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FUTURE CENTRAL BANKING IN EMERGING MARKET ECONOMIES

Solikin M. Juhro

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Abstract

This paper elaborates the theoretical and practical perspectives of future central bank policy in emerging market economies (EMEs). With salient thoughts presented to expand broader horizons, a special overview is presented on the experiences and practices of central bank policies in EMEs. For EME central banks, complex challenges are inevitable considering the current state of economic progress, economic endowments, and institutional capacity. Several theoretical assumptions that underlie policy thinking are also substantively not the case for EMEs. These conditions, however, provide broad opportunities and space for central banks in EME countries to deliver policy innovations and breakthroughs, not only from a practical level, but also a theoretical perspective. The implementation of flexible inflation targeting framework (ITF) and the central bank policy mix, as well as the policy trilemma management of an open economy are among many examples of how central bank policy has evolved towards a more integrated framework. Eventually, to become a relevant regulator, the central bank must put extra effort into strengthening policy coordination and institutional arrangements, fostering new sources of growth to support a broader scope of welfare amelioration, while reinforcing the central bank policy mix in the new era.

Keywords: central bank policy mix, integrated policy framework, inflation targeting, central bank in emerging markets.

JEL Classifications: E02, E31, E52, E58, E61, F62, G01

I. INTRODUCTION

Since inception, the central bank in the modern era has typically been mandated with maintaining currency stability (in this case inflation and exchange rates) and financial system stability. This mandate has theoretical and empirical relevance to the critical economic role of the central bank, bearing in mind that by maintaining stability, the central bank is expected to support sustainable economic growth. With the given mandates, the functions of monetary policy and regulation/supervision of the financial system fall under the authority of the central bank. Initially, these functions were simple but later became more complex with economic and financial advances both domestically and internationally. Due to large policy influence on the economy and welfare, stakeholders are very concerned about the behavior of the central bank, not only relating to the policies taken, but also how the institutional arrangements of the central bank are implemented. This is in line with changes in the world economic and political order over the last several decades, with many countries adopting a market economic system and democratic government.

The institutional arrangements of the central bank are implemented in accordance with the principles of good governance, namely by strengthening the legal framework and in implementing its policies. This, among others, can be seen from the modernization of the law by providing a clear mandate for the central bank as well as independence in discharging its duties. Strengthening accountability and transparency is also increasingly being demanded of the central bank when implementing its policies. Institutional strengthening of the central bank has been going on for the past two decades and became increasingly important after the 2008/09 global financial crisis (GFC) (Warjiyo & Juhro, 2019; 2022; Lagarde, 2023; Buch, 2023; Krogstrup, 2022). These changes reflect growing awareness in various countries of the need to strengthen the role and position of the central bank to support the achievement of economic policy goals.

Developments over the two decades prior to the GFC demonstrated a central bank focus on price stability. On one hand, this is part of the central bank's strategic response in overcoming high inflation, while still providing space for central bank independence when implementing monetary policy, outside of and free from government control. On the other hand, this is also in line with the growing theoretical perspectives in the Neo-Classical and Keynesian synthesis, which emphasizes that monetary policy can only affect inflation in the long term, even though there is a short-term trade-off between inflation and economic growth, as it exists in the Phillips Curve phenomenon. In this regard, the economy is assumed to always work in balance, and the main factor causing imbalances is price and wage rigidity. Likewise, there is no friction in the financial system so that money and credit are perfect substitutes, which are affected by interest rates. Foreign capital flows also move freely and, therefore, a flexible exchange rate system is the right choice. Under these conditions, it is sufficient for the central bank to set short-term interest rates to achieve the target of price stability. The economic and financial balance created will result in a level of economic growth with maintained macroeconomic and financial system stability.

Furthermore, with independence, governance is strengthened with increasing demand for higher transparency and accountability to maintain the credibility of central bank policies. This is in line with the theoretical perspective of rational expectations, policy consistency with standard principles, and the importance of transparency for managing inflation expectations according to the targets set by the central bank. Such thoughts prompted central banks in many countries in the 1990s to start implementing monetary policy with the target of price stability, otherwise known as the inflation targeting framework (ITF). In its development, more and more central banks are implementing ITF. Many empirical studies also review the success of implementing ITF in various countries, both developed countries and EMEs. However, the

occurrence of the crisis/GFC reversed the theoretical thinking and practice of central bank policies. Not because the central bank's policies based on ITF had failed. On the contrary, ITF implementation in many countries has succeeded in reducing inflation to a low level and, together with low interest rates, has been able to stimulate vigorous activity and high economic growth.

Miskhin (2011) evaluated nine principles of monetary policy holistically, including ITF, which had become a kind of consensus prior to the crisis, concluding that "*none of the lessons from the financial crisis in any way undermines the nine basic principles of the science of monetary policy*". The problem is, the stability and economic boom that endured previously for a long time encouraged rapid credit expansion, inflated asset prices (asset price bubbles), especially stocks and housing, and accelerated debt (high leverage). Financial acceleration occurred so that the financial cycle amplified the economic cycle. Economic stability caused financial system instability, which then led to a crisis (GFC), the biggest financial crisis since the Great Depression of the 1930s. In fact, price stability alone is not enough to produce macroeconomic stability if financial system stability is not properly maintained; "there is no macrostability without financial stability" (King, 2005). Financial friction turns out to be inevitable due to information asymmetry, financial product innovation, valuation and pricing, and risky behavior, so that the financial system is always in an imbalance that encourages financial acceleration and is vulnerable to systemic risk (Bernanke et al., 1996; Minsky, 1982).

As a result, the GFC has created a common awareness that the central bank's mandate should be returned to its original purpose, namely achieving price (and exchange rate) stability and supporting financial system stability. Central bank credibility and the framework that has been established through ITF implementation are the basis for achieving this dual mandate. This is not enough, however. The GFC demonstrated that the close linkages between the macroeconomy and the financial system (macro-financial linkages) require a macroprudential policy response by the central bank to mitigate the procyclicality between the financial sector and economic activity, which caused the crisis. Foreign exchange intervention policies and management of foreign capital flows are also needed to support exchange rate stabilization measures, even in a flexible system. This development prompted many central banks to implement macroprudential policies and manage foreign capital flows to strengthen the effectiveness of central bank monetary policies. In short, the monetary and macroprudential policy mix, as well as the management of foreign capital flows has become a new paradigm and is being practiced by central banks in various countries, especially post-GFC emerging market countries (EMEs), including at Bank Indonesia, which began implementing a policy mix in 2010 (Juhro et al., 2021). This actually shifts conventional thinking regarding the trilemma management of monetary, from the impossible trinity to the possible trinity (Palley, 2009; Patnaik and Shah, 2010; Juhro and Goeltom, 2015; Escude, 2014). Likewise, Rey (2013) declares the death of the trilemma, referring to the transformation of the 'trilemma' into a 'dilemma,' or 'irreconcilable duo'. The development of innovation in central bank policy practices certainly requires further development of the theory and the empirical studies that underlie it.

The dynamics of the strategic environment that characterize the area of central banking do not stop there. The complexity and uncertainty of the problems faced by central banks will evolve in the future, in line with technological developments. By its nature, the era of digitalization is developing with rapidity and affecting various aspects of life. These technological developments change the behavior of people and companies in transacting and carrying out their economic activities. In this regard, banking activities will also be encouraged to optimize technology utilization in meeting customer or market needs, as well as being a requirement to compete with FinTech and Big Tech companies. This will affect the response, transmission mechanism, and effectiveness of central bank policies. In this regard, the central

bank must be able to anticipate these developments, including the emergence of various new forms of digital currency (Juhro, 2022; Chen, et al., 2022; Maryaningsih et al., 2022).

The future role of central banks must also take into account other megatrends that will color the global economic dynamic moving forward, especially related to the role of the central bank in dealing with "beyond stability", issues, such as income inequality, climate change, and the pandemic crisis. The GFC changed the perceptions of academics and central banks regarding income inequality. Inequality is seen as an important issue that cannot be ignored by central banks (Mersch, 2014; Carney, 2014). In fact, there is increasing empirical evidence to suggest that monetary policy and income inequality are interrelated. Widening income inequality causes money to be distributed unequally in society. This affects the complexity of demand management by the central bank, so that the policy responses set can be differentiated among groups of people with different income levels.

Meanwhile, climate change can be extreme due to rising global temperatures (global warming), which is influenced by human indifference. Climate change affects sustainable development, disrupts the continuity of production and supply of goods and services, causing an imbalance in the demand for goods and services, which has the potential to disrupt the achievement of the inflation target by the central bank (Dikau and Vols 2018). This condition, therefore, necessitates a pre-emptive response from the central bank as the competent authority for managing the demand side (demand management). In its recent report, the World Economic Forum/WEF (2023) shows that climate and environmental risks are the core focus of global risk perceptions over the next decade. These salient developments certainly do not yet capture the complexity of the challenges faced by the central bank during the 2020-22 pandemic crisis, which distorted all aspects of the economy from the supply and demand sides. These dynamics and the potential problems that may arise inevitably encourage central bank to innovate policy (instruments), so that economic conditions can be managed as expected. As a consequence, central bank policy transmission will also become more complex.

These developments illustrate that, not only has the theory underlying the formulation of central bank policies developed rapidly, the practice of formulating and implementing policies at various central banks has also undergone rapid change, thus encouraging further development of the underlying theory. In other words, this progress has mutually beneficial influence between the development of monetary and financial economic theory in the academic world, and the various concepts of thought that underlie the practice of policy formulation at the central bank. Academia, in its efforts to provide explanations or offer solutions to resolve problems, has contributed a lot of conceptual and theoretical thinking to various phenomena and economic behaviors in society. This theoretical thinking has been so advanced and deep, both at the philosophical conceptual level, as well as through the use of quantitative methods and empirical analysis, although in some cases this is based on certain assumptions as a simplification of complex economic behaviors in society.

On the other hand, in the central banking domain, there have also been various advances in conceptual thinking and innovation in the practice of formulating central bank policies as a solution to complex and fast-developing economic-financial problems. In many ways, such policy innovation is also facilitated by close interaction in the central banking community through various forums and meetings at both the global and regional levels. The development of theoretical thinking in the academic world has certainly become the basis for central banks when formulating policies. The complexity of the existing problems often requires policy response innovations that must be taken by the central bank, which in many cases provides a stimulus for the academic world to carry out theoretical studies and the empirical evidence that underlies it. Ultimately, in a world characterized by rapid technological advances, the increasingly complex challenges that will be faced by central banks and other policy authorities will require the ability to hone and test the capabilities of policy authorities to develop new

ideas. Therefore, the central bank must be able to adapt quickly and precisely in dealing with these changes. Rapid developments in innovation and technology create great benefits and risks for the role of central banks in the future. Likewise, it is very important for the central bank to develop rapid monitoring and response in managing activities across the financial system.

Consequently, these environmental changes will broaden the central bank mandate moving forward. It is worth noting that a number of thoughts were also put forward to strengthen modern central bank policies after the GFC (Group of Thirty, 2015; BIS, 2011). This strengthening effort covers various aspects of central bank policy to support sustainable economic growth through monetary policy, macroprudential policy, capital flow management and payment system policy. Evolution since the inception of a central bank provides valuable lessons, while the experiences before and after the GFC provide an important foundation for building a modern central bank going forward.

This paper elaborates the theoretical and practical perspectives of future central bank policy in emerging market economies (EMEs). With salient thoughts presented to expand broader horizons, a special overview is presented on the experiences and practices of central bank policies in EMEs. The remaining sections proceed as follows. Section two presents a shift in the strategic policy environment in the post-GFC era and the evolution of central bank policy towards a more integrated framework. Section three presents some megatrends and central bank policy perspectives in navigating the challenges in the midst of bigger uncertainty ahead. The fourth section reviews some frontier thinking on what policy strategies should be prepared by central banks in EMEs, with the experiences and endowments they have, to become central banks that are always relevant in the future. Section five concludes the paper.

II. CENTRAL BANKS TOWARD A MORE INTEGRATED POLICY STRATEGY

2.1. Feasibility of Basic Theoretical Assumptions

Changes in the strategic environment, including shifts in the economic structure, changes in the behavior of economic agents, and evolving policy responses by the central bank, continue and foster the development of economic theoretical perspectives and modeling set-up, from unique to more up-to-date, in order to accommodate these changes. These dynamics have naturally moved away from the current theoretical understanding that has been built and has become the main reference for policymaking. The state of economic progress also differs between advanced economies and EMEs, such as in terms of productivity level, financial market development, public expectation management, and institutional maturity. The fundamental question is whether these dynamics encourage a shift in the way of thinking or assumptions that underlie existing theories? In other words, do the basic theoretical assumptions that have existed still hold true, are they feasible, so that they can be used as a reference for central bank policymaking in the future? This section attempts to review some of the basic theories that are inherent to central banking thoughts and practices, namely the stability-growth nexus, natural rate of interest, and policy trilemma management in an open economy.

Stability-growth nexus and inflation behaviour

The growth-stability nexus, as reflected by the behaviour of the Phillips curve, has become an important pillar in the economics literature, from both theoretical and policy perspectives. The formulation of a loss function that measures central bank policy preferences, for example, relies on the relationship between inflation and output growth in the Phillips curve. It is generally believed that there is a trade-off between inflation and output growth in

the short term; where an increase in output growth (lower unemployment) is accompanied by an increase in inflation. In this regard, a low unemployment rate is associated with relatively high wage inflation, and vice versa. This relationship has dominated the economy for the last few centuries. However, the phenomenon of stagflation experienced by developed economies in the 1970s and the last few years, including during the Covid-19 pandemic, is certainly in contrast to the relationship pattern of the Phillips Curve.

In fact, several studies in the last decade (among others are Fischer, 1993; Barro, 1995; Ghosh and Phillips, 1998) have concluded that there is a significant negative relationship between inflation and output growth. Recent studies have shown that the relationship between inflation and unemployment can be positive. For example, Ho and Iyke (2019) and Hooper et al. (2019) show that the relationship can be nonlinear, with any threshold at which the relationship changes from negative to positive. A number of reasons can explain the upward sloping Phillips curve. The relationship between inflation and unemployment depends on the phase of the business cycle. For example, King et al. (1995) show that, for the United States, the Phillips curve is unstable and the relationship between inflation and unemployment is positive during normal periods and negative during the business cycle. The Phillips Curve Theory, which has a micro-founded theory of the Phillips curve, argues that it is expensive for firms to increase output and employment in response to excess demand.

Some findings in advanced and emerging economies show that wage inflation can remain low, even though unemployment is very low, and vice versa. This indicates that the relationship in the Phillips curve has weakened, so that the Phillips Curve has become flatter. The causes of the flatter Phillips curve include globalization of the labour market, reduced union power, and increased industrial concentration. This basically represents inflation that is relatively more responsive to changes on the supply or institutional side, compared to economic conditions on the demand side, in this case represented by developments in output. Globalization, for instance, affects the domestic economy by lowering the sensitivity of inflation to the output or flattening the Philips curve, particularly before the pandemic crisis, as frequently indicated in the literature, such as Abbas et al. (2016), Hooper et al. (2020), and Jašová et al. (2020), among others.

Three factors may drive the decreasing inflation response to domestic output as suggested by Jašová et al. (2020). First, the presence of imported goods may force domestic producers to maintain prices in the face of increasing demand. Second, foreign investment makes goods less responsive to the domestic demand. Third, the free movement of labour makes the labour market more competitive and thus, domestic workers delay their demand for higher wages. A flattening of the Phillips curve may undermine the ability of monetary policy to influence inflation. Not only flattening, the Phillips curve also indicates non-linearity as proposed by studies, such as Benigno and Eggertsson (2023), Byrne and Zekaite (2020), and Juhro (2004). When inflation becomes very low, they may not be used as the main driving factor. However, increasing inflation may drive other prices to increase rapidly, as documented by (BIS, 2022). Thus, policymakers may have to face a high cost to reduce inflation. Policymakers are required to understand the causes of the flattening, not just the slope, to carry out optimal monetary policy.

Relating to flatter PC behaviour, a phenomenon that has required more attention from the central bank in recent years is the shift in the role of the demand and supply sides in influencing inflation dynamics. Recent studies show that supply shocks are becoming an increasingly important component behind inflationary surges (Stiglitz and Regmi, 2022; Akinci et al., 2022; Eickmeier and Hofmann, 2022; Cook, 2023). In this case, global supply factors are very strongly associated with recent inflation across countries, both historically and during the recent bout of inflation acceleration. While there are also transitory factors, such as supply chain disruptions and bottlenecks, and China's zero-COVID policy, these

presumably will abate at some point. But, the secular trends are likely to lead to a new equilibrium in many economies and global financial markets (Spence, 2023).

As a reflection, several important events in the last five years, such as the trade war or inward-looking policies, the Covid-19 pandemic crisis, and geopolitical tensions between countries, can be used as a factual reference in observing how dominant supply shocks are in pushing global inflation pressures. Monetary policy, then, is too blunt an instrument because it will greatly reduce inflation only at the cost of unnecessarily high unemployment, with severe adverse distributive consequences. Looking ahead, the outlook for inflation will depend, in part, on how the factors restraining supply respond and boost cost pressures on inflation. These findings have a fundamental implication that central banks should advance their understanding of how an environment of more frequent disruptions to the production and distribution systems will affect potential output, feed into inflation, and become an important element in forecasting inflation, assessing risks, and adjusting monetary policy. In other words, inflation policy, which relies on demand reduction, needs to be augmented by supply-side responses.

Another key aspect of the Phillips curve behaviour are inflation expectations, which influence the future direction of inflation and serve as an assessment of monetary policy credibility. Traditionally, the formation of expectations has been more backward looking. The subsequent development of business cycle theory by New Keynessian economists, however, gave birth to a new version of Phillips curve analysis, which is based on staggered analysis of nominal price formation, inspired by a study by Taylor (1980). The key difference of this approach, compared to the traditional version of the Phillips curve, is that price changes are the result of optimal decisions of business actors in monopolistic markets, with constraints in the form of price adjustment frequency. The general specification of the approach based on the staggered price setting model developed by Calvo (1983) shows that inflation is a forward-looking phenomenon.

In both advanced economies and EMDEs, long-term (five-year-ahead) inflation expectations have fallen over the past three decades. After a rapid decline during the 1990s, inflation expectations in advanced economies have remained stable at around 2% per year since the mid-2000s, with very little cross-country variation. Even during 2021, when inflation rose sharply, long-term inflation expectations remained steady in advanced economies (Vorisek et al., 2022). Well anchored inflation expectations have implications for well-maintained core inflation, which reflects domestic fundamental stability. Armantier et al. (2021) provides evidence that even though the current surge in inflation (due to pandemic) has affected short- and, to a lesser extent, medium-term inflation expectations, it did not significantly affect the anchoring of long-run inflation expectations. Well-anchored long-run inflation expectations therefore represent an important measure of the success of monetary policy. Certainly, low core inflation is also supported by other determinants, such as controlled external spillovers (i.e. exchange rate and imported price passthrough) on inflation and manageable domestic demand. Therefore, how to anchor inflation expectations may be beneficial to monetary policy in terms of affecting inflation in the midst of a flattening of the Phillip curve. Likewise, exchange rates also play a significant role through their implications on inflation expectations (Nasir *et al.*, 2020). Stabilizing the exchange rate, therefore, is not only important in maintaining imported prices through exchange pass through, but also to anchor inflation expectations.

Evolution of The Natural Rate of Interest

The natural rate of interest (NRI) or the equilibrium real interest rate, is an important concept in macroeconomics. NRI describes the real interest rate path consistent with the eventual full capacity utilization of available resources in the context of low and stable inflation. In other words, the real interest rate neither stimulates nor contracts the economy. It

is also an important reference for monetary policy, since it is a key determinant of a variety of simple policy rules that are often used to characterize monetary policy. Many studies have delivered sound estimations of the NRI using different methods, as well as the implications for monetary policy (Holston et al., 2017; Fiedler et al., 2018; Brand et al., 2018; Barrett et al., Borio et al., 2019; 2023). It should be noted that excessive use of the natural rate framework when making monetary policy decisions poses various risks, given the numerous uncertainties surrounding "natural" rates and related intrinsically noisy indicators.

Juhro (2016) suggests that the NRI measurement should be placed in the broader scope of the central bank policy domain, especially in the post-GFC era, such as the trade-off between internal-external balances, the role of the exchange rate, as well as risk perception in financial markets, that could potentially impact the equilibrium real interest rate. Likewise, Borio et al. (2019) show that the interactions between monetary policy and the financial cycle can generate important path dependencies and exert a persistent influence on the economy's evolution, including on the real interest rate. Given the serious issues about the use of the NRI as a monetary policy guidepost, central banks should utilize a broader macro-financial stability framework.

While there are uncertainties that typically surround estimates of the natural rate, recent studies focus on the evolution of the natural rate of interest across several large advanced and emerging market economies. Understanding the future direction of that rate and the cause of the decline is important for designing effective monetary policy. As has occurred, the policy rates set by central banks have been declining in many countries over the past two decades, as the natural rate of interest in those countries has fallen. A declining natural rate of interest reduces the ability of a central bank to respond to recessions with conventional monetary policy. Common trends have played an important role in driving real interest rates down.

A recent study by Barrete et al. (2023) revealed several important findings related to the evolution of NRI. The study shows that the natural rate has declined over the past four decades in most advanced economies and some emerging markets. While idiosyncratic factors can explain cross-country differences, common trends underlying demographic transitions and productivity slowdowns are key to understanding the synchronized decline. As global capital markets opened and fast-growing emerging market economies entered the scene in the 1980s and 1990s, foreign factors increasingly shaped long-term trends in interest rates. High growth in emerging markets has tended to drive up interest rates in advanced economies, while producing a glut of savings in emerging markets. These excess savings— in their quest for safe and liquid assets—have tended to flow back to advanced economies, pushing natural interest rates back down. On balance, these forces seem to have had broadly offsetting effects on capital flows and a moderate impact on natural rates over the past half-century. Based on conservative assumptions on demographic, fiscal and productivity developments, it is anticipated that natural rates in large emerging market economies will decline, gradually converging toward the low and steady levels expected in advanced economies.

Based on the above exploration, several factors could explain the decrease in NRI, including demographic change, productivity growth, financial integration, debt overhang and rising inequality. In this context, the risk that the COVID-19 crisis will exacerbate some of these factors, and thus put further downward pressure on the natural rate of interest, points to the need for structural policies to counter the natural rate decline (Tanaka et al., 2021). Meanwhile, Obstfeld (2023) emphasizes that external balance matter, so that 'equilibrium determination' of NRI requires not only the right policy setting for the real interest rate, but also exchange rate, long term interest rate, etc. It can be concluded that, in principle, monetary policy can mitigate the effects of a low natural rate of interest; however, it cannot adjust this rate directly. Importantly, a combination of structural measures to boost productivity growth,

on the one hand, and fiscal measures to stimulate global aggregate demand and support long-term economic growth, on the other, is needed to reverse the drop in the natural rate.

Policy trilemma management: from "impossible trinity" to "possible trinity"

A fundamental theory based on the seminal works of Mundell (1963) and Fleming (1962), which coined the policy trilemma, suggests that a country cannot achieve the three policy goals of monetary independence, exchange rate stability and financial integration simultaneously and only two out of the three conditions can be pursued together. The "Impossible Trinity" is hard to achieve in the "corner solutions". Consequently, the sole primary objective of the central bank was set as low and stable inflation. This was followed by the emergence of inflation targeting, encouraged by the New Keynesian model.. Following the global financial crisis, however, and amplified by the Covid pandemic crisis, the global economy has witnessed the emergence of widespread global uncertainty. Massive capital flow volatility in the wake of unconventional monetary policy in advanced countries has posed challenges for policymakers to restrain capital flows from aggravating the overheating pressures, particularly to the exchange rate and subsequent inflation, and to mitigate the risk that protracted periods of easy financing conditions could threaten financial stability (Ehlers & Takáts, 2013)

In addition, capital flow volatility may channel to the domestic economy through the banking sector. The presence of strong capital inflows may drive the domestic banking sector to expand loans disbursed to the private sector (Cavallino and Sandri, 2019). A sudden reversal of capital flows would force the domestic banking sector to absorb the bonds liquidated by foreign investors to retract their loan expansion. Greater domestic economic integration with the global economy, coupled with intense foreign capital flows and exchange rate dynamics, has increased the complexity of monetary management. Exchange rate dynamics amplify the shocks through volatility and level. The volatility and level of exchange rates affect the domestic economy through three main channels (Agénor *et al.*, 2014). First, substantial exchange rate volatility may disrupt the exchange rate expectations and lead to high fluctuations in the local market. Second, currency depreciation exacerbates the currency mismatches of domestic borrowers with large foreign currency debt exposures and increase the cost of borrowing. Third, the level of the exchange rate could amplify shocks because it influences how much foreign lenders value domestic collateral. Exchange rate depreciation erodes the value of collateral and initiates a feedback loop of tightening constraints and further exchange rate depreciation (Lubis et al., 2019). The volatility of the exchange rate is also amplified by the volatility of the market participants' risk appetite. This volatility increase is driven mainly by the offshore market, which represents the risk appetite of foreign investors. Monetary policy in advance economies, particularly US monetary policy, may become the main driver of the global financial cycle (Miranda-Agrippino and Rey, 2020). The use of foreign intervention helped stabilise the economy during the international capital market shock episodes that caused variations in the cost of capital to the economy (Alla *et al.*, 2020).

To confront these issues, the choice of monetary policy strategy has become how to transform the impossible trinity into a possible trinity. Policymakers ought to strike an optimal balance between mitigating the downward pressures on domestic economic growth arising from the global economic downturn and ensuring stability in the medium-term. Capital flow volatility must be managed to ensure the stability of the domestic economy and the use of monetary policy with macroprudential policy, along with capital flow management measures under a central bank policy mix strategy, which could significantly help optimize the policy choice outcome in coping with potential macroeconomic instability (Warjiyo and Juhro, 2019; Juhro and Anglingkusumo, 2020; Juhro et al., 2021).

Aizenman & Ito (2012) pointed out that many countries, particularly emerging market countries, are moving towards a middle-ground solution. By developing an index of policy convergence, which measures the magnitude of divergence in all three trilemma indexes, namely monetary independence, exchange rate stability and financial integration, they find that many countries are moving towards policy convergence, particularly after the global financial crisis. Aizenman et al. (2011) argue that countries implementing policy integration towards the middle-ground solution are experiencing lower investment and exchange rate volatility, which in turn is lowering output and inflation volatility. To some degree, FX intervention helps alleviate the trilemma by partly off-setting private capital flows (Steiner, 2017). Furthermore, FX intervention helps to stabilise the economy during the presence of risk appetite shocks and monetary policy shocks (Lubis *et al.*, 2023).

Complementing interest rate policy with FX intervention may affect real variables, such as output and inflation, by increasing output consumption at the time of a shock. However, as exposures to global financial spillovers and awareness of their domestic impact have both increased, policymakers in many EMEs have questioned the established tenet that external shocks can be fully accommodated by exchange rate flexibility and have relied on a suite of other policy instruments, such as macroprudential instruments and capital flow management measures (CFMs).

2.2. Toward a More Integrated Central Bank Policy Mix

From Inflation Targeting Framework (ITF) to Central Bank Policy Mix

As we know, prior to the GFC, global macroeconomic conditions were relatively stable. Inflation and interest rates declined during the last two decades before the crisis. These developments, among others, were due to an increasing number of central banks adopting the monetary policy framework, which focuses on maintaining price stability with the underlying support of institutional strengthening and central bank policy governance, known at that time as the inflation targeting framework (ITF) (Warjiyo and Juhro, 2019). Likewise, in the US, the economic environment prior to the GFC was also quite stable, known as the Great Moderation (Bernanke, 2004; Hakkio, 2013). Sustained monetary stability, however, occasionally created another problem of financial system instability. This reminds us of what Hyman Minsky alluded to in 1982, namely the financial instability hypothesis (Minsky, 1982). The GFC demonstrated the importance of the linkages between the macroeconomy and financial system; or the macro-financial linkages as we know it today (Morley 2016). It is important to understand the relation between the financial cycle and systemic risk, the procyclicality of the financial system and systemic risk.

The GFC also revealed capital flow volatility (Hannan, 2017). This issue applies mostly from the perspective of emerging market economies (EME). EMEs need to address this issue since capital flow volatility contributes to financial and macroeconomic instability in the economy (Baum et al., 2017). Central banks can respond with interest rate policy or greater exchange rate flexibility, but we need to complement this with new measures and policies, known as capital flow management. The GFC showed that maintaining price stability without maintaining financial system stability is insufficient to achieve macroeconomic stability. Capital flow dynamics quickly impact monetary policy effectiveness, therefore the monetary authority must use a variety of instruments, hence evolving from a normal situation where the central bank responds to inflation and the fiscal authorities respond to finance public expenditures.

As conventional economic policies are considered no longer sufficient in terms of stabilizing the domestic economy, several central banks have become aware of the condition

that a new global economic conjuncture necessitates a modification in the existing policy framework by enhancing other policies, such as macroprudential policy, exchange rate policy, capital flow management, fiscal policy coordination and structural adjustments. This is now referred to as the policy mix (Warjiyo and Juhro, 2019). Of course, from an academic point of view, we acknowledge that thoughts have been put forward concerning various formats of ITF implementation, from standard ITF to flexible ITF and integrated ITF (Juhro, 2015; Warjiyo and Juhro, 2019; Agenor and da Silva, 2019; Warjiyo and Juhro, 2022), which underlie this policy mix format.

It is worth nothing that policy mix formulation certainly requires an analytical framework and assessment of complex transmission mechanisms, as well as consideration of the trade-offs and interactions between policies. The CBPM integrates several policy instruments: (i) interest rate policy to ensure inflation forecasts fall within target; (ii) exchange rate policy to maintain the stability of exchange rate movements along its fundamental trend to ensure consistency on achieving the inflation target as well as mitigating excessive volatility that may adversely affect financial stability; (iii) capital flow management to support exchange rate policy, particularly during periods of high capital flow volatility; and (iv) macroprudential policy to maintain financial system stability and support the effectiveness of monetary policy transmission. This approach basically preserves the main objective of achieving and maintaining price stability, while safeguarding financial stability as the supporting or secondary objective.

Integrated Policy Framework (IPF) and Macro-Financial Stability Framework (MFSF)

Global economic development is progressing rapidly with several complex problems and anomalies. Given the more perplexing economic environment, accompanied by a higher level of economic openness, the impact of global shocks has become broader and more contagious. This phenomenon is more pronounced in emerging market economies (EMEs) than in advanced economies (AEs). As small open economies, EMEs are highly affected by the impact of global turmoil. Facing these challenges, the central bank is expected play a strategic role, thus increasing its policymaking capabilities and innovations beyond conventional wisdom. Furthermore, the central bank is expected to formulate an optimal policy response to mitigate the risks from negative global spillovers, while simultaneously maintaining support for the ongoing domestic economic recovery. Against a multiple objective setting, policymakers often face difficult trade-offs when pursuing domestic objectives, while mitigating risks from external global shocks. Therefore, the central bank nowadays cannot rely solely on deploying monetary policy to achieve macroeconomic stability but also needs to implement macroprudential policy and supervision to ensure financial system stability and exchange rate policies to mitigate external risks.

The importance and need to develop a policy framework in multiple objective settings are recognized by international organization, such as the International Monetary Fund (IMF) and Bank for International Settlements (BIS). IMF and BIS each developed a similar policy framework as guidance for its member countries, particularly EMEs, on the formulation of "multiple objectives - multiple instruments" policy. IMF developed the Integrated Policy Framework (IPF), which aims to provide a systematic analytical approach to formulating an appropriate policy mix for managing large and volatile capital flows and preserving macroeconomic and financial stability given domestic and external shocks. A systematic framework can help central banks employing multiple tools to communicate their policy decisions and enhance credibility (IMF, 2020). In the same spirit, BIS developed the Macro-Financial Stability Framework (MFSF), as a holistic approach to jointly operate monetary policy (including foreign exchange intervention and bond/money market intervention), micro

and macro-prudential policy, CFMs and fiscal policy to stabilize the economy, underpinned by structural policies as solid foundations (Borio et. al., 2023).

The IMF Integrated Policy Framework (IPF) jointly considers the role of monetary, exchange rate, including foreign exchange intervention (FXI), macroprudential (MPM) and capital flow management (CFM) policies and their interactions with each other and other policies to minimize trade-offs when pursuing domestic and external stabilization objectives in the presence of volatile capital flows. The framework, which draws on modelling work, empirical analysis and case studies, suggests that the optimal policy combination depends on the nature of shocks, country characteristics, and initial conditions. The findings also suggest that the deployment of policy tools should be guided by a clear framework and an assessment of costs and benefits, such that the macroeconomic and financial stabilization benefits of the IPF need to be balanced against potential costs in term of market development and other possible unintended consequences. The tools are not a substitute for deep markets, healthy balance sheets, or strong institutions. In addition, the tools should not be used to support misaligned exchange rates or substituted for warranted macroeconomic adjustment. Therefore, its operationalization should include safeguards to minimize the risk of inappropriate use of IPF policies.

Regarding operationalization, the IMF provides a micro-founded quantitative IPF modelling tool (QIPF), which can help quantify how using multiple policy instruments can improve policy trade-offs, thus yielding prescriptions for optimal policy choices to achieve policy objectives (Adrian et. al., 2021). The QIPF model can be calibrated and adjusted to represent the country characteristics of a specific economy. The QIPF model is an extension of New Keynesian open economy models with additional features, including a broad array of real and nominal rigidities, incomplete financial markets with frictions in domestic credit markets and foreign exchange markets to account for shallow financial markets as well as the absence of complete risk sharing internationally, discounting in IS and Phillips curves and imperfect exchange rate pass-through. QIPF modelling shows that economies with less well-anchored inflation expectations and significant foreign currency mismatch can potentially benefit from FXI and CFMs through improved monetary policy trade-offs. In the medium to longer term, however, the use of FXI and CFMs could slow the development of foreign exchange markets and lead to greater currency mismatches.

The Macro-Financial Stability Framework (MFSF) focuses on the countercyclical use of multiple policy instruments, including monetary policy (and FXI and domestic market intervention), MPM, CFMs, and fiscal policy to address inherent procyclicality, thus aiming to achieve macro, domestic financial and external stability objectives (BIS, 2022). Effective MFSF flattens the curve of boom-bust cycles by (1) leaning against credit booms to mitigate the build-up of financial vulnerabilities, (2) accumulating policy buffers to help weather negative shocks during a downturn, and (3) maintaining a portfolio of policies with a holistic perspective tailored to specific country circumstances. The two primary pillars of MFSF are sound monetary and fiscal policy, while macroprudential policy, CFMs, FXI and domestic financial market intervention are complementary tools that can support sound monetary and fiscal policy and mitigate policy trade-offs. In its implementation, MFSF needs to factor in several considerations, including the implementation costs, implementation/transmission lags of different tools, and differences in capital flow, business and domestic financial cycles.

MFSF emphasizes the impact of capital flow swings and exchange rate fluctuations on increased policy trade-offs, such that inflation and output might be pushed in opposite directions (intra-temporal trade-off) and financial imbalances in the future may arise when inflation and interest rates are persistently low (inter-temporal trade-off). The impact of volatile capital flows and exchange rates is likely to be more pronounced in EMEs than AEs due to country characteristics (BIS, 2019). EMEs, therefore, may benefit from using MFSF to

implement complementary policies other than interest rate policy to minimize policy trade-offs. In response to the current circumstances of high inflation and tight global financial conditions, MFSF prescribes that monetary policy focuses on maintaining price stability and avoiding a shift from a low to high inflation regime. Higher policy rates may help to limit capital outflows and maintain stable exchange rates. On the government side, tighter fiscal policy, while maintaining temporary and targeted subsidies on food and energy prices, may support the monetary policy tightening. Other policies, such as MPM, should be conducted to mitigate the risks posed by tight global and/or domestic financial conditions, thus maintaining financial stability.

Fundamentally, the IPF and MFSF are essentially using a similar approach to CBPM. According to the CBPM approach, however, the policy mix strategy is extended by financial market deepening, policy coordination (with the government and related authorities to ensure financial system stability and support macroeconomic stability and structural reform in the country) and communication. In operationalization, BI CBPM is backed up by a modelling structure that incorporates macro-financial linkages in the model forecasting and simulation, as well as rigorous work on empirical and policy discussions.

2.3. Emerging Market Experiences

After experiencing high inflation and crises in the 1990s, many EMEs opted for the ITF as their monetary policy framework, following the lead of advanced economies. There has been a substantial increase in the number of major EME central banks implementing an explicit inflation targeting regime, while the number using an explicit exchange rate anchor has decreased (BIS, 2019). Despite its success over the last two decades, the implementation of inflation targeting in emerging markets faces various challenges, including the difficulty of establishing and sustaining credibility, the risks associated with liabilities and fiscal dominance, the implications of terms-of-trade shocks for monetary policy, the role of exchange rate volatility and fear of floating, and the potential trade-offs between price stability and financial stability (Agénor and da Silva, 2019). In light of the GFC and facing external shocks, such as volatile capital flows, EMEs are reconsidering whether inflation targeting is still the most appropriate regime. In EMEs, borrowing is often in a foreign currency, financial markets tend to be shallower, and currency markets much thinner. Appreciation can harm the tradeables sector and hinder firms' access to finance, while depreciation can lead to widespread bankruptcies due to unhedged foreign currency exposure. Failure to internalize the aggregate impact of foreign borrowing can result in an over-exposure of the economy to exchange rate fluctuations (Ghosh *et al.*, 2016). Therefore, although EME central banks may not explicitly set an exchange rate target, most have a certain "comfort zone" beyond which they would not want to see the exchange rate move suddenly. This is evident in the way monetary and intervention policies are conducted.

Managing macro stability and financial stability under a more integrated policy framework

EMEs typically apply a range of policy measures to achieve macroeconomic, domestic, financial and external stability. These may include monetary policy, foreign exchange interventions (FXI), capital flow management (CFM) measures, and macroprudential measures. According to a survey conducted by the Bank for International Settlements, most EMEs allow exchange rate flexibility during normal times, but are prepared to use CFMs and/or FX interventions during periods of excessive volatility (Bank for International Settlements, 2020). Additionally, reliance on macroprudential measures to address specific domestic financial stability objectives has become more common. Combining different policy tools can

enhance their effectiveness, as many central banks use a variety of instruments to maintain external stability.

Emerging market economies (EMEs) have employed a variety of tools to address both domestic financial imbalances and external imbalances, such as volatile capital flows and exchange rates. According to Borio et al. (2023), EMEs have found greater success in using a combination of monetary policy, domestically focused macroprudential measures, financial stability-driven capital flow management measures, and foreign exchange interventions in the same direction during times of significant capital outflows and excessive exchange rate volatility. Furthermore, EMEs are now shifting towards a more integrated policy framework. Agénor and da Silva (2019) introduced an integrated ITF (IITF), defined as a flexible IT regime with four characteristics: (1) monetary and macroprudential policies are calibrated jointly to achieve macroeconomic and financial stability; (2) the central bank is bestowed an explicit but contingent financial stability mandate, with the scope depending, in particular, on the nature and persistence of shocks, and on how quickly macroprudential tools can be deployed; (3) the policy toolkit includes foreign exchange intervention and possibly temporary capital controls, which should be combined with monetary and macroprudential tools; and (4) greater transparency and communication, through integrated, and systematic, policy assessments. With those developments, emerging countries are reforming their policy frameworks. Turkey and India have moved to a more flexible ITF addressing financial stability objectives, while Indonesia has implemented a more integrated central bank policy framework, known as the Central Bank Policy Mix (CBPM) since 2010 (Warjiyo and Juhro, 2019).

Managing the policy trilemma

Studies have shown that emerging market inflation targeters often incorporate the exchange rate into their interest rate reaction function (e.g. Taylor rule) implicitly. In a typical inflation-targeting scenario, the exchange rate will only influence a central bank's interest rate if it affects expected inflation. However, a more practical approach would acknowledge the exchange rate's importance in emerging market settings and allow for some flexibility within the inflation target framework. The study conducted by Ghosh et al. (2016) analysed data from 15 emerging market economy IT countries between 2000 and 2012. The authors discovered that central banks in these countries typically follow the "Taylor principle" when setting interest rates. This means that they increase real interest rates when inflation is expected to exceed its target or when output is above its natural level. Additionally, they respond to real exchange rate movements even when they do not directly impact expected inflation.

Aizenman (2011) observed that emerging Asia has achieved a middle ground in the trilemma configuration, with limited financial integration, a degree of monetary independence, and a controlled exchange rate supported by significant international reserves. Author shows that EMEs are converging towards this middle ground. The pattern indicates that emerging economies may have been striving to maintain a balance between monetary independence and financial openness, while also ensuring greater stability in exchange rates. Meanwhile, according to Volz (2015), East Asian emerging countries have not relied solely on price stability as a target, but have also aimed for exchange rate stability, employment, financial stability, and the current account. As a result, East Asian central banks need to create transparent frameworks to manage multiple objectives and navigate the trilemma of inflation targeting, exchange-rate management, and financial stability. Due to the high degree of asset and liability dollarisation, exchange rate changes can have significant implications for financial stability. Therefore, many East Asian countries, such as Indonesia, South Korea, Thailand and the Philippines, continue to manage their exchange rates despite following inflation targeting formally.

Many EMEs also utilize Capital Flow Measures (CFM) to target various flows, like banking, bonds, equity, real estate, direct investment, and others. Borio et al., (2023) provides a summary of the usage of CFMs by the nine EMEs between 2000 and 2019, indicating the direction of target flows (inflows vs. outflows) and the direction of actions (tightening or loosening), and hence the overall impact on domestic credit (decrease or increase credit). Most economies have a more or less balanced number of CFMs loosening inflows and tightening inflows. Approximately half of the CFMs involve quantitative limits on capital inflows or outflows, while roughly two-fifths of the CFMs involve qualitative changes, such as allowing some types of investors to enter particular market segments. Furthermore, certain jurisdictions, including Brazil, Hong Kong SAR, India, Indonesia, South Korea and Singapore, levied or modified taxes on financial transactions that involve borrowing from non-residents or foreign investment in domestic bonds, equities, and real estate. Moreover, countries such as China, India and Indonesia tightened or loosened minimum holding period requirements for foreign investment in domestic bonds, equities and real estate as well as minimum maturity requirements for external borrowing by residents.

The role of macroprudential policy

Many inflation-targeting central banks have implemented macroprudential measures to achieve financial stability goals (BIS, 2019). Although the structure and implementation of these frameworks differ significantly among nations, the central bank has access to many of these tools and often takes part in decision-making processes, such as membership of a financial stability council or committee. As a result, macroprudential tools can thus be considered as part of the wider macro-financial stability framework in which the central bank plays a key role. Juhro et al. (2021) shows that the presence of macroprudential policies also enhances the effectiveness of monetary policy in EMEs when dealing with policy trilemma issues, leading to the suggestion that policymakers in emerging markets can optimize the effectiveness of the trilemma policy choice by giving more weight to exchange rate stability and monetary policy along with macroprudential policies. These results imply that managing the policy trilemma in an open economy blighted by high uncertainty is indeed relevant with the implementation of a more flexible inflation targeting framework for the EME. In line with this, comprehensive data on the use of macroprudential policy instruments compiled in Alam et al. (2019) shows that EMEs gradually tightened macroprudential regulation from 2000 to 2016.

A recent study estimating macroprudential policy reaction functions for a panel of 41 countries during the 2000–2017 period found that domestic credit and interest rates are more insulated from US monetary tightening for countries that employ macroprudential countercyclically (Filho and DingXuang, 2023); Borio et al. (2023) also provide an overview of the macroprudential measures targeting various types of credit used by 56 advanced economies and emerging markets between 1995 and 2020. The most frequently used measures were loan-to-value (LTV) limits, loan prohibitions, debt service-to-income (DSTI) limits, debt-to-income (DTI) limits, other lending criteria targeting household, consumer, or housing credit. The economies also used non-cyclical systemic risk capital surcharges, risk weights on housing or consumer loans, and housing-related taxes. EMEs were found to be more active in implementing macroprudential measures than AEs. During the period from 1995-2020, 14 central and eastern European countries took the highest number of policy measures among the EMEs. Following them were nine emerging Asian economies. One notable distinction between AEs and EMEs in terms of the deployment of macroprudential tools is that EMEs utilized diverse FX related instruments, such as FX-denominated liability-based reserve requirements,

currency mismatch limits, FX positions and FX denominated loans, and FX liquidity requirements. On the other hand, AEs seldom made use of such instruments.

III. ADDRESSING FUTURE STRATEGIC CHALLENGES

3.1. Some Megatrends

The future will be marked by several megatrends or changes in the strategic environment, such as accelerated digital transformation and widespread problems that demand the role of a central bank "beyond stability", such as income inequality, environmental/climate change, and the search for an optimal exit strategy in handling a crisis (i.e. pandemic).

Digital Transformation

Digital transformation is a phenomenon of technological progress that continuously changes all aspects of life, from corporate business models, activities and behaviour in the financial sectors, to perspectives in public policymaking. The increasingly rapid pace of technological development certainly requires central banks to have broader technological and informational capabilities as well as become more agile organizations. The central bank is also encouraged to remain at the forefront of technological developments, driven by intensive interaction and exchange of knowledge with technology providers and other public institutions, as well as mutual learning and sharing of best practices, both nationally and internationally (cross border).

The exponential growth of digital technology poses a major challenge to the centralized organizations and systems that have dominated economic and social life for more than a century. Most noticeably, information technology has changed the way organizations operate. The effects of continuous disruption have broken down traditional hierarchies and placed greater emphasis on roles and procedures based on responsibility, creativity and productivity. The expansion of network devices that are increasingly connected to each other (hyperconnected) further accelerates the paradigm shift from what was originally centralized to a more decentralized world. As an illustration, it can be seen from the latest developments and future trends in blockchain technology and distributed ledgers, artificial intelligence, and process automation, which have succeeded in distributing activities, functions and operations that were previously centralized.

In the central bank policy domain, the impact and opportunity creation of digital transformation is broad in nature. Specifically, it can be seen in the issuance of digital currency, which will offer a new instrument when implementing monetary policy, in addition to complementing the existence of physical cash. Also, big data analytics is creating new opportunities to analyse statistical data and other information that strengthens policy analysis. Meanwhile, in the money market area, trading and portfolio management applications and systems are also driven to become more sophisticated. However, with the emergence of innovation in the digital era, the potential for cyber risks will also become a major threat to financial stability. The central bank is required, therefore, to acquire new capabilities to supervise/regulate developments and the practices of financial institutions and payment systems (Juhro, 2022).

The central bank is likely to face technical and operational challenges to its core monetary policy mandates or, at a minimum, will need to adapt to the evolving financial technologies (Prasad, 2018). Blockchain technology, for instance, underlies the emergence of cryptocurrencies initiated by private actors/sectors and has become an essential variable in assessing the role of money in the future. The existence of cryptocurrency cannot be controlled absolutely because it will develop in line with the development of the technology itself. However, fully surrendering control of money to private publishers is also an alternative that

is beyond most of our mainstream thinking. Basic questions that will be difficult to answer include: What would happen if there were no central banks in this world? Can the money issued by the private sector be accepted by all economic actors? And how can the private sector issue and control money disbursements that can optimize the benefits for the wider community? "Everyone can create money; the problem is to get it accepted" (Hyman Minsky, 1986).

Given the various characteristics, benefits, and potential risks posed by cryptocurrencies, the central bank must also intervene in ensuring the maintenance of monetary and financial system stability, including in its efforts to issue Central Bank Digital Currency (CBDC). This is in line with the current best thinking that many refer to as building a hybrid system, where both private cryptocurrencies and official currencies (e.g. CBDC) co-exist. It is very important to observe this series of phenomena given that the existence of CBCD, which naturally co-exists with private cryptocurrencies, will affect the implementation and operation of the transmission mechanism and, thus, the effectiveness of monetary policy. Ultimately, various changes in the strategic environment will be accelerated and hyperconnected in the digital era going forward, which will definitely affect the functioning of the economic and financial systems, as well as the existence and mandate of the central bank.

Challenges "Beyond stability"

The post-GFC 2008/09 period was marked by shifts in the perceptions of academics and central bankers regarding the role of the central bank in dealing with several issues "beyond stability", namely income inequality, environmental or climate change, and the pandemic crisis. Income inequality is seen as an important issue that cannot be ignored by central banks. This is because central bank policies have an impact on income distribution, but these consequences are ignored in the theory and practice of monetary policy, especially in the form of unconventional monetary policy (Yves Mersch, ECB, 2014). The unconventional monetary policies implemented after the GFC in 2008/09 have resulted in several forms of unequal income distribution in society (Mark Carney, 2014).

Hitherto, the mandate does not require central banks to address issues of income distribution and inequality. The central bank believes that income inequality is not part of its duties. This is mainly because of the central bank's role in ensuring price stability, implying the central bank can maintain public purchasing power, so that it will not interfere with real income and the distribution of income. In Milton Friedman's view, central banks should focus on price stability and other issues, such as jobs and financial stability, and income distribution should not be handled by central banks. But the global financial crisis of 2008/09 changed the perceptions of academics and central banks about income inequality. Inequality is seen as an important issue that central banks cannot ignore anymore (Mersch, 2014; Carney, 2014). This thinking is supported by a growing body of empirical evidence showing that monetary policy and income inequality are interrelated. The development of research studies so far shows that the central bank has contributed to increasing income inequality. Monetary policy, especially unconventional policies, has an impact on income inequality (Auclert 2016). Several new central bank instruments in the macroprudential policy space also influence income inequality (Frost and Stralen 2017). Therefore, the very broad consequences of the relationship between monetary policy and income distribution require the central bank to consider this issue.

The second issue is environmental damage and climate change, which have induced losses to agricultural production, business and financial activities, property damage, and rising food prices, as well as other impacts. Environmental damage also causes instability in asset prices and a country's financial system, so that the central bank is also urged to think about this issue (Mark Carney BOE, 2015). Central banks are increasingly expected to address issues, such as climate change and inequality, outside of the narrow mandate of existing central banks

(Barry Eichengreen, 2021). In line with economic growth that continues to strengthen and the population that continues to increase, carbon emissions are projected to continue increasing moving forward. If increased production and economic growth are not accompanied by accelerated penetration of renewable energy, then carbon emissions will continue to increase every year (International Energy Agency, 2019). The positive trend of increasing carbon emissions poses various threats to the environment.

Increasing carbon emissions and environmental pollution over the past few decades, with a very broad scope and scale, have led to extreme climate change around the world. The further impact of extreme climate change has led to various risk, such as extreme weather events (floods and storms), spread of disease, rising sea levels, food insecurity and other disasters. In the next stage, climate change and environmental damage cause losses to agricultural production, business, finance and government, while damaging property and raising food prices, and many more. Carney (2015) states that there is a link between environmental damage and price volatility and a country's financial system. Therefore, risk management to address climate change is becoming more urgent considering the various losses that will occur if environmental changes are not taken into account. This is a challenge for the central bank, whereby in overcoming this risk the central bank must encourage other banking institutions to support environmentally friendly types of financing activities.

The third issue is the Covid-19 pandemic, which is considered an extraordinary event that has distorted the supply side (supply disruptions) and triggered a big shock on the demand side (demand shock). The pandemic prompted a crisis and increased economic inequality, so extraordinary measures and demands are needed for the central bank's role in economic recovery due to the pandemic. The relevant question is how exactly did the pandemic affect central bank practices, and how did the central bank respond to these problems? In the early days of the pandemic, of course, affirmative and concrete steps were difficult to implement, but the lessons from the 2008/09 GFC certainly helped several central banks, especially considering the similar magnitude of the economic shocks that occurred in both cases. Looking at five major central banks in the world (United States, Eurozone, Japan, United Kingdom and Canada), BIS noted that they all implemented full crisis management policies available in March and April 2020 when the virus first became a global pandemic. The benchmark interest rate (policy rate) was cut to near zero and, in some cases, entered negative territory. Monetary authorities currently have less wiggle room for interest rates, but in most cases, they remain committed to keeping monetary policy as loose as possible until normality returns in terms of growth, inflation and employment.

Under the pressure of unprecedented problems caused by the pandemic, the central bank's policy strategy cannot merely rely on monetary policy. The strategy designed must integrate various domains and policy instruments available to the central bank, such as macroprudential policies, supported by strong policy coordination with relevant policy authorities, such as the government (fiscal policy) and other financial services authorities. In this context, the management of policy space to support economic recovery from the pressures of the pandemic crisis can be maximized. Some of the coordinated steps taken include easing macroprudential policies both in aggregate and on a targeted basis for several sectors that have been hit very hard, restructuring credit, and expanding fiscal financing to support recovery and handling of health.

In the end, as is a historical fact, crises are phenomena that are unprecedented and prolonged, and ironically recurrent. However, the pandemic crisis also provided valuable lessons learned because it has accelerated the digitalization process, increased concern for environmental (green) issues, and strengthened policy synergy amongst the government, central banks, and related institutions in dealing with economic problems as well as formulating optimal exit strategies. Therefore, readiness, resilience, as well as the ability to adapt and

innovate with implementable breakthroughs are key to safeguarding the economic journey in the new normal era going forward. In this case, the existence and contribution of the central bank will certainly be a central part of the scenario.

3.2.   Emerging Market Policy Perspectives

Digitalization and Central Bank Digital Currencies (CBDC)

The digitalization of financial systems is an inexorable trend worldwide, and emerging market central banks are no exception. The adoption of digital currencies and the use of blockchain technology have the potential to revolutionize the financial industry, but also pose new challenges for central banks. Central banks worldwide have been increasingly involved with CBDCs. Like their counterparts in advanced economies, EME central banks are driven by the goal of achieving greater efficiency in payment systems (Boar and Wehrli, 2021). However, EMEs prioritize financial inclusion and express more concern over cybersecurity risks, bank disintermediation, and cross-border spillovers.

A survey on digital currencies conducted by BIS in 2022 reported that some central banks in emerging countries highlighted different points relating to their main motivation in issuing CBDCs. Central banks in Chile and Indonesia pointed out that CBDCs could aid them in maintaining their role as the issuer of the unit of account and the anchor of the monetary system. The Reserve Bank of India highlighted another potential reason for issuing CBDC, namely the potential savings from reducing cash in circulation. These savings could be derived from the decreased expenses associated with printing, transporting and storing banknotes and coins. The opportunity for savings is more significant in economies where cash circulation remains high. Furthermore, promoting financial inclusion is a common motivation cited for issuing CBDC. It is a top priority for Peru, Mexico and South Africa, and more than half of all central banks consider it a significant factor (Chen *et al.*, 2022). The Central Bank of Brazil has emphasized its focus on technology to encourage innovation and enhance the efficiency of financial markets (Araujo, 2022). The Bank of Thailand foresees CBDC as having the potential to become a reliable and trustworthy digital form of central bank money to better serve consumer needs in an increasingly digital economy, and provide the foundation for Thailand's future financial infrastructure (Arromdee and Koonprasert, 2022).

Central banks have expressed several macroeconomic, financial, and operational concerns. Increased operational responsibilities, such as maintaining system stability and cyber security, are a major concern, especially in a system that is becoming more digitalized and necessitates additional regulatory and supervisory activities for privacy protection and data management. Many EME central banks are also concerned about CBDC disintermediating banks and the resulting impact on financial stability. These worries are especially significant if CBDCs are widely adopted. At the same time, central banks are concerned about potential limited user adoption, raising questions about the value added of CBDC to consumers and businesses.

Due to varying circumstances, central banks approach CBDC differently, taking into account factors such as digital infrastructure, mobile phone and internet penetration, competition in payment systems, and data governance arrangements when deciding on CBDC issuance objectives, adoption and value added. Maryaningsih et al. (2022) found various differences in CBDC adoption across advanced and emerging countries. Wholesale CBDC projects are more advanced in countries with more developed financial markets and higher levels of cross-border transactions. On the other hand, countries with lower levels of financial inclusion, larger informal economies, and higher levels of innovation are more advanced in

retail CBDC projects. Furthermore, factors influencing the progress of retail CBDC projects for advanced and emerging countries also differ. Retail CBDC projects are more accelerated in emerging countries with a higher degree of openness, innovation capacity, large informal economy, and with greater involvement of the authorities.

Some central banks are unsure about the need for issuing CBDC in the near future, while others believe that careful design can keep the risks to a minimum and yield net benefits without harming the financial system. The latter group prefers a payment-focused CBDC that improves payment system efficiency and avoids serving as a store of value to prevent disintermediation and major monetary policy implications. These banks do not plan to offer remuneration on their CBDCs, and they prefer limits on balances and transaction values. Additionally, they aim to keep the amount of CBDC outstanding small (Chen *et al.*, 2022).

Central banks on sustainability issues: green, inclusion and pandemic

Central banks in emerging markets and developing countries (EMDCs) have taken significant steps towards greening the financial system and addressing environmental risks. To that end, they have adapted policy tools that have been in use in developing countries. In addition, new instruments have been introduced to enhance macroprudential regulation. Many EMDC central banks have a broader mandate to support sustainable development and the government's economic policy agenda, in addition to the price stability mandate. There are three main ways that countries tackle the issue of green finance and climate change. The first is through green credit allocation instruments that aim to provide credit to green sectors. The second is through green regulatory instruments, such as prudential and macroprudential measures, that aim to ensure financial stability. Lastly, some countries use other green central banking activities, such as creating green finance guidelines or establishing green bond markets (Dikau and Ryan-Collins, 2017).

In their study, Dikau and Ryan-Collins (2017) also explore how existing financial intervention traditions have influenced the approach of emerging markets towards green growth and credit allocation. Central banks, such as India and Bangladesh, that were previously involved in centralised credit allocation policies, have incorporated categories for green projects, especially renewable energy projects, into their existing priority loan programs. For instance, the central bank's green refinancing program in Bangladesh has supported approximately 10% of the population in installing home solar power systems. National development banks have played a more pivotal role in countries like South Korea, Brazil and China by providing credit support to green sectors, with the central bank concentrating on suppressing credit to brown sectors. In Brazil, the central bank mandates commercial banks to stress test their lending against environmental and social risk criteria and hold additional capital against these risks.

According to Milton Friedman (1968), there is wide agreement about the major goals of economic policy: high employment, stable prices and rapid growth. Today, most people would agree that environmental and social sustainability should be included to Friedman's list of primary economic policy goals, but differences remain about the best policies to implement in pursuit of these goals, their compatibility, and who should be in charge (United Nations Environment Programme, 2017). Sustainable finance has become an increasingly important topic in EMEs, with a growing number of monetary and financial authorities considering how to integrate climate and other environmental considerations into their policy frameworks, or to encourage financial institutions to incorporate environmental, social and governance (ESG) standards in lending and investment, as well as to implement environmental and social risk management (ESRM) practices. A survey conducted in 18 SEACEN countries shows that a number of Asia and Pacific central banks and regulatory authorities are already explicitly or implicitly promoting sustainable finance (Durrani et al., 2020). Most respondents believe that

they should be playing a key role in this regard, whether by providing capacity building, setting the regulatory framework, encouraging green loans and products, or incorporating climate change considerations into their monetary and financial policy frameworks. The establishment and quick growth of the Central Banks and Financial Supervisors Network for Greening the Financial System (NGFS) and the Sustainable Banking Network (SBN) best exemplify the understanding that central banks and financial supervisors need to address climate risks and support sustainable finance.

Although support for a pro-active sustainable development role of central banks is emerging, there are some risks posed by overstretching the central bank's mandate (United Nations Environment Programme, 2017). There are at least three risks that should be considered. The first is the risk of conflicting objectives. Central banks will encounter problems if they are supposed to achieve too many objectives and have too few tools. The second is the danger that too much power may be vested in unaccountable institutions. The third is the possible resistance to change from within the central banking community. In conclusion, emerging market central banks face significant challenges in balancing economic growth with sustainability considerations. To promote sustainable growth, central banks are incorporating ESG considerations into their policies and operations, strengthening financial system resilience to sustainability risks, and promoting financial inclusion. However, achieving sustainable growth requires greater international cooperation and coordinated action on sustainability issues.

Last but not least, as the Covid-19 pandemic exerted simultaneous pressures on the supply and demand sides, which posed feedback-loops to one another, policy strategy and timing taken by the central bank and the government is essential. The role of fiscal policy is critical to jumpstart the economy through a fast and appropriate budget absorption strategy, as well as programs to increase spending on public goods, such as social assistance, which are carried out in the early stages. This is then followed by other more integrated programs, complemented by monetary and financial stimuli to further accelerate real sector activity. It is also crucial to formulate an optimal 'exit policy'. The provision of massive fiscal and monetary stimuli to limit the impact of the Covid-19 pandemic, if not managed properly, could create vulnerabilities in the event of instability or even a new crisis. In this regard, AEs and EMEs applied different strategies to implement monetary policy during the pandemic, whereby EMEs generally had more policy options available than advanced economies. Countries that already had a positive inflation gap with interest rates close to the Zero Lower Bond (ZLB) responded first by raising interest rates. Conversely, countries with high excess liquidity tended to respond by normalizing liquidity first at the start of the 'exit policy' (Fratto et al., 2021). As implemented in Indonesia, the latter strategy, in terms of managing monetary policy transmission, has been more effective in influencing macroeconomic stability at a relatively low cost amidst a decline in economic growth (Nugroho et al., 2022).

IV. BECOMING A RELEVANT CENTRAL BANK IN THE FUTURE

4.1. New Realities

Referring to the historical experiences and strategic challenges described previously, there are new realities or trends that must be considered when assessing the central bank's strategic role moving forward. *First*, bigger uncertainty and complexity of issues, including those originating from structural changes, technological developments, the spread of the pandemic, and other strategic issues that affect the implementation of the central bank's mandate. The issue of monetary and financial stability is also increasingly widespread and interconnected, and this will escalate as a result of trends in technological developments and

innovations in various lines of the economy. In addition, it is difficult to clearly delineate the source of the crisis, whether triggered by vulnerabilities in the financial sector or real sector, whether the shocks originate from economic or non-economic sectoral issues, etc. The formulation of policy response/timing will also become increasingly challenging given the relatively short length of the technology cycle, which forces the central bank to prepare for possible changes in conditions and potential risks in a pre-emptive, forward-looking and measurable manner in accordance with a sound monetary and financial stability management strategy.

Second, increasingly rapid and hyperconnected changes in the digital era reveal other facts when technology has enabled market and public players to be involved in economic transactions by obviating the role of a central authority, so that a regulator may no longer be needed (relevant). On the other hand, although digital technology is believed to help businesses and financial services become more productive, create more jobs, and improve public services, regulators have a moral responsibility to ensure the economy receives optimal benefits from the digital dividend. Addressing the threats posed by the rapid development of payment systems and the emergence of digital currencies has added to the responsibility of the central bank in managing its mandate. The central bank, therefore, is required to become a digital regulator that can play a strategic role in creating a conducive environment for the economy, while remaining relevant in the digital era. Therefore, strengthening regulations and engaging in catalytic competition are two of several options that central banks can generally choose.

Third, the issue of welfare and economic sustainability are inseparable from the role of the central bank in discharging its duties to achieve and maintain price stability, such as economic growth, full employment and income equality, as well as environmental/climate change issues. In the evolution of modern central banks, there has always been a conflict between the central bank's role in maintaining economic stability and promoting economic growth. There is a body of strong empirical evidence, however, that central banks should not neglect their role in promoting economic growth. As a kind of butterfly effect, the pandemic amplified initially small shocks into very large turmoil across the entire system of a country or the world, thus demanding a developmental role from the central bank. Demand-side management strategy (short term) needs to be integrated with supply-side management to overcome structural problems (medium to long term). From a central bank policy perspective, the meaning of achieving stability needs to be directed in the context of supporting sustainable economic growth (stability for sustainability). Therefore, the complexity of policies and decision-making needs to be planned optimally to support the successful achievement of these goals nationally.

4.2. Policy Implications

Mandate, coordination and credibility

The complex challenges are expanding the tasks of the central bank dramatically, which occurs in most areas of activity affected by technological change. In this case, the central bank's concerns are naturally broadened by the presence of new market players and the development of alternative payment systems, beyond the current problems that focus on monetary and financial stability. In response to future complex challenges, the role of the central bank must undergo major transformation, which includes upgrading or developing several parts, such as the areas of organization, systems and infrastructure. In short, environmental developments that require technological advancements indicate the need for an arrangement that is proportional, holistic and ideally coordinated at the national/international level. However, the relevant authorities must also remember their policy objectives. Despite the significant role of

new technologies, the focus of central banks and supervisory authorities must remain focused on achieving the goals of monetary and financial stability, as well as adequate functioning of markets. Expansion of the central bank's tasks as a result of technological development is very broad, including in the implementation of monetary policy, monitoring financial stability, regulating payment systems, managing assets, publishing data/statistics, printing money, and institutional supervision.

The extension of the mandate is certainly not exclusive. Challenges to policy independence characterize the central bank's journey in safeguarding its mandate. From a general perspective, challenges to independence arise when there are demands or political pressure on the central bank to contribute more in terms of promoting economic growth, with the potential consequence of sacrificing the inflation target. In general, despite being empirically proven that central bank independence contributes to achieving low inflation, pressure on independence often occurs, especially during crises and recovery from crises. In a crisis situation, conventional monetary policy is no longer sufficient to secure price stability. Central banks can expand their set of instruments (beyond conventional instruments), therefore, in order to broaden their policy space and achieve their goals optimally.

Experience from various financial crises has shown that central bank concerns over maintaining financial system stability will continue to increase. To guarantee the optimization of economic welfare, the central bank must deploy its instruments in a manner that integrates the available dimensions and information sets (Warjiyo, 2022). New monetary and financial policy instruments must be developed and integrated into a policy mix strategy, which will ensure a broader central bank policy impact in the real sector. Such ideas contradict the views of some, however, who have stated that financial crises occur due to a central bank mandate that is too broad, giving the impression that the central bank's task is becoming less effective. The ability, therefore, of the central bank to optimally implement policy independence (instrument independence) to achieve the mandated goals will depend on the quality of policy coordination, which is a necessity and cannot be ignored under any circumstances. The implementation of central bank independence must be placed in the context of strengthening policy coordination among authorities for a broader strategic concern, known as "independence within interdependence". Consequently, institutional strengthening of central bank credibility is unavoidable.

Furthermore, central bank independence must be upheld as sacrosanct, accompanied by accountable and transparent policy implementation. In addition, stronger coordination is required amongst policy authorities within their respective jurisdictional corridors, supported by an effective communication strategy to articulate policy messages unambiguously to financial market players and stakeholders. As there are concerns about the implementation of unconventional monetary policy, namely the emergence of public unease regarding central bank action, the central bank must proactively explain the underlying reasons behind the policy response to the public. In this regard, central bank independence will be well guided if accompanied by strong accountability and good transparency. With this integrated strategy, central bank policy credibility can be well maintained.

Central bank policy mix in digital era

As companies continually hone their business models in response to environmental changes, central banks must also be agile to adjust their business processes to strategic environmental changes in the accelerated and hyperconnected digital era. Central banks need to work diligently not only to optimise the benefits afforded by digital technological advances but also to remain relevant in the era of digital transformation, which will only continue to accelerate moving forward. In this regard, a central bank must play a role in optimizing the

digital dividend amidst the expansion of increasingly hyperconnected network technologies (such as the internet of things, artificial intelligence, and blockchain), which further accelerates the paradigm shift from a centralized to a more decentralized financial system. In decentralized financial systems, the emergence of digital currencies issued by the private sector (i.e., cryptocurrencies) will ultimately colour the response, transmission mechanisms, and effectiveness of central bank policy. This is a very logical reason why central banks in many countries need to anticipate such developments, including by designing sound regulations, strengthening infrastructure and planning the issuance of central bank digital currencies.

The central bank policy mix is even more relevant after the COVID-19 pandemic and, therefore, must be improved continuously. A credible and independent central bank is unarguably an equal partner of the Government. As such, the central bank must rise to the occasion during extraordinary times, deploying the full panoply of instruments at its disposal to: (i) ensure the long-run economic viability of the state, (ii) address key vulnerabilities in the financial system, and (iii) look beyond the traditional price stability mandate, though maintaining stability would remain at the core of the central bank's objectives. Maintaining stability against a backdrop of elevated global uncertainty requires a more holistic and multidimensional approach (Warjiyo, 2023)

While the central bank policy mix remains a viable strategy, central banks are required to operate 'beyond conventional wisdom', with novel practices. Non-hierarchical business processes and multidisciplined procedures must be adapted by central banks through integrated policymaking. The introduction of new technologies in various economic lines has opened the door to new economic threats. Cyber-attacks have enormous potential to threaten financial systems and infrastructures in a country. It is critical, therefore, to develop systemic resilience through reliable supervision and cybersecurity systems. Clear supervision and regulation to overcome cyber-attacks, the ability of cyber security to detect attacks quickly and the development of solid systems and structures are necessary moving forward.

Central bank and green economy

Climate change and other environmental damage may have direct consequences on the stability of food and energy prices. In addition, environmental damage also poses the risk of instability in the financial system, thus affecting various central bank goals, which include achieving price stability, financial stability and sustainable growth. When environmental damage threatens price stability and financial system stability, the mitigation of environmental damage becomes part of the mandate and responsibility of the central bank indirectly.

Several cases demonstrate that environmental regulations implemented by environmental institutions are often weak or even ignored by economic actors. As a result, the damage to the environment cannot be resolved and tends to increase. In this case, through various strengths and its influence on the economy, the central bank holds a strong position to influence economic actors to consider environmental risks in their actions to generate profit through financial markets. The influence of the central bank is even stronger, especially in emerging markets and developing economies. Through regulation of the banking sector, central banks can effectively influence private investment decisions. The central bank, therefore, can promote green finance by providing funding incentives for environmentally friendly projects, while limiting funding for carbon-intensive industries.

Indirectly, the central bank plays an important role in the pursuit of sustainable development. The main mandate or responsibility of most central banks is to maintain low and stable inflation in the long term, as well as to maintain financial stability as an additional consideration. Additionally, the central bank also has other broad implicit goals in the economy, for example achieving sustainable growth or full employment. This is in line with

historical trends showing that central banks in most countries have played an important role in economic development by supporting targeted sectors, both in the manufacturing and financial sectors. Dikau and Volz (2018) distinguish five policy strategies in different areas to achieve several sustainability goals, through microprudential and macroprudential policies, financial market development, credit allocation, as well as soft power and guidelines.

Institutional capacity and strategic foresight

Policy transformation is not only about strengthening the policy mix, but it is also about developing the integrated monetary and macroprudential policy framework, supported by payment system digitalization. Policy transformation at central banks is in response to the challenges arising from diminishing globalization and rising digitalization. Institutional transformation is important to strengthen the governance and decision-making processes, and to digitalize the institutional business processes of policymaking. Human resource transformation is particularly important to continue enhancing the capacity and capabilities of central banks in discharging their mandates in a more complex environment of diminishing globalization and rising digitalization. Thus, it must encompass the capacity and capabilities in central banking but also in the digital economy and finance (Warjiyo, 2021).

The central bank must ensure resilience and efficiency by creating a reliable and agile organization in response to any changes in the environment. In responding to these developments, the central bank is required to understand the dynamics well and prepare all the tools available. The central bank needs to adjust the organizational structure and create human resources (HR) agile to these changes. In line with the rapid advancement of technology, improving the quality/competence of excellent human resources cannot remain business as usual, but must be accelerated. Central banks must remain in line or ahead of the curve with technological developments. This requires an organizational structure that is not rigid so that it can adapt quickly.

Forward-looking, adaptive and agile public policies can achieve better welfare goals for society, even in developing countries where resources are generally more limited. This is a challenging process. There is an urgent need, therefore, for strategic oversight within central banking practices to complement the well-established, research-based policymaking process. Strategic foresight will enable central bankers to collect information on future economic, social and political trends. It will help us prepare the "just-right" policy responses. For now, the strategic foresight concerns digital and green. We must be well-prepared to move towards it.

4.3. Becoming A Relevant Central Bank

Considering the new realities and future trends, as well as related policy implications, there are several principles that central banks can refer to when overcoming complex issues as well as remaining a relevant regulator/policy authority, as follows:

First, to strengthen policy coordination and institutional arrangements. First things first, the complexity of the problem requires more integrated policy strategies and stronger coordination. Effort to maintain stability is inevitable. Bearing in mind, however, that monetary and financial stability policy frameworks have shifted in response to various changes in the strategic environment, both must be integrated optimally into the central bank policy mix strategy, and coordinated with government policies, from a fiscal, sectoral and structural perspective. In this context, it is necessary to promote the spirit of "independence within interdependence" considering that history has also shown us that to optimize its role in the economy, a central bank cannot work alone. The central bank needs to focus constantly on maintaining policy credibility (retaining credibility), particularly with regard to stakeholder

trust in the domestic currency and strengthening coordination with relevant authorities in institutional arrangements and a more inclusive policy mix strategy.

Second, to broaden policy perspectives beyond stability, by encouraging new sources of growth. The broader challenge, beyond stability, of course, does not automatically require modifications or changes to the existing mandate. What is needed is the development of perspectives from various scientific disciplines and the necessary analytical angles to create a more realistic picture of how systems are formed and work in relation to one another. The central bank, therefore, must integrate and optimize the utilization of all policy instruments, including the main policies in the monetary, macroprudential, and payment system sectors, as well as other policies, to ameliorate welfare in a more concrete sense (sustainability concerns), namely economic growth that is more sustainable, including economic and financial inclusion and the green economy. In this context, a breakthrough strategy is required to orchestrate innovation in the context of creating new sources of growth, including through empowering local endowments and economic potential by utilizing technological advances and innovation capacity.

Third, to reinforce central bank policy mix in the new era. Ultimately, the central bank must play a role in navigating and optimizing existing digital advantages (optimizing the digital dividend). The central bank policy mix is still a viable strategy amidst the complexity of the existing problems. More than that, however, central banks are required to operate 'beyond conventional wisdom' with novel practices in the digital era in order to remain relevant. In the digital era, the role of data and information is fundamental, which includes explaining various economic phenomena that have never been properly explained before. To navigate the digital era well, central banks need to have superior human resources and build IT systems, as well as reliable central bank practices that are capable of making breakthroughs in properly safeguarding their mandate, meeting industry needs, and supporting real economic performance. On the other hand, the digital era has also unlocked new possible threats to the economy. It is critical, therefore, to build systemic resilience through a reliable surveillance system and cyber security.

V. CONCLUSION

Uncertainty and complexity are inevitable for central banks moving forward. Changes in the strategic environment, such as accelerated digital transformation and challenges beyond stability, accompanied by elevated uncertainty, have created new and more complex economic challenges. Navigating central banking practices in the digital era, blighted by high uncertainty, is very challenging and requires the central bank create breakthroughs and orchestrate policy innovations. Hence, optimizing the benefits of technological advances and remaining relevant in the digital era must be the anchor of the central bank strategy going forward. In carrying out the task of achieving and maintaining price and financial system stability, the role of the central bank must not ignore other welfare domains, namely economic growth. Indeed, the central bank also needs to pay attention to developments in other strategic issues, including those that are part of the Sustainable Development Goals (SDGs), such as climate change, income inequality, and inclusion.

For EME central banks, these complex challenges are inevitable considering the current state of economic progress, economic endowments and institutional capacity, which require further encouragement and regulation. Several theoretical assumptions that underlie policy thinking are substantively not the case for EMEs. These conditions may, however, provide broad opportunities and space for central banks in EME countries to deliver policy innovations and breakthroughs, not only from a practical level, but also a theoretical perspective. The implementation of flexible ITF and the central bank policy mix, as well as the policy trilemma

management of an open economy are among many examples of how central bank policy has evolved towards a more integrated framework, induced by the emergence of cases in EME countries.

As a final note, to become a relevant regulator, the central bank must put extra effort into strengthening policy coordination and institutional arrangements, fostering new sources of growth to support a broader scope of welfare amelioration, while reinforcing the central bank policy mix in the new era. When a central bank, with its strategic foresight, can observe and analyse future conditions, the central bank can endeavour to develop new ways of overcoming potential threats that arise and determine an optimal policy mix response. Therefore, the rapid evolution of policy and institutional ideas within the central bank, which includes academic theories and policy practices, must be reviewed and studied continuously to nurture central bank policy innovations that are constantly updated and relevant in the future.

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