**Government Finance by Central Banks and Inflation Expectations at the Onset of the COVID Pandemic**

Itai Agur (International Monetary Fund)[[1]](#footnote-1)\*

**Abstract**

At the COVID pandemic’s onset, many central banks responded with unconventional monetary policy (UMP) programs. In emerging and developing economies, various programs included components of direct government financing (DGF). This paper collects data on UMPs announced during 2020 and investigates how inflation expectations responded to different types of programs, providing a measure of real-time public perceptions of the inflation risks associated with them. Program announcements, including DGFs, did not lead to significant increases in inflation expectations. Possibly, the one-off nature of central banks’ COVID response was seen as credible in many countries, preventing an immediate de-anchoring of expectations.

Keywords: Central banks; Quantitative easing; Monetary finance; Inflation expectations.

JEL Codes: E58; E63; H69.

1. **Introduction**

When the COVID pandemic went global in March 2020, many central banks undertook unconventional monetary policies (UMPs). In advanced economies (AEs), central banks mostly embarked on asset purchases in secondary markets within the framework of quantitative easing.[[2]](#footnote-2) However, in emerging markets and developing economies (EMDEs), some UMPs included components of direct government financing (DGF) through the purchase of government bonds in primary markets or the extension of loans or grants to the government. These operations were often motivated with the explicit goal to support fiscal authorities at a time of exceptional needs.[[3]](#footnote-3)

There is a long history of inflationary monetary financing initiatives in EMDEs. Did DGF programs with a fiscal intent immediately raise the specter of such monetary financing in the public’s eye? Or were these programs interpreted differently because they were aimed at alleviating a one-off shock rather than providing long-term financing to the government? This paper approaches this question by looking at the response of inflation expectations, which provides a real-time gauge of public perceptions.[[4]](#footnote-4)

1. **Data**

The data collection encompasses all UMPs conducted between March 2020 and December 2020 in 49 AEs and EMDEs, identifying a total of 15 DGF programs and 64 other UMP programs, which are portrayed in Figure 1.[[5]](#footnote-5) This data collection includes statements issued by central banks when they announced the programs: all DGF programs in EMDEs were associated with central bank statements recognizing a fiscal intent upon program announcement, while none of the UMPs conducted on secondary markets had a stated fiscal intent.

Data on (end-of-period) inflation expectations is sourced from Consensus Economics where available (monthly data for 31 countries) and IMF WEO forecast vintages elsewhere (quarterly data for 18 countries).[[6]](#footnote-6)

1. **Empirical analyses**

We conduct two empirical exercises. The first is a cross-section analysis for all countries in the sample, wherein programs are differentiated by their size (% of GDP) and type (DGF or not). The second exercise is a panel data analysis for the monthly data subsample, where time fixed effects capture developments that were common around the world, such as the steep decline of inflation expectations in April 2020.

Table 1 presents the cross-section analysis. The first specification is considered the baseline.[[7]](#footnote-7) The dependent variable is the 2020 inflation forecast that is collected in the first survey after the central bank’s UMP announcement. In addition to the size of the UMP program and the dummy for DGF programs, several control variables are included: the last inflation forecast before the announcement (which captures inflation persistence), the country’s average inflation over the past ten years (which relates to its *de facto* monetary credibility), and the real-time forecast of the 2020 fiscal deficit at the time of the announcement (which represents the extent of the country’s fiscal needs).[[8]](#footnote-8) The baseline cross-section analysis finds no statistically significant effects associated with either UMP programs in general or DGF programs specifically.

Specifications 2-23 add a host of robustness checks. From these robustness checks there is also little evidence that the programs affected inflation expectations, as the UMP size variable is insignificant in 21 out of 23 specifications and the DGF dummy never attains statistical significance. In particular, specifications 2-7 bring in an interaction between the program type and its size, alternative real-time measures of countries’ fiscal positions (debt levels and structural and cyclically adjusted deficits), the output gap, and a measure of central bank transparency from Dincer et al. (2022).[[9]](#footnote-9) Specifications 8-9 consider sterilization efforts by central banks. The size of announced UMPs bears a strong relation to observed monetary base increases during 2020 (the correlation coefficient is 0.71). Nevertheless, in some countries efforts to sterilize UMPs, such as through the issuance of central bank bills, may have partially unwound their impact on the monetary base. Specification 8 includes as an explanatory variable the change in the monetary base divided by the total size of announced UMPs (per country; during all of 2020), as well as the interaction between this new variable and the DGF dummy; instead, specification 9 trims the sample and includes only UMP cases with little sterilization, where the monetary base increased by at least half of the announced size of UMP programs. Specifications 10-23 consider alternative dependent variables: inflation expectations for 2021 (rather than 2020) collected in the first survey after the announcements (in specifications 10-16); and the 2020 inflation expectations as collected in the *second* survey after the UMP announcement, potentially capturing delayed effects on inflation expectations (in specifications 17-23).

Table 2 presents the panel data analysis. The dependent variable is the 12-month ahead inflation forecast, which is constructed as a weighted average of the 2020 and 2021 inflation forecasts.[[10]](#footnote-10) The first specification represents the baseline panel data estimation, which includes country and time fixed effects. The explanatory variables are the lag of the dependent variable, the size of UMP programs, and the interaction with a dummy capturing DGF programs.[[11]](#footnote-11) The lagged dependent variable is statistically significant, while the UMP and DGF variables are not. Specification 2 considers the same regression without country fixed effects. Specifications 3 and 4 have the same fixed effects structure as the baseline but add terms dissecting UMP and DGF effects by country type (AEs or EMDEs), as well as quadratic UMP and DGF terms. Here, only the interaction between the EMDE dummy and the UMP size variable in specification 3 is statistically significant and positive. However, this effect is economically small (a UMP announcement equal to 1% of GDP raises inflation expectations by 0.04 percentage points) and applies to UMPs in general: the dummy that focuses on DGF programs among EMDEs is not statistically significant. Overall, then, none of our 23 cross-section regressions and 4 panel data regressions find any indication that DGF programs had a specific effect on inflation expectations, despite their stated fiscal intent and the fiscal nature of their implementation though primary market purchases, loans, or grants.[[12]](#footnote-12)

1. **Conclusion**

This paper provides a first foray into the relation between COVID-era UMP programs, including EMDEs’ DGF programs, and inflation, focusing on the direct impact on inflation expectations. The absence of such an impact might suggest that in most countries the public was persuaded by central banks’ presentation of these programs as one-off and in response to a unique shock. This finding mainly speaks to whether inflation expectations remained anchored in the face of such programs. The next question, whether inflation realizations ultimately responded to central banks’ COVID-era programs (and sanguine inflation expectations about them were therefore mistaken), is a promising venue for future research, which will require carefully disentangling the many factors that have affected countries’ inflation rates over the past few years, including supply bottlenecks and the impact of the war in Ukraine. This lies beyond the scope of the current paper, but the data that we collected on the programs conducted in 2020 could provide a foundation for such an empirical exercise.

**Disclosure statement**

No potential conflict of interest was reported by the author.

**ORCID**

Itai Agur (ORCID: 0000-0002-6150-737X)

**References**

Arena, Marco, Rudolfs Bems, Nadeem Ilahi, Jaewoo Lee, William Lindquist, and Tonny Lybek. 2021. “Asset Purchase Programs in European Emerging Markets.” IMF Departmental Paper 2021/021.

Arslan, Yavuz, Mathias Drehmann, and Boris Hofmann. 2020. “Central Bank Bond Purchases in Emerging Market Economies” BIS Bulletin No. 20.

Bhattarai, Saroj, and Christopher J. Neely. 2020. “An Analysis of the Literature on International Unconventional Monetary Policy” Federal Reserve Bank of St. Louis Working Paper 2016-021 (May 2020 revision: <https://doi.org/10.20955/wp.2016.021>).

Binder, Carola. 2020. “Coronavirus Fears and Macroeconomic Expectations.” *The Review of Economics and Statistics*, 102(4): 721–730.

Cerutti, Eugenio, and Thomas Helbling. 2021. “Unconventional Monetary Policies in Emerging Asia during the COVID-19 Crisis: Why Now? Will They Work?” in: Chang Yong Rhee and Katsiaryna Svirydzenka (eds.) *Policy Advice to Asia in the COVID-19 Era*, IMF Press.

Coleman, Winnie and Dieter Nautz. 2021. “Inflation Expectations, Inflation Target Credibility and the COVID-19 Pandemic: New Evidence from Germany.” CFS Working Paper 658.

Dell'Ariccia, Giovanni, Pau Rabanal, and Damiano Sandri. 2018. "Unconventional Monetary Policies in the Euro Area, Japan, and the United Kingdom” *Journal of Economic Perspectives* 32 (4): 147-72.

Dincer, Nergiz, and Barry Eichengreen, 2014, “Central Bank Transparency and Independence: Updates and New Measures.” *International Journal of Central Banking* 10 (1): 189–253.

Dincer, Nergiz, Barry Eichengreen, and Petra Geraats. 2022, “Trends in Monetary Policy Transparency: Further Updates” *International Journal of Central Banking* 18(1), 331-348.

Fabo, Brian, Martina Jančoková, Elisabeth Kempf, Ľuboš Pástor. 2021. “Fifty Shades of QE: Comparing Findings of Central Bankers and Academics.” *Journal of Monetary Economics* 120: 1-20.

[Fratto](https://www.imf.org/en/Publications/Publications-By-Author?author=Chiara++Fratto&name=Chiara%20%20Fratto), Chiara, [Brendan Harnoys Vannier](https://www.imf.org/en/Publications/Publications-By-Author?author=Brendan++Harnoys+Vannier&name=Brendan%20%20Harnoys%20Vannier), [Borislava Mircheva](https://www.imf.org/en/Publications/Publications-By-Author?author=Miss+Borislava+Mircheva&name=Miss%20Borislava%20Mircheva), [David de Padua](https://www.imf.org/en/Publications/Publications-By-Author?author=David++de+Padua&name=David%20%20de%20Padua), and [Hélène Poirson](https://www.imf.org/en/Publications/Publications-By-Author?author=H%c3%a9l%c3%a8ne++Poirson&name=H%C3%A9l%C3%A8ne%20%20Poirson). 2021. “Unconventional Monetary Policies in Emerging Markets and Frontier Countries.” IMF Working Paper 21/14.

Garriga, Ana Carolina, and Cesar M. Rodriguez. 2020. “More Effective than We Thought: Central Bank Independence and Inflation in Developing Countries.” *Economic Modelling* 85 (1): 87–105.

IMF. 2020. “Emerging and Frontier Markets: A Greater Set of Policy Options to Restore Stability”, Global Financial Stability Report, October 2020.

Klomp, Jeroen, and Jakob de Haan. 2010. “Inflation and Central Bank Independence: A Meta-Regression Analysis.” *Journal of Economic Surveys* 24 (4): 593–621.

Kuttner, Kenneth N. 2018. "Outside the Box: Unconventional Monetary Policy in the Great Recession and Beyond." *Journal of Economic Perspectives*, 32 (4): 121-46.

Lombardi, Domenico, Pierre Siklos, and Samantha St. Amand. 2018. “A Survey of the International Evidence and Lessons Learned About Unconventional Monetary Policies: Is a ‘New Normal’ in Our Future?” *Journal of Economic Surveys* 32: 1229-1256.

Rebucci, Alessandro, Jonathan S. Hartley, and Daniel Jiménez. 2022. “An Event Study of COVID-19 Central Bank Quantitative Easing in Advanced and Emerging Economies” Advances in Econometrics 43A, Ch. 13, 291-322.

Sever, Can, Rohit Goel, Dimitris Drakopoulos, and Evan Papageorgiou. 2020. “Effects of Emerging Market Asset Purchase Program Announcements on Financial Markets During the COVID-19 Pandemic” IMF WP 20/292.

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |

**Figure 1: UMPs in 2020 – Values of Announced Packages in % of GDP.** [[13]](#footnote-13)



**Table 2: Panel data analysis**

Dependent variable: 12-month ahead inflation forecast (see note below table for details).



1. \* Contact: Itai Agur. Email: iagur@imf.org. Research Department, IMF, 700 19th Street, Washington DC 20431, USA. I am grateful to Damiano Sandri, Giovanni Dell’Ariccia, Soledad Martinez Peria, and Damien Capelle for comments and to Chenxu Fu for excellent research assistance. **The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management.** [↑](#footnote-ref-1)
2. For the literature on measuring the impact of quantitative easing programs in AEs since the global financial crisis, we refer to the literature reviews in Bhattarai and Neely (2020), Dell’Ariccia et al. (2018), Fabo et al. (2021), Kuttner (2018) and Lombardi et al. (2018). [↑](#footnote-ref-2)
3. For example, on 4/15/2020, the Bank of Ghana announced it had purchased a Government of Ghana COVID-19 relief bond on the primary market and that “The Bank stands ready to continue with its Asset Purchase Programme up to GH¢10 billion in line with the current estimates of the financing gap from the COVID-19 pandemic.” [↑](#footnote-ref-3)
4. Arena et al. (2021), Arslan et al. (2020), Fratto et al. (2021), IMF (2020), Rebucci et al. (2022) and Sever et al. (2020) also consider UMPs during COVID, but focus on the response of bond yields, whereas we focus on inflation expectations. To our knowledge, our sample of UMPs during COVID is also the largest to date and particularly expands on the coverage of EMDEs, including their DGF programs. [↑](#footnote-ref-4)
5. The sources used for this are: [IMF COVID-19 policies tracker](https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19); [Yale COVID-19 financial responses tracker](https://som.yale.edu/node/222278); [ESRB COVID-19 measures tracker](https://www.esrb.europa.eu/home/search/coronavirus/html/index.en.html); [IMF MFS](https://data.imf.org/?sk=B83F71E8-61E3-4CF1-8CF3-6D7FE04D0930); IMF (2020); Cerutti and Helbling (2021); and national authorities. [↑](#footnote-ref-5)
6. These measures represent inflation expectations among professional forecasters, available for many countries. For a few countries, there is evidence that household inflation expectations positively diverged from those of professional forecasters when COVID first spread (Binder, 2020; Coleman and Nautz, 2021). However, Binder (2020) finds that these differences did not pertain to the actions of monetary authorities (in fact, when uninformed households were told of the monetary policy actions, their inflation expectations declined). [↑](#footnote-ref-6)
7. All regressions are conducted in levels, which is consistent with the literature on the determinants of inflation. See, for example, Dincer and Eichengreen (2014), Garriga and Rodriguez (2020) and Klomp and De Haan (2010). [↑](#footnote-ref-7)
8. We also include a dummy for Mauritius which is an EMDE outlier in UMP size (Figure 1). [↑](#footnote-ref-8)
9. Many of these specifications have smaller sample sizes than the baseline, because the additional variables are not available for all countries in the sample. [↑](#footnote-ref-9)
10. See the note to Table 2 for additional detail. [↑](#footnote-ref-10)
11. An interaction dummy is needed here: a simple DGF dummy would be subsumed by the country fixed effects. [↑](#footnote-ref-11)
12. We note that all regressions in Tables 1 and 2 appear to have decent explanatory power, with the lowest R2 being 0.75. [↑](#footnote-ref-12)
13. For UMP programs in the “other” category, see the 2021 IMF Staff Reports on [WAEMU](https://www.imf.org/en/Publications/CR/Issues/2021/03/02/West-African-Economic-and-Monetary-Union-Staff-Report-on-Common-Policies-for-Member-50139) and [Malaysia](https://www.imf.org/en/Publications/CR/Issues/2021/03/17/Malaysia-2021-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-50272). [↑](#footnote-ref-13)