How the Liberation Day Announcement is Shaping the Global Trade Order : Recent Developments in Financial Stability, Macroprudential Arrangements, and Shadow Banking

Ojo, Marianne

Centre for Ingenuity, Innovation and Sustainable Development

2025

How the Liberation Day Announcement is Shaping the Global Trade Order: Recent Developments in Financial Stability, Macroprudential Arrangements, and Shadow Banking

ABSTRACT

On the 20th December 2023, the Financial Stability Board published revised policy recommendations to address structural vulnerabilities from liquidity mismatch in open ended funds (OEFs). Main points which were highlighted in relation to new recommendations include the following:

- Revised FSB recommendations and IOSCO Guidance on Anti Dilution Liquidity Management Tools (LMTs), which are aimed at achieving significant strengthening of liquidity management by open ended funds (OEFs), compared to previous practices.

This paper aims to investigate the impact of Basel III on shadow banking and its facilitation of regulatory arbitrage as well as consider the response of various jurisdictions and standard setting bodies to aims and initiatives aimed at improving their macroprudential frameworks.

Furthermore, it will also aim to illustrate why immense work is still required at European level as regards efforts to address systemic risks on a macroprudential basis. This being the case in spite of significant efforts and steps that have been taken to address the macroprudential framework. In so doing, the paper will also attempt to address how coordination within the macroprudential framework as well as between microprudential and macroprudential supervision could be enhanced.

It is remarked that "Trump's reciprocal tariff doctrine, holds foreign countries accountable". Against this backdrop of discontent with World Trade Organisation's dispute resolution mechanisms, which will be further elaborated on, in the paper, the immediate and possible long term impacts of the April 2nd 2025 Announcement, will be considered. As well as exploring the reasons for recent developments – by way of reference to historical developments and data, the paper also considers the underlying frameworks governing the calculations of recent tariff rates and hikes. Whilst there are arguments regarding the validity of such calculations, or whether the current scenario justifies the basis for implementing "national emergency measures", what can be regarded as an emergency response can be determined through a consideration of underlying and contributory factors.

How the Liberation Day Announcement is Shaping the Global Trade Order: Recent Developments in Financial Stability, Macroprudential Arrangements, and Shadow Banking

Dr Marianne Ojo

Introduction

"Donald Trump's tariffs will fix a broken system ". According to Navarro, (Financial Times, 2025a) whose remarks relate to the WTO's resolution mechanism, the WTO's dispute resolution system, is "functionally broken". This is illustrated by way of reference to the U.S. having brought several high profile agricultural trade disputes to the WTO – "targeting foreign bans on poultry, hormone treated beef and genetically modified crops……and that even though the U.S. has prevailed in nearly every case, and that the E.U's ban on hormone treated U.S beef was ruled illegal in 1998," the ban hasn't been lifted by the E.U.

He further adds that "Trump's reciprocal tariff doctrine, holds foreign countries accountable".

This paper will commence with an introductory section which provides the conceptual and theoretical frameworks, as well as the background to the study. It will then consolidate on the literature review with various arguments, by way of reference to relevant data that is provided in the study. Even though the ramifications and consequences of the April 2nd Announcement are still unfolding, its immediate and devastating impacts on global stock markets across the world are already apparent. The immediate repercussions do not only embrace the turbulence and volatility currently being witnessed in stock markets and exchanges across the globe, but also its potential to partially or significantly impact trading relationships. Whilst its apparent and immediate impacts can be seen across global stock markets – with growing concerns of retaliatory and counter retaliatory measures, particularly by those countries impacted, the principal rationale behind the unprecedented announcement appears to have its origins and association with the manner in which current multilateral trade agreements are functioning and the dissatisfaction with current world trade dispute resolution mechanisms.

The main issues to be addressed, will constitute the focus of the second section. Under this heading, far reaching impacts and consequences of the recent decisions will be considered: namely, impacts on inflation levels and how central banks can address these in anticipation of recent events, the current challenges faced in the steel and car manufacturing industry – particularly in the United Kingdom, fears relating to consequences of recession – in the face of job losses currently being encountered in certain sectors, as well as impacts on government budgets and higher employer contributions.

Further major contributory factors to recent tariff announcements will be considered – as well as recommendations for the way forward and possible paths to achieving meaningful negotiations – particularly at bilateral trade level negotiations. This will be followed by a conclusive section.

Will the April 2nd Announcement generate its intended objectives? It's still early days – however, it appears increasingly likely that negotiation outcomes – particularly between those significantly impacted by the Announcement, will be a major determinant in deciding whether the tariff hikes resulting from the April 2nd Announcement, will be short or long term.

Literature Review and Background to the Topic

According to the Centre for Strategic and International Studies (CSIS, 2025), the April 2nd Announcement is comprised of two distinct tariff actions:

- A universal 10% tariff which will apply to virtually all U.S. imports, starting from April the 5th;
- And, from April 9th , the imposition of "country specific reciprocal tariffs" – targeted at 57 named countries – with rates reaching as high as 50%

The second group of countries related to "country specific reciprocal tariffs", were so identified in the CSIS report, "based on their bilateral trade surpluses with the United States, perceived tariff asymmetries, and other barriers to U.S. exports.

The Oberserver (2025), highlights the "master plan" behind Trump's tariffs as follows:

"The U.S. President wants to revive the manufacturing sector with a mix of protectionist policies, tax cuts and deregulation…….and the cash generated by the tariffs, will be the source of funds for tax cuts……."

The U.S. manufacturing sector is not the only one with its challenges. Even prior to the April 2nd Announcement, the U.K. steel and car manufacturing sectors had been subjected to severe challenges – with closures and losses of jobs having been announced in both sectors – prompting the U.K. government's consideration of nationalisation of British Steel. Concerns over its main plant at Scunthorpe had been highlighted – as well as potential job losses of up to 3,000 workers. The U.K government was also recently faced with issues related to the TATA steel plant in Port Talbot where 2,500 jobs were lost.

According to the Times (2025b), the car industry, already faced with challenges of demand for electric cars, wants "tax discounts to stimulate demand."

On the 9th April 2025, a week on from the 2nd April announcement, President Trump's tariffs went into effect and the initial general imposition of 10% tariffs on all imports, escalated in certain cases of retaliatory measures which resulted in an increase to as high as 125% on one of its major trading partners. The impacts of the tariffs are considered to be far reaching – amongst others, not just necessitating bilateral trade negotiations – as evidenced with 70 countries already lined up for talks by the 9th April, but also potentially diverting and altering trade and relationships to, and between countries.

(As at the end of the 9th April 2025, President Trump announced a 90 day pause on reciprocal tariffs for all countries except China).

Other impacts of the April 2nd Announcement, also primarily relate to rising inflation levels. In anticipation of higher levels of inflation, many major central banks are expected to announce cuts in interest rates in the coming days and weeks. Current levels of uncertainty – and how long such uncertainty persists, will most likely, impact the levels to which interest rates will be determined over the coming months. As it stands, negotiations between the world's two largest economies, will be crucial in resolving and addressing prevailing levels of uncertainty.

Section Three: What Constitutes Emergency Measures? (For copyright reasons restricted)

Section Four: Central Bank approaches to Addressing Rising Inflation Levels.

(restricted for copyright reasons) See attached publication "Addressing Current Inflation Levels through Green Energy Technologies and Techniques: Recent Developments). Also see publication, "Inflationary Impacts Since Global Pandemic Crisis)

Section Five: The Art of Negotiations: Are Bilateral Trade Agreements the Way Forward? (Restricted for copyright reasons)

Conclusion (Restricted for copyright purposes and protection)

References

Bank of England (2025). “Relationship Lending and Monetary Policy Pass – Through” by J Cao, P Dubuis, and K Liaudinskas. March 21 2025

Bank of England (2025). “Weathering the Storm: Sectoral Economic and Inflationary Effects of Floods and the Role of Adaptation, by M Ficarra and R Mori 28 February 2025

Bank of England (2025). “Do Inflation Expectations Respond to Monetary Policy? An Empirical Analysis for the United Kingdom, by N Burr, 10 January 2025

Bloomberg UK (2025) “Tariffs Are For Emergencies” 7th April 2025

Board of Federal Reserve (2025). “Lecture by Governor Kugler on Inflation Dynamics and the Phillips Curve”

< https://www.federalreserve.gov/newsevents/speech/kugler20250407a.htm>

Centre for Strategic and International Studies (2025). https://www.csis.org/analysis/liberation-day-tariffs-explained

Federal Reserve (2025). “Speech by Governor Kugler on Inflation Expectations and Monetary Policy Making”

At Public Talk: Reflections on Recent Economic Developments, Princeton University, New Jersey

https://www.federalreserve.gov/newsevents/speech/kugler20250402a.htm

Federal Reserve (2025). "Speech by Vice Chair Jefferson on the U.S. Economic Outlook and Central Bank Communication

At Financial Intermediaries, Markets, and Monetary Policy "

https://www.federalreserve.gov/newsevents/speech/jefferson20250403a.htm

Federal Reserve (2025). "Speech by Chair Powell on the Economic Outlook "

At the Society for Advancing Business Editing and Writing Annual Conference, Arlington

<https://www.federalreserve.gov/newsevents/speech/powell20250404a.htm>

Financial Times (2025a) " Donald Trump's Tariffs Will Fix a Broken System" April 7th 2025

Financial Times (2025b) "Trump Has No Idea What He Has Unleashed" April 2025

Nation Cymru (2025). "Labour Accused of Abandoning Port Talbot Steel Plant While Considering Nationalisation for Scunthorpe" Emily Price, April 8 2025

The Budget Lab (2025) "Where We Stand: The Fiscal, Economic, and Distributional Effects of All U.S Tariffs Enacted in 2025 Through April 2" <https://budgetlab.yale.edu/research/where-we-standfiscal-economic-and-distributional-effects-all-us-tariffs-enacted-through-2025-through-april

Where We Stand: The Fiscal, Economic, and Distributional Effects of All U.S. Tariffs Enacted in 2025 Through April 2 | The Budget Lab at Yale

The Guardian (2025). "Donald Trump Unleashes New Wave of Tariffs Against Dozens of Countries" 9 April 2025

The Observer (2025). "The Fall Out from Trump's Tariffs: Is there a Masterplan, are we Heading for Recession and what does it mean for the U.K?

The Times (2025a). "UK Government Considers Nationalising British Steel" April 9 2025

The Times (2025b) "Keir Starmer Set for Profound Trump Tariff Challenge " 8th April 2025

Figures and Tables

Source: Centre for Strategic and International Studies (2025).
https://www.csis.org/analysis/liberation-day-tariffs-explained

Prelude to “Liberation Day”: The Road to April 2, 2025

Trump’s Inauguration and “America First Trade Policy”

January 20, 2025

Immediately upon returning to the White House, President Trump issues a presidential memorandum promoting an “America First trade policy.” This directive lays the rhetorical groundwork for aggressive tariffs to “revitalize U.S. manufacturing,” signaling that trade imbalances and industrial decline would be treated as national emergencies.

China Tariffs Announced (10 Percent)

February 1, 2025

Citing a crisis of fentanyl trafficking and “Chinese inaction,” Trump invokes emergency powers to hit all Chinese imports with a 10 percent tariff, reigniting the U.S.-China trade war.

Canada and Mexico Tariff Threat

February 1, 2025

The same day, the administration turned its ire towards its North American neighbors, announcing a 25 percent tariff on all imports from Canada and Mexico based on allegations that they were not doing enough to curb cross-border drug and immigration issues.

Canada and Mexico Tariffs Pause

February 3, 2025

After commitments from Mexico and Canada to work with the United States on illegal immigration, fentanyl, and border security, as well as pushback from U.S. automakers and farmers, a 30-day pause (grace period) is granted. Mexico commits 10,000 National Guard troops to its northern border and extradites 29 cartel leaders to the United States, while Canada pledges to name a fentanyl czar, list Mexican cartels as terrorist groups, and launch a “Canada-U.S. Joint Strike Force” to combat cross-border crime.

10 Percent Tariffs on China Go Into Effect

February 4, 2025

China retaliates, adding tariffs of up to 15 percent on U.S. goods, including coal, natural gas, crude oil, and large machinery. Beijing also quietly places export controls on certain U.S. firms and products, with a focus on critical minerals and relevant processing technologies.

China Tariffs Double to 20 Percent

March 4, 2025

The temporary calm is short-lived. Trump follows through on his threat to increase tariffs on China, bringing the total tariff on Chinese imports to 20

China Retaliates

Canada and Mexico Tariffs “Pause” Expires—Retaliation Follows

March 4, 2025

Tariffs of 25 percent on Canada and Mexico go into effect, with a reduced rate of 10 percent applied to Canadian energy and energy resources. Canada immediately announces a 25 percent tariff on $105 billion worth of U.S. goods, while Mexico promises retaliation without offering specifics.

Relaxation of Canada and Mexico Tariffs

March 6, 2025

U.S. tariffs on Mexico and Canada are somewhat relaxed in response to concerns about their impacts on the auto industry. There are now no tariffs on those goods from Canada and Mexico that qualify for the United States–Mexico–Canada Agreement (USMCA) preference, though 25 percent tariffs still apply to those that do not.

Global Steel and Aluminum Tariffs

March 12, 2025

The Trump administration reimposes a 25 percent tariff on imported steel and on aluminum globally, resurrecting and amplifying the 2018 Section 232 tariffs. A key difference from 2018 was that allies such as Canada, Mexico, the European Union, Australia, and South Korea were not spared from the tariffs. The European Union imposes retaliatory tariffs on a wide range of U.S. products, including agricultural products, alcoholic beverages, and clothing.

“Liberation Day” Teased on Social Media

March 21, 2025

Trump intensifies the rhetoric on his Truth Social account, dubbing April 2 as “Liberation Day” in the United States, suggesting that it will dwarf all prior tariff actions. The message unnerves trading markets.

25 Percent Secondary Tariffs on Venezuela

March 24, 2025

President Trump threatened to impose a “secondary tariff” of 25 percent on countries that purchase oil from Venezuela, set to go into effect on April 2. China and the United States are Venezuela’s primary oil purchasers.

25 Percent Auto Tariffs Announced

March 26, 2025

President Trump announces a new 25 percent tariff on imported automobiles, to take effect on April 3. The long-threatened action hits cars globally from all trading partners. Canada and Mexico will benefit from a temporary exemption for USMCA-qualified vehicles until June 24, at which point automakers will be required to calculate U.S.-only content, which will not be tariffed in cars that are USMCA-compliant. So, if a USMCA-qualifying car is $20,000 but $10,000 is U.S.-content, then the tariff only applies to $10,000.

“Reciprocal” Tariffs Announced

April 2, 2025

In a Rose Garden event and accompanying executive order, President Trump invokes the International Emergency Economic Powers Act to place a universal 10 percent tariff rate as well as differential “reciprocal” tariffs on all U.S. trading partners.

Source: Author’s analysis.

CSIS

Figure 1: U.S. Reciprocal Tariff by Trade Deficit in 2024

Search in table

Page 1 of 2

Countries and Territories	Reciprocal Tariff	U.S. Trade Deficit
China	34%	270.4B
European Union	20%	213.7B
Vietnam	46%	113.1B
Taiwan	32%	67.4B
Japan	24%	62.6B
South Korea	26%	60.2B
India	27%	41.5B
Thailand	37%	41.5B
Switzerland	32%	25.5B
Malaysia	24%	22.1B
Indonesia	32%	16.4B
Cambodia	49%	11.4B
South Africa	31%	7.9B
Israel	17%	6.7B
Bangladesh	37%	5.7B
Iraq	39%	5.4B
Philippines	18%	4.4B
Guyana	38%	3.9B
Pakistan	30%	2.7B
Sri Lanka	44%	2.5B

Countries with 2024 deficits under $1 billion are excluded from this table. The reciprocal tariff is adjusted; the U.S. trade deficit in 2024 does not include December.

Table: CSIS Economics Program and Scholl Chair in International Business • Source: White House, *Annex I: Tariff Rates*, Apr. 2025; U.S. Bureau of Economic Analysis, *Trade Deficit Report*, Feb. 2025, aggregated at *U.S. Trade Deficit by Country*.

CSIS

Figure 2: Countries Targeted in Reciprocal Tariffs by Region

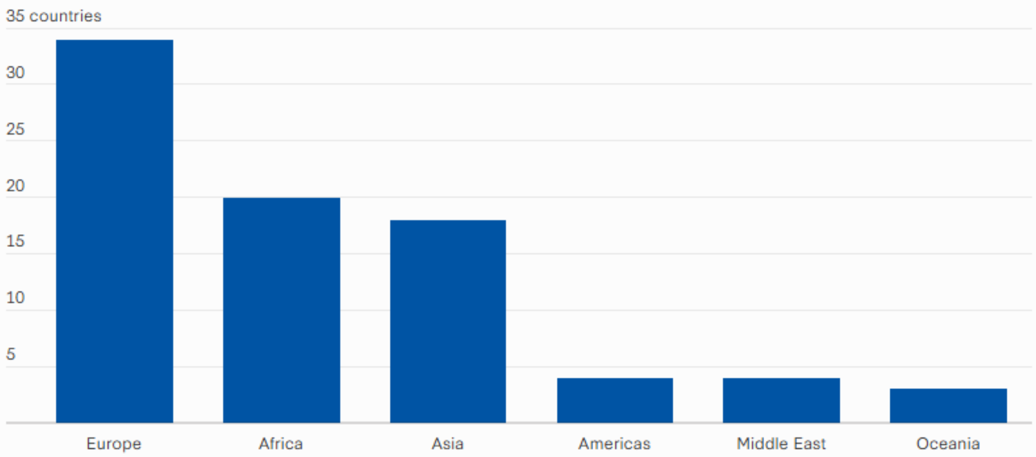

Chart: CSIS Economics Program and Scholl Chair in International Business • Source: CSIS Economics Program and Scholl Chair in International Business's analysis.

CSIS

Inflationary impacts since the Global Pandemic Crisis: the potential of forecasting techniques and technologies

Ojo, Marianne

Centre for Innovation and Sustainable Development

March 2024

Inflationary Impacts Since the Global Pandemic Crisis: The Potential of Forecasting Techniques and Technologies

Dr Marianne Ojo

Introduction

There were, as is still the case, currently, calls for possible consideration of further accommodative and expansive monetary policies which include macro prudential tools. Interest rate adjustments in other jurisdictions; as well as fears of retaliatory responses – as previously highlighted - which include the use of currency devaluations, also all added to the heighted and increased levels of uncertainty, which not only impacted central bank policy instruments of other jurisdictions, but also global stock markets. The effects of lower interest rates on the central bank's inflation targeting policies – as well as consumer expectations, constituted a subject of contentious debates. Whilst lower interest rates are needed to stimulate economic activity – even where it appears that reasons for doing so are not immediately apparent, there were also concerns that such actions may impact consumer expectations by delaying spending in the hopes of lower rates or even worse, trigger fears and concerns amongst investors.

Main Issues to be addressed

Global stable coins (GSCs) are considered to present "significant adverse effects" domestically and internationally in terms of monetary policy - as well as financial stability. "Further, their challenges to cross jurisdictional efforts to combat money laundering and terrorist financing presents further issues for international monetary systems- with implications for monetary sovereignty.

In accentuating the potential effects and impacts of stable coins, the following have been observed (Brainard, 2019:8): 1) Widespread adoption of stable coins could have implications for the role of central banks and monetary policy. 2) The central bank's approach to implementing monetary policy may be complicated to the extent that bank's participation in short term funding markets is affected. Reference is made to open economies and their susceptibility to a payments system impacted by digital currencies that are controlled by private actors - in which case it is highlighted that Sweden, along with countries like Australia, New Zealand, Canada and Norway, fall within a category of countries - a group of small open economies with floating exchange rates and inflation targets which experience relatively similar challenges and problems (Ingves, 2019: 2). It is further added: - Through free capital movement, low real interest rates have been imported, and a downward pressure on inflation, generated through processes such as globalization.

Questions that have been brought to light, center round whether central banks considering the issue of digital currencies should also assign interest rates to such currencies - as well as conditions and factors which would impact such currencies. Would those rates be more flexible and volatile than the previous floating exchange and inflation targeting rates? Why should governments back stable coins which have the potential to trigger risks of systemic nature, relevance and importance where there were options to support their central banks with much needed stability? Why should governments back private actors engaged in crypto assets and global stable coins' issue where regulatory, legal uncertainty, sound governance and public policy issues - amongst several other challenges still needed to be resolved? Why not render support to, and consolidate on the measures, mechanisms and existing mechanisms available to central banks? Governments can be criticized for engaging in purely politically motivated and political interests where regulatory safeguards appear to be overlooked as a means of endorsing certain actors which may ultimately benefit their political interests. Certain actors, by virtue of their national values, as well as their significance, relevance, and impact on stock markets, may be accorded preferential treatment - a kind of "too big to fail institution ". However, providing assistance and support to prevent a systemic failure does not necessarily infer that license is permitted to carry on with unregulated activities. This is precisely why moral hazard issues arise - sometimes politically motivated interests may end up undermining central bank stability mandates.

Which is why the engagement of accommodative unconventional and conventional monetary policies does not necessarily undermine central bank independence. Sometimes asset backed government programs do not compromise independence - rather it is the support of governments for unregulated untested ventures which have potentially devastating systemic consequences that poses serious matters of concern. It is welcomed that the Financial Stability Board is currently engaged in initiatives aimed at considering the regulatory issues of stable coins. In accentuating what sets Libra apart from other stable coins, Brainard (2019: 5) states that "the issuance of a private digital currency opaquely tied to a basket of sovereign currencies, through an active user network representing more than a third of the global population " necessitated the responsibility of addressing fundamental sets of legal and regulatory challenges before initial payment could be facilitated.

As a means of addressing public policy challenges, Beau (2019: 4) proposes the following responses: 1) Ignoring crypto assets - however this in his view, is not recommended on the basis of risks presented- more so in the case of stable coins 2) Banning crypto assets;
3) Promoting innovations with the potential to change the payment services market, namely establishing appropriate regulations that make it possible to reconcile the following two fundamentals: reconciling i) Risks already highlighted. ii) Preserving the potential for technological innovation offered by crypto assets.

Hence financial stability concerns constitute just one aspect to crypto assets.

The innovative possibilities - as well as those of distributed ledger technologies constitute benefits which can be harnessed to enhance digital possibilities of the Fourth Industrial Revolution.
Such benefits are as follows (Beau, 2019: 2,3)

- Block chain technology and more broadly, the distributed ledger technologies (DLT), could help address the market's needs and demands - particularly demand for quick and safe cross border payment solutions which are available 24-7

- DLT (distributed ledger technologies) could help remedy the current limits of the existing wholesale market infrastructures

- Crypto assets undergoing technical and economical trials bring about not only opportunities to improve payment systems, but also material risks which on the contrary, might weaken them, if not addressed.

Forecasting Techniques as a Means of Mitigating Uncertainties: Artificial Intelligence and Block chain Technologies

The use of machine learning techniques as a means of predicting bank distress in the United Kingdom, is highlighted by Treitel, H.and Suss .J., (2019, in their paper "Predicting Bank Distress in the UK with Machine Learning."[1]

[1] Treitel.,H. and Suss .J, (2019). "Predicting Bank Distress in the UK with Machine Learning" Bank of England Staff Working Paper No 831

In their analysis, they compare and contrast classic linear regression techniques with modern machine learning approaches that are able to "capture complex non-linearities and interactions." They find that the random forest algorithm "significantly and substantively outperforms other models" when utilizing the AUC and Brier Score as performance metrics (Treitel and Suss, 2019).

Other findings are as follows (2019:3,4):

- In justifying their argument that conventional approaches, such as logistic regression models, are unable to account for complex interactions and non-linearities, thereby tending to perform worse than their more flexible machine learning counterparts, they compare pooled logistic regression with a linear random effects model, the k nearest neigbours (KNN) algorithm, two classification tree ensembles (random forest and boosting), and a support vector machine (SVM).
- In order to measure performance, they estimate out-of-sample predicted probabilities using a unique cross validation design that accounts for various potential sources of bias - repeating the entire cross validation exercise ten times to account for the variability that arises due to the specific initial random split performed.

- Even though they find that the random forest algorithm significantly outperforms the other approaches examined in terms of the area under the ROC curve (AUC) and Brier score, the cost benefit analysis of implementation is also highlighted in the sense that "the performance advantage of the random forest algorithm comes with a transparency cost relative to the pooled logit model which, depending on the requirements of regulators, could outweigh the benefits."

They further, conclude that that lagged macroeconomic variables are very important for predicting distress and that for the random forest, a measure of average real UK earnings constitutes the single most important variable – the average earnings, in contrast, not being as important.[2]

Conclusion

Important lessons which were drawn from the most recent GFC - notably, the growing need for accommodative policies (unconventional and conventional) to facilitate appropriate responses - given limited monetary policy spaces, the emergence, rise and evolution of private actors and their implications for monetary policies and financial stability. Unregulated and without legal certainty, there are potential causes for concerns in respect of the global adoption of stable coins - even though when harnessed and regulated appropriately, these could provide much needed innovative changes and benefits. Central banks should still assume vital monetary policy setting functions - even amidst uncertainties relating to how central bank digital currencies should be issued - particularly in respect of which and whether interest rates should be attached to these. Rehn states that a key lesson of monetary policy of the last ten years is

[2] "relatively speaking, for the pooled logit model."

that timely action is essential to avoid the zero lower bound - as well as an extended period of extremely low levels of inflation. The incorporation of innovative forecasting techniques with monetary policy setting may greatly mitigate current uncertainties linked to particular accommodative monetary policies. Contrasted to the policy of leaning against the wind, such techniques - along with more relevant, applicable, tried and tested techniques, and up to date indices, could generate greater confidence in the data being used - as well as expectation and inflation levels.

Incorporating Uncertainty in Forward Looking Monetary Policy Tools

"Because it takes time before monetary policy has its full impact on inflation, monetary policy is guided by forecasts for the economy and inflation. In addition, the Riksbank publishes, among other things, its own assessment of the likely future path for the repo rate and the degree of uncertainty surrounding that path. This interest rate path "is a forecast, not a promise". In connection with every monetary policy decision, "the Executive Board makes an assessment of the repo-rate path needed for monetary policy to be well-balanced. A well-balanced monetary policy is normally a question of finding an appropriate balance between stabilizing inflation around the inflation target and stabilizing the real economy"(Goodfriend and King, 2015:21). The journey since the most recent GFC has highlighted the need for several considerations, including, namely: the need to consider pro cyclical effects – as well as business and financial cycle risks, risks attributed to the changing financial environment – in form of emerging technological risks – and particularly unregulated blockchain technologies and platforms through which crypto currency markets are currently dependent on – as well as protectionist risks.

References

Agénor, P-R, E Kharroubi, L Gambacorta, G Lombardo and L A Pereira da Silva (2017): "The international dimensions of macroprudential policies", BIS Working Papers, no 643, June.

Amiti, M and D Weinstein (2011): "Exports and financial shocks", The Quarterly Journal of Economics, vol 126, no 4, pp 1841–77.

Armantier, O., Kosar, G., Pomerantz,R., Skandalis, D., Smith, K., Topa, G., & Van der Klaauw, W. (2021). How economic crises affect inflation beliefs: Evidence from the Covid-19 pandemic. Journal of Economic Behavior & Organization, 189, 443-469.-Victor, V., Karakunnel, J. J., Loganathan, S., & Meyer, D. F. (2021).

Avdjiev, S, L Gambacorta, L Goldberg and S Schiaffi (2017a). “The Shifting Drivers of Global Liquidity“, BIS Working Papers, no 644, June.

Avdjiev, S, R McCauley and P McGuire (2012). “Rapid Credit Growth and International Credit: Challenges for Asia”, BIS Working Papers, no 377, April. Bank for International Settlements (2019). G7 Working Group on Stable Coins, Committee on Payments and Markets Infrastructures "Investigating the Impact of Global Stable Coins October 2019 BIS (2019).

Bank of England, (2021). “Inflation Now and Then”, Remarks given by Jonathan Haskel, External Member of the Monetary Policy Committee, Bank of England, and Imperial College Business School, Imperial College, London Adam Smith Business School, University of Glasgow 23 November 2021

Borio, C., Drehmann, M., and Xia, D, “Predicting Recessions: Financial Cycle versus term spread” BIS Working Papers No 818 October 2019

Boivin, Jean, Michael T. Kiley, and Frederic S. Mishkin (2010). "How Has the Monetary Transmission Mechanism Evolved over Time?" in Benjamin M. Friedman and Michael Woodford, eds., Handbook of Monetary Economics, vol. 3. Amsterdam: Elsevier, pp. 369–422

Bullard, James (2018). "The Case of the Disappearing Phillips Curve," Speech delivered at the 2018 ECB Forum on Central Banking, Sintra, Portugal, June 19

Beau, D. (2019)."The Role of Cryptoassets in the Payment System " First deputy governor of the Bank of France at the Official Monetary and Financial Institutions Forum (OMFIF) Meeting, London, 15 October 2019

Bloomberg (2019). “Britain's Inverted Yield Curve Is Nothing Like America's” 15 August 2019 https://www.bloomberg.com/opinion/articles/2019-08-16/britain-s-yield-curve-is-nothing-likeamerica-s?srnd=premium-europe

Bloomberg (2019). “U.K.’s Johnson to Double Down on Brexit in Germany, France Trip” https://www.bloomberg.com/news/articles/2019-08-17/u-k-s-johnson-to-double-down-on-brexitin-germany-france-trip?srnd=premium-europe

Brainard, L.(2019) ."Digital Currencies, Stable Coins, and the Evolving Payments Landscape " Remarks at the Future of Money in the Digital Age, Sponsored by the Peterson Institute for International Economics and Princeton University's Bendheim Center for Finance,Washington D.C October 16 2019

CGFS-FSB, (2017). “FinTech credit: Market structure, business models and financial stability implications”, May 2017. Committee on the Global Financial System, “Unconventional Monetary Policy Tools: A Cross Country Analysis” CGFS Papers No 63 October 2019, Bank for International Settlements

Centre for Economic Policy Research (2022). “Rising Inflation is Worrisome: But Not for the Reasons You Think” D’Acunto, F. and Weber, M., January 4 2022

Coroneo, L. and S Pastorello (2017). “European Spreads at the Interest Rate Lower Bound” unpublished manuscript CPMI, (2017). “Distributed ledger technology in payment, clearing and settlement – an analytical framework”, February 2017.

Federal Reserve (2024). “Federal Reserve Board and Federal Open Market Committee Release Economic Projections from the March 19-20 FOMC Meeting”
Accessed via
https://www.federalreserve.gov/newsevents/pressreleases/monetary20240320b.htm

Federal Reserve (2024). “Federal Reserve Issues FOMC Statement”

Federal Reserve Bank of San Francisco, (2022). “This Time is Different Because We Are” Remarks by Mary C Daly, President of the Federal Reserve Bank of San Francisco, Los Angeles, CA, February 23, 2022

Fendel, R., N Mai, and O Mohr (2018). “Recession probabilities for the Eurozone at the Zero Lower Bound”, WHU Working Paper Series in Economics, no 18/04

Financial Stability Board (2019). "FSB Sets Out Work to Consider Regulatory Issues of Stable Coins" 18th October 2019 https://www.FSB.org/2019/ 10/fsb-sets-out-work-to-considerregulatory-issues-of-stable-coins/

Financial Stability Board (2018). “ Crypto Asset Markets: Potential Channels for Future Stability Implications, October 2018

Financial Times (2024). “U.K. Inflation Hits Lowest Rate Since 2021 at 3.4%”
20th April 2024. Accessed at
https://www.ft.com/content/9f31261e-7d10-4963-b652-9b96822822bd

Financial Times (2023). “Breaking Stormont Impasse Requires Action by London, DUP warns” April 18th 2023

Financial Times (2023). “EU Will Miss its Green Hydrogen Targets, Executives Say” May 11 2023

Financial Times (2023). “ Steelmakers Explore Hydrogen to Power Energy Hungry Processes” July 15 2022

Financial Times (2023). “US and EU Launch New talks on Critical Minerals Trade in Green Tech Race” March 11 2023

Financial Times (2022). “Green Hydrogen Will be Price Competitive by 2030” July 15 2022

Forbes, K, D Reinhardt and T Wieladek (2016): “The spillovers, interactions, and (un)intended consequences of monetary and regulatory policies”, Journal of Monetary Economics, vol 85, pp 1–22.

Goodfriend M and M King (2015).“The Evolution of Monetary Policy: “Review of the Riksbank’s Monetary Policy 2010-2015” at page 21 ISSN 1653-0942 978-91-87541-39-1 Riksdagstryckeriet, Stockholm, 2015

Hofmann, B, I Shim and H S Shin (2016): “Sovereign yields and the risk-taking channel of currency appreciation”, BIS Working Papers, no 538, revised May 2017.

Korstanje, M. E., & George, B. (2021). “From a recession to the COVID-19 pandemic: Inflation–Unemployment Comparison between the UK and India”. Economies, 9(2), 73. Mobility and globalization in the aftermath of COVID-19: Emerging new geographies in a locked world. Basingstoke: Palgrave Macmillan.

Markets Committee, MC Compendium “Monetary Policy Frameworks and Central Bank Market Operations” October 2019, Bank for International Settlements

Markets Committee, “Large Central Bank Balance Sheets and Market Functioning” Report Prepared by Study Group Chaired by Lorie Logan (Fed Reserve Bank of New York) and Ulrich Bindsell (ECB), October 2019, Bank for International Settlements Publications

New York Times (2019). Economic Trouble Signs Hang Over Trump’s Trade War August 15 https://www.nytimes.com/2019/08/13/business/economy/donald-trump-jobsc

Quarles, R. K. (2019). ” The Financial Stability Board at 10 years : Looking Back and Looking Ahead”, Building a Positive Future for Europe, Vice Chair of the Board of Governors of the Federal Reserve System, 3 October 2019, Brussels

Rehn, O. (2019). "On Conventional and Unconventional Monetary Policies" http://www.bis.org/review/ r191011b.htm

Shin, S. H (2015). “Exchange rates and the transmission of global liquidity”, speech at the Bank of Korea– IMF conference on Leverage in Asia: lessons from the past, what’s new now, and where to watch out for, Seoul, 11 December 9999

Soederberg (2019). "The e krone now and in the future " Economic Commentaries No 8 Sveriges Riksbank

Svensson, Lars E.O. (2017). "Cost-benefit analysis of leaning against the wind " Journal of Monetary Economics 90, pp 193-213

Sveriges Riksbank (2017). "The Riksbank's e-krona project", Report 1 Sept 2017

Sveriges Riksbank (2018a). "Account of Monetary Policy 2018", Sveriges Riksbank Sveriges Riksbank (2018b), The Riksbank's e-krona project ", Report 2, Oct 2018
Sveriges Riksdag (2018). "Evaluation of monetary policy for the period 2016-22018, Committee on Finance Report 2018/ 19: FiU24

Randal K Quarles, (2019). ” The Financial Stability Board at 10 years : Looking Back and Looking Ahead”, Building a Positive Future for Europe, Vice Chair of the Board of Governors of the Federal Reserve System, 3 October 2019, Brussels

Rachel, Lukasz, and Thomas D. Smith (2017)."Are Low Real Interest Rates Here to Stay?" (PDF) International Journal of Central Banking, vol. 13 (September), pp. 1–42 RUSI (2019). “Data Analytics and Algorithmic Bias in Policing” The Royal United Services Institute (RUSI) Report 16 September 2019

Restoy, F.(2019). “What is Going On, and Where Are the Challenges?” Chairman, Financial Stability Institute, Bank for International Settlements, Washington DC, 16 October 2019

Rosengren, Eric S. (2015). "Changing Economic Relationships: Implications for monetary policy and simple monetary policy rules " Speech on 16 April, Federal Reserve Bank of Boston WSJ, (2019). “ECB Follows Fed in Signaling Fresh Stimulus” https://www.wsj.com/articles/ecb-officials-signal-intention-to-launch-fresh-stimulus11562847288?mod=itp_wsj&mod=&mod=djemITP_h www.wsj.com/articles/ecb-to-launch-new-stimulus-measures-11551963228?mod=article_inline

The Economist (2019). “Masters of the Universe: The Rise of Financial Machines” https://www.economist.com/leaders/2019/10/03/the-rise-of-the-financial-machines

WSJ, (2019). “ECB Signals Possible Rate Cut Prompting Trump Tweets” https://www.wsj.com/articles/ecb-signals-possible-rate-cut-bond-buying-extension11560849634?mod=article_inline WSJ (2019). “Computers Can Now Bluff Like a Poker Champ Better Actually” https://www.wsj.com/articles/computers-can-now-bluff-like-a-poker-champ-better-actually11562873541?mod=cxrecs_join#cxrecs_s

WSJ, (2019). “Fed’s Powell Says Facebook’s Libra Raises “Serious Concerns” https://city.wsj.com/articles/2f104ab0-3105-4111-94fe-7498cd6f4694

WSJ (2019). “Computers Can Now Bluff Like a Poker Champ Better Actually” https://www.wsj.com/articles/computers-can-now-bluff-like-a-poker-champ-better-actually11562873541?mod=cxrecs_join#cxrecs_s

White House.Gov (2023). “Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act’s Investments in Clean Energy and Climate Action” January 2023 version 2

Yellen, Janet (2015)."Inflation Dynamics and Monetary Policy," speech delivered at the Philip Gamble Memorial Lecture, University of Massachusetts, Amherst, September 24

Inflationary impacts since the Global Pandemic Crisis: the potential of forecasting techniques and technologies

Ojo, Marianne

Centre for Innovation and Sustainable Development

March 2024

Inflationary Impacts Since the Global Pandemic Crisis: The Potential of Forecasting Techniques and Technologies

Dr Marianne Ojo

Introduction

There were, as is still the case, currently, calls for possible consideration of further accommodative and expansive monetary policies which include macro prudential tools. Interest rate adjustments in other jurisdictions; as well as fears of retaliatory responses – as previously highlighted - which include the use of currency devaluations, also all added to the heighted and increased levels of uncertainty, which not only impacted central bank policy instruments of other jurisdictions, but also global stock markets. The effects of lower interest rates on the central bank's inflation targeting policies – as well as consumer expectations, constituted a subject of contentious debates. Whilst lower interest rates are needed to stimulate economic activity – even where it appears that reasons for doing so are not immediately apparent, there were also concerns that such actions may impact consumer expectations by delaying spending in the hopes of lower rates or even worse, trigger fears and concerns amongst investors.

Main Issues to be addressed

Global stable coins (GSCs) are considered to present "significant adverse effects" domestically and internationally in terms of monetary policy - as well as financial stability. "Further, their challenges to cross jurisdictional efforts to combat money laundering and terrorist financing presents further issues for international monetary systems- with implications for monetary sovereignty.

In accentuating the potential effects and impacts of stable coins, the following have been observed (Brainard, 2019:8): 1) Widespread adoption of stable coins could have implications for the role of central banks and monetary policy. 2) The central bank's approach to implementing monetary policy may be complicated to the extent that bank's participation in short term funding markets is affected. Reference is made to open economies and their susceptibility to a payments system impacted by digital currencies that are controlled by private actors - in which case it is highlighted that Sweden, along with countries like Australia, New Zealand, Canada and Norway, fall within a category of countries - a group of small open economies with floating exchange rates and inflation targets which experience relatively similar challenges and problems (Ingves, 2019: 2). It is further added: - Through free capital movement, low real interest rates have been imported, and a downward pressure on inflation, generated through processes such as globalization.

Questions that have been brought to light, center round whether central banks considering the issue of digital currencies should also assign interest rates to such currencies - as well as conditions and factors which would impact such currencies. Would those rates be more flexible and volatile than the previous floating exchange and inflation targeting rates? Why should governments back stable coins which have the potential to trigger risks of systemic nature, relevance and importance where there were options to support their central banks with much needed stability? Why should governments back private actors engaged in crypto assets and global stable coins' issue where regulatory, legal uncertainty, sound governance and public policy issues - amongst several other challenges still needed to be resolved? Why not render support to, and consolidate on the measures, mechanisms and existing mechanisms available to central banks? Governments can be criticized for engaging in purely politically motivated and political interests where regulatory safeguards appear to be overlooked as a means of endorsing certain actors which may ultimately benefit their political interests. Certain actors, by virtue of their national values, as well as their significance, relevance, and impact on stock markets, may be accorded preferential treatment - a kind of "too big to fail institution ". However, providing assistance and support to prevent a systemic failure does not necessarily infer that license is permitted to carry on with unregulated activities. This is precisely why moral hazard issues arise - sometimes politically motivated interests may end up undermining central bank stability mandates.

Which is why the engagement of accommodative unconventional and conventional monetary policies does not necessarily undermine central bank independence. Sometimes asset backed government programs do not compromise independence - rather it is the support of governments for unregulated untested ventures which have potentially devastating systemic consequences that poses serious matters of concern. It is welcomed that the Financial Stability Board is currently engaged in initiatives aimed at considering the regulatory issues of stable coins. In accentuating what sets Libra apart from other stable coins, Brainard (2019: 5) states that "the issuance of a private digital currency opaquely tied to a basket of sovereign currencies, through an active user network representing more than a third of the global population " necessitated the responsibility of addressing fundamental sets of legal and regulatory challenges before initial payment could be facilitated.

As a means of addressing public policy challenges, Beau (2019: 4) proposes the following responses: 1) Ignoring crypto assets - however this in his view, is not recommended on the basis of risks presented- more so in the case of stable coins 2) Banning crypto assets;
3) Promoting innovations with the potential to change the payment services market, namely establishing appropriate regulations that make it possible to reconcile the following two fundamentals: reconciling i) Risks already highlighted. ii) Preserving the potential for technological innovation offered by crypto assets.

Hence financial stability concerns constitute just one aspect to crypto assets.

The innovative possibilities - as well as those of distributed ledger technologies constitute benefits which can be harnessed to enhance digital possibilities of the Fourth Industrial Revolution.
Such benefits are as follows (Beau, 2019: 2,3)

- Block chain technology and more broadly, the distributed ledger technologies (DLT), could help address the market's needs and demands - particularly demand for quick and safe cross border payment solutions which are available 24-7

- DLT (distributed ledger technologies) could help remedy the current limits of the existing wholesale market infrastructures

- Crypto assets undergoing technical and economical trials bring about not only opportunities to improve payment systems, but also material risks which on the contrary, might weaken them, if not addressed.

Forecasting Techniques as a Means of Mitigating Uncertainties: Artificial Intelligence and Block chain Technologies

The use of machine learning techniques as a means of predicting bank distress in the United Kingdom, is highlighted by Treitel, H.and Suss .J., (2019, in their paper “Predicting Bank Distress in the UK with Machine Learning.”[1]

[1] Treitel.,H. and Suss .J, (2019). “Predicting Bank Distress in the UK with Machine Learning” Bank of England Staff Working Paper No 831

In their analysis, they compare and contrast classic linear regression techniques with modern machine learning approaches that are able to "capture complex non-linearities and interactions." They find that the random forest algorithm "significantly and substantively outperforms other models" when utilizing the AUC and Brier Score as performance metrics (Treitel and Suss, 2019).

Other findings are as follows (2019:3,4):

- In justifying their argument that conventional approaches, such as logistic regression models, are unable to account for complex interactions and non-linearities, thereby tending to perform worse than their more flexible machine learning counterparts, they compare pooled logistic regression with a linear random effects model, the k nearest neigbours (KNN) algorithm, two classification tree ensembles (random forest and boosting), and a support vector machine (SVM).
- In order to measure performance, they estimate out-of-sample predicted probabilities using a unique cross validation design that accounts for various potential sources of bias - repeating the entire cross validation exercise ten times to account for the variability that arises due to the specific initial random split performed.

- Even though they find that the random forest algorithm significantly outperforms the other approaches examined in terms of the area under the ROC curve (AUC) and Brier score, the cost benefit analysis of implementation is also highlighted in the sense that "the performance advantage of the random forest algorithm comes with a transparency cost relative to the pooled logit model which, depending on the requirements of regulators, could outweigh the benefits."

They further, conclude that that lagged macroeconomic variables are very important for predicting distress and that for the random forest, a measure of average real UK earnings constitutes the single most important variable – the average earnings, in contrast, not being as important.[2]

Conclusion

Important lessons which were drawn from the most recent GFC - notably, the growing need for accommodative policies (unconventional and conventional) to facilitate appropriate responses - given limited monetary policy spaces, the emergence, rise and evolution of private actors and their implications for monetary policies and financial stability. Unregulated and without legal certainty, there are potential causes for concerns in respect of the global adoption of stable coins - even though when harnessed and regulated appropriately, these could provide much needed innovative changes and benefits. Central banks should still assume vital monetary policy setting functions - even amidst uncertainties relating to how central bank digital currencies should be issued - particularly in respect of which and whether interest rates should be attached to these. Rehn states that a key lesson of monetary policy of the last ten years is

[2] "relatively speaking, for the pooled logit model."

that timely action is essential to avoid the zero lower bound - as well as an extended period of extremely low levels of inflation. The incorporation of innovative forecasting techniques with monetary policy setting may greatly mitigate current uncertainties linked to particular accommodative monetary policies. Contrasted to the policy of leaning against the wind, such techniques - along with more relevant, applicable, tried and tested techniques, and up to date indices, could generate greater confidence in the data being used - as well as expectation and inflation levels.

Incorporating Uncertainty in Forward Looking Monetary Policy Tools

"Because it takes time before monetary policy has its full impact on inflation, monetary policy is guided by forecasts for the economy and inflation. In addition, the Riksbank publishes, among other things, its own assessment of the likely future path for the repo rate and the degree of uncertainty surrounding that path. This interest rate path "is a forecast, not a promise". In connection with every monetary policy decision, "the Executive Board makes an assessment of the repo-rate path needed for monetary policy to be well-balanced. A well-balanced monetary policy is normally a question of finding an appropriate balance between stabilizing inflation around the inflation target and stabilizing the real economy"(Goodfriend and King, 2015:21). The journey since the most recent GFC has highlighted the need for several considerations, including, namely: the need to consider pro cyclical effects – as well as business and financial cycle risks, risks attributed to the changing financial environment – in form of emerging technological risks – and particularly unregulated blockchain technologies and platforms through which crypto currency markets are currently dependent on – as well as protectionist risks.

References

Agénor, P-R, E Kharroubi, L Gambacorta, G Lombardo and L A Pereira da Silva (2017): "The international dimensions of macroprudential policies", BIS Working Papers, no 643, June.

Amiti, M and D Weinstein (2011): "Exports and financial shocks", The Quarterly Journal of Economics, vol 126, no 4, pp 1841–77.

Armantier, O., Kosar, G., Pomerantz,R., Skandalis, D., Smith, K., Topa, G., & Van der Klaauw, W. (2021). How economic crises affect inflation beliefs: Evidence from the Covid-19 pandemic. Journal of Economic Behavior & Organization, 189, 443-469.-Victor, V., Karakunnel, J. J., Loganathan, S., & Meyer, D. F. (2021).

Avdjiev, S, L Gambacorta, L Goldberg and S Schiaffi (2017a). "The Shifting Drivers of Global Liquidity", BIS Working Papers, no 644, June.

Avdjiev, S, R McCauley and P McGuire (2012). "Rapid Credit Growth and International Credit: Challenges for Asia", BIS Working Papers, no 377, April. Bank for International Settlements (2019). G7 Working Group on Stable Coins, Committee on Payments and Markets Infrastructures "Investigating the Impact of Global Stable Coins October 2019 BIS (2019).

Bank of England, (2021). "Inflation Now and Then", Remarks given by Jonathan Haskel, External Member of the Monetary Policy Committee, Bank of England, and Imperial College Business School, Imperial College, London Adam Smith Business School, University of Glasgow 23 November 2021

Borio, C., Drehmann, M., and Xia, D, "Predicting Recessions: Financial Cycle versus term spread" BIS Working Papers No 818 October 2019

Boivin, Jean, Michael T. Kiley, and Frederic S. Mishkin (2010). "How Has the Monetary Transmission Mechanism Evolved over Time?" in Benjamin M. Friedman and Michael Woodford, eds., Handbook of Monetary Economics, vol. 3. Amsterdam: Elsevier, pp. 369–422

Bullard, James (2018). "The Case of the Disappearing Phillips Curve," Speech delivered at the 2018 ECB Forum on Central Banking, Sintra, Portugal, June 19

Beau, D. (2019)."The Role of Cryptoassets in the Payment System " First deputy governor of the Bank of France at the Official Monetary and Financial Institutions Forum (OMFIF) Meeting, London, 15 October 2019

Bloomberg (2019). "Britain's Inverted Yield Curve Is Nothing Like America's" 15 August 2019 https://www.bloomberg.com/opinion/articles/2019-08-16/britain-s-yield-curve-is-nothing-likeamerica-s?srnd=premium-europe

Bloomberg (2019). "U.K.'s Johnson to Double Down on Brexit in Germany, France Trip" https://www.bloomberg.com/news/articles/2019-08-17/u-k-s-johnson-to-double-down-on-brexitin-germany-france-trip?srnd=premium-europe

Brainard, L.(2019) ."Digital Currencies, Stable Coins, and the Evolving Payments Landscape " Remarks at the Future of Money in the Digital Age, Sponsored by the Peterson Institute for International Economics and Princeton University's Bendheim Center for Finance,Washington D.C October 16 2019

CGFS-FSB, (2017). "FinTech credit: Market structure, business models and financial stability implications", May 2017. Committee on the Global Financial System, "Unconventional Monetary Policy Tools: A Cross Country Analysis" CGFS Papers No 63 October 2019, Bank for International Settlements

Centre for Economic Policy Research (2022). "Rising Inflation is Worrisome: But Not for the Reasons You Think" D'Acunto, F. and Weber, M., January 4 2022

Coroneo, L. and S Pastorello (2017). “European Spreads at the Interest Rate Lower Bound” unpublished manuscript CPMI, (2017). “Distributed ledger technology in payment, clearing and settlement – an analytical framework”, February 2017.

Federal Reserve (2024). “Federal Reserve Board and Federal Open Market Committee Release Economic Projections from the March 19-20 FOMC Meeting”
Accessed via
https://www.federalreserve.gov/newsevents/pressreleases/monetary20240320b.htm

Federal Reserve (2024). “Federal Reserve Issues FOMC Statement”

Federal Reserve Bank of San Francisco, (2022). “This Time is Different Because We Are” Remarks by Mary C Daly, President of the Federal Reserve Bank of San Francisco, Los Angeles, CA, February 23, 2022

Fendel, R., N Mai, and O Mohr (2018). “Recession probabilities for the Eurozone at the Zero Lower Bound”, WHU Working Paper Series in Economics, no 18/04

Financial Stability Board (2019). "FSB Sets Out Work to Consider Regulatory Issues of Stable Coins" 18th October 2019 https://www.FSB.org/2019/ 10/fsb-sets-out-work-to-considerregulatory-issues-of-stable-coins/

Financial Stability Board (2018). “ Crypto Asset Markets: Potential Channels for Future Stability Implications, October 2018

Financial Times (2024). “U.K. Inflation Hits Lowest Rate Since 2021 at 3.4%”
20th April 2024. Accessed at
https://www.ft.com/content/9f31261e-7d10-4963-b652-9b96822822bd

Financial Times (2023). “Breaking Stormont Impasse Requires Action by London, DUP warns” April 18th 2023

Financial Times (2023). “EU Will Miss its Green Hydrogen Targets, Executives Say” May 11 2023

Financial Times (2023). “ Steelmakers Explore Hydrogen to Power Energy Hungry Processes” July 15 2022

Financial Times (2023). “US and EU Launch New talks on Critical Minerals Trade in Green Tech Race” March 11 2023

Financial Times (2022). “Green Hydrogen Will be Price Competitive by 2030” July 15 2022

Forbes, K, D Reinhardt and T Wieladek (2016): “The spillovers, interactions, and (un)intended consequences of monetary and regulatory policies”, Journal of Monetary Economics, vol 85, pp 1–22.

Goodfriend M and M King (2015).“The Evolution of Monetary Policy: “Review of the Riksbank’s Monetary Policy 2010-2015” at page 21 ISSN 1653-0942 978-91-87541-39-1 Riksdagstryckeriet, Stockholm, 2015

Hofmann, B, I Shim and H S Shin (2016): “Sovereign yields and the risk-taking channel of currency appreciation”, BIS Working Papers, no 538, revised May 2017.

Korstanje, M. E., & George, B. (2021). “From a recession to the COVID-19 pandemic: Inflation–Unemployment Comparison between the UK and India”. Economies, 9(2), 73. Mobility and globalization in the aftermath of COVID-19: Emerging new geographies in a locked world. Basingstoke: Palgrave Macmillan.

Markets Committee, MC Compendium “Monetary Policy Frameworks and Central Bank Market Operations” October 2019, Bank for International Settlements

Markets Committee, “Large Central Bank Balance Sheets and Market Functioning” Report Prepared by Study Group Chaired by Lorie Logan (Fed Reserve Bank of New York) and Ulrich Bindsell (ECB), October 2019, Bank for International Settlements Publications

New York Times (2019). Economic Trouble Signs Hang Over Trump’s Trade War August 15 https://www.nytimes.com/2019/08/13/business/economy/donald-trump-jobsc

Quarles, R. K. (2019). ” The Financial Stability Board at 10 years : Looking Back and Looking Ahead”, Building a Positive Future for Europe, Vice Chair of the Board of Governors of the Federal Reserve System, 3 October 2019, Brussels

Rehn, O. (2019). "On Conventional and Unconventional Monetary Policies" http://www.bis.org/review/ r191011b.htm

Shin, S. H (2015). “Exchange rates and the transmission of global liquidity”, speech at the Bank of Korea– IMF conference on Leverage in Asia: lessons from the past, what’s new now, and where to watch out for, Seoul, 11 December 9999

Soederberg (2019). "The e krone now and in the future " Economic Commentaries No 8 Sveriges Riksbank

Svensson, Lars E.O. (2017). "Cost-benefit analysis of leaning against the wind " Journal of Monetary Economics 90, pp 193-213

Sveriges Riksbank (2017). "The Riksbank's e-krona project", Report 1 Sept 2017

Sveriges Riksbank (2018a). "Account of Monetary Policy 2018", Sveriges Riksbank Sveriges Riksbank (2018b), The Riksbank's e-krona project ", Report 2, Oct 2018
Sveriges Riksdag (2018). "Evaluation of monetary policy for the period 2016-22018, Committee on Finance Report 2018/ 19: FiU24

Randal K Quarles, (2019). ” The Financial Stability Board at 10 years : Looking Back and Looking Ahead”, Building a Positive Future for Europe, Vice Chair of the Board of Governors of the Federal Reserve System, 3 October 2019, Brussels

Rachel, Lukasz, and Thomas D. Smith (2017)."Are Low Real Interest Rates Here to Stay?" (PDF) International Journal of Central Banking, vol. 13 (September), pp. 1–42 RUSI (2019). “Data Analytics and Algorithmic Bias in Policing” The Royal United Services Institute (RUSI) Report 16 September 2019

Restoy, F.(2019). “What is Going On, and Where Are the Challenges?” Chairman, Financial Stability Institute, Bank for International Settlements, Washington DC, 16 October 2019

Rosengren, Eric S. (2015). "Changing Economic Relationships: Implications for monetary policy and simple monetary policy rules " Speech on 16 April, Federal Reserve Bank of Boston WSJ, (2019). “ECB Follows Fed in Signaling Fresh Stimulus” https://www.wsj.com/articles/ecb-officials-signal-intention-to-launch-fresh-stimulus11562847288?mod=itp_wsj&mod=&mod=djemITP_h www.wsj.com/articles/ecb-to-launch-new-stimulus-measures-11551963228?mod=article_inline

The Economist (2019). “Masters of the Universe: The Rise of Financial Machines” https://www.economist.com/leaders/2019/10/03/the-rise-of-the-financial-machines

WSJ, (2019). “ECB Signals Possible Rate Cut Prompting Trump Tweets” https://www.wsj.com/articles/ecb-signals-possible-rate-cut-bond-buying-extension11560849634?mod=article_inline WSJ (2019). “Computers Can Now Bluff Like a Poker Champ Better Actually” https://www.wsj.com/articles/computers-can-now-bluff-like-a-poker-champ-better-actually11562873541?mod=cxrecs_join#cxrecs_s

WSJ, (2019). “Fed’s Powell Says Facebook’s Libra Raises “Serious Concerns” https://city.wsj.com/articles/2f104ab0-3105-4111-94fe-7498cd6f4694

WSJ (2019). “Computers Can Now Bluff Like a Poker Champ Better Actually” https://www.wsj.com/articles/computers-can-now-bluff-like-a-poker-champ-better-actually11562873541?mod=cxrecs_join#cxrecs_s

White House.Gov (2023). “Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act’s Investments in Clean Energy and Climate Action” January 2023 version 2

Yellen, Janet (2015)."Inflation Dynamics and Monetary Policy," speech delivered at the Philip Gamble Memorial Lecture, University of Massachusetts, Amherst, September 24