



# BIS Bulletin

No 67

Does money growth help explain the recent inflation surge?

Claudio Borio, Boris Hofmann and Egon Zakrajšek

26 January 2023

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The editor of the BIS Bulletin series is Hyun Song Shin.

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ISSN: 2708-0420 (online)

ISBN: 978-92-9259-630-9 (online)

## Does money growth help explain the recent inflation surge?

### Key takeaways

- *The strength of the link between money growth and inflation depends on the inflation regime: it is one-to-one when inflation is high and virtually non-existent when it is low.*
- *A link can also be seen in the recent possible transition from a low- to a high-inflation regime. An upsurge in money growth preceded the inflation flare-up, and countries with stronger money growth saw markedly higher inflation.*
- *Looking at money growth would have helped to improve post-pandemic inflation forecasts, suggesting that its information value may have been neglected.*

Does money growth help to explain the post-pandemic surge in inflation? Monetary aggregates have gradually lost relevance since the heyday of monetary targeting in the 1970s and 1980s as their link with inflation has weakened considerably. Consequently, they have largely disappeared from academic analysis (Laidler (2002)), as well as from monetary policy design and implementation. More recently, however, they have enjoyed a certain revival, as the surprising resurgence of inflation has gone hand in hand with increases in the money stock in a number of jurisdictions prominent in economic debates (Congdon (2022), Issing (2021a), Laidler (2021), Goodhart (2021), King (2021))<sup>1</sup> as well as more generally (Graph 1).

In this Bulletin, we provide some systematic cross-country evidence on the link between monetary aggregates and inflation. While the focus is on the current inflation flare-up, we also offer some longer-term evidence for context. Our aim, of course, cannot be to settle a debate that has raged in the profession since the 1950s; not least, we are concerned here only with the signalling value of monetary aggregates for inflation, not with the direction of causation. Rather, the goal is to provide a more solid basis for understanding the current and still unfolding episode of inflation.

### The reference framework: a two-regime view of inflation and the money link

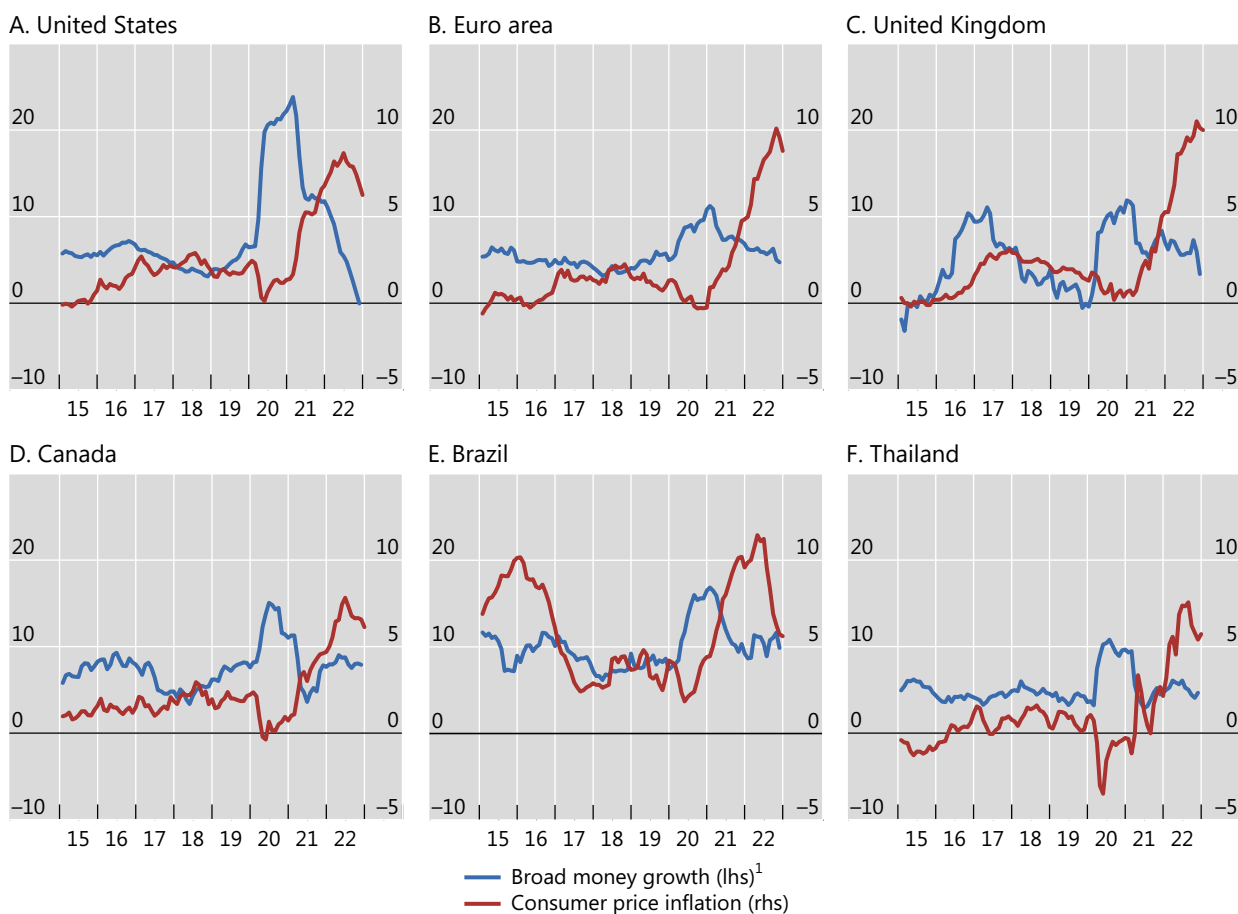
In considering the link between money growth and inflation, it is useful to think of inflation as a two-regime process, with transitions from the low- to the high-inflation regime that are potentially self-reinforcing (BIS (2022), Borio et al (forthcoming)). Recent analysis has documented that inflation behaves very differently in the two regimes. In the low-inflation regime, ie when inflation has settled at a low and stable level, measured inflation mostly reflects the short-lived effects of largely uncorrelated sector-specific price changes – ie the importance of the “common component” of price changes is low – while wages and prices are only loosely linked (Borio et al (2021)). As a result, the inflation process has certain self-stabilising properties. In the high-inflation regime, by contrast, sectoral price changes are much more correlated, inflation is more sensitive to changes in salient prices, such as those of food and energy, or the exchange rate, and wages and prices are more tightly linked. As inflation rises and the importance of the

<sup>1</sup> For a senior central banker expressing doubts about the neglect of monetary aggregates, see Signorini (2022).

## Money growth and inflation

Year-on-year, in per cent

Graph 1



<sup>1</sup> BR: Currency, overnight deposits, high-liquidity issues conducted primarily on the domestic market by deposit-taking corporations, fixed income fund quotas and the portfolio of public and private securities acquired in repo operations by the money holders in the broad concept. CA: Currency, personal deposits, non-personal demand and notice deposits, non-personal term deposits, foreign currency deposits of residents and adjustments to M3. EA and GB: Currency in circulation, overnight deposits, deposits with agreed maturity up to two years, deposits redeemable at notice up to three months, repurchase agreements, money market funds shares/units, money market debt securities up to two years. TH: Currency, demand deposits, foreign currency deposits, other deposits, securities other than shares. US: Currency in circulation, demand deposits at commercial banks, checkable deposits, saving deposits, small denomination time deposits and balances in retail money market funds.

Sources: Datastream Refinitiv; national data; BIS calculations.

common component increases, price hikes become more similar and synchronised, acting as a kind of coordinating device for agents' decisions. This, in turn, increases the likelihood of wage-price spirals.

The difference between the two regimes carries over to the link between money growth and inflation, helping to explain why monetary aggregates have fallen out of favour. Previous studies have found evidence that the link is strong when inflation is high and weak when inflation is low (eg Laidler (2002), De Grauwe and Polan (2005), Sargent and Surico (2011), Gertler and Hofmann (2018)).<sup>2</sup> Graph 2 generalises these results. Panel A illustrates the long-run relationship between inflation and "excess money growth" – the difference between money growth and real GDP growth<sup>3</sup> – in a large sample of advanced

<sup>2</sup> Relatedly, Benati (2021) highlights the existence of a close link between the low-frequency, or trend, components of money growth and inflation in individual countries over long time spans.

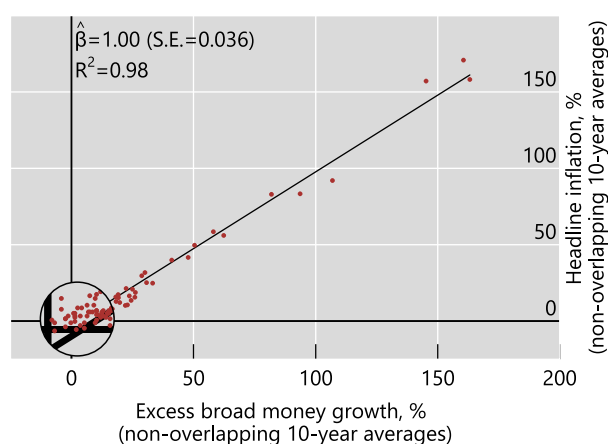
<sup>3</sup> The discussion here is couched in terms of excess money growth rather than money growth: from the quantity equation, it is excess money growth that should be more closely linked to inflation. That said, qualitatively, the results are similar for money growth.

economies (AEs) and emerging market economies (EMEs) for the period 1951–2021 using annual data. The graph displays the relationship between these two variables based on non-overlapping 10-year averages.<sup>4</sup> When the observations from all countries are pooled, the standard relationship emerges clearly: there is a precisely estimated one-to-one link between excess money growth and inflation. But, as shown in panel B, if we split the observations into high- and low-inflation ones using different 10-year average inflation rate thresholds, we see that this relationship exists only when the inflation threshold moves out of the “low-inflation regime region”. Moreover, as expected, the difference narrows noticeably as the inflation threshold increases further.<sup>5</sup>

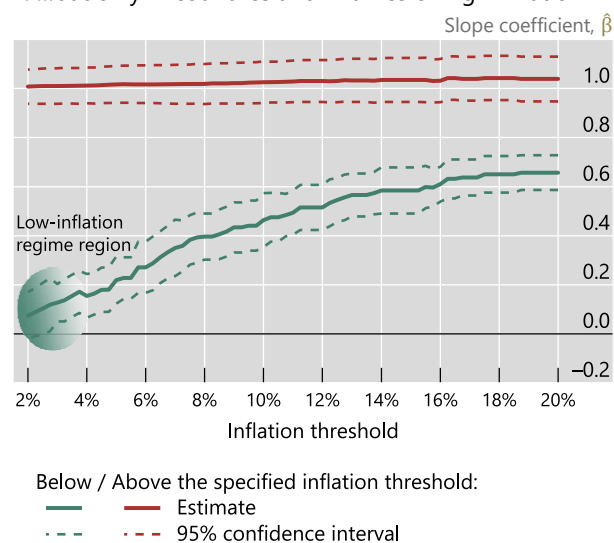
## Inflation and money growth go hand in hand<sup>1</sup>

Graph 2

A. Inflation is closely linked to money growth...<sup>2</sup>



B. ...but only in countries and in times of high inflation<sup>3</sup>



<sup>1</sup> Country-specific non-overlapping 10-year averages from 1951 to 2021 (subject to data availability). The sample covers: AR, AU, BR, CA, CH, CL, CN, CO, DK, EA, GB, HU, ID, IL, IN, JP, KR, MX, MY, NO, NZ, PE, PH, RU, SA, SE, SG, TH, TR, TW, US and ZA. Broad money is defined following the national broad money definitions (M2 or M3) and money plus quasi-money for PE, backdated with money and quasi-money data to get long series. Excess broad money growth is defined as the difference between the growth in broad money and the growth in real GDP. <sup>2</sup> The circled area shows a zoomed-in section where excess money growth and inflation are below 5%. <sup>3</sup> Slope coefficients from the regression of non-overlapping 10-year average inflation on non-overlapping 10-year average excess money growth, where the coefficient on excess money growth (as well as the intercept) is allowed to switch across the specified inflation threshold; the shaded area highlights the range of (10-year average) inflation rates that are generally acknowledged as constituting a “low-inflation regime”.

Sources: ECB; IMF; OECD; Datastream Refinitiv; Global Financial Data; national data; BIS calculations.

The result is intuitive. On theoretical grounds, one would expect money growth to be more closely linked to the common component of inflation, as this component is conceptually closest to “true” inflation”, ie a generalised increase in prices. And, as we have seen, when inflation is low, the importance of this component in explaining the overall variability of price changes tends to be low relative to the idiosyncratic or sector-specific one.

A natural question then arises: what about the link between money and inflation around *transitions* across regimes? Can money help to herald them? This is particularly relevant today, as inflation has flared up across the globe. And it is especially important because it is precisely during transitions that standard models of inflation perform worse (De Fiore et al (2022)). Notably, the models tend to assume that the parameters governing the inflation process are independent of the level of inflation, so that they cannot capture self-reinforcing dynamics. Moreover, those parameters may well have been estimated during a

<sup>4</sup> The exercise can be seen as a combination of the two illustrations of the validity of the quantity theory put forward by Lucas (1980): a close link between long-run country average of money growth and inflation in Latin American countries; and one between the long-horizon moving averages of money growth and inflation in the United States.

<sup>5</sup> The same result holds if the thresholds are defined in terms of the excess money growth rate rather than of inflation.

period of low and stable inflation, as was the case before the pandemic. Put differently, the models are least valuable when needed most. No doubt this helps to explain in part the persistent forecasting misses as inflation surged recently.

## The link between money growth and inflation today

There is indeed evidence that money growth and inflation have been closely linked recently. For example, across countries, there is a statistically and economically significant positive correlation between excess money growth in 2020 and average inflation in 2021 and 2022 (Graph 3, panel A).<sup>6</sup>

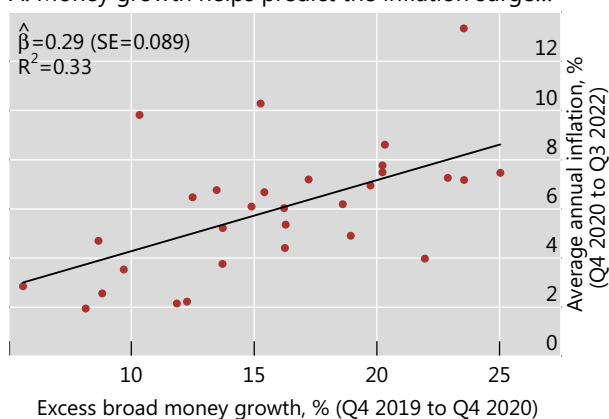
But the test can be made more demanding: could incorporating information about money growth have helped to improve the forecasts of professional economists? This is a tougher test because these forecasts presumably contained all the information available to forecasters when they were making their projections.

The answer appears to be “yes”. Across countries, there is a statistically and economically significant positive relationship between excess money growth in 2020 and professional forecasters’ misses of inflation in 2021 and 2022 (Consensus Economics forecasts) (Graph 3, panel B). That is, the underprediction of inflation was greater for those countries that saw higher excess money growth during the pandemic.

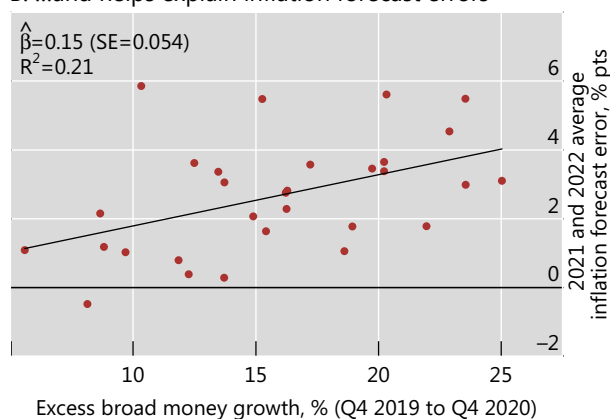
### Money growth and the post-pandemic inflation surge<sup>1</sup>

Graph 3

A. Money growth helps predict the inflation surge...



B. ...and helps explain inflation forecast errors<sup>2</sup>



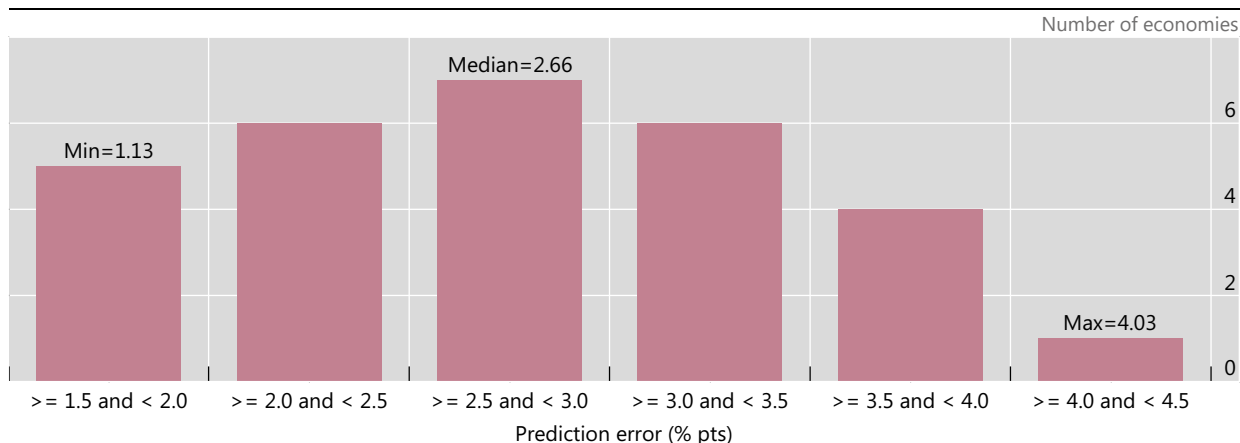
<sup>1</sup> The sample covers: AU, BR, CA, CH, CL, CN, CO, DK, EA, HU, IL, IN, ID, JP, KR, MX, MY, NO, NZ, PE, PH, RU, SA, SE, SG, TH, TW, UK, US and ZA. Broad money is defined following the national broad money definitions (M2 or M3) and money plus quasi-money for PE. <sup>2</sup> Inflation forecast errors for 2021 are calculated as the difference between actual CPI inflation in 2021 and the 2021 inflation forecasts from Consensus Economics as of December of 2020; inflation forecast errors for 2022 are calculated as the difference between actual CPI inflation in 2022 (if available) or the annualised year-to-date inflation and the 2022 inflation forecasts from Consensus Economics as of December 2021.

Sources: ECB; IMF; OECD; Consensus Economics; Datastream Refinitiv; national data; BIS calculations.

Taken at face value, the results indicate that the improvement is material. Each 1 percentage point difference in the rate of excess money growth in 2020 across countries reduces the average 2021–22 inflation forecast error by 0.15 percentage points. This means that the median adjustment is about 2.5 percentage points, and the range about 1–4 percentage points (Graph 4).<sup>7</sup>

<sup>6</sup> The information content of excess money growth for the recent surge in inflation is robust to controlling for differences in the post-pandemic rebound in economic growth. If stronger rebounds followed bigger recessions, one might have expected excess money growth in the recession year to have “spuriously” inherited information content from the behaviour of output alone.

<sup>7</sup> All the results concerning the transition also hold if based on money growth rather than excess money growth.



<sup>1</sup> Inflation prediction errors for 2021–22 implied by the linear relationship between Q4 2019–Q4 2020 excess money growth and inflation forecast errors from Consensus Economics, as shown in panel B of Graph 3.

Sources: ECB; IMF; OECD; Consensus Economics; Datastream Refinitiv; national data; BIS calculations.

## Concluding considerations

The findings above should be interpreted with great care and caution.

First, they say little about causality. The debate about the direction of causality in the link between money and inflation has not been fully settled. The observation that money growth today helps to predict inflation tomorrow does not, in and of itself, imply causality (eg Tobin (1970)). Causality is neither necessary nor sufficient for money to have useful information content for inflation – which is our focus here.

A few examples may help to fix ideas. In a monetarist narrative, an *exogenous* increase in money would generate excess balances, which in turn would have a broad influence on rates of return, expenditures and ultimately inflation (eg Friedman (1956)). An example of an exogenous increase would be the central bank making unsterilised large-scale asset purchases from non-banks. Or perhaps (unsterilised) government transfers to households and firms – although in this case, the impact of the increase in the money stock may in fact capture the income effect of the fiscal transfer.<sup>8</sup> But in other cases, the increase is largely endogenous, ie demand-driven, as in 2020, when companies drew heavily on their credit lines. And, more generally, agents may adjust their portfolios in advance of their spending based on changes in their income: in this case, it is income, not money, that causes spending to increase, with the evolution of money balances acting as a signal. In the current episode, the source of the increase in money stock has varied a lot across countries, as suggested by the relative importance of the increase in the counterparts on the asset side of banks' balance sheets – bank reserves, credit to the government or to the private sector (Annex Graph A1).

Second, the findings are based on just one episode, albeit one that is broadly shared across countries. The acid test will come in the years ahead. Having said all this, the findings give pause for thought. Might the neglect of monetary aggregates have gone too far? In the end, only time will tell.<sup>9</sup>

<sup>8</sup> In fact, the transfer may leave the stock of money unchanged if, for instance, the government holds its deposits with the banks. In this case, the transfer results only in a redistribution of deposits. This is equivalent to the central bank sterilising the increase in reserves that takes place if the government holds its deposits with the central bank.

<sup>9</sup> More generally, there is a noise/signal issue related to the two regimes. Specifically, *even if* money turns out to have a close link with inflation *whenever* transitions are under way, there may be surges in inflation that are *not* followed by transitions. Indeed, this is what tended to happen during the low-inflation regime, when, for instance, money growth sometimes coincided with asset price “inflation” rather than inflation in goods and services (Borio and Lowe (2004)). That said, money growth could still help cross-check the information coming from *incipient* increases in inflation as transitions get under way. On a similar point, in the context of model limitations, see eg Issing (2021b).

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