CONCEPTUALISING AN INTEGRATED POLICY FRAMEWORK FOR TRINIDAD AND TOBAGO: INITIAL CONSIDERATIONS

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ABSTRACT

The International Monetary Fund developed the Integrated Policy Framework (IPF) in response to shortcomings in the Mundell-Fleming model (M-F). However, MFM-based measures become problematic, especially when Emerging Market and Developing Economies (EMDEs) experience severe economic upheaval exacerbated by structural constraints. The primary objective of the IPF is an optimal policy mix that accounts for the type of shock and distinctive country characteristics. This research outlines the considerations for a domestic framework and identifies significant elements of its design, using a combination of IMF guidance and empirical research. Volatile energy prices and changes in international interest rates were identified as external shocks which could have the most influential impact on domestic conditions. Therefore, there is a valid case for ex-ante ratification of an IPF policy toolkit and formalised coordination to minimise the costs of macroeconomic instability.

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[1] The views expressed in this paper are those of the authors and do not necessarily represent those of the Central Bank of Trinidad and Tobago

1. Introduction

For several decades, the Mundell-Fleming framework (M-F) formed the prevailing wisdom followed by countries to achieve macroeconomic stabilisation. This theory advocates that flexible exchange rates can be used to stabilise an economy faced with external shocks, both real and financial. Additionally, the model recommended that policy interest rates can be used to buffer economic conditions when faced with fluctuations in inflation and output. Central banks adopted monetary policy frameworks to achieve their price/low inflation mandates, taking into account the M-F framework. The frameworks varied across countries depending on country-specific circumstances and have also evolved over the years to meet changing circumstances and challenges facing various central banks. Thus, some central banks pursued inflation targeting regimes while others focused on maintaining low inflation by targeting a specific value for their country's exchange rate. The ideas of the M-F framework are brought out in the monetary trilemma. One of the main implications of the trilemma is that a central bank can only pursue two sides of the triangle to achieve price stability.

The M-F framework provides important insights on implementing monetary policy to achieve price stability, but it has its limitations. One of the main issues is that the M-F does not take account of other policy mandates/objectives (such as financial stability) of central banks. Since the global financial crisis, it became clear that central banks ability to conduct monetary policy can be impacted by financial system risks which could lead to financial instability. Central banks, therefore, have an obvious interest in financial stability issues. Although in the long term, central banks can achieve monetary and financial stability objectives simultaneously, in the short term, achieving one objective may not necessarily lead to achieving the other. At times policy instruments in one area could impact the policy space in another area and prevent the central bank from achieving other policy objectives. Short-term policy actions could, therefore, generate conflicts which require decision-making on trade-offs. Thus, rather than a case of one target and one instrument as portrayed by the M-F framework, in practice most central banks nowadays have multiple targets (objectives) which require multiple instruments according to the Tinbergen rule.

In addition, several assumptions of the M-F model do not fit the practical realities facing many countries. For instance, many Emerging Market and Developing Economies (EMDEs) are characterised by less than perfect market conditions regarding cross-border capital mobility, heavy export concentration, trade invoicing in a dominant currency, weak monetary policy transmission, and markets beset by frictions. Therefore, adopting extreme positions on the impossible trilemma may not be appropriate in many of these economies to achieve monetary stability objectives (more so to achieve financial stability objectives). Also, since globalisation/trade liberalisation, many countries (especially EMDEs) have experienced heightened susceptibility and vulnerability to economic shocks –stemming from large swings capital flows and significant currency mismatches. As the policy

interest rate, on its own, became an insufficient tool in the fight to stabilise the exchange rate and/or prevent capital flight, policy-makers in some EMDEs (at various points in time) have leaned on more coordinated policy frameworks to ward off challenging situations.

In light of the challenges facing central banks in dealing with capital flows, the International Monetary Fund (IMF) has been developing an Integrated Policy Framework (IPF) to inform its institutional view on countries' responses to shocks in the context of also addressing large swings in capital flows. An IPF seeks to provide a comprehensive, systematic and analytical approach to selecting an appropriate mix of policy tools to maintain macroeconomic and financial stability and achieve national policy objectives. The IMF has published many papers on an IPF applicable to EMDEs. These papers are devoted to understanding the policy options and trade-offs available to policy-makers systematically and analytically. To date, the IMF remains guided by its institutional view on the Liberalisation and Management of Capital Flows. Changes to that policy framework are likely to be considered during the forthcoming review of the institutional view, tentatively scheduled for 2021. The work on the IPF will be a crucial input for this review, along with a report by the Independent Evaluation Office on the IMF Advice on Capital Flows. The IMF's IPF provides a very systematic and analytical way of assessing the impact of capital flows and central banks' appropriate use of tools.

Trinidad and Tobago also faces a variety of circumstances that require comprehensive policy responses to shocks. For instance, commodity price volatility, financial market imperfections (that result in weak monetary policy transmission and foreign financial spillovers), and imperfect capital mobility require the Central Bank of Trinidad and Tobago (Central Bank) to respond comprehensively to mitigate the effects of shocks on the economy. The presence of frictions and policy constraints (for instance, exchange rate adjustment) complicate the policy responses since these can potentially amplify the impact of shocks on the economy. Another reality is the mandate to pursue multiple policy objectives set out in the Central Bank Act Ch. 79:02. Apart from price stability, the Central Bank has responsibility for supervision and regulation (micro-prudential regulation) of several types of financial entities (such as banks, insurance companies, pension funds, non-bank financial institutions). Also, since the global financial crisis, the Central Bank has significantly increased its focus on promoting financial stability through macro-prudential analysis[2].

A major policy challenge for the Central Bank is integrating and operating a policy framework involving multiple objectives in the face of the realities highlighted above. This paper seeks to conceptualise an IPF considering the fundamentals that could apply to Trinidad and Tobago. Our conceptual outline discusses three fundamental external shocks that impact the Trinidad and Tobago economy: an energy price collapse, a US Federal funds rate hike and a sudden rise in US Treasury bond yields (which is triggered by an increase in US economic uncertainty),

[2] The Central Bank currently does not have a formalised macroprudential framework.

their transmission through the domestic economy, available policy options and potential policy trade-offs. The paper also assessed the IPF responses to a domestic natural disaster and the case of a pandemic, especially in light of the Covid-19 shock and its impact on countries globally.

The remainder of the paper is organised as follows. Section 2 discusses the literature related to the use of IPFs by EMDEs and countries' experiences with policy coordination globally. This section also critiques the M-F model in terms of its applicability to policy decision-making in EMDEs. Section 3 reviews some critical stylised facts on Trinidad and Tobago's structural and financial market features and highlights the issue of policy tools to address key external and internal shocks. Section 4 discusses some shocks relevant to the Trinidad and Tobago economy, including the policy tools applicable under an IPF for the country. In section 5, we conclude with a brief outline of the way forward.

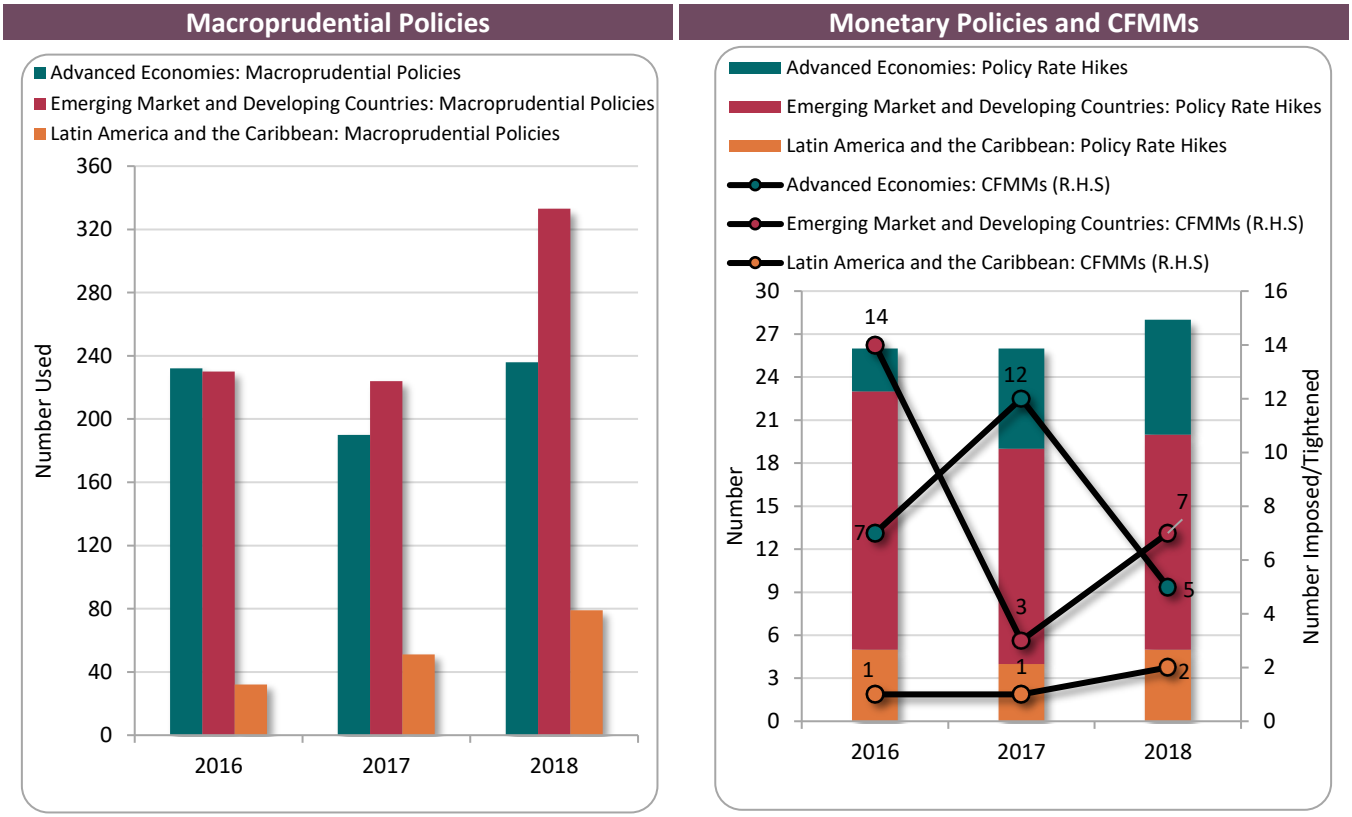
2. Literature Review

2.1. What is an Integrated Policy Framework?

Basu et al. (2020) define an Integrated Policy Framework (IPF) as an arrangement that seeks out the most appropriate mix of monetary policy, capital flow management measures (CFMMs), foreign exchange intervention (FXI) and macroprudential measures (MPMs) to achieve macroeconomic and financial stability in an open economy. The IPF framework was primarily motivated by two reasons. Firstly, many countries have employed eclectic approaches rather than the standard interest rate setting and floating exchange rates to cope with shocks. For instance, IMF (2020c) notes that while some countries broadly follow a "one target one instrument" approach with monetary policy aimed at domestic stabilisation (full employment and low inflation), other countries have adopted "multiple targets multiple instruments" where monetary policy is used to address price, financial and external stability concerns. Similarly, Basu et al. (2020) noted that in response to the COVID-19 pandemic, many Emerging Market Economies (EMEs) faced with capital outflow pressures used multiple tools to achieve macroeconomic stabilisation including, a reduction in policy rates, an easing of macroprudential regulation, along with sales of foreign exchange reserves and a relaxation of some CFMMs. Others have 'leaned against the wind', using monetary policy as a first line of defence against financial imbalances.

There has been significant heterogeneity across countries in their use of CFMMs, MPMs, and monetary policies (Basu, et al. 2020). For example, during the US Federal Reserve's (Fed) monetary policy normalisation undertaking (between 2016 and 2018) it can be observed from Figure 1 that, to cushion the adverse effects of the external tightening: (i) Advanced Economies (AEs) mainly used CFMMs and MPMs; (ii) EMEs and Developing Countries relied heavily on (MPMs), CFMMs and policy rate hikes; and (iii) Latin American and the Caribbean (LAC) leaned on MPMs and contractionary monetary policy. The IMF (2020c) observed that those countries authorities gave diverse rationales for their eclectic policy mix. Even so, using a variety of tools for multiple objectives could have adverse consequences and/or costs as often times the trade-offs (that is, unintended consequences) are not immediately evident (Fayad and Poirson Ward 2020). Still, these instances of policy coordination indicate that countries are moving past the recommendations from traditional theories on aggregate demand and monetary policy like the M-F Framework.

Figure 1 : Macroprudential and Monetary Policies Used by Region during the US Fed's Monetary Policy Normalisation Undertaking, 2016 – 2018



Source: IMF Capital Flow Management Measures Taxonomy, IMF Macroprudential Policy Survey Database and IMF Monetary and Financial Statistics Database.
Note: R.H.S stands for right hand side.

Secondly, the empirical evidence is inconsistent with some of the assumptions underlying the M-F framework. Pioneered by Robert Mundell and Marcus Fleming in the early 1960s, this famous dictum states that in an economy with high and mobile capital flows, a country cannot have both a fixed exchange rate regime and an independent monetary policy. In other words, countries can simultaneously choose any two, but not all of the

three following policy aspirations; exchange rate stability, monetary independence and financial openness – this insight is often described as the "impossible trinity" or "trilemma". Despite its popularity as a de facto guide for policy-making in EMEs, the rise in boom-bust cycles in capital flows over the past few decades have raised questions about the M--F model's insights (Rey 2013). Namely, real-world complexities exist that make policy-making more involved than setting a policy rate and allowing the exchange rate to move freely (Basu, et al. 2020). For instance, Farhi and Werning (2012) built a standard macroeconomic model to validate if, as the "trilemma" states, a country's monetary and financial conditions can be conveniently controlled by only one tool, the short-term interest rate. They found that in a small open economy with a fixed exchange rate regime, the arbitrage between domestic and foreign financial markets should be contained through CFMMs.

Bergant, et al. (2020) also provided evidence that real-world complexities exist that make policy-making more involved than just setting a policy rate. More specifically, by using panel regression analysis, Bergant, et al. (2020) showed that tighter macroprudential regulation: (i) reduces the sensitivity of GDP growth in EMEs to external and capital flow shocks; and (ii) allows monetary policy to respond more countercyclically to global financial shocks. These studies reinforce comments made by Rey (2013), that is, "*the Trilemma misleads us by assuming that domestic monetary and financial conditions shaping the macroeconomic situation of a country can be conveniently summarised by this one single variable, the short-term interest rate*". Further, the M-F framework assumptions are inconsistent with empirical data regarding trade and finance as many EMEs have dollar invoicing shares above 80 per cent (IMF 2020c). This gives rise to the dominant currency paradigm where export prices are pegged in a dominant currency. Currently, the United States (US) has a high degree of influence on international financial transactions (given the widespread use of the US dollar) however, a standardised international digital payment procedure may cause a huge shift in the geopolitical landscape when it comes to international financial transactions. For instance, in February 2021, SWIFT announced that it had set up a joint venture with China's Digital Currency Research Institute and Clearing Centre to roll out a universal digital payment network to support different countries' Central Bank Digital Currencies (Reuters, 2021). Regardless, on the financial side, several authors have noted imperfections in international and domestic capital markets (Gopinath 2019, Gopinath, Casas, et al. 2020, Basu, et al. 2020). For instance, these authors showed how foreign currency borrowing can link the exchange rate and the macroeconomy through currency mismatches and external borrowing constraints. Additionally, international financial intermediaries generally have a limited appetite for taking on EMEs' currency exposure; thus, the uncovered interest parity condition breaks down. Overall, the combination of the dominant currency paradigm and currency mismatches reduces the exchange rate's automatic stabilising role (IMF 2020c, Worrel 2000).

There is growing literature investigating how policy combinations can be more effective than a single instrument in responding to external shocks. The empirical evidence from Table 1 suggests that the appropriate use of MPMs, CFMMs, and FXIs may afford greater room for monetary policy to focus on domestic stability objectives (IMF 2020c). In that vein, Brandao-Marques et al. (2020) find that MPMs are more effective in dealing with domestic financial conditions and global financial shocks than monetary policy tightening (to 'lean against the wind'), which is associated with higher losses. Poirson Ward et al. (2020) suggest that a combination of policies such as FXI and MPMs in tandem with monetary policy can increase the effectiveness of attempts to dampen volatility in growth and inflation. However, this result depends on the nature of the shocks and country circumstances. Similarly, Mano and Sgherri (2020) indicated that the use of targeted macroprudential policy and CFMMs can help "free the hands" of monetary policy by allowing it to focus more squarely on domestic cyclical developments. Meanwhile, Adrian, et al. (2020) show that FXI and CFMMs may improve policy trade-offs under certain conditions, especially for economies with less well-anchored inflation expectations, substantial foreign currency mismatch, and that are more vulnerable to shocks.

Table 1: Empirical Results on IPF Policy Tools

Instrument	Macroprudential Measures	Foreign Exchange Intervention	Capital Flow Management Measures
Primary uses	● Control domestic credit	● Build precautionary FX reserves ● Mute volatility in shallow FX markets ● Mitigate currency mismatch risks ● Control inflation ● Curb exchange rate misalignments	● Manage capital in/outflows or flows in specific asset classes ● Alter composition of flows
Effectiveness	● Reduce domestic build-up of vulnerabilities from easy global financial condition ● Cost to output seems small	● Affects exchange rate in short-run ● May help manage capital flows ● Adequate reserves reduce vulnerabilities	● Can change composition of flows ● May impact overall size of flows, but this is less clear ● Precautionary CFMMs can help contain financial stability risks from surges ● Less evidence for reactive use
Unintended consequences and spillovers	● Can "leak" via credit provision by nonbanks and from abroad ● May enhance resilience of other countries	● May induce higher FX borrowing ● Might impact central bank credibility, but evidence is weak	● Tends to be "sticky" ● Limited evidence on growth impact ● Can deflect capital flows to other countries
Policy Interactions	May help increase monetary policy autonomy		
	● Help limit exchange rate appreciation associated with fast credit growth	● Combinations of monetary policy and FXI can help smooth the impact of external financing shocks	● Can enhance FXI effectiveness ● Can reduce leakage from MPMs and dampen feedback effects

Source IMF (2020).

Within recent times the role of communication has emerged as a cornerstone in aiding the efficacy of policy measures. According to Weidman 2018, effective communication of central bank policies can steer the expectations and result in achieving the objectives set out by monetary authorities. Studies have expounded on the importance of clear and concise communication from central banks to aid policy objectives. Effective and efficient communication of the IPF mechanism can improve the success of the framework. Dhanessar and Mitchell (2021) found that communication by the Central Bank of Trinidad and Tobago (CBTT) complements monetary

policy whereby the communication assists the Bank in forwarding its policy objectives. In light of this, the communication of the IPF framework will be fundamental in achieving the Bank's objectives.

2.2. Country Experiences with Policy Coordination

Under a traditional, non-coordinated mandate, monetary and macroprudential policy have separate goals and/or objectives and only interact occasionally to satisfy competing interests (di Giovanni and Shambaugh C. 2008). In these frameworks, the objective of monetary policy is typically to keep inflation and employment stable, the objective of macroprudential policy is to address risks and vulnerabilities within the financial system that can destabilise the economy. Sometimes, to help reduce the degree to which monetary and macroprudential interventions are needed, policy-makers use CFMMs to mitigate the impact of capital inflows (outflows) on domestic risk taking (Kalemli-Özcan 2019, Basu, et al. 2020). Under a coordinated mandate, monetary policy, MPMs and CFMMs share a joint objective, maximising social welfare – the conjunction of the intentions of the individual policy frameworks in the traditional mandate (Van der Ghote 2018). Although IPF is a relatively new area of research[3], some early instances of policy coordination can be found in Argentina, Brazil, Canada, Nigeria, the Republic of Korea and Turkey.

Advanced economies are the earliest known users of tools that address risks and vulnerabilities in the financial sector. Even so, often times they were rarely used in conjunction with monetary policies and CFMMs (IMF 2013). The instances where they were harmonised to achieve shared objectives were often in the face of severe systemic shocks. For instance, to mitigate the economic impact of the 2014 slump in oil prices on their economic recovery efforts, the Bank of Canada quickly lowered their policy rate from 1.0 per cent (in 2014) to 0.5 (in 2015 and 2016) per cent (well below their target range of 1 to 3 per cent). To ensure that the accommodative monetary stance did not fuel speculative activity, MPMs and CFMMs were deployed to manage the housing market. For example, on the macroprudential side, mortgage insurance premiums were raised (also, for properties over Can$500,000 the minimum down payment increased from 5 to 10 per cent) (IMF 2020b) while, on the CFMM side, British Columbia (in August 2016) introduced a property transfer tax of 15 per cent (on foreign entities) on residential property located in the Greater Vancouver Regional District (IMF 2019). The Republic of Korea also adopted a coordinated policy approach between 2010 and 2011 where, following the GFC, national authorities faced a challenging environment characterised by speculative short-term foreign currency borrowing and high household debt (IMF 2012). To help address these imbalances, between 2010 and 2011, the Republic of Korea, inter alia: (i) raised their policy rate from 2.5 to 3.75 per cent (to meet the goals of their inflation targeting framework); (ii)

[3] It appears that IPF was first discussed by the IMF (2018) – in their "Fall 2018 Global Policy Agenda".

placed limits on debt-to-income ratios (to tame household debt) and; (iii) set restrictions on foreign currency derivative positions[4] (to curb short-term foreign currency borrowing).

As with the AEs, EMEs appeared to lean on a coordinated policy framework when faced with challenging situations. For instance, between 2014 and 2015, Nigeria's economy was facing substantial difficulties following the fall in energy prices – the non-energy sector accounts for 90 per cent of GDP in Nigeria. More specifically, lower oil prices eroded the fiscal and external accounts and decimated government revenues (CNB 2016). The resulting uncertainty created a persisting surplus of liquidity in the banking system and fuelled speculative activities in the foreign exchange market (CNB 2016). To address these imbalances, Nigeria, inter alia: (i) loosened their monetary policy stance (the policy rate fell from 13.0 per cent to 11.0 per cent); (ii) raised the cash reserve ratio on private sector deposits from 20.0 per cent to 25.0; and (iii) restricted forty-one (41) "non-essential" items from having access to foreign exchange. The policy thrust was aimed at stimulating investment activity, curbing banking system liquidity and stabilising the foreign exchange market. A cocktail of policy measures was also used by Turkish authorities to help restore their economy between 2009 and 2010. More specifically, in the aftermath of the GFC, Turkey's economic environment was characterised by widening current account deficits, strong short-term capital inflows, and rapid credit growth (IMF 2012). These challenges were addressed by, inter alia: (i) lowering their policy rate from 6.5 per cent to 1.63 per cent (to slow the appreciation of the Lira); (ii) raising several reserve requirement ratios (to mop up excess liquidity and slow loan growth); and (iii) prohibiting banks from lending out foreign exchange.

In the LAC region, IMF (2012) and Bank for International Settlements (2017) noted that Argentina and Brazil are active users of monetary policies and MPMs. Although both countries follow different strategies when conducting their policy work, between 2011 and 2012 they adopted similar policy coordination strategies. More specifically, following the GFC, with the high uncertainty and sluggishness of the global economy, both countries adopted a cautious monetary policy approach, combined with tighter MPMs and CFMMs to reduce vulnerability to capital inflows (Haines, Ferrari-Filho and Neyra 2020). For instance, the Banco Central de la República Argentina kept its policy rate at 9.5 per cent between 2011 and 2012 while the Banco Central do Brasil lowered their policy rates from 11.00 per cent to 7.25 per cent. Further, in November 2011 the loan-to-value requirements and risk weights were lowered in Brazil for motor vehicles loans and for shorter-term loans respectively (IMF 2012) while, in June 2012, Argentina lifted the daily reserve requirements on dollar deposits to help improve liquidity in their banking

[4] In October 2011, the Republic of Korea set maximum limits on banks' foreign exchange derivative contracts at 50.0 per cent (domestic banks) and 250.0 per cent (foreign bank branches) of the bank's capital in the previous month (IMF 2019).

system[5]. Finally, to stem balance of payments deterioration, both countries used approval requirement and tax-based CFMMs.[6]

The case studies showed that at different points in time countries realised that structural imbalances could not be contained by only using the policy rate (Table 2). That certain conditions will arise that require moving beyond traditional recommendations and adopting a coordinated policy approach. In those instances, it was observed that generally: (i) monetary policy was used procyclically (eased to facilitate an economic rebound); (ii) MPMs were used countercyclically (raised to manage liquidity or to contain credit growth during the rebound); and (iii) CFMMs were used countercyclically (raised to stem capital outflows during the rebound). It should be noted that economies in LAC used their MPMs procyclically. Given that MPMs aim to prevent excessive risk-taking in the financial system it can be some cause for concern that countries are easing these policies during periods of accommodative monetary policy as low interest rates fuel loan demand and past financial crises have been preceded by strong credit growth (Takáts and Upper 2013). This observation reinforces the need for policy coordination to take part under a comprehensive and continuously evolving IPF as using a variety of tools for multiple objectives can have adverse consequences and/or costs as often the trade-offs are not immediately evident (Fayad and Poirson Ward 2020).

Although the available literature is scarce, some work has been done on the regional and domestic level on policy coordination. Critically, in these studies, policy mixes: (i) have been suggested in an ad-hoc manner; or (ii) they lack a comprehensive, clearly established framework that appreciates the trade-offs and potential interactions between monetary, macroprudential and CFMM tools. Nevertheless, the strategies divulged in these works are a step in the right direction and can support the development of a domestic IPF.

Two noteworthy studies in the Caribbean were Worrell (2000) and Robinson (1998) which highlighted the need for monetary and fiscal policy coordination. Worrell adopted a regional perspective and highlighted that in small open economies, monetary changes may lead to capital flows and currency substitution rather than changes in output and prices, regardless of the exchange regime. Furthermore, the transmission of monetary changes to output and prices is seldom clear cut, and the trade-off between inflation and other economic objectives is often the subject of controversy. Worrell's suggested that commonly used arrangements for anti-inflationary policies existed but they depended on cooperation between the central bank and the treasury.[7] Robinson's study

[5] Otaola, Jorge. "Argentina Loses a Third of its Dollar Deposits." *Reuters*. June 8, 2012. https://www.reuters.com/article/argentina-dollar-idUSL1E8H8EJA20120608

[6] For example, in 2011 Argentina's Government announced that from October, tourism packages and online goods and services can only be purchased after getting approval from the proper authorities (IMF 2019). In Brazil (in December 2012) the maximum maturity of external loans subject to the 6 per cent Imposto sobre Operações Financeiras (a tax on various types of financial transactions in Brazil) rate was decreased from 720 days to 360 days (IMF 2019).

7 Although the goal of IPF is to coordinate monetary, macroprudential and CFMM tools, IMF (2020c) stressed the importance of other considerations, including integrating fiscal policy more fully into the analysis.

suggested that the Bank of Jamaica should introduce policies which coordinated annual targets for inflation, the exchange rate, growth and reserve accumulation within the ambit of a rolling three-year financial programme. This detailed synchronisation of financial flows would be achieved by the Bank of Jamaica working closely with the Ministry of Finance.

Domestic research on policy coordination is examined in Edwards and Garcia-Singh (2018) and Ramlogan and Sookram (2018). The authors found that the combination of standard monetary policies and a macroprudential index (MPI) had a more substantial impact on credit and lending spreads with less reliance on the Repo rate.[8] Ramlogan and Sookram concluded that coordination of monetary and fiscal policies has been weak over the last twenty-five years. Overall, the authors found that fiscal policy appears to be conducted in a highly pro-cyclical manner which implies that it tends to be less responsive to shocks. Although monetary policy aims to neutralise associated inflationary effects of fiscal injections, excess liquidity often restricts its effectiveness.

[8] As there are currently no explicit macro-prudential tools, in use by Trinidad and Tobago authorities, to proxy financial stability policy Edwards and Garcia-Singh (2018) estimate an MPI – a composite index consisting of the sum of the growth rates of; total credit, capital-to-assets and non-performing loans in the domestic banking system (consists of 8 commercial banks and 16 non-banking financial institutions).

Table 2: Synopsis of the Macroeconomic Conditions and the Monetary, Macroprudential and External Policies used in the Country-Case Studies

Country	Exchange Rate Regime	Monetary Policy Framework	Macroprudential Policy Framework	CFMM Measures Used	Instance of Policy Coordination		
					Pre-Shock Macroeconomic Conditions	**Shock**	**Policy Frameworks Used**
Argentina	Floating	Monetary Aggregate Target	Broad-based tools applied to: the household sector, corporate sector, banking sector liquidity, systemic liquidity risk and fire sale risk in the nonbank sector, risks from systemically important institutions and interconnectedness within the financial system, and other sources of systemic risks.	Reserve requirements, approval requirements, repatriation requirements, bans	In 2010: GDP growth was high (10.1 per cent), inflation (10.5 per cent) and unemployment (7.8 per cent) rates were high, the current account balance and fiscal balance were in deficit and public sector debt to GDP was low (43.4 per cent).	Global financial crisis	Between 2011 and 2012 authorities used: neutral monetary policy, procyclical macroprudential policy and CFMMs that targeted capital outflows.
Brazil	Floating	Inflation Targeting	Broad-based tools applied to: the household sector, liquidity in the banking sector, systemic liquidity risk and fire sale risk in the nonbank sector, risks from systemically important institutions and interconnectedness within the financial system, and other sources of systemic risks.	Taxes	In 2010: GDP growth was high (7.5 per cent), the inflation rate stood at 5.0 per cent, the unemployment rate stood at 8.5 per cent, the current account balance and fiscal balance were in deficit and public sector debt to GDP stood at 63.0 per cent.	Global financial crisis	Between 2011 and 2012 authorities used: procyclical monetary policy, procyclical macroprudential policy and CFMMs that targeted capital outflows.
Canada	Free Floating	Inflation Targeting	Broad-based tools applied to: the household sector, liquidity in the banking sector, systemic liquidity risk and fire sale risk in the nonbank sector, risks from systemically important institutions and interconnectedness within the financial system, and other sources of systemic risks.	Taxes	In 2013: GDP growth was stable (2.3 per cent), the inflation rate was low (0.9 per cent), the unemployment rate was 7.1 per cent, the current account balance and fiscal balance were in deficit and public sector debt to GDP was high and rising (86.1 per cent).	2014 collapse in oil prices	Between 2014 and 2015 authorities used: procyclical monetary policy, countercyclical macroprudential policy and CFMMs that targeted capital outflows.
Republic of Korea	Floating	Inflation Targeting	Broad-based tools applied to: the household sector, corporate sector, liquidity in the banking sector, systemic liquidity risk and fire sale risk in the nonbank sector and risks from systemically important institutions and interconnectedness within the financial system.	Limits, taxes	In 2009: GDP growth was very low (0.8 per cent), the inflation rate stood at 2.8 per cent, the unemployment rate stood at 3.6 per cent, the current account balance and fiscal balance were in surplus and public sector debt to GDP was low (30.0 per cent).	Global financial crisis	Between 2010 and 2011 authorities used: countercyclical monetary policy, countercyclical macroprudential policy and CFMMs that targeted capital outflows.
Nigeria	Stabilised Arrange-ment	Monetary Aggregate Target	Broad-based tools applied to: the household sector, corporate sector, liquidity in the banking sector, risks from systemically important institutions and interconnectedness within the financial system, and other sources of systemic risks.	Limits, bans	In 2013: GDP growth was high (5.4 per cent), inflation (8.5 per cent) and unemployment (10.0 per cent) rates were high, the fiscal balance was in deficit, the current account balance was in surplus and public sector debt to GDP was very low (18.3 per cent).	2014 collapse in oil prices	Between 2014 and 2015 authorities used: procyclical monetary policy, countercyclical macroprudential policy and CFMMs that targeted capital outflows.
Turkey	Floating	Inflation Targeting	Broad-based tools applied to: the household sector, corporate sector, liquidity in the banking sector, systemic liquidity risk and fire sale risk in the nonbank sector and risks from systemically important institutions and interconnectedness within the financial system.	Restrictions	In 2008: GDP growth was very low (0.8 per cent), inflation (10.4 per cent) and unemployment (10.0 per cent) rates were in double digits, the current account balance and fiscal balance were in deficit and public sector debt to GDP was low (37.8 per cent).	Global financial crisis	Between 2009 and 2010 authorities used: procyclical monetary policy, countercyclical macroprudential policy and CFMMs that targeted capital outflows.

Source: IMF Capital Flow Management Measures Taxonomy, IMF Macroprudential Policy Survey Database and IMF Monetary and Financial Statistics Database.

Three important conclusions can be drawn from a review of the literature. First, adopting an IPF requires careful consideration in determining when, how and what policy tools should be implemented to reach policy goals based on the country's inherent characteristics (TCMB 2020). These characteristics include: (i) dominant currency pricing; (ii) currency and maturity mismatches (in financial institutions and corporations' balance sheets); (iii) borrowing constraints; and (iv) strength of the monetary transmission mechanism. Second, in many economies, a policy interest rate, on its own, may be insufficient to stabilise the exchange rate and prevent capital flight and requires a policy framework that coordinates the use of various tools. Third, effective communication of IPF tools is important in achieving the central bank's policy objectives under an IPF.

3. Background and Stylised facts

3.1 Considerations for a Native IPF

The development of an IPF for Trinidad and Tobago requires the consideration of several factors. These include issues of monetary policy and other policy objectives of the Central Bank, the availability of appropriate tools, and structural features of the domestic financial market and the broader economy.

3.1.1 Monetary Policy

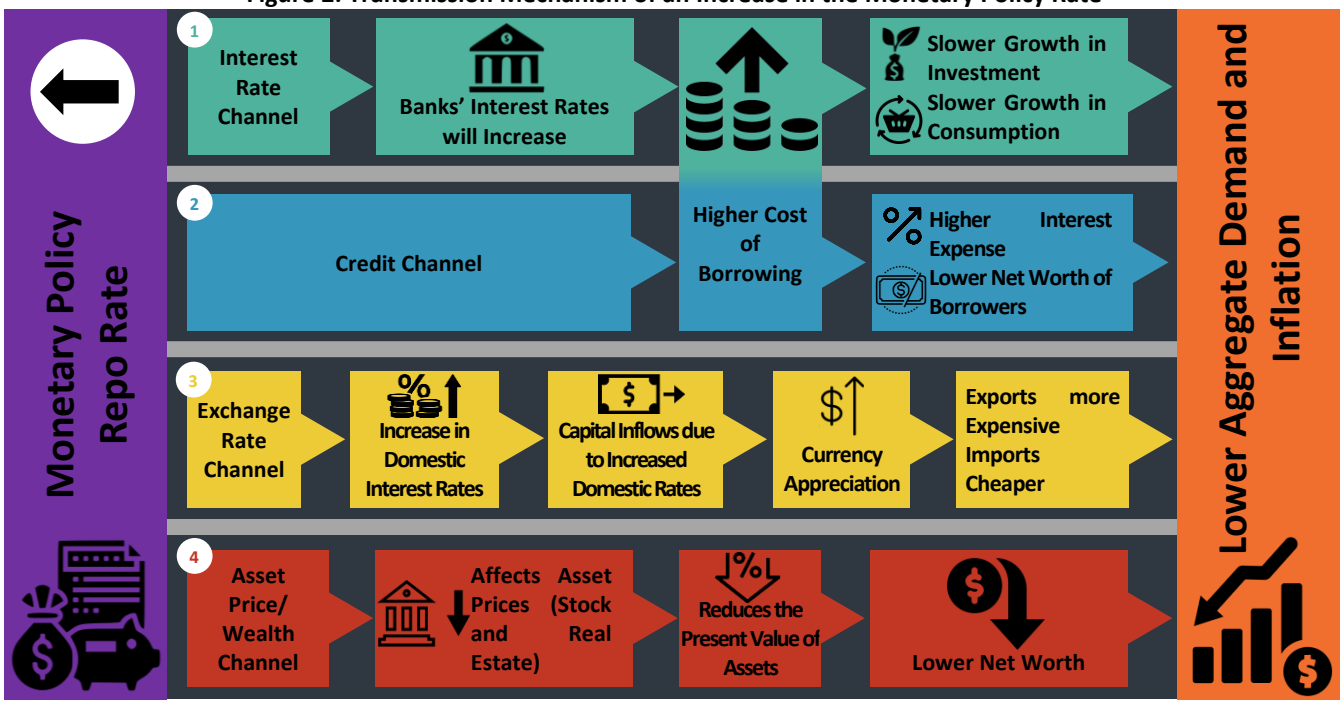
Like many EMEs, Trinidad and Tobago's monetary objectives are wider than just inflation control and include ensuring an orderly foreign exchange market and an adequate level of foreign reserves. Two issues arise as a result of multiple monetary policy objectives.

The Central Bank achieves these objectives through direct and indirect monetary policy tools, primarily the Repurchase (Repo) rate, which is supplemented by Open Market Operations (OMOs), and the primary Reserve Requirement (RR). The transmission of the main monetary policy tool, the Repo rate, occurs mainly through the interest rate and credit channels in Trinidad and Tobago (Figure 3.1), but their effectiveness has been weak mainly due to two factors. These are excess liquidity conditions and contagion effects due to the integration of the domestic and foreign financial markets. Chronic excess liquidity has led to a decoupling of the Repo rate from bank lending rates. Over the years, excess liquidity has generally been prompted by surges in energy sector revenues. When excess liquidity is persistent, commercial banks do not need to borrow funds overnight from the Central Bank, and the Repo rate does not factor into banks funding costs. In this situation, commercial banks are not forced to adjust their lending rates in response to Repo rate changes[9]. The interest-rate pass-through to bank lending rates is therefore weakened by the presence of excess liquidity.

[9] Excess liquidity is a common feature in many energy exporting economies, such as in North Africa and Qatar. There is a general increase in excess liquidity when oil prices rise. In these countries, oil prices positively impact exports, government

Figure 3.2 shows the trends in the Repo rate, the weighted average lending rate of commercial banks and excess liquidity conditions over 2002 to 2018. For instance, in response to the 2008 global financial crisis, the Central Bank took steps to drastically reduce the Repo rate from 8.75 per cent in 2008 to 3.00 per cent by 2011 (or a reduction of 575 basis points). However, over the same period, commercial banks' weighted average lending rate fell from 11.19 per cent to 9.30 per cent, which represented a decline of 189 basis points. Over the entire period, the correlation between the Repo rate and the weighted average lending rate was 57 per cent, indicating a less than full pass-through of the policy rate to commercial banks' lending rates.

Figure 2: Transmission Mechanism of an Increase in the Monetary Policy Rate



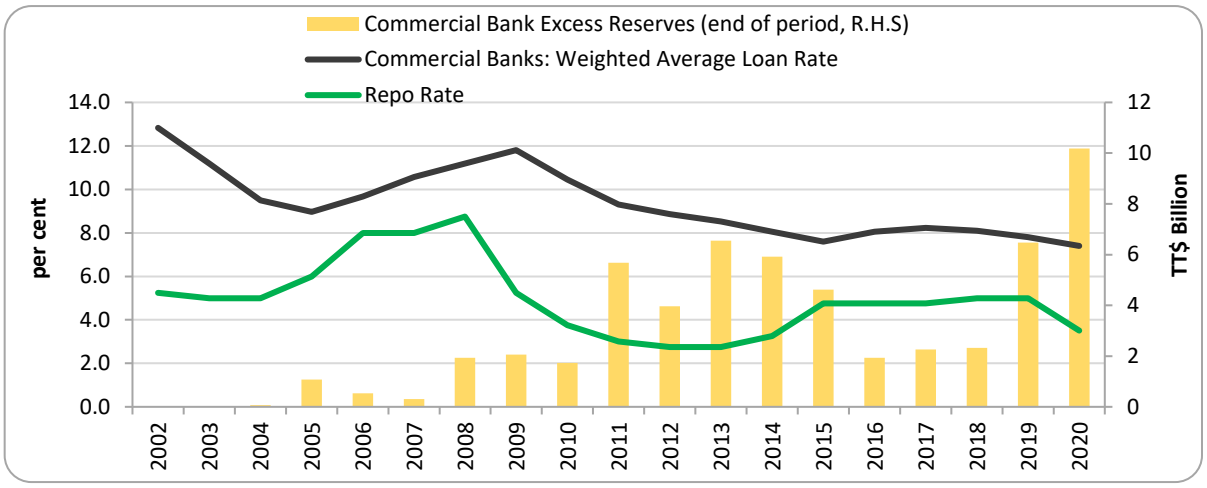
Source: Authors' construction.

Also, the Repo and the US Federal Funds Rate trended very similarly since the Repo rate over 2002 to 2020 (Figure 3.3). The correlation between the Repo rate and the Federal Funds Rate was 68 per cent overall[10]. However, the correlation between the Repo rate and the commercial banks weighted average lending rate was 57 per cent. The correlation between the US 10-year treasury bond and the commercial banks' weighted average lending rate was relatively highly positive at 68 per cent. This finding suggests that the US 10-year bond yields impact the pricing of banking sector interest rates.

revenues, fiscal balances and GDP growth. Although the economy expands, excess liquidity still increases. The economy cannot fully absorb the increased inflow from the energy sector and remains in the banking sector.

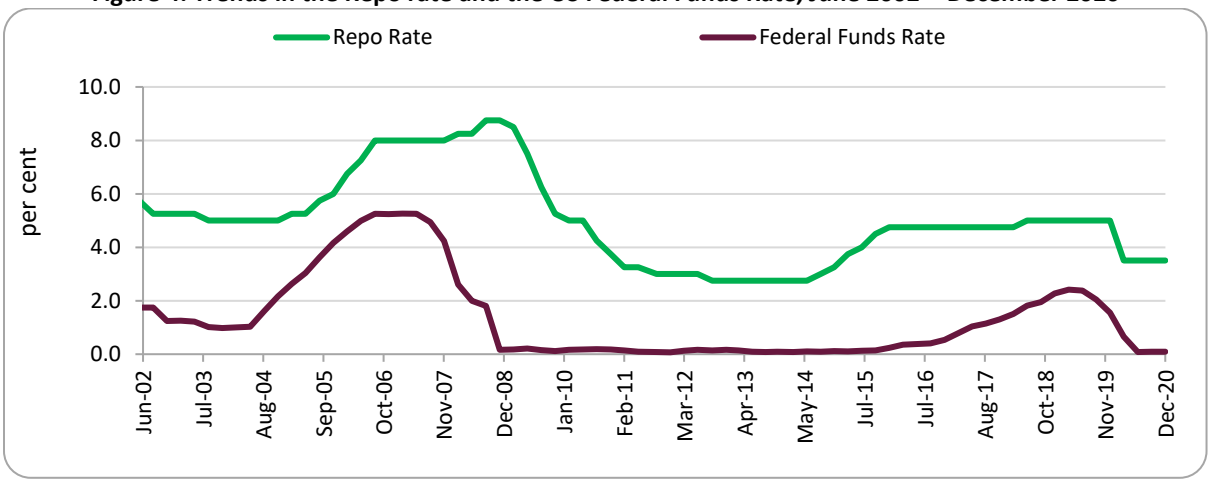
[10] Birchwood (2013) also found a high correlation between the Repo rate and the Federal Funds rate.

Figure 3: Movements in the Repo rate, Weighted Average Lending Rate and Excess Liquidity, 2002 – 2020



Source: Central Bank of Trinidad and Tobago.

Figure 4: Trends in the Repo rate and the US Federal Funds Rate, June 2002 – December 2020



Source: Central Bank of Trinidad and Tobago.

3.1.2 Capital Flows

Since April of 1993, the foreign exchange market and cross-border capital flows were largely liberalised (see the Exchange Control Act Chap. 70:50)[11], and many of the restrictions within this Act were repealed with the passage of the Central Bank (Amendment) Act, 1993 and the par value of the Trinidad and Tobago Dollar Order, 1993. The par value of the Trinidad and Tobago dollar, with some restrictions, now floated against the US dollar, and the exchange rate was subsequently determined by the prevailing market rates, with authorised dealers specifying its trading rates for the US dollar and the Central Bank adopting a rate according to the average of the trading rates.

[11] Prior to 1993, controls and regulations related to dealings in local and foreign currencies were governed by the Exchange Control Act. Other complementary regulations in place at the time was the Financial Institutions Act (1993, revised 2008) which provided regulation of the commercial banking sector and the Securities Industry Act (1995, repealed and replaced by the Securities Act (2012)) which provided regulation of the securities market.

Since liberalisation it became possible for Trinidad and Tobago residents to hold and operate foreign currency accounts in the domestic banking system, resulting in foreign currency deposits in commercial banks increasing from US$152.5 million in 1993 to US$4,000.2 million at the end of 2020.

Also, financial capital can move out of Trinidad and Tobago into other jurisdictions to earn higher rates of return. Differences in interest rates (such as the TT-US interest rate differential) could motivate the movement of short-term financial capital under the current financial setup. The Central Bank has sought to maintain a positive differential favouring domestic interest rates to prevent significant outflows (Figure 3.4).

Unlike other EMDEs, one of the main forms of private capital inflows is foreign direct investment. Over the years, foreign direct investment mainly went to the local energy sector. This capital flow pattern ties directly with the country's trade specialisation (the energy exports sector). However, capital flow management measures are crucial to limit swings in capital flows that could pose macroeconomic and financial stability risks to the economy.

Figure 5: 3-Month TT-US Differential

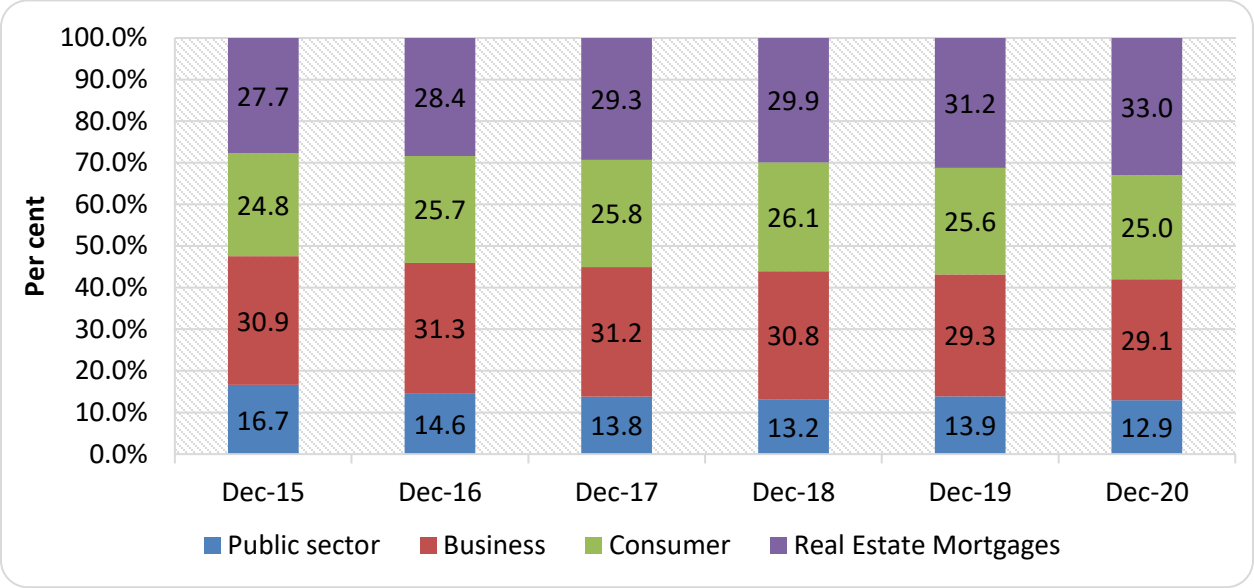
Source: Central Bank of Trinidad and Tobago.

3.1.3 Macroprudential Policies

Macroprudential policies are essential in mitigating risks to the financial system. The 2008 global financial crisis highlighted the importance of MPMs to ensure financial stability. A financial system characterised by high risks such as high leverage and heavy reliance on short-term funding poses particular financial stability threats. These vulnerabilities present challenges for the system if any systemically important institution fails. Macroprudential policies aid in the mitigation of these failure risks and the impact they will have on the financial system. In Trinidad and Tobago, there is no formal macroprudential policy framework (MPF). However, the development of tools to promote financial stability is an important aspect undertaken by the Central Bank of Trinidad and Tobago. For instance, the ability to place limits on loan-to-value ratios of commercial banks can reduce their high exposure to the local real estate market.

In Trinidad and Tobago, real estate is commonly used by firms and households as collateral to access credit for the purchase of real estate (that is, mortgages) and other long-term lending types. Also, the large and growing share of real estate mortgages (33 per cent of overall credit at the end of December 2020) granted by commercial banks is evidence of the strengthening tie between the local real estate market and the financial system (Figure 3.5). Therefore, real estate prices have significant wealth effects on households and firms and credit, consumption, investment and economic activity.

Figure 6: Banking Sector Credit Distributed by Type

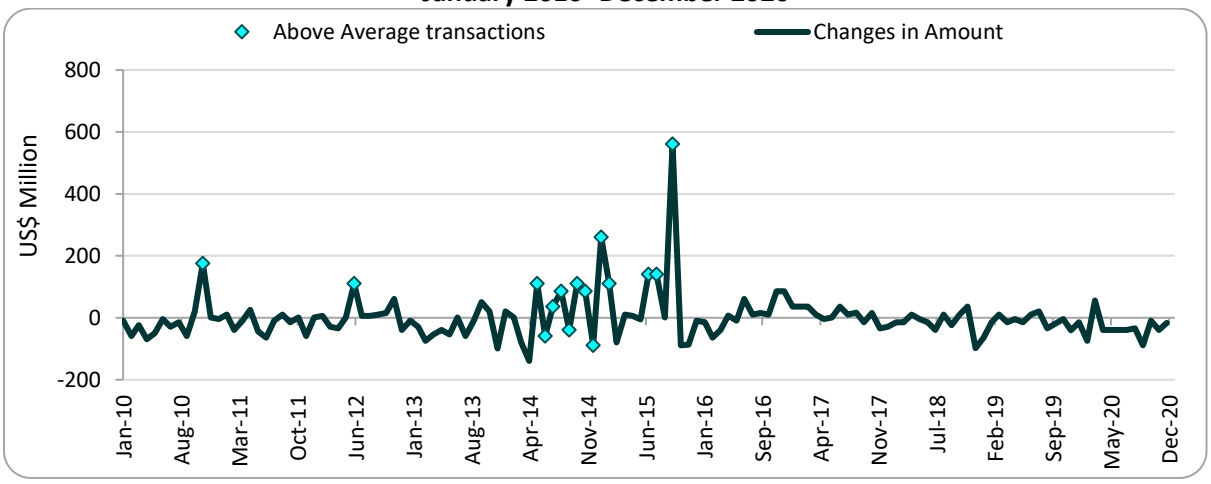


Source: Central Bank of Trinidad and Tobago.

3.1.4 Foreign Exchange Intervention

Owing to a tight foreign exchange market, the Central Bank conducts interventions to ensure adequate liquidity to ensure an orderly foreign exchange market and avoid financial distress. These interventions influence the nominal exchange rate, which the Central Bank stabilises within a very narrow band. Over the last decade, FXI measures have taken the form of foreign exchange sales to authorised dealers by the Central Bank. The size of monthly sales of foreign exchange to authorised dealers stood generally below the long-run average sales for the period. However, Figure 3.6 also shows that during the periods of energy price declines (e.g. between 2014 and 2015), the size of interventions rose substantially.

Figure 7: Foreign Exchange Sales to Authorised Dealers by the Central Bank in Excess of 10-Year Average, January 2010- December 2020



Source: Central Bank of Trinidad and Tobago.

3.2 The Trinidad and Tobago Experience with Policy Trade-offs

EMEs routinely use unconventional measures, such as CFMMs and MPMs to adequately address economic shocks. These countries have structural features and market frictions which often require atheoretical policy responses. In this section we identify past economic shocks and evaluate the domestic policy responses and trade-offs taken at that time through the use of historical Central Bank publications. The primary external shocks identified were the 1986 oil price collapse, the 1997 Asian Financial Crisis, the 2008 Global Financial Crisis and the 2014 petroleum and natural gas price collapse. Although the effects were lagged, the significant impact on the domestic economy challenged extant policy dynamics.

In 1986, world oil prices plunged in response to higher production from non-OPEC countries and lower global demand. Brent Crude oil spot prices moved from around a high of $40 in January 1980 to a low of $10 in June 1986. West Texas Intermediate (WTI) spot prices declined from a high of $30 in September 1985 to $10 in March 1986.[12] This slump triggered severe economic distress, followed by the introduction of a structural adjustment programme under a 1989 IMF Stand-By Arrangement. Real economic growth contracted on average by 4.6 per cent annually over the period 1983 to 1988. At the end of 1988, foreign exchange reserves had fallen to a US$ 23.8 million deficit and public sector external debt stood at 59.3 per cent.

The policy response to the 1980s oil shock was sluggish and characterised by broad instruments. The subdued actions lengthened the recovery period and increased the severity of the adjustment. Both unemployment and inflation were high. The average unemployment rate in the second quarter of 1989 was 22.3 per cent, while the retail price index increased by 11.4 per cent in 1989, the highest increase since 1984. Monetary policy included

[12] Energy price data is sourced from Trading Economics and is based on over-the-counter contracts and contract-for-difference financial instruments.

adjustments to the reserve requirements. The secondary reserve requirement was reduced in three phases by 600 basis points. Exchange rate adjustments included discrete devaluations in 1985 and 1988, then full liberalisation in 1993. Fiscal policy was conducted under an IMF-supported structural adjustment programme and comprised of comprehensive tax reform and expenditure reduction policies. These measures involved voluntary retrenchment, a 10 per cent wage cut, and a delay of retroactive salary awards for public service employees.

Although private sector credit growth had slowed, there was difficulty collecting on outstanding loans. As impaired loans mounted, coupled with asset-liability mismatches, eventually the real sector shock culminated in a financial shock as several commercial banks failed in the late 1980s and early 1990s. The Central Bank assumed control of Trinidad Co-operative Bank in 1986 and Workers Bank in 1989. In 1992, National Commercial Bank was deemed insolvent and the Central Bank intervened to prevent a bank run.

Notwithstanding some marginal improvements in real GDP growth in 1990 and 1991, economic conditions In Trinidad and Tobago truly stabilised in 1994 as Trinidad and Tobago embarked on a prolonged period of sustainable economic growth alongside falling unemployment and inflation rates. However, it should be noted that it took approximately 8 years for policy interventions (both fiscal and monetary) to bring about this change.

The next economic shock was the indirect result of the 1997 Asian financial crisis and the corresponding monetary policy stance taken by AEs. In the 1990s, the Asian region dominated capital flows to developing countries. The subsequent reversal of capital flows resulted in balance of payments difficulties, external debt shocks and speculative currency attacks in many Asian economies. Interest rates in developed countries declined due to investors 'flight to safety' and central banks' accommodative monetary policy to stave off potential economic decline. Policy-makers struggled with excessively liquid financial conditions and high credit growth. Private sector credit growth increased 19.4 per cent in 1996, driven primarily by consumer credit demand especially for motor vehicles.

Although Trinidad and Tobago enjoyed favourable macroeconomic conditions (namely buoyant economic growth, low inflation and falling unemployment) in 1997, the Central Bank suspended its policy of reducing reserve requirements due to escalating exchange rate pressures and ineffectual open market operations. Over the year, the exchange rate depreciated by 4 per cent to TT$6.2846 for US$1 and the Central Bank needed to intervene in the market with US$39 million to meet the excess of foreign currency sales. Eventually, the Central Bank increased the reserve ratios for commercial banks and non-bank financial institutions to 24 per cent and 9 per cent, respectively, 300 basis points higher than the beginning of the year. In this case, the Central Bank used broad, indirect monetary instruments to offset the impact of expansionary fiscal policy and attempted to stabilise the foreign exchange rate by augmenting the supply. The benefits from these policy interventions were realised

almost immediately as the exchange rate fluctuated between TT$6.2982 and TT$6.2998 (per US dollar) between 1998 and 2000 – in fact, the exchange rate appreciated in 2001 by -1 per cent to TT$6.23144 (per US dollar).

The collapse of the US housing bubble, coupled with widespread investment in sub-prime financial securities, culminated in the collapse of several financial institutions in 2008. The European debt crisis closely followed in 2009. After a period of high global inflation during 2008, lower investor confidence and credit availability gave way to plummeting stock and commodity prices. Domestically, although real growth slowed, headline inflation was still high, ending the year at 14.5 per cent, approximately twice that of the previous year's price growth. Substantial levels of excess liquidity contributed to a 390 basis point decline in the treasury bill rate. Another shock occurred in January 2009, when the systemically important financial institution CL Financial announced its insolvency.

By this time, the primary monetary policy instrument was the Repo rate. During 2008, the Repo rate had been tightened three times from 8.25 per cent to 8.75 per cent at the end of the year. This was further buttressed by reserve requirement increases, open market operations and government bond issues. The contractionary stance was quickly reversed due to economic conditions, slowing credit growth and declining inflationary pressures. At the end of 2009, the Repo rate fell to 5.25, which amounted to a 350-basis point decline in the space of nine months. The Central Bank then amended its focus from reducing inflationary pressures to stimulating growth. Although the economic recovery effort was tainted by oil and gas production stoppages, as a result of safety upgrades/maintenance work at several major companies in the domestic energy sector (CBTT 2015), following these policy interventions Trinidad and Tobago grew at an average rate of 1.4 per cent between 2010 and 2013. Additionally, over that period, the unemployment rate fluctuated between 5.9 per cent and 5.0 per cent while the inflation rate averaged at 8.3 per cent.

In 2014, slower growth from Europe and China and OPEC's inability to reduce the global oil supply resulted in another shock to petroleum prices. Brent spot prices declined from an approximate high of $112 in June 2014 to $38 eighteen months later in 2015. WTI prices declined from approximately $104 to $37 over the same period.[13] The domestic economy was still grappling with a high liquidity overhang, and inflation had begun to accelerate. Headline inflation rose to a monthly average of 7.9 per cent during the second half of 2014 compared to a monthly average of 3.4 per cent in the first semester. Private sector credit showed signs of slowing, with year-on-year consolidated credit growth slowing to 5.3 per cent in November 2014, down from 7.3 per cent over the course of five months. Growth was heterogeneously distributed among lending categories, with mortgage credit experience

[13] Data is sourced from US Energy Information Administration and prices are measured in Cushing, OK WTI Spot Price Free-On-Board (FOB) in dollars per barrel and Europe Brent Spot Price FOB in dollars per barrel.

accelerating growth while year-on-year business credit growth fell to 1.9 per cent from 7.5 per cent five months earlier.

The Central Bank adopted a contractionary monetary policy over the 2014 period. The Monetary Policy Committee based this policy reversal on steady growth in the non-energy sector, higher inflation expectations and monetary policy normalisation in the US. The Committee was concerned that a negative interest rate differential between the US and TT short-term rate could increase capital outflows, as foreign investments would have higher risk adjusted rates of return. This stance was a trade-off between exchange rate stability and supporting economic and private sector credit growth.

Although policy interventions helped to keep inflation and unemployment rates low, Trinidad and Tobago has not experienced two consecutive years of economic growth since 2012. Additionally, the surge in COVID-19 infections and associated containment measures resulted in substantial disruptions to economies and international markets in 2020. This pandemic can be considered an external productivity shock with both supply and demand dimensions. Economies across the world experienced substantial declines in the real sector through lower production due to quarantine measures. Demand has also been impacted since industries such as travel have been severely limited by public health restrictions. These effects have also extended to the financial sector through higher market volatility and increased credit quality risks. Declines in global output, coupled with domestic pandemic measures had adverse economic outcomes for all sectors of the domestic economy[14]. Policy-makers announced a host of private sector support policies to bolster macroeconomic stability. Monetary policy measures centred on managing the macro-financial repercussions of the quarantine measures. This included reductions in the both the Repo rate and the primary reserve requirement during March 2015. Fiscal injections were also higher due to the notably larger outlays warranted by social support measures stemming from the fallout of the pandemic. Although it is likely that the full extent of the effects has not yet been realised, on-going policy surveillance and coordination is focused on mitigating the risks to the economy.

For the most part, fiscal and monetary interventions have sufficiently addressed the various shocks Trinidad and Tobago has experienced from 1986 to 2020 – particularly, those that originate within the financial sector. However, as witnessed after the fall in oil prices in 1986 and 2014, the return to sustainable economic growth has been slow or much more difficult for real sector shocks (compared to financial sector shocks). It can be argued that it takes 8 years for Trinidad and Tobago to recover from adverse systemic shocks when relying mainly on fiscal and monetary interventions – Trinidad and Tobago took 8 years to attain sustainable economic growth from the fall

[14] In the first half of 2020, economic activity contracted 7.5 per cent on a year-on-year basis. Central Bank of Trinidad and Tobago, *Monetary Policy Report*. November 2020. https://www.central-bank.org.tt/sites/default/files/reports/monetary-policy-report-november2020.pdf

[15] The Repo rate decline by 150 basis points to 3.5 per cent while the primary reserve requirement was reduced by 3.0 per cent to 14 per cent. Central Bank of Trinidad and Tobago. “Monetary Policy Report”, November 2020, 22.

in oil prices in 1986 and has yet to experience consecutive years of economic growth since the collapse in oil prices in 2014. Therefore, given Trinidad and Tobago's history of lagged recoveries to particularly adverse events, given the dynamic nature of the pandemic a more efficient course of policy action must be taken by coordinating monetary policy with other MPMs and CFMMs – to: (i) ease the demands on monetary instruments; (ii) reduce the risks of further economic volatility and; (iii) engineer an effective, efficient, and nimble economic recovery.

4. A Conceptual Outline of Trinidad and Tobago's Proposed IPF

This section, outlines a conceptual IPF for Trinidad and Tobago (Figure 8). Specifically, the proposed framework will allow the Central Bank to implement the appropriate mix of policies (that is, monetary policy, FXI, CFMM, and MPM) to achieve macroeconomic and financial stability.

Our IPF framework considers price stability to be the primary monetary policy objective, which requires coordination with other monetary policy objectives. Price stability refers to both internal price stability and exchange rate stability. The Central Bank is responsible for macroprudential oversight in the conceptual framework, (although no formal macroprudential framework currently exits). Under the current legislation, the Central Bank has responsibility for microprudential regulation of various financial sector entities (commercial banks, non-bank financial institutions and insurance companies and pension funds). The underlying assumption is that changes to the Central Bank Act to expand the range and powers of policy tools will not take place in the short run. Given these various policy objectives, internal coordination among the various departments is necessary to set the appropriate policy mix, considering the spillovers and trade-offs involved in various options.

External policy coordination is also necessary under the IPF. Fiscal and monetary policy should be well coordinated to be able to achieve price stability as well as financial stability. Policy coordination with other macro policy-making bodies is essential since policies measures in one agency could upset the ability of the other to achieve its objectives.

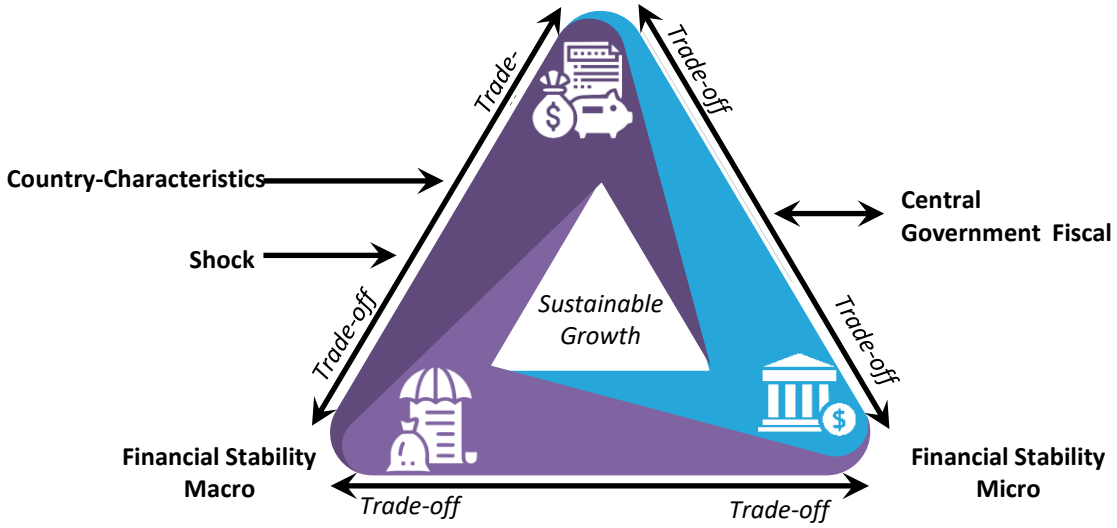
Similar to Basu et al. (2020), our IPF framework characterises a small open economy comprising of: a commodity (energy) sector, a differentiated goods sector, a non-tradable (services) goods sector, commercial banks, households and a government. The tradable goods sector uses labour and capital to produce tradable goods (e.g. the manufacturing sector). The non-tradable sector produces non-tradable goods, assumed in this case to be real estate.

This conceptual approach differs from the traditional policy analysis based on the Tinbergen (1952) rule, where the central bank achieves pre-determined targets set at optimal levels. Instead, the IPF is focused on setting policy instruments to achieve welfare goals (Sustainable GDP Growth and Well-being). If intermediate targets are set,

these should be aligned to the welfare objective. A drawback to this framework is that policy instruments and intermediate targets may not necessarily be connected to the welfare objective. Also, it is necessary to ensure that the framework explicitly clarifies how the intermediate targets contribute to the ultimate welfare objective. Given that policy instruments are insufficient and incomplete including multiple policy objectives, there are definite trade-offs involved in using instruments. It is crucial that the framework explicitly clarify how to choose the trade-offs between alternative intermediate targets.

Another drawback of the IPF is that given that there are trade-offs, the literature is clear on which policy combinations are inefficient in achieving the welfare objective. However, when several policy options are efficient at achieving the desired welfare target, it may be challenging to select one policy combination over another under the framework.

Figure 8: Integrated Policy Framework for Trinidad and Tobago – Conceptual Model



Source: Authors' construction.
Note: An alternative configuration could be to merge microprudential and macroprudential regulation. The three objectives, in this case, would be FX reserves, Financial Stability and Monetary Stability. It should be noted that tensions may exist regarding policy tools used for microprudential and macroprudential financial stability that should be considered.

4.1 Shocks and IPF Responses

Due to the existence of intra- and inter-sectoral linkages, shocks are unlikely to affect one sector in isolation. As such, research on IPFs must account for the channels that allow segments of the economy to turn into powerful propagators of shocks which initially were not generated inside of it. However, this calls for models that can estimate multiple non-linear relationships simultaneously. Given that this lies outside the scope of this paper, a tractable approach was taken where policy mix prescriptions were couched according to the source of the shock – namely real and financial.

4.1.1 An Integrated Policy Framework to Address Real Sector Shocks

A real sector shock may be defined as an unexpected or unpredictable event that affects the fundamental factors of production (BIS 2011). They are not limited to one industry/market and may be augmented by and transmitted to other areas of the economy. Typically, the effects of real sector shocks are modelled by making changes to fundamental macroeconomic variables – factors that substantially impact measures of economic performance such as; consumption, investment, inflation, and unemployment. While these shocks are often unpredictable, they can have widespread and long-lasting effects on the economy and are thought to be the root cause of recent crises.

To subvert real sector shocks, a country's IPF should be designed to (i) boost 'safeguards'; or (ii) support the recovery effort. Safeguards (or ex-ante policies) are often commitment strategies employed to reduce the likelihood of real sector shocks. Given their vulnerability to shocks in the global community, developing countries should adopt ex-ante policies that involve managing capital inflows (as these funds can fuel sudden increases in domestic demand, which can fuel speculative risk-taking behaviours) and the build-up of foreign reserves (to relieve balance of payments pressures caused by external shocks). In both cases, tax incentives can be used to manage capital inflows (for example, a tax on real estate purchases by non-nationals) and build-up foreign reserves (for example, raising the online purchase tax or import duties). If prevention fails, ex-post policies are employed to reduce the macroeconomic fallout from real sector shocks. Typically, these measures attempt to: (i) improve market liquidity; (ii) stabilise the balance of payments; and (iii) limit capital outflows. However, the ex-post policies that will be most appropriate for a real sector shock will depend on the nature of that event as real sector shocks typically fall under two classes, internal or external.

4.1.1.1 Policy Mix for Internal Real Sector Shocks

Internal shocks are localised adverse events or national incidents that make production at the national level more difficult or impossible for at least some industries. They can have a perverse impact on the macroeconomy as reductions in the potential output of an economy can place upward pressure on the price level as, as production costs rise, income margins are squeezed and, to try to maintain profit levels, firms raise their prices. Higher prices will decrease demand, causing actual output to fall. Collectively, the reduction in total factor productivity and potential output can generate pessimistic expectations of future income and wealth, causing further cutbacks on expenditure, and with it, even lower profit levels. Unabated internal shocks, therefore, can create a self-reinforcing negative spiral in economic activity.

While social unrest and natural disasters, such as major earthquakes and/or floods are some traditional examples of internal shocks, the ex-post policy space is dependent on the nature of the shock. For instance, factory protests can raise the price of intermediate products used in the manufacturing sector. This can raise inflation (Garcia-

Cicco, et al. 2017), and with it, the cost of imports (causing a worsening of the trade balance). It should also be noted that the domestic financial sector creates an amplification mechanism for the effect of this price shock as inflation can have an adverse effect on asset holdings and/or investment returns. This can deteriorate the balance sheets of all agents in the economy, leading to a reduction in net worth and tighter credit conditions (financial institutions may raise loan requirements to protect themselves from moral hazard during these times). To protect against these risks, an IPF should focus on easing inflationary pressures, raising capital inflows and injecting liquidity into the financial system. Easing inflationary pressures (by, for example, raising the policy rate) will absorb the adverse pricing effects of the social unrest shock while increasing capital inflows (by, for example, lowering taxes levied on non-nationals for purchasing domestic real estate) and injecting liquidity into the financial system (by for example lowering reserve requirements) will counter the knock-on effects of the shock by stimulating foreign investments (which will help improve the balance of payments) and encouraging loan growth (consumption).

Another internal shock that may be meaningful to the discussion on a native IPF is a natural disaster event (See Appendix 1). Although the long-term effects of natural disasters might be positive (as a result of the stimulus provided by reconstruction needs), both short and medium-term impacts of these events are overall negative (Loayza, et al. 2013). More specifically, disasters have an immediate impact on productivity/output (curtailing it significantly) and increase the need for external borrowing as reconstruction needs (to return to normalcy) have raised government expenditure levels. The fall in output will be reflected in a sharp fall in exports. Imports, however, will be on the rise to help support reconstruction needs (construction material, for example, would be needed to fix damaged buildings and roadways). This negative trade balance will coincide with a temporary hike in inflation rates as scarcity (as good stocks are likely to be damaged/unusable) drives up the demand. While insurance payouts would help households and corporations to absorb some of these economic costs, loan delinquency may be on the rise as income streams may have temporarily dried up. To address these risks, a native IPF should lower the policy rate, as credit growth will be paramount to the recovery effort. CFMM inflow restrictions should also be removed to support the balance of payments (encouraging foreign investments may also help reduce the need for public sector external debt). To bolster efforts to fuel credit growth, liquidity should be injected into the financial system (by lowering the liquidity coverage ratio) to encourage financial institutions to extend loans. Also, to further reconstruction efforts credit-related MPMs, like the loan-to-value ratio, should be eased – loan deferrals could also be encouraged so as to temporarily address the existing non-performing loan dilemma.

4.1.1.2 Policy Mix for External Real Sector Shocks

An external shock is an adverse event that originates outside an economy but is expected to impact it in a tangible and significant way. As with internal shocks, unabated external shocks can fuel self-reinforcing negative spirals in

economic activity as these events can force a sudden and significant shift in private spending patterns – lower consumption and/or investment can depress economic activity but, the resulting fall in GDP will have negative income effects leading to further reductions in private spending.

External shocks typically come in the form of economic downturns in major export markets however, as an energy-based economy, adverse shifts in commodity prices is a more meaningful external shock for Trinidad and Tobago. Following a decline in energy commodity prices, the terms-of-trade and the external accounts are adversely affected given that the energy sector underpins exports earnings and accounts for a significant share of fiscal revenues. More specifically, a sudden drop in global energy prices is reflected in a sharp falloff in energy exports and deteriorations in the trade and current account balances. Additionally, the lower energy price environment constrains foreign direct investment by multinational energy sector companies. Gross official reserves also decline on account of the reduction in exports earnings. Similarly, the fiscal accounts are also impacted by the reduction in energy revenues coupled with the slowdown in domestic economic activity, which affects the non-energy tax base. Amidst a decline in revenues, the Central Government aims to streamline expenditure while supporting domestic economic activity. Overall, the combination of lower revenues and the downward stickiness of current expenditure results in the fiscal accounts recording deficits. Further, the decline in oil and gas receipts contributes to the reductions in gross official reserves and a tightening in domestic foreign exchange market. Any additional costs businesses incurred due to foreign exchange market pressures may be passed on to consumers.

Given Trinidad and Tobago's stabilised exchange rate arrangement, an energy price shock can therefore influence inflation and the real effective exchange rate (REER)[16]. Also, energy price shocks prompt an imbalance in the distribution of resources (labour and capital) in the economy. For instance, positive energy price shocks prompt domestic inflation and an appreciation of the REER. Higher prices for tradable goods impact their international competitiveness, but higher prices for non-tradable goods benefits firms in the non-tradable sector. Firms in the non-tradable sector experience a higher net worth and lower external financing costs. Thus, labour and capital shift from the tradeable to the non-tradable sector as credit, investment, and employment increase. However, in the event of an adverse shock, the reallocation of labour away from the non-tradable housing sector to the tradable sector may be restricted, given the tradable sector firms' low ability to absorb the excess labour due to a deficiency in capital investment. Sectoral financial friction generates a terms-of-trade externality and a misallocation of labour and capital in the economy, which influences credit conditions (See Appendix 2).

In response to negative commodity price shocks, the IPF suggests that the policy rate—the Repo rate—should remain unchanged while allowing the exchange rate to depreciate within a band, which is broadly consistent with

[16] The transmission of the higher commodity prices to an appreciation of the real effective exchange rate is known in the economic literature as the Dutch Disease (Corden and Neary 1982, W. Corden 1984, Wenner, Bollers and Hosein 2018) found evidence to support Dutch Disease symptoms from 1991 to 2016, the second energy boom in Trinidad and Tobago since 1970.

the traditional M-F approach. The depreciation in the exchange rate would result in imports becoming more expensive while there would be no impact on export demand. The change in trade volumes is limited to imports, primarily reflective of domestic firms' extensive use of the US dollar in trade pricing (Dominant Currency Paradigm). As a result, policies will be geared towards import substitution. Notwithstanding the upward trend in total public sector debt since the GFC, Trinidad and Tobago's external debt remains relatively low as well as the domestic economy can access financing in international financial markets. In that vein, the IPF does not recommend the imposition of capital controls following a commodity price shock. Meanwhile, given that the domestic foreign exchange market is shallow, the IPF prescribes that foreign exchange intervention should minimise the external premia while allowing for exchange rate flexibility.

In the context of achieving its objectives, the Central Bank intervenes in the domestic foreign exchange market to avoid wide fluctuations in the TT dollar. Consequently, the recommended flexibility in the exchange rate in response to commodity price shocks does not apply to the domestic economy. Therefore, in the case of Trinidad and Tobago, the policy responses to commodity price shocks are limited based on the IPF.

Although the IPF is limited pertaining to the domestic context, policy-makers can adopt multiple policies to effectively deal with external shocks. More so, in the case of a negative commodity price shock, the Repo rate could be loosened to stimulate domestic economic activity. Notably, in response to the COVID-19 pandemic, the Central Bank lowered the Repo rate by 150 basis points to 3.50 per cent and reduced the primary reserve requirement applicable to commercial banks by 3 per cent to 14.0 per cent. These measures were geared towards increasing liquidity and making credit more accessible and cheaper to businesses and consumers.

The decline in global energy prices would also impact the domestic foreign exchange market owing to a falloff in foreign exchange earnings from energy sector companies. To avoid a large depreciation of the TT dollar and ensuing inflation, the Central Bank could provide support to the domestic foreign exchange market. However, the Central Bank should be cognisant of both the benefits and drawbacks of FXIs. Foreign exchange interventions can dampen the effects of shocks and increase the monetary policy space, but it could also incentivize economic participants to increase risk taking and take on more foreign exchange debt, thereby posing a risk to the financial system. However, this risk could be mitigated by foreign exchange macroprudential tools as well as policies aimed at promoting financial development (Csonto and Gudmundsson 2020). More so, in an environment of subdued global energy prices, which continues to weigh on the level of foreign exchange reserves, the Central Bank would have to consider its intervention strategy carefully going forward.

Capital flow management measures can be used to mitigate capital outflows following a commodity price shock. Currently, one of the requirements for manufacturing companies to access the Export-Import Bank of Trinidad and Tobago Limited (EXIMBANK) Foreign Facility is to convert a proportion of their foreign exchange proceeds

into domestic currency. This requirement which helps to limit capital outflows, could be expanded to include other exporters such as energy sector companies. Given that the energy sector contributes to outflows through the repatriation of profits, the expansion of this CFMM would help to limit outflows and address structural imbalances of supply and demand in the domestic foreign exchange market. However, careful consideration must be given in calibrating the percentage of proceeds that companies are required to convert into domestic currency, particularly for the energy sector, since this measure could hinder foreign direct investment into Trinidad and Tobago.

The COVID-19 pandemic is another illustration of a severe, real sector shock with a global impact. While a pandemic is a rare event, the novel coronavirus (COVID-19) morphed into an extraordinary shock that spawned numerous risks across multiple jurisdictions as efforts to contain transmission of the virus stifled economic activity, leading to heightened uncertainty and turmoil in the financial and real sectors. The transmission channels that the pandemic has affected the domestic economy share several similarities with an adverse productivity shock (Central Bank of Trinidad and Tobago, 2019). Ultimately, a reduction in international productivity can fuel a global economic contraction, as well as a fall in world commodity prices. The ensuing disruption in global value chains can worsen countries' current account balance. Further , halting non-essential activities can compromise public and private incomes – at the national level, which can diminish a nation's productive capacity or GDP.

To help mitigate mounting balance sheet imbalances, fiscal and monetary measures may be implemented to support households and businesses negatively impacted by pandemic containment restrictions. For instance, in response to the COVID-19 pandemic, fiscal policies — income support, loans, and guarantees — were targeted at protecting financially impacted households and businesses while monetary policies — reductions in benchmark interest rates, liquidity support actions, and expanded asset purchase programmes — were aimed at stabilising financial systems. Domestically, the Central Government introduced several measures including salary relief and income grants, liquidity support to credit unions and a grant facility to Tobago hoteliers. While the Central Bank lowered the Repo rate by 150 basis points to 3.50 per cent and reduced the primary reserve requirement applicable to commercial banks by 3 per cent to 14.0 per cent. These measures were intended to increase liquidity and make credit more accessible and cheaper for businesses and consumers.

However, policy support can create additional strain on government resources, thus contributing to higher fiscal deficits and downward pressures on foreign exchange reserves and interest rates. Further, deficit spending amplifies the financial sector's exposure to the government. Given that income shocks have already heightened credit risks for financial institutions (as they may result in delays in debt-service payments), a pandemic may threaten financial sector stability via several channels (Appendix 3). Moreover, countries with a high level of sovereign or household debt increase the likelihood of liquidity spirals and financial distress. In this case, exchange rate flexibility can have an adverse impact and may exacerbate financial constraints. Basu et al. (2020) suggests that a combination of ex-ante macroprudential policy and prudent foreign exchange interventions can improve

financial stability and monetary policy transmission. An IPF for a pandemic should therefore consider monetary responses to prevent a possible credit crunch – including the lowering of interest rates and increasing market liquidity. Additionally, to help improve the overall external balance and support economic stabilization efforts, CFMMs and macroprudential policies should focus on decreasing capital outflows, injecting liquidity into the financial system and mitigating credit risks. Collectively, this may be achieved by, raising taxes on online purchases, lowering reserve requirements and deferring loan payments.

4.2 Policy Mix for External Financial shocks

A native IPF policy mix in response to a hike in the US federal funds rate would focus on stemming significant capital outflows. Since the Central Bank's monetary policy is not primarily focused on achieving a predetermined quantitative inflation target, the policy action must consider external conditions and financial stability concerns. Policymakers may be tempted to increase the domestic monetary policy to reduce the interest rate differential between the local and foreign financial markets to disincentivise investors from moving capital abroad to seek higher returns. . This pre-emptive tightening may be appropriate if there is the need to alleviate the pressures on the Central Banks's foreign exchange reserves.

However, an increase in domestic interest rates also needs to be considered in the context of financial stability. Higher interest rates can weaken banks' balance sheets. The extent of losses is typically greater when banks hold assets with long durations (like fixed-rate mortgages and other fixed-rate loans) and short duration liabilities (like deposits (Di Tella and Kurlat 2016). A weakening of balance sheets hinders banks functioning, which can propagate financial stability shocks.

A rise in the domestic policy interest rate increases the financing premiums of borrowers (households' and non-financial private sector firms' balance sheets), which is reflected in their borrowing costs. Changes in financing premiums can impact households and firms access to financing and thereby impact macro-financial stability. These effects are amplified in the presence of financial frictions. Variations in financing premiums in the domestic context where financial frictions exist, the need for ex-ante macroprudential policy measures to limit debt accumulation by households and firms becomes important. However, in terms of responding to a US federal funds rate hike under the native IPF, an appropriate ex-post macroprudential measure should ensure that banks have sufficient liquidity to function (See Appendix 4).

Foreign exchange interventions and ex-ante capital controls are recommended for countries with shallow foreign exchange markets since it mitigates financial intermediary inefficiency. These policies are particularly useful where there is an external debt vulnerability since they can improve monetary autonomy and widen policy space. Another notable aspect of IPF is that Basu, et al. (2020) recommends a wide range of monetary and financial

policies. Furthermore, the authors advocate for combined macroprudential regulation and CFMMs, specifically where there is incomplete regulatory coverage of intermediaries and households.

Appendix 5 illustrates the IPF policy responses to a rise in US bond yields triggered by an increase in US economic uncertainty. Movements in US bond yields can have important impacts on capital flows and financial stability in many EMDEs. In Trinidad and Tobago, the potential effects are also for capital outflows. However, an additional financial market factor is at play. A rise in US bond yields can impact economic agents' balance sheets (net worth), credit risk, and financing premiums based on a fall in exports by domestic firms and the overvalued nominal exchange rate[17].

4.3 Examining IPF Policy Responses and Trade-offs[18]

Table 3 summarises the expected IPF policy responses under the various external shocks. Domestic policy responses consist primarily of monetary policy tools and FXIs. However, this limited policy toolkit is accompanied with its own trade-offs. One such trade-off is that often FXI accompany policy rate changes in response to commodity market shocks. Frequent FXI amidst declining national income sacrifices inflation and reserve adequacy objectives for the short-run objectives of clearing the foreign exchange market. Monetary policy tools tend to be broad and lagged which puts significant pressure on a small number of instruments to achieve many objectives. This underscores the importance of CFMM and MPMs in building macroeconomic resilience. IPF advocates strongly suggest that the appropriate combination of CFMM, FXI and MPM can act as targeted stabilisers which complement monetary policy.

[17] In practice, several channels can be at play simultaneously. This response to external financial shocks considers only the financial sector channel impact through capital flows and risk contagion effects channels. However, due to the adverse on exports, the overvalued nominal exchange rate would also impact the economy through the real sector channel.

[18] Fiscal policy and sovereign debt levels can erode a country's resilience to external shocks. However, since it is not generally as flexible and effective as other policy measures, an optimal fiscal policy is beyond the scope of this approach.

Table 3: Summary of Policy Measures, Interactions and Trade-offs in Response to External Shocks

Shock	Policy Target	Policy Tool			FXI	Policy trade-offs
		Repo rate	OMO	RR		
Real sector shocks						
Productivity (Price increase)	Inflation	↑	↑	↑		Policy rate increases may result in debt servicing issues for highly indebted households.
Commodity Price (Price decrease)	Stable forex market	↓	↓	↓	X	Lower income and higher FXI can put pressure on reserves. Lower policy rates can lead to debt overhang.
Financial sector shocks						
World interest rate (Increase in interest rates)	Stable forex market	↑				Tighter monetary conditions to stave off capital outflows can stymie economic growth.
Foreign Appetite (Increase in inflows)	Inflation	↑				Increasing interest rates to reduce inflation would increase the return on capital inflows and make credit more expensive for the domestic consumers and firms.
External debt limit (increase in international borrowing costs/ reduced credit supply)	Stable forex market	↑			X	Policy-makers may increase the domestic rate to compensate for additional country risk and offset any capital outflows. But this may adversely affect local credit growth and increase the likelihood of defaults
Financial sector shocks						
Housing debt limit (Increase in mortgage credit)	Inflation	↑				In an effort to reduce mortgage borrowing, an increase in rates can result in debt servicing pressures for households.

Source: Authors' estimation.
Note: Direct (OMOs and RRs) and alternative (FXI) monetary policy tools are used to bolster the effect of the Repo rate, particularly when the interest rate transmission is weak.

5. Conclusion and Recommendations

An IPF is a formal system used to stabilise macro-financial conditions by identifying the optimal mix of monetary policy, foreign exchange intervention, macroprudential policy and CFMMs for different shocks and country characteristics. These instruments have been used by EMEs to tackle potential threats to stability with varying degrees of success. However, using a variety of tools for multiple objectives could have adverse consequences as often times the externalities are not immediately evident (Fayad and Poirson Ward 2020). Additionally, the wide range of existing policies complicates the task of determining optimal combination of which addresses macro-financial imbalances. Where necessary, IPFs are the IMF's suggested solution to this dilemma. IPF tools build countries' macro-financial resilience while mitigating the shortcomings of the M-F framework. The theory asserts

that responding to shocks with policy rate alone may not be an optimal solution. Particularly, where the country has high imports, dominant currency pricing and shallow foreign exchange markets.

While research on an optimal policy structure is still ongoing, the IMF notes that policy interaction is deeply influenced by structural factors and that policies are not hierarchical. Nevertheless, preliminary research indicates that a clearly established and communicated policy in response to adverse external volatility can contribute to output stabilisation and greater financial stability. Given that these polices can have leakages and externalities on the rest of the economy, IPF tools must be used within a specified framework with clear objectives and limits. IPF tools should not be used to delay genuine macroeconomic adjustment or support misaligned exchange rates as this can increase systemic risk and adverse long-run effects. Lastly, it is often difficult to distinguish the nature of a shock while it is ongoing, which challenges policy implementation and calibration in real time.

External shocks are a major source of macroeconomic and financial instability in Caribbean economies. A country's structural features play a large role in determining the policy response to these shocks. Trinidad and Tobago is characterised as a small, open and commodity-reliant economy. The dominance of energy exports increases the country's vulnerability to international price shocks. This drawback is evidenced by a rapid expansion in external debt and lower levels of international reserves as a result of subdued international energy prices. Additionally, there is also preliminary evidence of a dominant currency paradigm given the size of US-based trade and high exchange rate pass-through. An analysis of past crisis episodes has revealed that Trinidad and Tobago has predominantly used broad monetary policy responses and FXIs. Exchange rate policy measures have been applied very sparingly in response to severe macroeconomic adjustment.

Extant policy frameworks and objectives guide the design of the IPF. Currently, the Central Bank's policy objectives include price, foreign exchange and international reserve stability. Next, determining the nature and source of the shock (either real or financial or internal vs external) is critical to selecting an optimal policy mix. Temporary real sector shocks to supply, such as a natural disaster, can require policy-makers to address inflationary and liquidity pressures. However, a hawkish monetary policy stance should be balanced with higher default risks amidst lower credit quality. Declining commodity prices illustrate an adverse demand shock, another type of real sector shock. This type of shock is particularly significant in the domestic context since instances of low energy prices have historically driven acute macroeconomic imbalances. Accommodative monetary policy can be supported by FXIs. However, extended use of international reserves to stabilise the foreign exchange market can have disastrous balance of payments implications.

Financial shocks include fluctuations in the world interest rate, increase in foreign risk appetite for domestic securities and changes in the cost or availability of a country's funding. Domestically, an important financial shock would be the sudden normalisation of US policy rates after prolonged loose monetary conditions. In this instance,

the optimal policy mix would require measures which limit capital outflows and sudden liquidity reversal. Ideally, stable monetary policy with tighter macroprudential policy measures and capital flow measures would adequately address financial stability risks. However, in the absence macroprudential tools, policy-makers may be tempted to increase policy rates which has higher macroeconomic and financial stability costs.

Caution must be applied in the use of IPF tools since it is evident that prolonged use or abuse can lead to long-run instability. These tools require a carefully crafted and communicated framework for the most favourable outcomes. Although these tools improve monetary policy transmission and independence, they should not be used to avoid necessary macroeconomic adjustment or artificially prop-up an exchange rate. Furthermore, it is evident that thorough, empirical research is required to inform effective macro-financial policies with fewer side-effects. Successful policy coordination also requires well-defined legislative and operational frameworks for macroprudential and capital flow management. Ad-hoc or ex-ante application of these measures are associated with higher economic costs and longer recovery periods. Finally, IPFs are valuable to policy-makers but must be used judiciously with the necessary safeguards and be supported by the empirical evidence.

From the literature, it was observed that IPF recommendations were based on a small, open economy's response to real and financial shocks. However, models which use applied general equilibrium theory require granular databases and EMEs are often plagued with data gaps. The Bank of Jamaica's coordination relied on in-house models which identified an optimal policy mix for inflation, the exchange rate, economic growth and reserve accumulation (Robinson 1998). This framework can serve as the blueprint for developing Trinidad and Tobago's own IPF as the Central Bank can leverage its own Financial Programming and Policy (FPP) framework.

'Financial programming' has been used in different contexts and with different meanings. These include: (i) to analyse a country's current state of affairs; (ii) forecast where the economy is headed; and (iii) identify economic policies that can change a country's course of development. The IMF advises developing countries with goals for inflation and foreign exchange reserve accumulation to engage in financial programming exercises (Easterly 2002). Consequently, the Central Bank uses financial programming to generate projections of key macro-financial indicators. This framework could be used, alongside other deterministic forecasting models to define an IPF for Trinidad and Tobago as it analyses macroeconomic balances following policy adjustments. Results from this analysis can estimate the impacts of shocks to the domestic economy with and without interventions. Thus, these estimates could validate the proposed policy mix which addresses specific imbalances. Additionally, the Central Bank's FPP provides projections on over 100 different variables. This allows for a wide range of risks and scenarios to be considered.

Notwithstanding the aforementioned benefits of the FPP, in the pursuit of macro-financial stability, there is no 'silver bullet'. In fact, the proposed system for refining IPF recommendations is not without its flaws, as the FPP is

open to a number of criticisms. For instance, Easterly (2002) and Choudhury (2012) criticise: (i) the realism of their underlying assumptions; and (ii) the effectiveness of the model's internal structure. Nevertheless, "*there are no perfect forecasts; they always contain some error*" (Evans 2002). "*The forecaster calibrates or estimates the parameters of the relationships supplied by economic theory to arrive at values that are reasonable for the country in question*" (IMF 2013).

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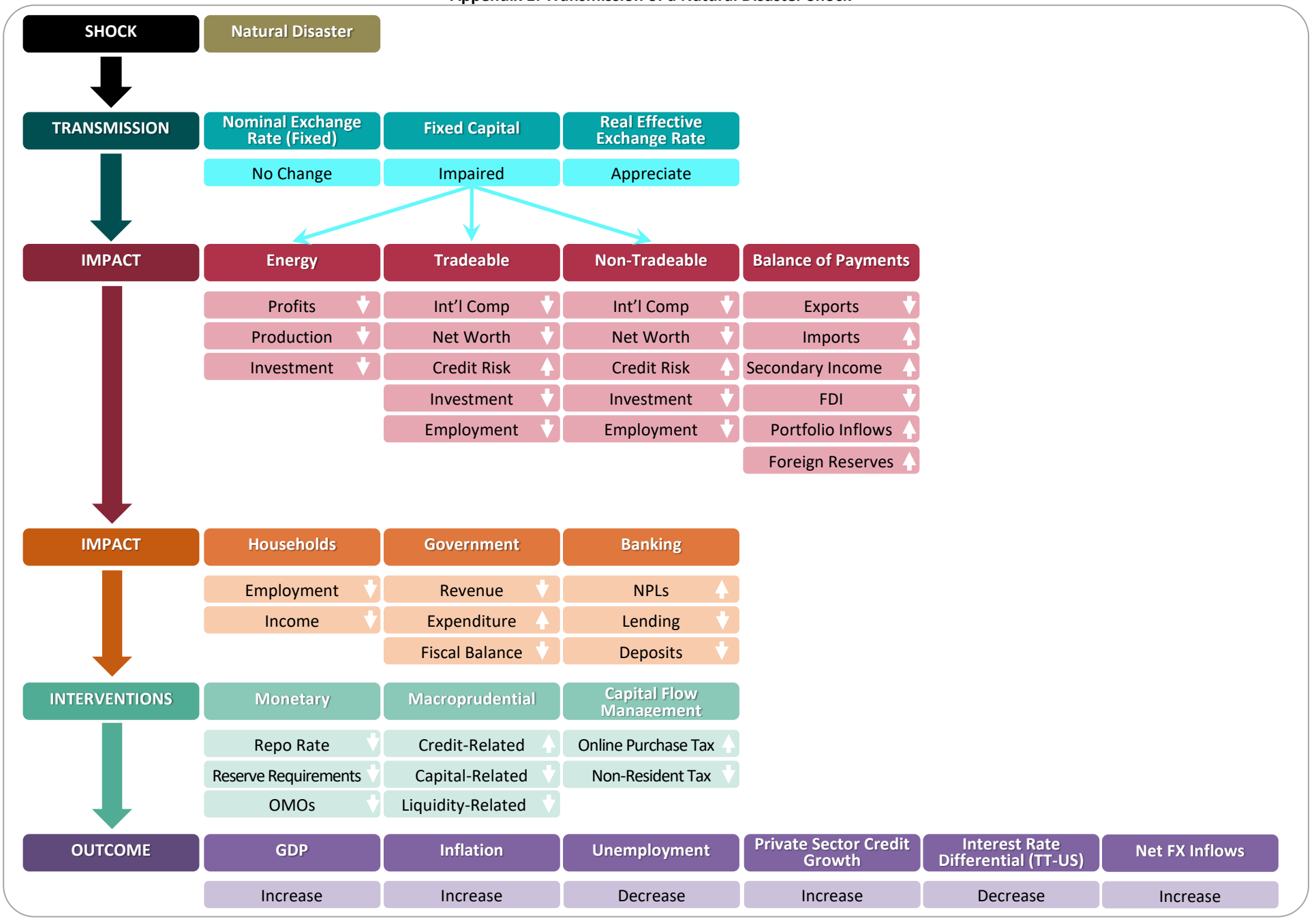
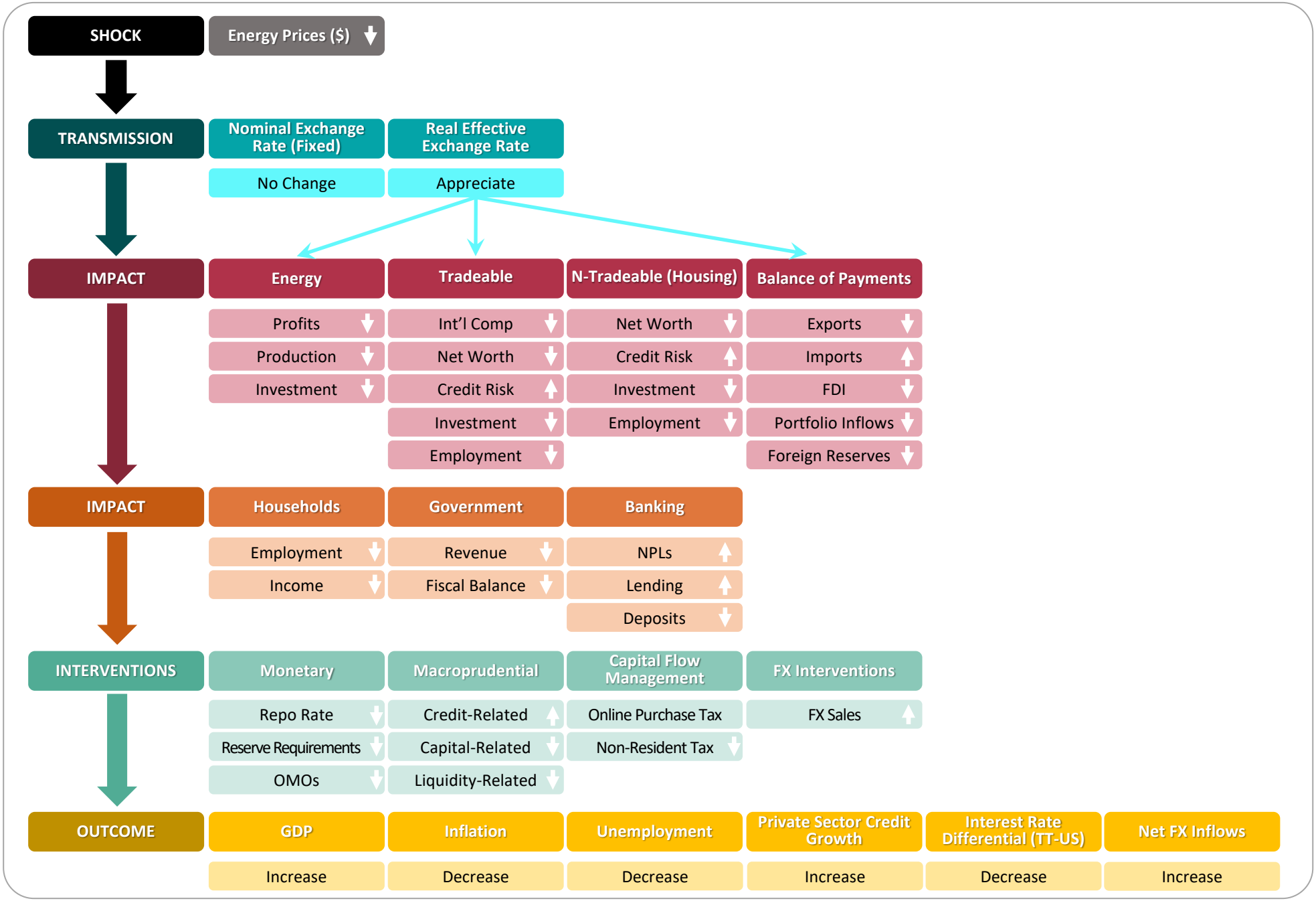
Appendix

Appendix 1: Transmission of a Natural Disaster Shock



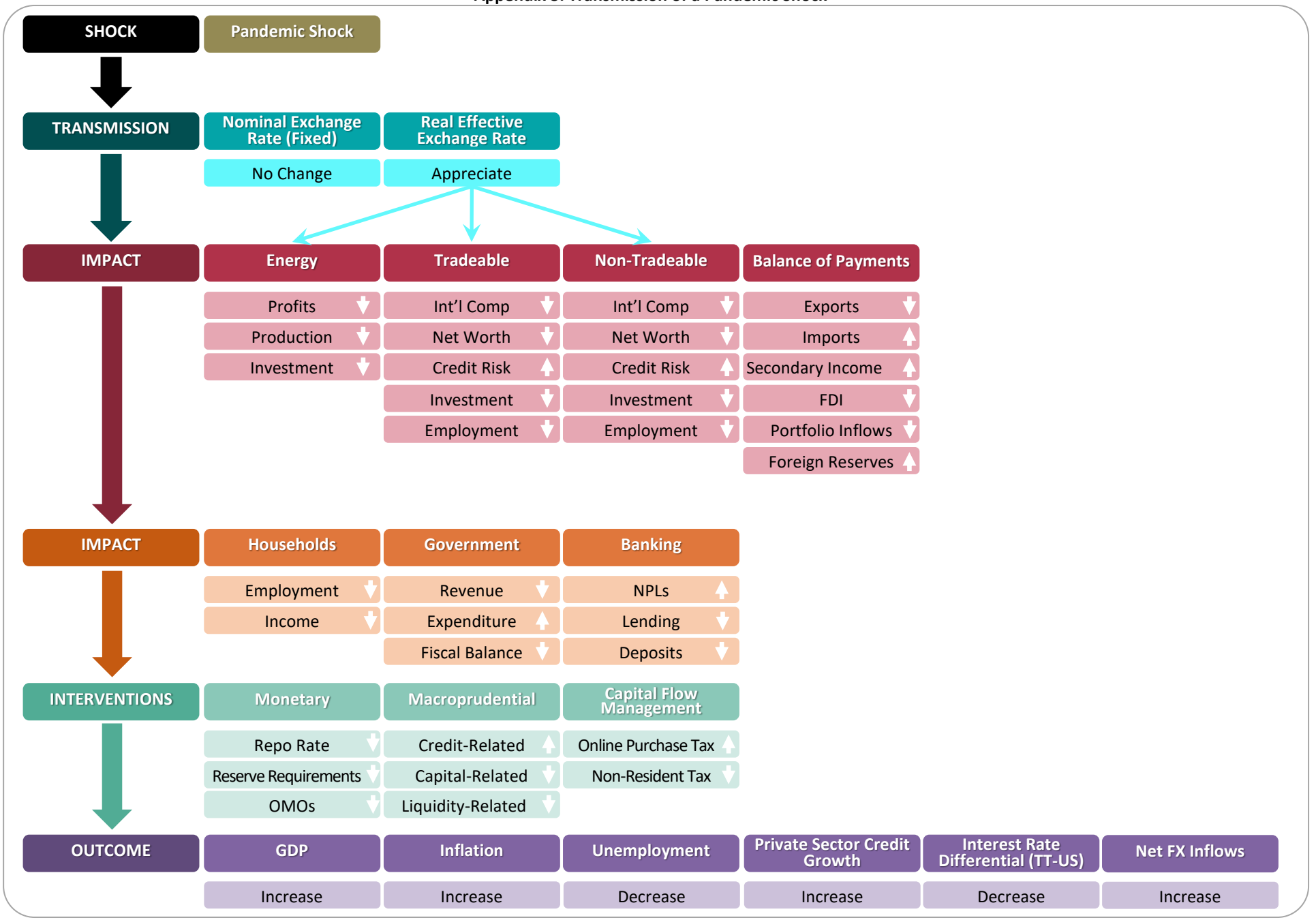
Source: Adapted from Benedicte Vibe Christensen. "Challenges of low commodity prices for Africa" (2016).

Appendix 2: Transmission of Decline in International Energy Prices



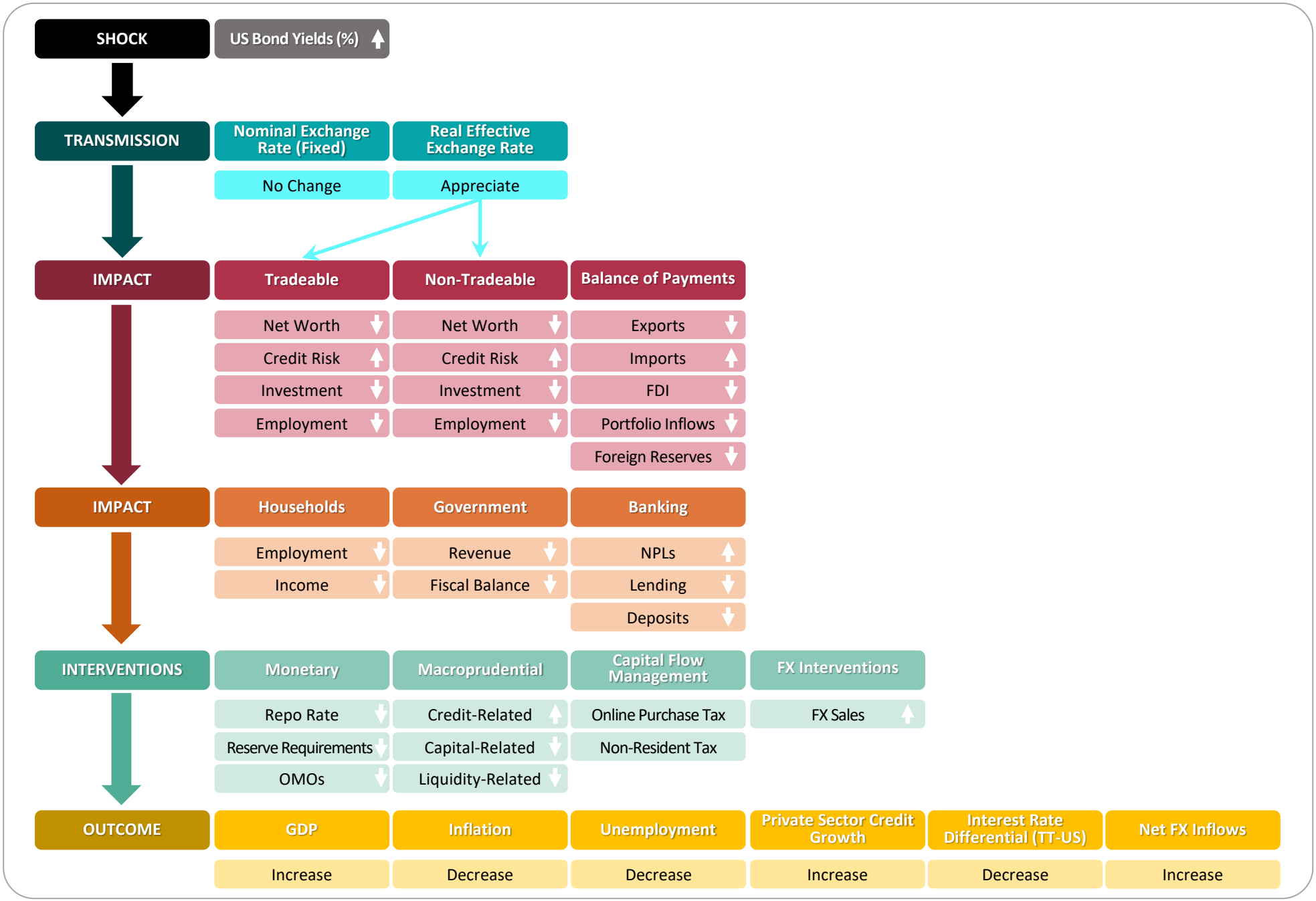
Source: Adapted from Benedicte Vibe Christensen. "Challenges of low commodity prices for Africa" (2016).

Appendix 3: Transmission of a Pandemic Shock



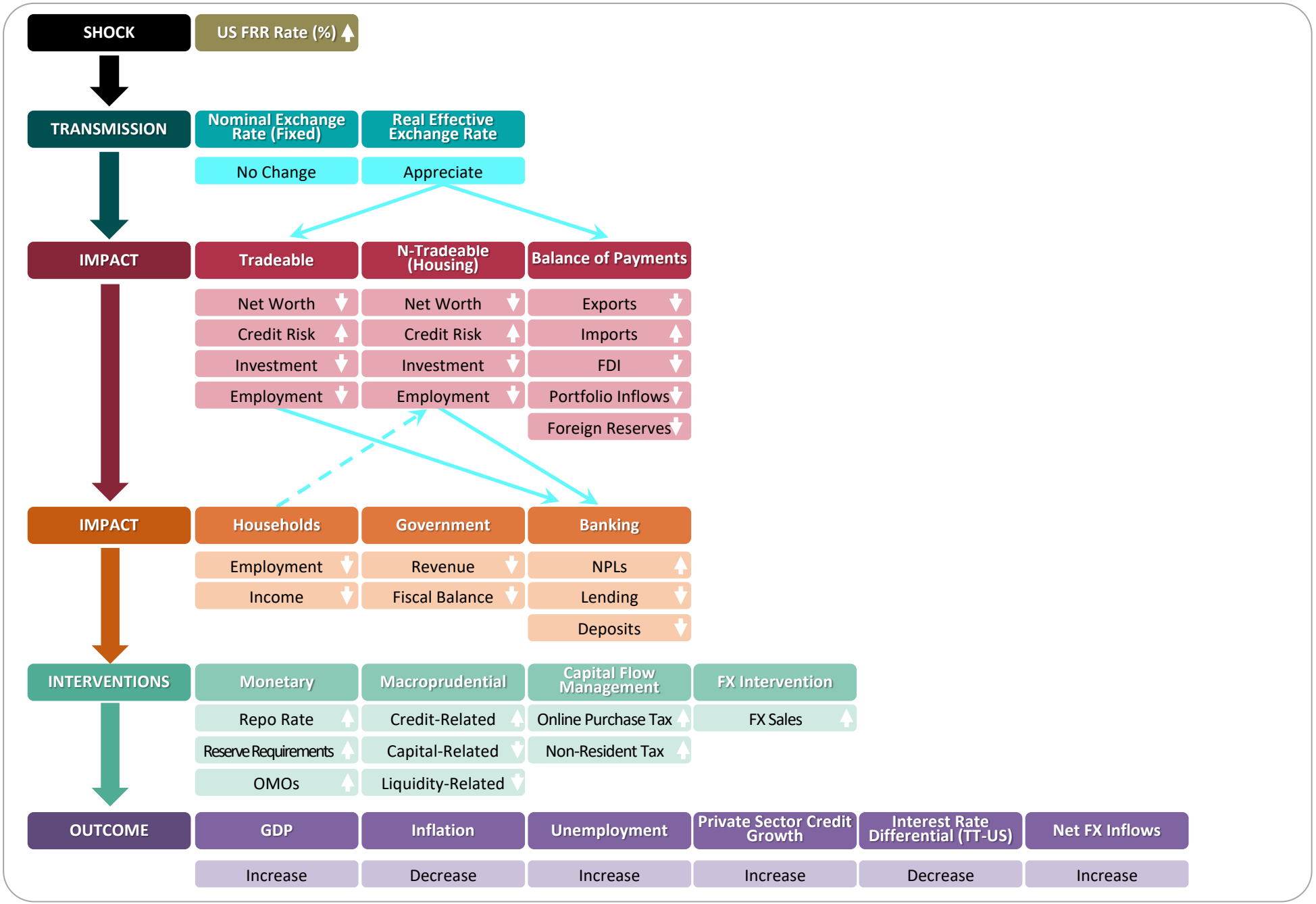
Source: Adapted from Benedicte Vibe Christensen. "Challenges of low commodity prices for Africa" (2016).
Note: "Portfolio Inflows" only captures information from the private sector.

Appendix 4: Transmission of Tightening in US bond yields



Source: Adapted from Benedicte Vibe Christensen. "Challenges of low commodity prices for Africa" (2016).

Appendix 5: Transmission of Increase in the Federal Reserve's Federal Funds Rate



Source: Adapted from Benedicte Vibe Christensen. "Challenges of low commodity prices for Africa" (2016).