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A diverse investor base impacts the effectiveness of large-scale asset purchases

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To combat the Great Recession following the 2008 financial crisis and the more recent Pandemic Recession, central banks around the globe purchased unprecedented quantities of securities. This article examines how different investors adjust their security holdings in response to central bank purchases and how such adjustments – also known as portfolio rebalancing – impact the effectiveness of central bank purchase programmes. The results can also be applied to thinking about the impact of quantitative tightening.

Overview

The balance sheets of major central banks around the world ballooned in size in recent years. At their peak, these balance sheets reached between 40% (US Federal Reserve System, Bank of England) and 130% (Bank of Japan) of their country's GDP. This was largely the result of large-scale asset purchases (also known as "quantitative easing" or QE).

By purchasing large quantities of assets, central banks aim to affect asset prices throughout the economy. Indeed, QE operates well beyond its direct effect on the prices of assets the central bank purchases. As investors selling assets to the central bank reinvest the proceeds, they "rebalance" into other securities not eligible for central bank purchases. This second, indirect effect is called the "portfolio rebalancing channel" of QE.

So much for the theory. Discussions among economists about the effectiveness of QE in practice actually generate a lot of heat. It is difficult to separate the effects of QE from those of other events and policy measures happening at the same time. There are several challenges to overcome in identifying and quantifying the particular channels through which QE operates, as investors' decisions to sell securities to the central bank and rebalance their portfolios are affected by a host of factors.

In Breckenfelder and De Falco (2024), we set out to address these challenges and quantify both the direct and indirect effects of large-scale asset purchases. We use detailed security-level data on asset holdings of major investors in the euro area (banks, insurance companies, pension funds and mutual funds). We analyse these data to see how different investors adjust their holdings of the same security within the same time period in response to asset purchases conducted by the European Central Bank (ECB).

Our analysis encompasses two major purchase programmes: the asset purchase programme and the pandemic emergency purchase programme (PEPP). These two combined amounted to nearly €5 trillion of purchases – some 60% of euro area GDP – by the end of 2022.[2] One important difference between the two programmes is that under the PEPP, the central bank could purchase larger shares of an individual

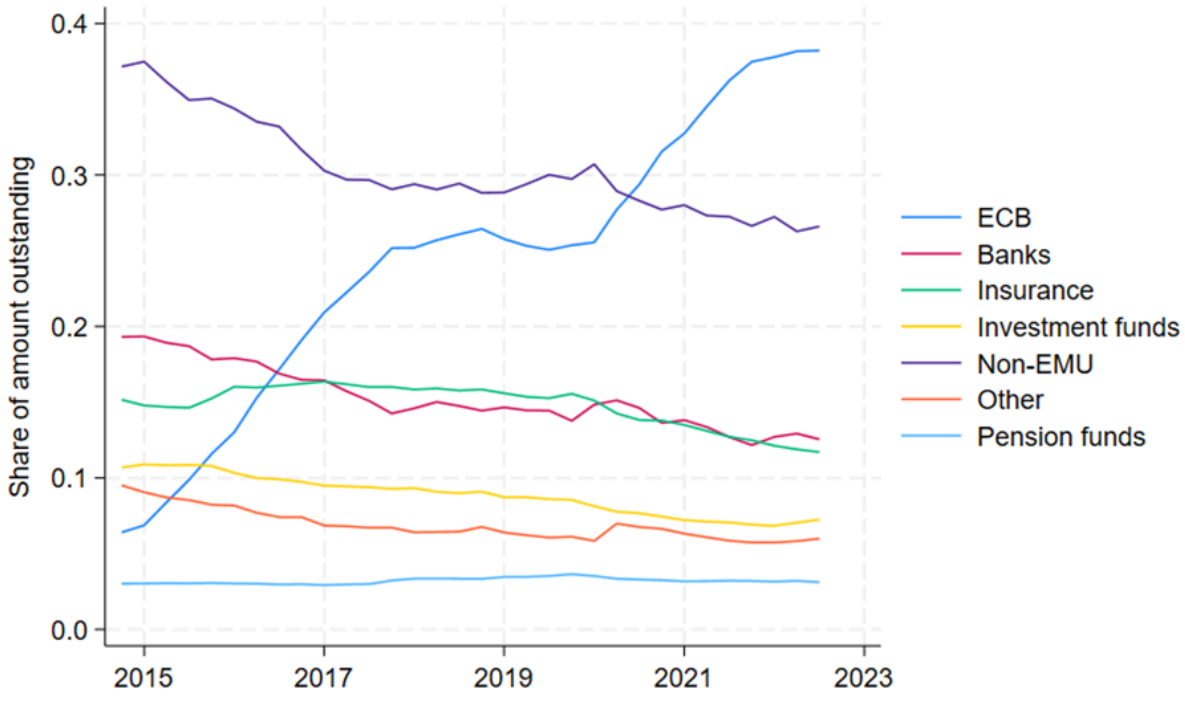
security. This makes our findings even more relevant for the PEPP period, as we will see below. Our main argument is that the effects of QE depend crucially on which investors are selling a particular security to the central bank at a particular time. We discuss first the direct effects of purchases and then the indirect effects.

Do direct effects depend on who the ECB buys from?

Chart 1 illustrates the share of the amount outstanding of euro area sovereign bonds held by different investors. We group sovereign bond holders into seven types: (i) ECB, (ii) banks, (iii) investment funds, (iv) insurance companies, (v) pension funds, (vi) investors outside the euro area (non-Emu), and (vii) other, which corresponds to smaller residual investors (governments, households, etc.). It is apparent that by 2020, the ECB – through its large-scale purchase programmes – became the largest holder of euro area sovereign bonds, while all other investors reduced their holdings as a share of the total. Investors selling bonds to the ECB demand compensation for parting with them, which raises the question: does it matter who the central banks buys from?

Chart 1

Euro area sovereign bonds held by different investors



Source: Breckenfelder and De Falco (2024).

Our data allow us to measure the direct effects of purchases at the security level. As we would expect, central bank purchases increase the prices of purchased securities and lower their yields (prices and

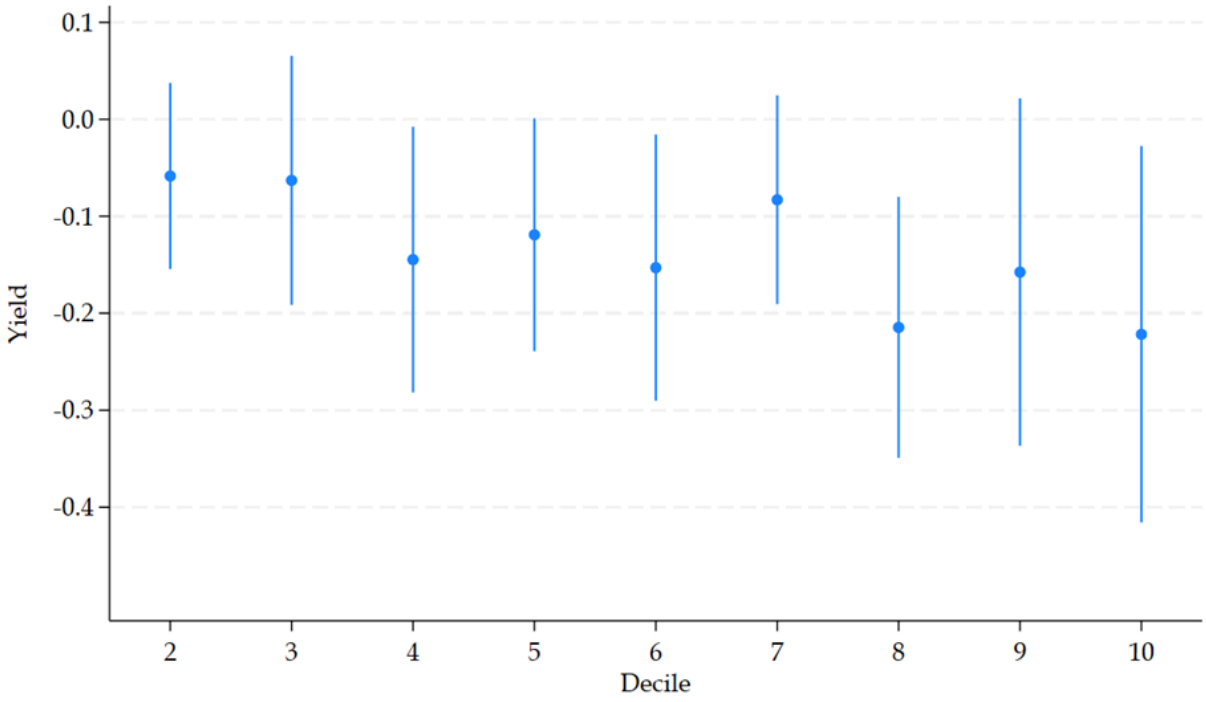
yields are inversely related). Importantly, we show that central bank purchases have smaller effects on securities predominantly held by investors who react more sensitively to prices – so-called price-elastic investors, namely mutual funds, banks and foreign investors (non-EMU).[3] Comparing a security at the 90th percentile of the investor elasticity distribution with a security at the 10th percentile, the price impact of central bank purchases is only two-thirds as large.

Why is this the case? Chart 1 illustrates that the ECB holdings of sovereign bonds grew over time and this pattern is also true at the individual security level. We document that the first investors to sell their bonds to the ECB are the price-elastic investors. Hence, as the central bank purchases more of a particular security, the remainder is increasingly in the hands of investors that are less price sensitive. This implies that, for them to sell that bond to the ECB, the central bank has to offer a relatively higher price. As a result, the impact of purchases on prices is not constant and changes as the investor base changes. Our finding suggests that QE has important “stock effects”: the amount of a particular security (or “stock”) held by a central bank impacts the effectiveness of QE, with the impact increasing as the central bank’s holdings increase.

Chart 2 illustrates how the impact of purchases on a security price depends on how much of that security the ECB already holds. First, every security the ECB holds is sorted into one of the 10 “buckets” – or deciles – according to the share the ECB holds in the total amount outstanding of that security. Securities in the 1^{st} decile are those the ECB holds least of, while securities in the 10^{th} decile are those the ECB holds most of. Second, the chart plots the price impact of ECB purchases on securities from the 2^{nd} to the 10^{th} decile, as compared with the 1st decile. For example for the 10^{th} decile, if the ECB buys more of bonds it already holds a lot of, this decreases yields by an extra 20 basis points compared with the bonds that were purchased the least.

Chart 2

Impact of purchases on prices with increasing ECB share



Source: Breckenfelder and De Falco (2024).

What do we know about indirect effects?

To assess the portfolio rebalancing effects, we first measure the degree to which different investors were exposed to central bank purchases. We do this based on investors' holdings of securities eligible for central bank purchases before the QE programme was even announced. The idea of employing such an ex ante measure is that it is not affected by the QE programme itself.

Second, we show that mutual funds and banks – both major investors in the bond markets – sell eligible securities to the central bank and rebalance their portfolios towards ineligible securities. And those investors more exposed ex ante to central bank purchases rebalance more. In contrast, insurance companies and pension funds respond less to central bank purchases, and therefore contribute less to the portfolio rebalancing channel.

Third, using detailed holdings data for mutual funds, we estimate how the average fund allocates each euro of proceeds from selling securities to the central bank. The average fund allocates 88 cents to ineligible assets and 12 cents to other eligible assets that the central bank did not buy in that time period. The prices of ineligible securities held by funds more exposed to central bank purchases increase compared with those held by less exposed funds, underscoring the fact that the portfolio rebalancing channel is at work.

Conclusions

We find that a diverse investor base selling to the central bank affects both the direct and indirect impacts of large-scale purchases. We show that the direct effects of purchases on prices are smaller when securities are held predominantly by more elastic investors, i.e. mutual funds and banks. We also show that funds and banks sell eligible securities to the central bank and rebalance their portfolios towards securities that are ineligible for central bank purchases, with investors ex ante more exposed to central bank purchases rebalancing more. As a result, the price of ineligible securities held by more exposed investors increases compared with those held by less exposed investors. Our results highlight that large-scale asset purchases do also affect asset prices indirectly – well beyond the direct effect on the prices of the assets the central bank actually purchases. The fact that the effects depend crucially on which investors hold the assets has important implications for the design of future large-scale asset purchase programmes.

Our results can also be applied to thinking about the impact of quantitative tightening (QT). We show that, over time, QE effects became larger for the same security, as the remaining investor base became more inelastic. If we think of QT as QE in reverse, then effects on prices could be relatively mild at first. Inelastic investors who have a strong preference for holding particular securities may step in first when the central bank reduces its bond market footprint. However, over time, as more price-elastic investors need to be enticed to acquire securities, the effects of QT may become more pronounced.

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Many other studies have analysed large-scale asset purchases in the euro area, including portfolio rebalancing effects (e.g. Bergant et al., 2020, and Albertazzi et al., 2021) and price elasticities (Koijen and Yogo, 2019, De Santis and Holm-Hadulla, 2020, Koijen et al., 2021).

3.

These investors tend to actively manage their portfolios and trade more frequently, in contrast to the “buy-and-hold” investors.