc.); developing platforms for macroeconomists to gain and share knowledge (e.g. brown bag lunches, seminars, workshops, and conferences); coordinating the efforts of the MPD with other departments within the central bank (including both administrative-oriented staff such as information technology, cybersecurity, human resources, as well as production-oriented teams including statistics, research, financial stability, and so on). In many ways, the DO would be the best of the group managers, described below. The DO would be supported by an assistant to help carry out these tasks, and/or by an HR Manager, as described below.

3. Administrative Group Managers

Group managers would be advanced macroeconomists, possessing expert mastery of the core competencies outlined in subsection C.1. and have achieved towards the upper end of the certification levels (see subsection C.3). More important than their technical skills, however, is their ability to manage people from the perspective of human capital development. We understand the term manager in its truest sense—as someone who leads people, guides their development, and pushes them to become better—rather than as signifying someone who is their "boss" on a given project, or who is the most skilled economist, modeler, or scenario-builder. In addition to serving as traditional macroeconomists responsible for executing and producing work (see subsection B.4 below), the managerial component of the group managers' time would be spent on the following key areas:

- Training, Coaching and Collaboration: Managers as part of the FPAS process coach the staff. They also collaborate or backup staff producing FPAS Mark II products. (majority of time)
- Help manage resources to maximize the effectiveness of all the FPAS teams. (limited amount of time)
- Provide ongoing feedback and complete APRs. Understand relevant HR rules and ensure job responsibilities are updated. (limited amount of time)

Managers would need to be highly inspirational, people-oriented, and agreeable, taking the time to cultivate one-on-one relationships with their teammates and create a culture of teamwork and collegiality every day. Understandably, managing, leading and inspiring people and the teams are among the soft skills that are developed over time within the team, likely at the upper end of the GFS levels. Importantly, this role is not that of a traditional boss or superior, in the sense that this role is intended to facilitate growth and development among the team and create a team culture, rather than representing necessarily the best performers or smartest economists.

4. Macroeconomists

Macroeconomists form the core foundation of the team. They are the most essential members of the team, responsible for building and running models, drafting monetary policy reports, conducting cutting-edge research and analysis in hot topics in macroeconomics, and so on. As a result, macroeconomists who are part of the FPAS Mark II must be on track to becoming the best in the world, and should meet all of the core competencies. These core competencies include current analysis; scenario-building and policy analysis; communication; and modern macroeconomics. Macroeconomists should have working fluency in both Armenian and English possess an excellent command of advanced

mathematics (as a foundation for carrying out empirical analysis), and have at least working knowledge of coding languages (e.g. R/Python, Matlab/Julia, etc.).

Underlying each of these core competencies is the most important trait that an FPAS Mark II macroeconomist must possess: the ability to think critically. Rather than deferring to the analytical tools (e.g. "the model says…therefore, it must be true that…") or to the literature (e.g. "I read ten papers from name-brand economists that argue this point, so it must be true that…"), an FPAS Mark II critical thinking macroeconomist would have no choice but to develop and defend their own opinions via critical reasoning and empirical analysis.

5. Discrete Project-Based Contract Hires

We recognize that not all highly-skilled macroeconomists/modelers/statisticians would be willing or able to make the commitment to join the Macroeconomist career path at the MPD, which requires an explicit commitment to being a team player and developing extraordinary internal and external communication skills. However, we recognize the importance of finding an avenue to utilize the resources of these types of individuals to the benefit of the MPD team and its output. Additionally, there may exist expert economists from outside of the CBA (such as from other central banks, IFIs, or other institutions abroad) that could make an important short-term impact to the CBA, but not be able to make a long-term commitment to this career path.

A practical and efficient solution would be for these individuals—who could include, for example, professional researchers, statisticians, modelers, programmers—to be brought into the team for discrete projects on a contractual basis for a fixed period of time. This would be particularly useful at times when highly specialized skills are needed that the team does not possess (whether due to a shortage in resources or time), and would

allow the MPD team to leverage their specific strengths without sacrificing the critical elements of DLE and culture that are critical for FPAS Mark II MPDs. Another very important contribution from such specialists would also be training and research collaboration provided by them to the whole team involved in the FPAS processes.

C. Organization during Projection Rounds

An important element of the organization of staff during the projection round is the team-based structure. During each projection round, two of the four MPD teams (each comprising six macroeconomists) would be actively involved in the process. One of the teams would be engaged in "heavy lifting" and actually building out the scenarios, while the second team would play a support role, providing key tactical and technical support to the projection team and guiding them throughout the process. During each round, each team would be led by a Projection Round Team Lead, on a rotational basis, who serves as the thought leader for the team in that round and is responsible for guiding the rest of the team through the day-to-day of the projection round and presenting content to the Board. Notably, this role differs from the Group Managers, the latter of whom serve a human capital/resource management role, and would not necessarily also be the Projection Round Team Lead. As thought leader during the projection round, the Projection Round Team Lead would also receive support from the Chief Economist during the round.

The six-person MPD team that is leading the projection round could allocate resources and responsibilities in the following way. Four macroeconomists would be assigned to work on the case scenarios (Case A, Case B, and where necessary, Case X/Y), and would take full ownership of the scenario-building process. These four macroeconomists would also be responsible for drafting the sections of the Monetary Policy Report (MPR) that pertain to their case scenarios, as well as assisting the Projection Coordinator/Chief Economist in fleshing out the Board presentation and

the remaining portions of the MPR in the days leading up to decision day, such that the MPR can be published almost concurrently with the Board's decision. The remaining two team members would serve as Coordinators for the Board Members, as described in the following subsection C.

The remaining two MPD teams would be less heavily involved in the process, providing tactical support where necessary but primarily dedicating their time to "preparing for the future." This would include continuing to work on trailblazing, policy-relevant research output; developing and refining the analytical toolkit; conducting current analysis on specific issues; and so on. At the same time, with this they might generate special analysis (e.g. boxes) that could appear in the MPR of the current projection round.

1. Role of Board Coordinators in Lead-Up to Projection Round

Beginning in the kick-off meeting, and leading up to the decision day, two members of the MPD, selected from the team that is leading the projection round, would be designated as Coordinators for the Board members. These Coordinators would represent, at a minimum, Level 2 GFS knowledge and skills, and would be highly adept macroeconomists who excel in economics, have strong modeling skills, are star communicators, and can manage resources and time highly efficiently.

Following the kick-off meeting, the two coordinators would work closely with the Board members to translate their thoughts, ideas, and concerns—first articulated during the Kick-Off Meeting, but further fleshed out during subsequent formal and informal meetings, brainstorming sessions, and discussions—into one-page submissions. These one-pagers would take a narrative approach, cogently articulating the Board members' key essential ingredients that reflect their understanding of where the economy is today, what is driving the economy, and what the policy response might be in

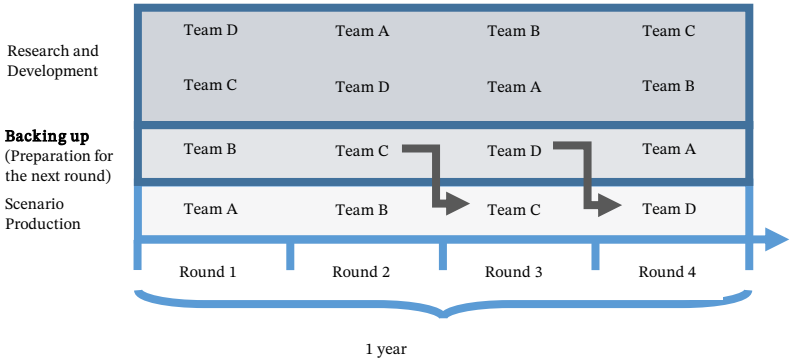
order for the central bank to address the medium-term macroeconomic challenges and meet its policy objectives. In countries where English is not the official language or is co-official with other languages, the coordinators would be drafting concurrently in both English and the native language(s). The coordinators, working with the Board, would then submit the One-Pagers to the Chief Economist/Projection Coordinator and other members of their team leading the Projection Round.

2. After the Projection Round

After locking in the Case Scenarios, and after the Policy Decision is made and the MPR is published, the projection round is considered complete, and the teams begin to prepare for the next policymaking cycle. In the period before the next projection round, the team that served as "back-up" in the prior projection rounds assumes a leading role for the next Projection round. This team takes the responsibility during the weekly macroeconomic monitoring meetings to be prepared with key analysis and stories for the next kick-off meeting to brief decisionmakers about the current economic drivers. Thus, each of the four teams in the MPD has the opportunity to lead the projection round once per year, serve as back-up once per year, and contribute to "planning for the future" for the remaining two quarters of the year. This rotation of teams helps to ensure the sustainability of the processes, while at the same time contributing to an increase in productivity, efficiency, collaboration and motivation.

Figure II.4.3. Organization of Teams during Projection Rounds

Panel A. Annual Rotation of Teams



The key tasks for each of usual 4 teams during and leading up to typical Projection rounds are summarized in panel B (e.g. Round 1, where Team A leads the projection).

Panel B. Team Roles and Responsibilities during Round 1

Round 1/Key Processes	Team A (Lead)	Team B	Team C	Team D
Building Scenarios (Coordination of the Projection Round)	Lead	Back-up		
MPR	Lead	Back-up		
Internal and External Communication	Lead	Back-up		
Special analysis (Boxes in the MPR)		Lead	Lead	Lead
Assist the Board on One-Pagers	Lead	Back-up		
Weekly Macro Monitoring (Preparation for the next round, since the end of the round)		Lead		
Other tasks, policy notes, research, model-development, policy analysis; TCCP		Partly Involved	Lead	Lead
Policy Evaluation (during the First round of each year)			Lead or Task Force	Lead or Task Force

V. Monetary Policy Strategy

Martin Galstyan, Armen Nurbekyan, and Hovhannes Khachatryan

A. Principles of an Effective Strategy

A precondition that must guide our Monetary Policy strategy is an explicit recognition of the role uncertainty plays in our analytical framework, policy deliberations and public communications. We believe that embracing higher levels of transparency along each of these dimensions is consistent with the function of policymaking under uncertainty. In most cases, our mantra is that transparency *is* the strategy meaning higher levels of analytical and policy transparency such as constructing multiple scenarios and Board minutes help paint a more realistic picture around policy. However, a natural pitfall of increased transparency is a lack of coherence which we agree with Rumelt (2011) and the RBNZ is necessary for a good strategy. Hence, FPAS Mark II is designed to provide a formal structure to discuss policy and uncertainty in a coherent manner. In most cases, the presentation of the three plausible scenarios (Case A, B, and the market) encapsulates the extent needed for a central bank to discuss uncertainty around its policy decision:

1. A recognition of the market pricing of the policy path
2. How the policy decision relates to the current market pricing to frame its communication and objective to nudge markets in a particular direction
3. The scenarios on each side of the current market pricing provide a contingency plan and outlook regardless of how the data could evolve in between policy meetings. This underpins the commitment of the Bank to react appropriately to a materialization of different risks to maintain price stability.

Another pillar of the framework is credibility which we admit embracing uncertainty and transparency can threaten credibility in a variety of ways. However, by confronting the issue of credibility we are positioning ourselves in the best way to maintain it in the same way that setting an explicit inflation target has helped anchor inflation expectations.

Monetary policy in action has four main components that contribute to the strategy:

1. Clear objective (flexible)
2. Analysis and risk assessment (under uncertainty)
3. Policy deliberations (under uncertainty)
4. Policy statement (under uncertainty, flexible but unquestioned commitment to the objectives of the Bank)

1. Clear Objective

Under flexible inflation targeting the objective is to provide a nominal anchor for the economy while placing weights on other objectives such as employment must not be inconsistent with providing an anchor for inflation and inflation expectations. A clear objective is critical to marshal resources of the different arms of the institution in a common direction. The objective provides the throughline of the institution and guides the analysis, the policy, and the commitment.

2. Analysis and Risk Assessment

The objective helps frame the analysis of the Staff where the Staff are tasked to conceptualize and quantify forward-looking scenarios of the economy that answer 3 essential questions:

1. Where is the economy today?

2. What are the underlying forces?
3. What do we need to do with our instruments to achieve our objectives?

A summary of the current state of play in the economy, a summary of key sources of uncertainty around underlying forces in the economy and potential shocks on the horizon and finally a ***quantitative*** forward path for policy under distinct alternative but plausible conditions. The Monetary Policy Report serves as the core analytical document that summarizes this exercise and is used as an important, but not the only, input for policy deliberations.

3. Policy Deliberations

The Board minutes act as a vehicle to better understand the ***qualitative*** views and concerns of the Board that add important color the analysis of the Bank and should also help inform the overall communication of the Bank.

4. Policy Statement

The combination of quantitative and qualitative analysis provided creates the foundation of a statement that incorporates the three components necessary for the Bank to communicate the policy decision and accompanied uncertainty. The statement finishes with a commitment of the Bank to act in a manner depending on new developments that will steer policy that is consistent with its objectives. The substance of this statement is reinforced by the presentation of multiple scenarios that should act as an illustrative guide for contingency plans to support the commitment.

B. Adopting a Monetary Policy Strategy for Armenia: Inflation-Forecast Targeting with Risk Avoidance

As a small open economy that is rapidly developing and evolving, the Armenian economy contends with its fair share of external shocks and meaningful uncertainty. Under these conditions, conventional and overly simplistic rules that try to mechanically guide policy through a measured, linear response hardly represent a useful approach. Rather, the strategy for making and communicating monetary policy needs to be much more robust and dynamic, reflecting prudent approaches that take seriously the need to maintain price and macroeconomic stability regardless of the circumstances. In this sense, a risk management strategy that focuses on avoiding the most dangerous risks, managing the balance of more moderate risks, and keeping the economy away from bad equilibriums[67] represents the most prudent approach for effective and transparent monetary policy.

Operationalizing this risk management approach to monetary policy requires a holistic policymaking framework that covers analytics, communications, decision-making processes, transparency, and more. From a technical point of view, the analytical framework in part incorporates this approach by "loss-minimizing" monetary policy with a quadratic loss function, which places an increasingly heavy penalty on deviations of inflation from the target and of output from potential. The foundational assumption behind the loss function—that systematic deviations of inflation and output can create bad equilibriums that have nonlinear effects on welfare outcomes—also influences the overall approach of the Board. In practical terms, this implies prompt and prudent

[67] Bad equilibriums (notably referred to by Blanchard as "dark corners where danger lurks") would involve destabilized expectations—for example, high and variable inflation or deflation—which could have very costly welfare implications.

policy actions whenever a shock or risk threatens to drag the economy into a dark corner.

Under inflation-forecast targeting, forward guidance is a continuous process in which the central bank provides a steady flow of information on its current policy actions and its view of what medium-term actions may be appropriate. When describing the policy outlook, the CBA should avoid using simple thresholds that, when met, could signal changes in policy. The Staff and the Board's view of the future path of the policy rate depends on a complex assessment of what may be necessary to return the inflation rate to target, and reconciling this view with what risks actually materialize: they have a clear perception of the objectives of policy and the conditional nature of their projections for the policy instrument. Such assessments by the CBA are informed by illustrative forecasts derived with macroeconomic models that take account of numerous factors influencing the outlook and the judgment of the forecasters. Announcing thresholds for inflation and unemployment creates a self-imposed communications bind that risks misguiding financial markets about the scope of other considerations that may influence policymakers' outlook for the interest rate. This could lead financial market participants to underestimate the degree of uncertainty in the outlook, and hence make financial markets vulnerable to the arrival of unexpected news.

The principle that underlies the effectiveness of forward guidance and the publication of scenarios applies more generally: if the markets understand where monetary policy is heading subject to new developments, they are likely to move interest rates in a direction that supports policy. Thus, publishing interest rate scenario paths (with clear narrative descriptions of the economic interpretation and types of risks embodied in the path) would be the single most obvious way of clarifying for the public the policy implications of alternative economic outlooks. Moreover, the framework-based commitment to price stability provides assurance to markets that the response to shocks in the future will be just as vigorous as prudent, since

the central bank doesn't simply communicate conditional paths for the future policy rate to the public. Rather, the central bank also devotes significant portions of its communications to explaining the rationale and narratives for setting policy, and a sense of how this expected path might change under alternative developments. This underlines the conditionality of the scenarios, while simultaneously strengthening confidence in the long-term outlook.

This highlights the practical advantage of the systematic approach to policy formulation and communication under a transparent inflation-forecast-targeting regime. The central bank does not have to announce the time horizon of its forward guidance, nor list the data-dependent threshold conditions that would switch it off. Relying on a transparent and logical combination of quantitative and qualitative forward guidance better helps provide a nominal anchor for the economy and achieve the price stability objective.

VI. Charter (Working Draft)

The Board of the Central Bank of Armenia

A. Introduction

The Board is responsible for formulating monetary policy directed at achieving the economic objectives of price stability, as set out in Article 4 of the Central Bank of Armenia Law (2018) ("the Law"). This charter aims to facilitate effective decision making by the Board and ensure transparency of these decisions and the decision-making process, in order to aid the effectiveness of monetary policy and hold the Board and its individual members accountable.

B. Decision-Making

1. Board members are tasked to abide by the code of conduct and engage constructively with each other to achieve informed and timely monetary policy decisions. The Board's decision making is enhanced by embracing the reality that decisions are made under uncertainty. This requires remaining open-minded about alternative viewpoints and making efforts to avoid the trap of groupthink.
2. Board members will respect each other's contributions and be open to diverse viewpoints as a benefit to the decision-making process. The Board's decision making is enhanced by listening to different opinions that reflect, for example, members' unique personal and professional experiences and educational backgrounds. Diversity of thought and backgrounds should be a strength of the Bank's decision-making. Members should be open to learning from each other and maintaining a collegial, collaborative culture.

3. To support decision-making under uncertainty, individual Board members will submit succinct one-page narratives ("Initial Macroeconomic Risk Assessments") specifying the high-level economic developments, assumptions and risks that they would include in their preferred Case A-type and Case B-type scenarios. The one-page macroeconomic narratives would be submitted to the Chief Economist three days in advance of the Issues Meeting. This provides guidance to the Staff without circumscribing their analysis.
4. To support decision-making under uncertainty and improve the efficiency of the policy deliberations among the Board members, the Chief Economist will submit Case A and Case B scenario (and Cases X or Y when relevant) using the one-page macroeconomic narratives as one of several inputs for constructing the scenarios as illustrative examples. They would not be prescriptive, and thus would not preclude Board members from maintaining their own perspectives on the economic outlook and risks.
5. The culture of the Board should encourage a constructive and collegial dialogue among the individual members regarding the monetary policy and communication strategy, especially in the context of any tradeoffs and uncertainty that is relevant at the time. The primary goal of such a constructive dialogue is to share views and foster deeper thinking and understanding, and not necessarily to achieve a consensus. Individual Board members, through this process, should be able to accurately articulate the views of fellow Board members. This will support the external communications strategy of Board members, who would need to articulate the institutional view of the Board as a whole before expressing their own views in public, if they choose to do so.
6. The Board may take decisions if at least five members of the Board are present at the session, including the Central Bank Governor or at least one Deputy Governor, provided that the number of the Governor and Deputy Governor participating in the Board session

is not greater than the number of other members participating. A decision shall be deemed adopted if a majority of the Board members present at the session have voted for it. In case of a tie vote, the vote of the Central Bank Governor, and in their absence or inability to perform official duties, the vote of the Deputy Governor presiding over the session, shall be decisive. A record of the votes shall be maintained for each decision.

C. Transparency and Accountability

1. The Board will publish each monetary policy decision promptly on the Bank's website. The announced decision of the Board will be followed by minutes of the Board meeting that includes an overview of the economic outlook, the risks and policy options discussed, any material differences of view or judgement, and a record of the vote taken.
    a. The Statement by the Board of the Central Bank of Armenia must explain how the current monetary policy decision and strategy contribute to achieving its primary objective of price stability.
    b. The Statement must be written in Armenian and English.
2. On a quarterly basis, the announced decision will also be accompanied by a Monetary Policy Report that will, in addition to the requirements set out in Article 6 of the Law:
    a. Publish scenario projections for all critical variables necessary to evaluate how the Bank is managing the short-run output inflation trade-off and how it plans to adjust its policy instruments in order to achieve its objectives. These include projections for overall inflation, non-traded sticky price inflation, exchange rate, estimates for potential GDP and the output gap and an endogenous interest rate path.

b. In conjunction with publishing the scenario projections, the Bank will also publish the data, the model, and the judgment used to construct the case scenarios.

3. Board members will each provide a final submission that summarizes their assessments of the alternative plausible scenarios. The final submission will document their contribution and their position relative to the Bank's monetary policy decision.

D. External Communication

1. The Board's communications—both collective and individual—should contribute to the overall effectiveness of the monetary policy decision, the public's understanding of monetary policy, and the accountability of the Board and its members.
2. The Governor (or acting Governor in the event of his or her absence) will be the sole spokesperson for the official announcement of the decision.
3. A technical meeting with analysts will be held following the publication of the decision. This meeting will include a technical presentation of the case scenarios and risk assessment by the Chief Economist followed by a Q&A session among analysts. If a policy-related question comes up, a non-Executive Board member should be present to answer it on a rotational basis. That answer should reflect the discussion the Board had and not represent a personal view. The meeting will be live-streamed on the Bank's website to support broader economic and financial literacy.
4. In any public remarks regarding the Board's policy strategy and decision, members are to draw on the Board's official communications. Board members may express their own views about monetary policy and the economic outlook, but those views should be consistent with their final submissions and no new information should be provided. The majority (approximately 80%) of the Board member's discussion should focus on the institutional

view and only a minority of the time (approximately 20%) should be devoted to expressing individual views. Members are to consult with the Board within a reasonable timeframe in advance of any public communication, and ensure such communication is publicly advised in advance and on the record (on the Bank's website) in real-time.

5. Given financial market sensitivities, Board members must respect the blackout period and refrain from any public communications relevant to monetary policy during the seven-day period preceding the decision.

VII. Code of Conduct (Working Draft)

The Board of the Central Bank of Armenia

A. Application

This code applies to all members of the Board.

B. Purpose

The code of conduct of the Board sets out minimum standards of ethical and professional conduct that must be adhered to by members of the Board.

C. Standards of Conduct

Members must formulate monetary policy consistent with the economic and operational objectives set out in the Central Bank of Armenia Law (2018) ("the Law"), and consistent with the charter.

This code meets the requirements of the Law and is to be read subject to the Board charter, which also includes expectations of members' conduct, particularly placing constraints on members speaking in the public domain about the Board's activities.

Members must at all times act with honesty and integrity, in good faith, with respect for their colleagues and staff, and with reasonable care, diligence, and skill, having regard to the functions of the Board and the CBA.

D. Promoting Participation and Preparation

Members have an obligation to the Board to:

- Carry out their responsibilities in an efficient and competent manner and to a high standard of performance.
- Contribute actively and constructively to the Board meetings, treating others' contributions with respect at all times, and exchange ideas freely to promote excellence in the Board's deliberations.
- Develop, enhance and maintain expertise in the subject matter of the Board.
- Continually seek to improve the effectiveness of their contribution.
- Attend all meetings, except where absence is unavoidable.
- Be adequately prepared to participate in meetings, including by reading any meeting papers supplied.
- Respect the time and effort of the staff to incorporate the views and opinions of the Board into the analytical process, namely timeliness of the one-page macroeconomic narrative submissions.

E. Ethics

Ethical conduct by the Board is governed by Articles 27-29 in the Law that lay out conflict of interests, service secrecy and the by-laws of the Bank.

VIII. Statement of Long-Run Monetary Policy Objectives (Working Draft)

The Board of the Central Bank of Armenia

As enshrined in "The Law of the Republic of Armenia on the Central Bank of Armenia," **the primary objectives of the Central Bank of Armenia are to ensure price stability and financial stability.** The Board of the CBA is committed to using its full suite of monetary policy instruments to achieve its price stability mandate and provide a nominal anchor for the economy.

We emphasize that the primary objectives of price stability and financial stability are a means to an end. The ultimate purpose of the CBA as an accountable public-sector institution is improving the welfare of our nation. Achieving low and stable inflation provides a credible nominal anchor for the economy and thereby helps to avoid inefficient boom-bust cycles, stimulates investment, supports the economic development of the country, and improves living standards over time.

The fundamental role of monetary policy is to provide an anchor for inflation and inflation expectations. The Board believes that a four percent inflation target for CPI inflation is consistent with its price stability mandate. Although CPI inflation is the best measure of the cost of living, the overall CPI basket of goods and services includes several items that are subject to seasonal fluctuations and global economic developments, which are not directly influenced by monetary policy. We therefore consider alternative measures of inflation, such as the prices for non-traded goods, as better indicators of underlying inflation.

The CBA's primary means of adjusting the stance of monetary policy is through changes in the expected path of short-term interest rates. If interest

rates were to be constrained by the effective lower bound, the Bank would be prepared to use its full range of policy tools.

Given the primary objectives of achieving price stability and financial stability over the medium term, the CBA recognizes that it is also responsible for managing the short-run tradeoff between inflation and output. In an open market economy, periodic economic and financial shocks cause output and inflation to fluctuate over time. The CBA does not target CPI inflation on a period-by-period basis. For example, it would be inappropriate for the CBA to bring CPI inflation back to two percent in the short term if it would result in undue economic and financial instability.

Effective monetary policy improves welfare by anchoring long-term inflation expectations and reducing the volatility of output and unemployment. Avoiding excessive volatility in the economy can result in substantial improvements in welfare by reducing the average levels of unemployment and raising the productive capacity of the Armenian economy. The Bank understands that placing weight on other near-term objectives must not be inconsistent with its primary responsibility of achieving its three percent target in the medium term.

The Board places great emphasis on the importance of clearly communicating its policy and decision-making framework to the public. Clear and effective communication helps make policy more effective, and encourages financial markets, businesses, and the general public to better understand and manage risks and uncertainties. Moreover, this communications approach plays an important role in enhancing the transparency of monetary policy and central bank accountability, which is a key priority for an independent institution such as the CBA.

The Board will review and renew the Statement of Long-Run Monetary Policy Objectives every five years.

IX. Looking Ahead

Martin Galstyan

The essence of good monetary policy lies in part in the ability of the policymaking framework to adapt and evolve over time, in response to changing forces and undercurrents. This book has argued, rather forcefully, that the post-2020 global reality—whether economic, social, or geopolitical—marks a turning point from prior periods. This new order requires novel approaches to policymaking that can appropriately deal with today's policy imperatives—a heightened level of risk and uncertainty—not just in Armenia, but around the world.

By developing the FPAS Mark II framework, the Board of the Central Bank of Armenia has taken an important step toward operationalizing prudent risk management approaches to monetary policy within an institutional setting. But in doing so, the Board of the CBA also acknowledges that some operational and procedural elements of the framework may need to evolve over time, in response to changing global and regional economic factors that are impossible to predict today. What characterizes a good framework—FPAS Mark II or others—is the institution's commitment to reform and improve the framework in a continuous way.

To this end, the CBA will be evaluating the framework on an annual basis, each April, with the appropriate reforms taking effect at the beginning of the following year. This ensures that the framework remains dynamic—that it is not simply a novel approach for a specific time and place that loses relevance over time. We remain steadfast in our institutional commitment to continue to invest in the framework, to reform and adapt it over time, and to do whatever is necessary at the institutional and operational level to ensure that we continue to achieve our price stability objective and improve the welfare of the Armenian state and people.

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