CHAPTER 7

COVID-19: The Fiscal and Monetary Responses to a Global Pandemic

7.1 Faster Than a Speeding Train: The "Light Switch" Recession

The story is still (sadly) fresh in our minds, but let's start with a brief recap. A fast-spreading global pandemic (COVID-19, a type of respiratory illness) started in late 2019 in a large, populous country that is also a key link for the global economy, the People's Republic of China. From there, it reached the whole planet in a few months. On January 30, 2020, the World Health Organization declared COVID-19 to be a public health emergency and, on March 11, upgraded the threat to "pandemic" (e.g., a disease outbreak that spreads across countries or continents) status.

Massive and speedy policy responses to deal with a new and contagious disease of uncertain mortality levels and for which no vaccine was initially available were taken worldwide, first and foremost a comprehensive government-mandated curtailing of physical interactions (e.g., "lock-downs"), which inevitably led to very significant economic effects and to

L. Vinhas de Souza, *A Century of Global Economic Crises*,
https://doi.org/10.1007/978-3-031-53460-7_7

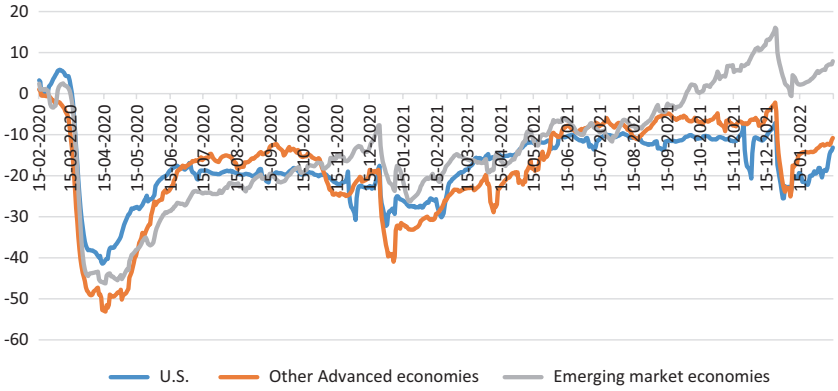

Fig. 7.1 Google mobility data (index)
(The mobility index is a simple average of Google's grocery, workplace, retail, recreation, and transportation mobility. Other advanced economies are Canada, France, Germany, Italy, Japan, Spain and the UK, while emerging markets are Argentina, Brazil, Chile, Colombia, Hong Kong, Korea, Indonesia, Malaysia, Philippines, Singapore, Taiwan and Thailand. Series ends on March 26, 2022. Source: Google, FED. 0 is the pre-pandemic level of mobility)

a remarkable and global reduction of the levels of human mobility, which, by some measures, *more than halved* in about a month (Fig. 7.1).[1]

The speed through which this policy shock spread was astounding: between early February 2020 and early April, 2020, the global economy experienced *double digit contractions in a matter of a few weeks* (Fig. 7.2).

[1] Bearing in mind the elevated uncertainty at the time they were introduced, a proper evaluation of the effectiveness of the level of strictness of those lockdowns, comparing not only their stated objectives (e.g., to reduce the loss of human lives) but also assessing the relative costs they imposed toward that aim (in GDP, education losses, unemployment, and, last but not least, inflation and disruption of supply chains, etc.) is still to be made. Given that there are intuitive empirical counterfactuals readily available (e.g., the different types and levels of lockdowns through time within the same country and between countries, say, the US and Brazil or India, Sweden and the EU/euro area, or Florida and New York), this seems a complex but worthwhile and achievable analytical undertaking (of course, properly taking into account differences in terms of overall level of development, comprehensiveness of health system, demographics—notably the share of elderly in total population, etc.: one may here refer to the saga concerning Herby, J., Jonung, L. and Hanke, S. (2022), "A Literature Review and Meta-Analysis of the Effects of Lockdowns on Covid-19 Mortality—II", version two, and Herby, J., Jonung, L. and Hanke, S. (2022), "A Literature Review and Meta-Analysis of the Effects of Lockdowns on Covid-19 Mortality", version one).

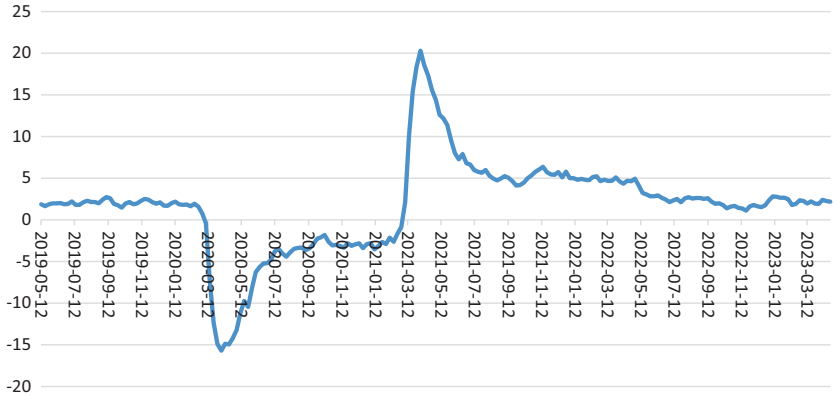

Fig. 7.2 "Weekly Tracker", GDP growth proxy. (See source and the explanation of how this series is constructed at OECD, Tracking GDP growth in real time, Paris. Source: OECD)

This truly was a global "light switch" recession, as would naturally be the case given the nature of the hurried-up (not to say panicked) and similar policy actions that were undertaken around the globe: in total, the global economy contracted by -2.8% in 2020 (-4.5% in Advanced economies, while Emerging markets suffered a much shallower contraction, at -1.7%, even with the large stresses faced by the Chinese economy). Some of those actions (the lockdowns and the related fiscal/monetary support) will also have medium-term, direct implications concerning the global inflationary spike that will be examined in Chap. 8.

This made the COVID recession more synchronized (and sharper) than the GFC itself—albeit far briefer (Fig. 7.3), as it was a shock shared by both Developed and Developing countries and largely simultaneously (an inherent implication of it having started in a Developing country, and a particularly central one from the point of view of the global economy, and of the type of policy responses).

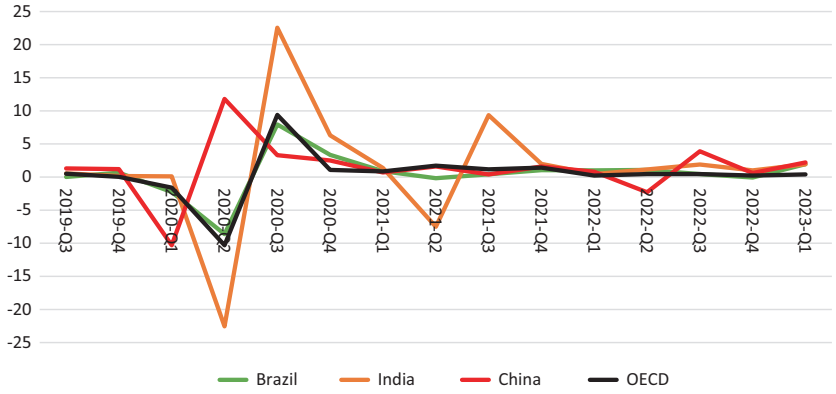

Fig. 7.3 Quarterly GDP in selected economies (percentage change, previous period). (Source: OECD)

7.2 The Policy Reaction: There We Go Again (But Now with Even More Fiscal Support)

The situation described above had significant and clear implications in terms of both price dynamics and the stability of the financial sector, the core mandates of a monetary authority, and therefore when the global pandemic hit, those institutions duly acted, applying measures similar to the ones they used during the GFC (which, as a reminder, can be largely described as an endogenous financial shock): however, as this time the global economy faced what can be best described as an *exogenous real shock*, the size and comprehensiveness of the fiscal measures was much larger than before (even if in many cases tilted toward guarantees, see Fig. 7.4). This *a priori* justifiable policy set would later complicate further the medium-term challenges monetary authorities were already facing.[2]

Following the structure used earlier in this book, it will now zoom in on the measures deployed by some of the largest economies in the world.

[2] Beyond the economic and financial aspects, the technological and medical policy response was also historically unique: already by December 2020 the first effective vaccines had been developed, and by the spring of 2021 over a billion doses had been administered (this figure had reached **13 billion** by the fall of 2022: see Mathieu, E., Ritchie, H., Rodés-Guirao, L., Appel, C., Giattino, C., Hasell, J., Macdonald, B., Dattani, S., Beltekian, D., Ortiz-Ospina, E. and Roser, M. (2020), "Coronavirus Pandemic (COVID-19)", published online at OurWorldInData.org.

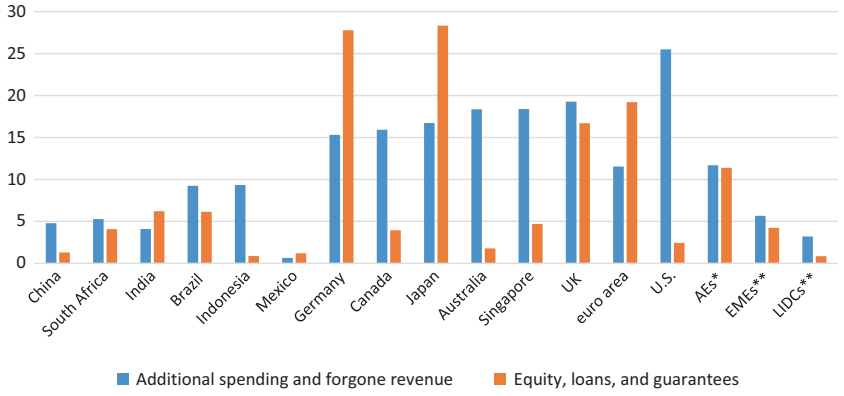

Fig. 7.4 Scale of fiscal measures in response to the Pandemic (% of GDP). (The IMF has a very comprehensive policy tracker of the economic measures applied by each individual country during the Pandemic: see, IMF, Policy Responses to COVID-19, Washington, DC. Source: IMF, data as of October 2021, modified by the author.*AEs: Advanced economies; **EMEs: Emerging market economies; ***LIDCs: Low income Developing countries)

7.2.1 The US Policy Response

The US Fed had started a rather slow "normalization" of its policies already in late 2015. There were eight small but successive interest rate increases of 0.25% between December 2016 and December 2018 (a 0.25% increase had been decided already in December 2015). The reduction of the size of its balance sheet was even slower, as it stayed around its GFC high mark of $4.4 trillion from mid-2014 till early 2018, picking up some speed from that point onward and thereby falling to $3.7 trillion (or over four times the pre-GFC size) by the fall of 2019. However, between 2019 and 2020, this partial "normalization" was not only fully reversed, but these policy levers were pushed far beyond their GFC levels: CPI prices halved between 2018 and 2020, falling to slight more than 1%, but Fed policy rates had reached zero by March 2020, and the Fed balance sheet was back to $4.4 trillion (it would surpass $7 trillion by the summer of the same year, and reach almost $9 trillion by March 2022, *or over twice its GFC high mark and an order of magnitude higher than the pre-GFC one*).

The Fed policy actions can be grouped into four broad categories. First, the tried and tested interest rates and balance sheet operations; second,

measures to provide liquidity and funding to money markets (including outside the US, via the reinforcement of the swap lines created during the GFC); third, facilities to support the flow of credit to multiple public and private economic agents and fourth, temporary regulatory and supervisory relief to incentivize banks to continue issuing credit.[3] This blueprint would be largely followed worldwide.

While several of these Fed actions effectively revived facilities created during the GFC, expanding and tweaking those (for instance, in its renewed QE operations, it now purchased securities of different maturities), several tools were new, and went considerably beyond the scope of the previous frameworks, by, for instance, purchasing loans of nonfinancial businesses and the debt of US federal states and municipalities. Also building on the Fed's GFC experience, many of these facilities were structured as SPVs or LLCs, allowing the pooling of Fed and Treasury[4] funds (as was the case with the "Maiden Lane" LLC described earlier), while avoiding restrictions on the purchase of assets that are ineligible under the Federal Reserve Act, such as corporate debt.[5]

As the current Fed Chairman Jerome Powell said in 2020, "the Fed has lending powers, not spending powers".[6] Therefore, upon initiative of the US Government and Congress, not only the monetary, but also the fiscal policy response in the US was truly unprecedented in scale, scope and speed: over **$5.1 trillion in fiscal support was provided to the US economy, or a staggering 25% of its GDP** (Table 7.1). As a comparator, the amount of fiscal support during the GFC (i.e., the Troubled Asset Relief Program—TARP—of October 2008, and the American Recovery and Reinvestment Act—ARRA—of February 2009) altogether provided federal economic stimulus totaling "just" about $1 trillion, or around 7%

[3] Clarida, R., Duygan-Bump, B. and Scotti, C. (2021), "The COVID-19 Crisis and the Federal Reserve's Policy Response", Finance and Economics Discussion Series 20,221–035, Federal Reserve Board, Washington, DC.

[4] The 2020 CARES act appropriated up to $500 billion to the US Department of Treasury's Exchange Stabilization Fund (ESF) to support several of the emergency lending facilities created by the Fed in response to the COVID-19 pandemic.

[5] Labonte, M. (2021), "The Federal Reserve's Response to COVID-19: Policy Issues", Congressional Research Service, R46411, Washington, DC.

[6] Powell, J. (2020) "Current Economic Issues", Federal Reserve Board, Washington, DC. Jerome Powell, incidentally, renewed the pre-Burns tradition of non-economist heading the Fed (he is a lawyer, just like, incidentally, Christine Lagarde, the current head of the ECB).

Table 7.1 Pandemic-related fiscal support in the US

Pandemic-related bills	*Date of enactment*	*Total ($ billion)*
Coronavirus Preparedness and Response Supplemental Appropriations Act (CPRSAA)	March 6,2020	8.00
The Families First Coronavirus Response Act (FFCRA)	March 18,2020	192.00
The Coronavirus Aid, Relief, and Economic Security Act (CARES)	March 27,2020	1721.00
The Paycheck Protection Program and Health Care Enhancement Act (PPHCEA)	April 24,2020	483.00
Coronavirus Response and Relief Supplemental Appropriations Act (Response and Relief, or CRRSAA), a component of the Consolidated Appropriations Act	December 27,2020	868.00
The American Rescue Plan Act (ARPA)	March 6,2021	1844.00
Total		**5116.00**

Source: CRS (2021), "The COVID-19-Related Fiscal Response: Recent Actions and Future Options", CRS Insight IN11734

of US GDP, and the average COVID-19 fiscal response for Advanced economies in Fig. 7.4 is 11.7% of GDP.[7]

7.2.2 The Policy Response of a (Less Fragmented) Euro Area

The ECB (and the EU) reacted in a much faster, bigger and more coordinated way than to the previous crisis, to no small measure because of the several institutional reforms implemented to address the shortcomings of the euro area described in Sect. 6.4 (and the sheer experience acquired in addressing a deep crisis by all European institutions involved). Also, by far and large, the fragmentation pressures that were the hallmark of the euro area part of the GFC were now absent.

On the fiscal side, the EU created several temporary fiscal facilities, the largest of which was the "Next Generation EU", or NGEU, instrument, worth € 750 billion. The bulk of NGEU funds (€ 724 billion) were for financing the so-called Recovery and Resilience Facility (RRF), a

[7] CRS (2008) "Cost Estimate - Economic Stimulus Act of 2008", Washington, DC, and CRS (2014), "Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output in 2014" Washington, DC.

framework designed to finance investments (and some structural reforms) identified at each individual EU member state, via so-called National Recovery and Resilience Plans, or RRPs: € 386 billion of the RRF funds were in the form of loans, and € 338 billion as grants.[8] In addition, the EU created a € 100 billion fund to finance short-term work schemes under the so-called Support to Mitigate Unemployment Risks (leading to the imaginative acronym of SURE). The ESM also created a Pandemic Crisis Support (PCS) instrument, with a maximum envelope of € 240 billion in loans (all euro area countries were eligible for this for amounts up to 2% of their respective GDPs). Finally, the European Investment Bank (or EIB, the EU's development bank, somewhat akin to the World Bank, but with the crucial difference that it overwhelmingly operates in the Developed economies of the EU) set up a € 25 billion Pan-European Guarantee Fund (EGF) to support EU companies affected by the pandemic. These instruments together amount to around € 1.2 trillion (however, while the NGEU, SURE and EIB facilities where effectively all fully used, there was no demand for the ESM's PCS funds, which brings the actual amount of EU-level fiscal support down to around € 1 trillion).

In total, and besides the ECB, the EU collectively (so, EU plus EU member states, or EU MS) mobilized about € 3.4 trillion. This is equivalent to almost 25% of the EU's GDP, and was the largest (and fastest) EU response to a crisis ever.[9] However, these € 3.4 trillion were mostly *liquidity measures* without a direct fiscal impact, and were also very heterogeneously distributed between EU MS (naturally, MS with more "fiscal space" like Germany could afford both more stimulus in general and more stimulus of a fiscal nature). Additionally, a very significant flexibilization of several EU policy frameworks was adopted (notably of the SGP, whose application of its excessive deficit procedure component was effectively suspended, and remains so to this date), to allow the individual EU member states to pursue both stimulus and liquidity measures. For the euro area, the IMF estimates an actual net fiscal impulse of around 11.5% of

[8] In another difference in relation to the US, the actual distribution of NGEU funds during the pandemic shocks was actually quite limited (they can be used until 2026).

[9] As a comparison, the EU fiscal response to the euro area sovereign crisis, the so-called European Economic Recovery Plan (EERP) was estimated at about 1.8% of EU GDP (or up to 4%, if adding the estimated effects of automatic stabilizers—that is, increases in spending and/or decreases in taxes when the economy slows down that happen without the need for discretionary policy action). Support to bank sectors (mostly via guarantees from EU member states) would add another 12.6% to this figure.

GDP (an impressive figure, but two and half times smaller than in the US), plus another 19% of GDP in guarantees. This fiscal impulse was not only smaller, but also considerably more targeted than in the US (no "check is in the mail" for individual households).

The ECB exceptional measures in response to the pandemic include the March 2022 expansion of its existing Asset Purchase Program and the launching of a Pandemic Emergency Purchase Program (PEPP) for both public and private sector securities, initially with a volume of € 750 billion but subsequently increased in two steps to € 1.85 trillion.[10] The ECB also continued to provide liquidity through additional LTROs, and in May 2020 it launched non-targeted so-called Pandemic Emergency Longer-Term Refinancing Operations (or PELTROs). Like the Fed, it also engaged in temporary regulatory and supervisory relief, by allowing financial institutions to operate with lower capital requirements, adding an estimated €120 billion to banks' CET1 capital that could be used to provide more loans to the private sector (the ECB also forced all euro area banks to suspend dividend payments and equity buybacks, to prevent these resources from being distributed to shareholders), and other macroprudential authorities across the euro area released or reduced an additional €20 billion via lower capital buffer requirements. Regarding the provision of euro liquidity to non-euro-area central banks, the ECB reactivated existing swap lines and repo arrangements and established new ones with non-euro-area central banks.[11]

7.3 The (Short-Term) Effectiveness of Policy Measures

GDP in the US and the euro area contracted by, respectively, -2.8 and -6.1% in 2020, but growth returned already by the next year (with increases of 6.0% and 5.3%): this macro trajectory picture is similar in other Developed economies. These massive (budget deficits reached 14% and 7% of GDP in those two economic areas in 2020, increasing by factors of 3 and 10, respectively) and fast measures were effective in not only cushioning the economic and social fallout of the pandemic and associated lockdown policies, but also in containing financial stresses: stress

[10] The PEPP was a temporary program, terminated in March 2022.

[11] Kok, C., Mongelli, F. and Hobelsberger, K. (2022), "A Tale of Three Crises: Synergies between ECB Tasks", ECB Occasional Paper n. 2022/305.

indicators duly went up, **but far off from 2007–2008 levels, and only briefly** (Fig. 7.5). The regulatory and institutional changes brought about by the previous crisis also helped to achieve this outcome.

These fast and large responses can also be observed in the balance sheet of the monetary authorities (Fig. 7.6): the speed and the scale in the

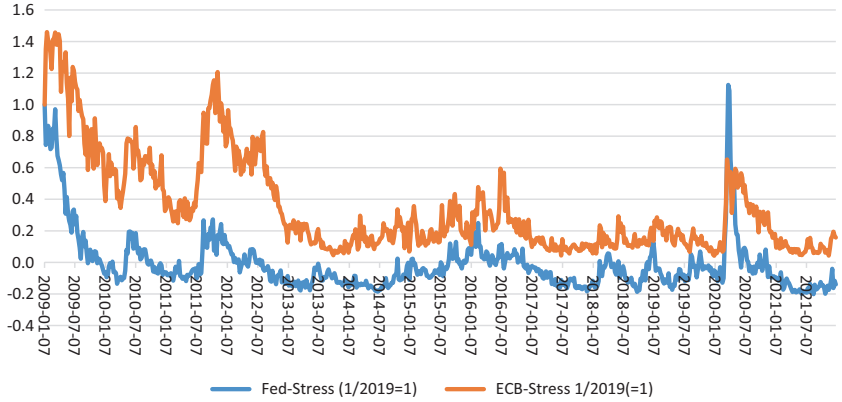

Fig. 7.5 Fed and ECB systemic stress indicators (January 2009 set to 1). (Sources: FRED and ECB)

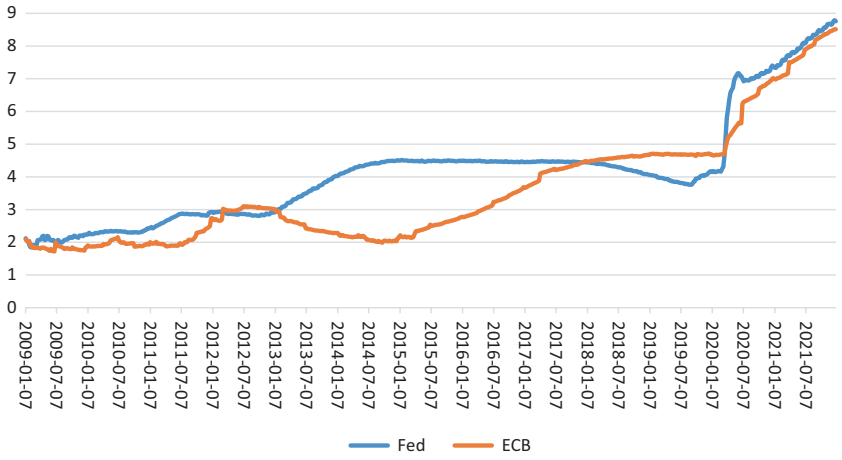

Fig. 7.6 Fed and ECB balance sheets ($ and € trillion). (Sources: FRED and ECB)

increases is strikingly similar for the Fed and the ECB (suggesting a much greater degree of coordination—even if informal—than before). As a result, by the end of 2021, the size of the Fed balance sheet to US GDP was around 38%, while in the euro area this was just shy of 70% (as a comparator, the balance sheet of the BoE almost doubled, from around £ 600 billion to around £ 1.1 trillion, while that of the BoJ grew by 30%, from ¥5.7 to ¥7.4 trillion, between January 2020 and March 2022).

So, from a short-term point of view, these policy measures achieved their stabilization objectives. However, distortions were *again* created that will lead to instability later on (see Chap. 8).

7.4 The Pandemic Policy Response in Developing Economies

How about the less developed economies? An analysis of the policy responses reveals (a) a much larger scale of support than in preceding crises, (b) a broad similarity with measures undertook in Developed economies (naturally bearing in mind specific constraints, like a more limited fiscal space and structural features, notably shallower financial markets) and (c) a high level of coordination between fiscal and monetary measures. By far and large those measures also achieved their intended aims and most countries (bar some low-income Developing economies, mostly in Africa) were largely spared the "sudden stop" of capital inflows episodes common to emerging markets in earlier moments of stress. This will be illustrated with the examples of two systemically important large emerging markets,[12] India and Brazil.

7.4.1 India

India imposed a nationwide lockdown on March 25, 2020, which lasted only until the end of May 2020 and was then lifted in a phased fashion. The country suffered a brief but severe economic contraction, with GDP estimated to have fallen by 24% in Q1 FY[13] 2021, and by 7.3% in FY 2020–2021 as a whole (the 2020 calendar year contraction was -5.8%, but

[12] "Emerging markets" is a higher-income category of Developing country, officially used by the IMF in its documents and analysis.

[13] FY stands for fiscal year, which in India starts on April 1 and ends on March 31 of the following year.

GDP in 2021 increased by over 9%). The policy response to the economic impact of both the pandemic and the subsequent brief lockdown was an effectively coordinated mix of fiscal, monetary, financial and regulatory measures.[14] Total fiscal stimulus was estimated by the IMF at about 4% of GDP (additional spending plus foregone revenue: this was smaller than the emerging markets average of 5.7% calculated by the IMF), with an additional 6.2% in guarantees (4.2% for emerging markets): the budget deficit reached almost 13% in 2020, and almost 10% in 2021 (from almost 8% in 2019).

The Reserve Bank of India (RBI, the country's central bank and a self-described "flexible inflation targeter")[15] cut its policy rate from 5.15% to 4%. Among other measures, the RBI lowered the banks' reserve ratio to provide additional liquidity to the banking system, a measure worth about 0.7% of GDP, and LTROs-like operations worth a similar share of GDP were made, as were asset purchases of government securities in the secondary market amounting to 1.5% of GDP (or about 30% of all central government's total net market borrowings), and it also created special refinancing facilities for different market segments and institutions: in total, RBI support amounted to around 7% of India's GDP.[16] Similarly to other jurisdictions, the RBI also engaged in temporary "regulatory forbearance" measures.

7.4.2 Brazil

Brazil, another inflation targeter (see Annex 7.A), by far and large did not impose lockdown measures at national level (albeit some federal states and even municipalities imposed some localized measures, of different types, strictness and duration). The first and second quarters of 2020 saw GDP contractions of around -10%,[17] but the total year average was -3.3%, and

[14] Chakraborty, L. and Harikrishnan, S. (2022), "COVID-19 and Fiscal-Monetary Policy Coordination: Empirical Evidence from India", Levy Economics Institute, Working Papers Series 1002.

[15] Reserve Bank of India, "Monetary and Fiscal Policy Interactions in the Wake of the Pandemic", BIS Papers n. 122: 149–157.

[16] Mohan, R. (2021), "The Response of the Reserve Bank of India to Covid-19: Do whatever it Takes", Centre for Social and Economic Progress, Working Paper 8, New Delhi.

[17] Morceiro, P., Tessarin, M. and Pereira, H. (2022), "Políticas Macroeconômicas Adotadas no Brasil em Resposta à Pandemia de COVID-19 em 2020", Textos de Economia, Florianópolis, 25(1):1–23, Universidade Federal de Santa Catarina.

the country grew by 5% the following year. Total fiscal stimulus was estimated by the IMF at about 9.3% of GDP (almost double the emerging markets' average), with an additional 6.2% in guarantees. The budget deficit reached 13.3% of GDP in 2020 (over twice the 2019 figure) but fell back to around 4% in 2021. The most noticeable element in the Brazilian fiscal response were the large direct income transfer programs, worth over 5% of GDP and which reached an estimated 66 million people: 40% of households, representing over 50% of the Brazilian population, benefited from some sort of assistance.[18]

Temporary waivers from the legal provisions concerning the recently adopted fiscal rules framework and the CBB mandate were approved (including the capacity for the CBB to buy public and private bonds in secondary markets: this in the end was not necessary, as the *signaling* was enough to help calm markets, similarly to the case of the ECB's OMT),[19] allowing the monetary authority to provide liquidity support and capital relief to the banking sector in more flexible ways (liquidity and capital relief measures totaled around 17% of GDP *each*). The CBB also lowered its policy rate from 4.5% to 2% between January and August 2020.

However, while the measures were similar in nature, Figs. 7.7 and 7.8 show that the CBB adjusted both the size of its balance and its policy rate in a more flexible way than the RBI, speedily adjusting downward the size of its balance sheet when markets stabilized, and quickly increasing interest rates as inflation started going up in early 2021.

Albeit this is a largely encouraging story about emerging markets (where, additionally, newly flexible exchange rates adjusted downward—reflecting the looser fiscal and monetary policies—and thereby supporting external sustainability), lower income Developing countries showed a notably smaller capacity for implement polices to cushion the pandemic shock: while Developed economies managed to provided fiscal support worth 11.7% of GDP (plus 11.4%% in guarantees), and "emerging markets" 5.7% and 4.2%, respectively, lower-income Developing countries could only muster on average 3.2% of fiscal support (around a quarter of the Developed countries figure) and an order of magnitude less in guarantees (0.9%). Additionally, some would experience "sudden stops" and

[18] Comisión Económica para América Latina y el Caribe, (2021), "Preliminary Overview of the Economies of Latin America and the Caribbean 2020", Santiago.

[19] Nechio, F. and Fernandes, B. "Brazil: Covid-19 and the Road to Recovery", BIS Papers n. 122: 39–55.

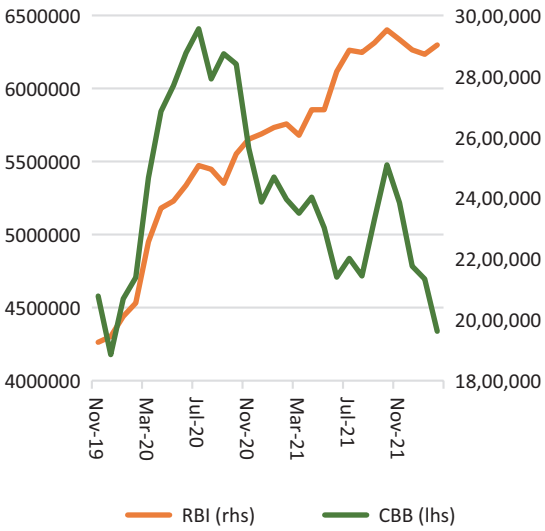

Fig. 7.7 Balance sheet, RBI and CBB (₹ & R$)

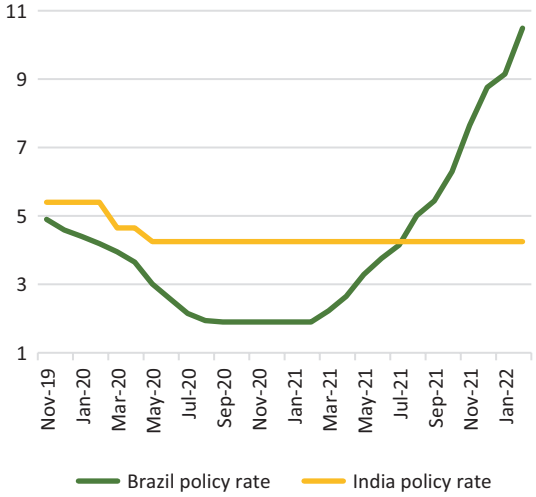

Fig. 7.8 Policy rates, RBI and CBB. (Sources: RBI, CBB and FRED)

external sustainability crises (but this time, those crises were fundamentals-driven, not expectations-driven, ones).

Another less positive point is that the policies used during the pandemic sowed the seeds of a worldwide inflationary spike not seen since the "Great Inflation" 40 years before: this will be addressed in Chap. 8.

Annex 7.A: What Is Inflation Targeting after All?

Inflation targeting is currently the monetary framework of choice for central banks around the world, easily replacing the alternative of German-style monetary targeting (largely due to the increased unreliability of the relation between monetary aggregates and inflation, linked to financial innovation and changes in economic agents' behavior). Inflation targeting (or, in Svensson 1996[20] words, inflation *forecast* targeting) is a monetary policy framework with an explicit commitment to price stability as a goal, providing an anchor for inflation expectations while making the central bank more transparent and accountable. Following Leiderman and Svensson (1995),[21] inflation *forecast* targeting regimes have as essential characteristics (a) an explicit quantitative inflation target (in the form of either single points or bands, symmetric or asymmetric) for a specific price measure at a specific date in the future (b) no intermediate monetary aggregate or exchange rate target (the exchange rate was a common one among Developing countries), (c) an explicit policy decision framework to achieve the stated objectives and (d) a high degree of transparency concerning the course of action planned by the central bank to achieve its aims. Implicitly, the monetary authority capable of delivering on those characteristics would be an *independent* one.

Since these requirements do not guarantee that monetary policy achieves price stability, it is important to elaborate on what inflation (forecast) targeting means. To understand the rationale behind it, it is useful to think of it as a three-pronged strategy to improve the performance of monetary policy (Bernanke et al. 1999).[22] First, price stability is defined as the *primary goal* for monetary policy. Second, the central bank should

[20] Svensson, L. (1996), "Inflation Forecast Targeting: Implementing and Monitoring Inflation Targets", National Bureau of Economic Research Working Paper n. 5797.

[21] Leiderman, L. and L. Svensson, L. (eds) (1995), *Inflation Targets*, Centre for Economic Policy Research.

[22] Bernanke, B., Laubach, T., Mishkin, F. and Posen, A. (1999), *Inflation Targeting*, Princeton University Press.

have the *flexibility* to choose the means for achieving the goal. Third, through *transparency* on the implementation of monetary policy, the central bank is accountable for achieving the goal.

These elements, following Bernanke and Mishkin (1997),[23] define it as a *framework* that allows monetary policy to be implemented within a "constrained discretion" setting. *Transparency* is what effectively constrains monetary authorities since the central bank is accountable to the general public *and* to its principals for achieving that goal. On the other hand, *flexibility* is what allows the central bank to respond to short-term macroeconomic fluctuations as needed, since there is no pre-commitment to an intermediate target. Therefore, the key issue for inflation forecast targeting framework is to find the right balance between *transparency* and *flexibility within the constraints of the framework*.

Annex 2.A showed how gold provided the price anchor during the "Gold Standard". In inflation targeting regimes, a framework that speedily became the standard for the implementation of monetary policy, **the short-term nominal interest rate, i_t, provides this anchor**.[24] A related important difference is that this anchor is an exogenous one, and that it only guarantees a stable equilibrium under particular conditions (as a reminder, in Annex 2.A, the equilibrium is endogenous, unique and stable).

Given the context of Emerging markets, a "flexible inflation forecast targeting" can formally be operationalized as a Taylor rule, as given by (Eq. 7.1):

$$i_t = \bar{i} + \gamma\left(\pi_t - \bar{\pi}\right) + \lambda\left(y_t - \bar{y}_t\right) \tag{7.1}$$

On the left-hand side of (Eq. 7.1) we have the **short-term nominal interest rate** (the exogenous "anchor"), i_t, which depends on $\bar{i}$, the equilibrium interest rate, as well as on deviations of the inflation rate, π_t, and output, y_t, from their target values $\bar{\pi}$ and $\bar{y}_t$, respectively. $\bar{\pi}$ is **chosen by the monetary authority as to stabilize prices**, $\bar{y}_t$ is potential output and, hence, $\left(y_t - \bar{y}_t\right)$ is the output gap.

[23] Bernanke, B. and Mishkin, F. (1997), "Inflation Targeting: A New Framework for Monetary Policy?", National Bureau of Economic Research Working Paper n. 5893.

[24] For the inflation targeting experience of emerging markets in general and of Latin America in particular (namely, Argentina, Brazil, Chile and Mexico), see Langhammer and Vinhas Souza (2005), ibid.

An open economy version of it would add terms for the real exchange rate, q_t, and for and exchange rate target level, $\bar{q}_t$, as in (Eq. 7.2) below:

$$i_t = \bar{i} + \gamma\left(\pi_t - \bar{\pi}\right) + \lambda\left(y_t - \bar{y}_t\right) + \delta\left(q_t - \bar{q}_t\right) \tag{7.2}$$

Therefore, an emerging market monetary authority may choose to use an inflation forecast target that is actually an extended, open economy Taylor rule.[25]

From its origins in a country with the worst OECD inflation track record between 1970 and 1984—namely, New Zealand—in 1989, the increase in inflation targeting frameworks use among Developing countries has been truly remarkable: by 2021, these countries housed around 72% of all 109 monetary authorities that followed this framework (Fig. 7.9).

This expansion among emerging markets (EMs) was for a long time concentrated in Latin America, starting in the late 1990s, as inflation targeting was the framework of choice for the stabilization of those economies after the hyperinflationary period,[26] with developing Asia and the Middle East and North Africa regions catching up only from the mid-2010s onward (Fig. 7.10). Sub-Saharan Africa lags in terms of adoption, due to the structural constraints of implementing more sophisticated monetary policy frameworks like inflation targeting (e.g., shallow domestic financial markets, faulty transmission mechanism) in such mostly low income Developing countries.[27]

[25] Clarida, R., Galí, J. and Gertler, M. (1997), "Monetary Policy Rules in Practice: Some International Evidence", National Bureau of Economic Research Working Paper n. 6254.

[26] Mariscal, R., Powell, A. and Tavella, P. (2014), "On the Credibility of Inflation Targeting Regimes in Latin America", IDB Working Paper Series, n. IDB-WP-504, Washington. This was of course not a universal tendency in the region, as Argentina's late 2023 proposals for dollarization (and abolishing of its Central Bank) shows. For Argentina's earlier travails, see McCandless (2005) and Pesce and Feldman (2023), ibid.

[27] Morozumi, A., Bleaney, M. and Mumuni, Z. (2020),"Inflation targeting in low-income countries: Does IT work?", Review of Development Economics.

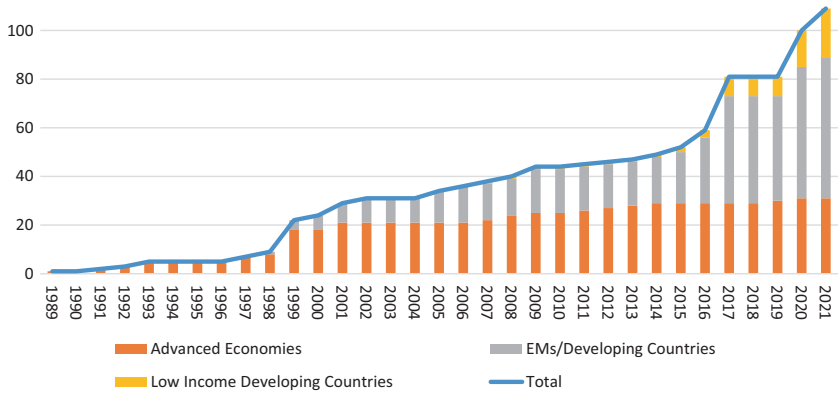

Fig. 7.9 Growth in the number of inflation targeting monetary authorities (Members of EU common currency are classified as inflation targeters from the moment they join the euro area; however, as the requirements of ERM participation imply an exchange rate pegging, they are not classified as such before joining. The same procedure is used for the countries that are members of the Eastern Caribbean Central Bank [ECCB], and Central Bank of the West African States and the Bank of the Central African States [BCEAO and BEAC, respectively], as the ECCB manages a peg to the US dollar, and the BCCEAO and the BEAC manage a peg to the euro. Source: Author, based on IMF)

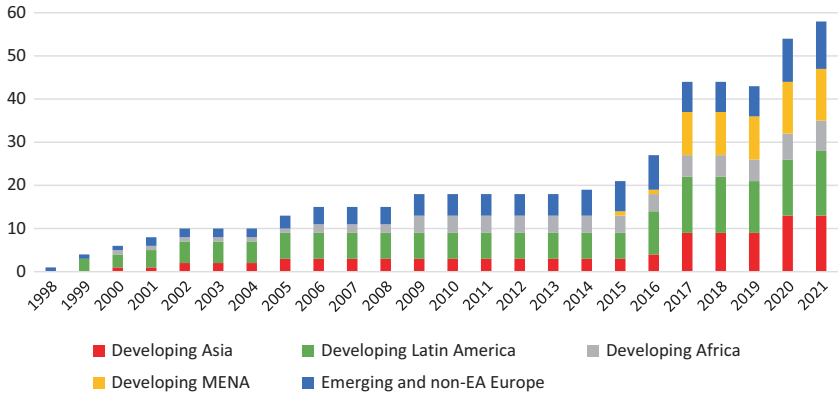

Fig. 7.10 Expansion of inflation targeting in developing regions. (Source: Author, based on IMF)

Annex 7.B: China's Limited Role in Global Financial Crises

The Chinese experience had a somewhat limited coverage in this book, compared with other smaller emerging markets like Brazil or India. The reason for that is simple: **the differentiated patterns of China's real and financial (re) integration into the global economy, and that country's different role as concerning global real and financial shocks** (Miranda-Agrippino and Rey 2021),[28] which is linked to the more reduced level of financial integration of China compared with other large Emerging markets. I will elaborate on that below.

The return of China as a systemically important part of the global economy is by now a well-established fact: with an average real annual GDP growth of 9% since 1980, its economy grew from a paltry 1.7% of the global nominal GDP as recently as 1991 to an estimated 17% of that total in 2023 (a figure that, incidentally, shows a fall from the 18.5% registered in 2021). However, its growth has sharply decelerated since the highs of the late 2010s, from an average of over 10% *p.a.* between 1990 and 2010 to around 6.5% in the period since. This has led to a reduction of the speed of its sharp trajectory of convergence to the US level of GDP per capita, which has recently plateaued at around 15% of the US nominal GDP per capita.[29]

This slowdown aside, and even with increased doubts about the future growth rates of China, that country is and will remain a major economic factor globally. However, its importance concerning global economic and financial cycles has been restricted, largely due to its limited level of financial integration, where it clearly "punches below its weight".

While China (ex-Hong Kong) was responsible for 18% of global exports and 13% in global imports in 2022 (ex-intra EU trade, which is a free-trade area)—both figures are around three times their pre-WTO accession level, the international financial role of China is quite limited: based on SWIFT data, the use of China's currency, the renminbi (RMB), is minimal, accounting for 3.7% of all global cross-border payments by September

[28] Miranda-Agrippino, S. and Rey, H (2021), "The Global Financial Cycle", NBER Working Paper Series n. 29327, Boston.

[29] Not a uniquely Chinese phenomenon by any means: the convergence of the EU as an aggregate has stalled at around 55% of the US per capita GDP since the 1970s.

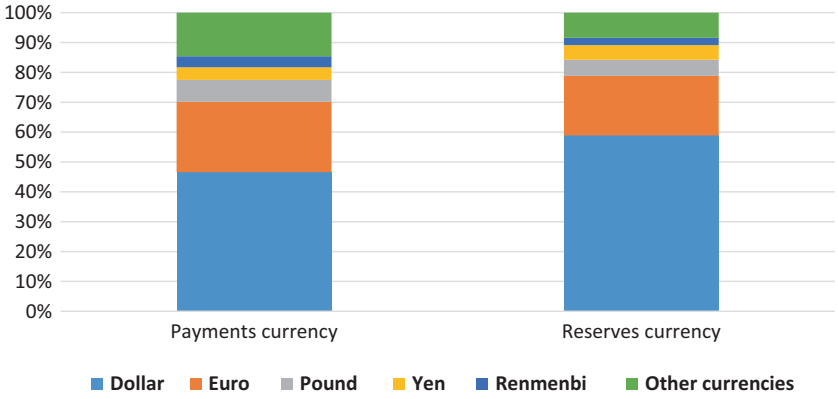

Fig. 7.11 Shares of main currencies in payments (September 2023) and reserves (Q2 2023). (Source: SWIFT and IMF)

2023[30]—compared with over 70% for the US dollar and the euro combined, and around 2.5% of global *allocated*[31] central bank reserve assets by mid-2023—compared with almost 70% for the US Dollar and the euro (Fig. 7.11).

The channels of global transmission of Chinese shocks identified by Miranda-Agrippino and Rey (ibid.), are also very different from those they estimate for the US and the EU. Global financial variables are largely unaffected by Chinese shocks, with world financial conditions, the VIX, and the global factors in asset prices and capital flows not responding to those in any significant way, **while world production does**, due to the effects of Chinese domestic demand contractions on world trade and commodity prices. Hence, the main channel of the international transmission of Chinese monetary and financial shocks is its large relative weight in world GDP, and therefore the Chinese monetary policy seems to affect mainly international trade and commodity markets but not the "Global Financial Cycle". Miranda-Agrippino and Rey (ibid.) conclude that while the Fed

[30] SWIFT is the "Society for Worldwide Interbank Financial Telecommunication", a body that provides services related to the execution of financial transactions and payments between most global banks. One should note that this latest figure for China shows an over sevenfold increase when compared to the September 2012 share of 0.51%.

[31] Using IMF data, around $900 billion, or 8% of total, global central bank hard currency reserves have no reported currency denomination linked to them.

plays an important role in the Global Financial Cycle, the PBOC (and, incidentally, the ECB) plays an important role for international trade, output and commodity prices, driving what the call a "Global Trade and Commodity Cycle".

Notwithstanding the above and the significant capital account restrictions, the PBOC began promoting RMB internationalization, notably after the GFC (see Perez-Saiz and Zhang 2023)[32]: in 2009, the PBOC began permitting cross-border settlements in RMB, initially in selected Chinese provinces, and nationwide since 2011, and it has also introduced bilateral swap lines (most recently used by Argentina) and offshore clearing banks to facilitate the cross-border use of RMB (which joined in 2015 the basket of IMF's Special Drawing Rights). Additionally, Zhang (2023)[33] concludes that, based on the experience of comparator economies, an open capital account could lead to a significant expansion of China's global financial footprints, while Barcelona et al. (2022)[34] estimate that using an expanded definition of "shock" that takes into account the second-round effects of Chinese real shocks on domestic and external financial variables (and also using an alternative series for Chinese GDP), China's role as a source of global financial shocks may be already somewhat larger than that estimated by Miranda-Agrippino and Rey (2021). Therefore, a greater consideration of China as a source of future financial crises in and of itself seems warranted.

[32] Perez-Saiz, H. and Zhang, L. (2023), "Renminbi Usage in Cross-Border Payments: Regional Patterns and the Role of Swaps Lines and Offshore Clearing Banks", IMF Working Papers Series WP/23/77.

[33] Zhang, L. (2023), "Capital Account Liberalization and China's Financial Integration", Harvard Kennedy School, Working Paper Series n. 196, Cambridge.

[34] Barcelona, W., Cascaldi-Garcia, D., Hoek, J. and Van Leemput, E. (2022), "What Happens in China Does Not Stay in China" International Finance Discussion Papers 1360, Board of Governors of the Federal Reserve System, Washington, DC.