

// Carlo Birkholz (ZEW Mannheim) and  
Friedrich Heinemann (ZEW Mannheim)

## MAGNITUDES AND CAPITAL KEY DIVERGENCE OF THE EUROSISTEM'S PSPP/PEPP PURCHASES – UPDATE DECEMBER 2021

Study supported by the Brigitte Strube Foundation

# CONTENTS

- EXECUTIVE SUMMARY ..... 3
- 1. INTRODUCTION..... 5
- 2. PURCHASE SPEED AND REMAINING PEPP ENVELOPE..... 6
- 3. CAPITAL KEY DIVERGENCE - PEPP ..... 9
- 4. CAPITAL KEY DIVERGENCE – PSPP AND PEPP COMPARED AND COMBINED ..... 11
- 5. CAPITAL KEY DIVERGENCE – TREND SINCE 2015 ..... 14
- 6. MACROECONOMIC MAGNITUDES..... 16
- 7. CONCLUSIONS..... 17

## EXECUTIVE SUMMARY

The ECB Council has to take a decision on the future of its asset purchase programmes as the monetary crisis support that was appropriate in the early phase of the pandemic needs to be adjusted to new circumstances. The changing environment is characterized by an advanced recovery from the pandemic contraction and by new growth obstacles such as shortages of important inputs. With these changes, initially convincing arguments for extraordinary monetary policy supports are losing their strength.

Against this background, this study updates an earlier quantitative analysis on the conduct of both the PEPP and the PSPP since the outbreak of the pandemic. For PSPP/PEPP purchases between March 2020 and September 2021, this expertise assesses the size of purchase flows and stocks, country allocations and their proportionality to the ECB capital key, and their magnitude relative to GDP and public debt.

Key findings are as follows:

- By the end of September 2021, the Eurosystem's cumulated net purchases of public sector securities have reached almost €4 trillion with a PEPP share of 35%.
- Monthly PEPP purchases reached their high point in June and July 2020 with a subsequent decline and peaking again in summer 2021.
- At the current speed the PEPP purchases are on course to exactly use up the full envelope of €1,850 billion by March 2022. This implies that the PEPP with its current envelope would not offer any leeway to react to a scenario with economic setbacks from new infection waves.
- The PEPP has made use of its flexibility to diverge from the ECB capital key for its country allocations. Since its introduction the PEPP shows the largest upward divergence for Italy (+8.1% relative to capital key), Spain (+4.2%), Greece (+3.8%), and Portugal (+3.1%). However, PEPP purchases have come closer to the ECB capital key for the Southern European countries in the second year of the pandemic. While the divergence for Italy was +13.1% in 2020 it declined to +2.5% in 2021.
- A comparison of the PEPP and PSPP country allocations since the outbreak of the pandemic reveals that for Italy and Spain the PSPP is closer to the proportions of the capital key. For several other countries such as Cyprus, France, Slovenia, Belgium, and Ireland though, the PSPP shows a larger divergence than the PEPP.
- Analyzing the divergence of combined purchases under PSPP and PEPP from the capital key shows a maximum of +23% for Cyprus and +8% for Italy since March 2020. Countries with an overweight of between 4 and 5% are Slovenia, Spain, and Ireland.
- The analysis of the accumulated PSPP stocks since 2015 confirms a long-run trend in divergence from the capital key. Over three points in time (end of 2015, 2018, and September 2021), Spain, Italy, and France had positive and growing deviations from the capital key. Hence, a trend of overweighting these countries was already clearly under way before the pandemic and cannot be explained by the special circumstances and need for intervention in the Covid-19 pandemic.
- A final step of the analysis puts the PSPP/PEPP purchases in proportion to GDP and total government debt pointing to the relative national importance of the programmes. Differences are

huge: In Spain, Portugal, and Italy, total cumulated PSPP and PEPP purchases until September 2021 are approaching 40% of GDP. By contrast, for the Baltic states, Luxemburg, Malta, and Ireland, PSPP and PEPP stocks are below 15% of GDP. Relative to total government debt, we observe the highest share of total PSPP/PEPP holdings to public debt for Slovenia, Netherlands, Slovakia, Germany, and Finland.

- A particular interesting picture emerges for Greece: The PEPP to GDP ratio exceeds with 18% by far any other country and signals a particular dependence of this country's bond market liquidity on the PEPP. This high share is also remarkable in light of the fact that the larger part of Greek debt is not bond-financed but provided through official lending from the ESM and other Member States. Greece's extreme dependence on the PEPP seems to signal that the country still lacks the reputation to finance itself without massive assistance in the markets.

The analysis reaches the conclusion that the Eurosystem's current practice of public sector purchases has effectively relaxed the initially strict PSPP rules. The increasing tension between these rules and the magnitude of purchases also becomes evident with respect to the PSPP's issue and issuer limit. With a share of almost 30% of total euro area government debt in the hands of the Eurosystem under the combined PSPP and PEPP purchases, this threshold is exceeded for more and more countries.

For the upcoming decision of the ECB Council, these results point towards difficult trade-offs. It is highly uncertain whether the euro area sovereign bond markets could remain stable without a continuation of the massive financing support from the Eurosystem for the high-debt countries. However, the enormous monetary policy support for the financing of high government deficits, the increasingly asymmetric use of PSPP already before the pandemic, and purchases approaching or exceeding important thresholds, all this signals a movement into legally risky territory.

# 1. INTRODUCTION

The ECB Council has to take a decision on the future of its asset purchase programmes. Since the outbreak of the coronavirus pandemic in March 2020, the Eurosystem has been buying government bonds under the Pandemic Emergency Purchase Programme (PEPP). The PEPP was set up as a non-standard policy measure to encounter the economic and financial consequences of the pandemic and has complemented the ongoing Public Sector Purchase Programme (PSPP).

Despite the recent pandemic setbacks with new infection waves and uncertainties from a new virus variant, the economic recovery of the euro area is well advanced. By the fourth quarter of 2021, output in the euro area as a whole is expected to return to pre-crisis levels, albeit large country-specific differences in the speed of recovery.<sup>1</sup> At the same time, the nature of growth obstacles has changed. While in spring 2020, stringent lockdowns, border closures and quarantine measures caused a very sharp and sudden contraction, the situation in 2021 is fundamentally different. Due to a powerful recovery of global trade with a high demand for raw materials and industrial goods, shortages of important inputs and high energy price have become the crucial bottlenecks for the ongoing recovery. As a consequence, the extraordinary fiscal and monetary crisis support that was appropriate in the early phase of the pandemic needs to be readjusted to these new circumstances.

Currently, the Eurosystem buys euro area assets through its Asset Purchase Programme (APP) at a monthly pace of €20 billion, of which sovereign bonds under the PSPP make up the by far most important component. At the same time PEPP current net purchases surpass PSPP purchases by a wide margin and are to be continued with the current envelope of €1,850 billion until at least the end of March 2022. ECB Council members have signaled that the PEPP could be discontinued by the end of March but that the APP with the sovereign bond purchases under the PSPP will remain active, possibly with an adjustment of rules and purchasing speed.

For this decision it is essential to recall the differences in purchase rules between PSPP and PEPP.<sup>2</sup> In general, the PSPP is bound by more constraints compared to the PEPP that was designed for the situation of the pandemic emergency. For the PSPP issue and issuer limits apply that define maximum thresholds for the purchases. Moreover, the allocation of purchases across euro countries has to follow the ECB capital key more stringently for the PSPP, whereas the PEPP rules claim a larger margin of flexibility to match the rapid and unpredictable nature of the crisis.

Earlier empirical studies have revealed that indeed both programmes, the PEPP and the PSPP, had been applied with significant divergence from the ECB capital key.<sup>3</sup> Notably, for the PSPP, the divergence had already developed and steadily widened well before the pandemic, with purchases of the high-debt countries increasingly overshooting relative to the capital key. In the first phase of the pandemic, from March to September 2020, the divergence from the capital key was even larger for the PSPP than for the PEPP with a strong overweight for France, Italy, Cyprus, Belgium, and Spain.

---

<sup>1</sup> European Commission (2021), European Economic Forecast, Autumn 2021, Institutional Paper 160, p. 27.

<sup>2</sup> For a detailed analysis see: Havlik, Annika and Heinemann, Friedrich (2021), Sliding Down the Slippery Slope? Trends in the Rules and Country Allocations of the Eurosystem's PSPP and PEPP, Credit and Capital Markets, 54(2): 173-197.

<sup>3</sup> Havlik, Annika and Heinemann, Friedrich (2020), Magnitudes and Capital Key Divergence of the Eurosystem's PSPP/PEPP Purchases - Update December 2020, ZEW Expert Brief 16, 8 December 2020.

This study updates the quantitative analysis of the PEPP and PSPP conduct since the outbreak of the pandemic. For PSPP/PEPP purchases between March 2020 and September 2021, this expertise assesses the size of purchase flows and stocks, country allocations and their proportionality to the ECB capital key, and their magnitude relative to GDP and public debt. Moreover, we assess the speed of purchases in relation to the current envelope.

## 2. PURCHASE SPEED AND REMAINING PEPP ENVELOPE

The box below summarizes current and historic purchase details of both PSPP and PEPP.

### Box: PSPP and PEPP – current purchase speed and envelope

**PSPP:** The **Public Sector Purchase Programme** (PSPP) started in March 2015 as the most important component of the Asset Purchase Programme (APP) and continues until this day, with the exception of a pause in net purchases between January and October 2019. By the end of September 2021, the cumulated PSPP net purchases of the Eurosystem reached €2,588 billion (of which €2,320 billion are national debt and €268 billion supranational). The PSPP purchases bonds from all euro members with the exception of Greece. APP net purchases currently amount to €20 billion per month.

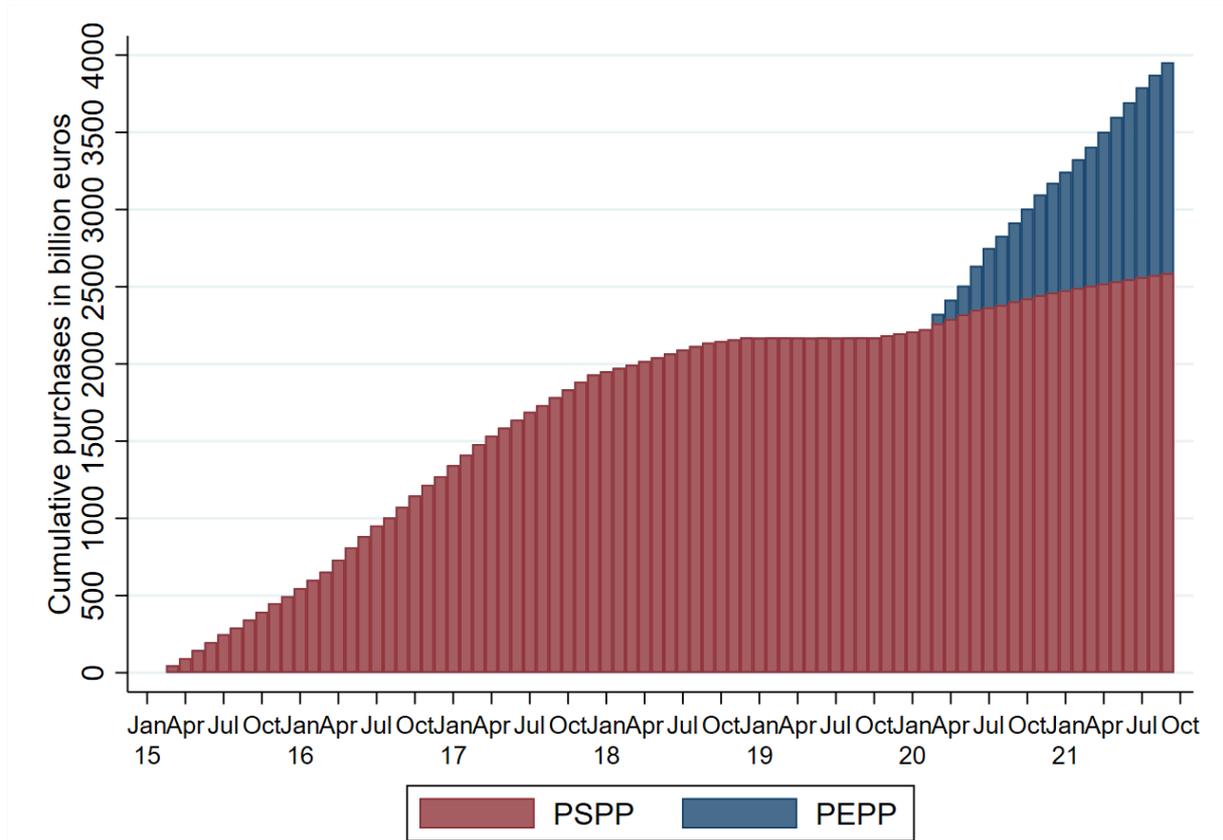
**PEPP:** With the **Pandemic Emergency Purchase Programme** (PEPP), the Governing Council has added a second purchase program that complements the ongoing APP. PEPP is an asset purchase program of private and public sector securities. Initially, it was set up with a target of €750 billion until the end of 2020, but the ECB Council increased the envelope in two steps: First in June 2020 to €1,350 billion and second in December 2020 to €1,850 billion, while extending the horizon for net purchases until at least March 2022. As in the APP, purchases of government bonds are by far the most important item under PEPP. The PEPP buys bonds from all euro members including Greece. By the end of September 2021, the Eurosystem PEPP holdings of public sector securities amounted to €1,366 billion, which is 97% of all PEPP purchases.

By the end of September 2021, the Eurosystem's cumulated net purchases of public sector securities through both programmes reached €3,954 billion<sup>4</sup> (€2,588 billion PSPP and €1,366 billion PEPP, see Figure 1).

---

<sup>4</sup> All figures on government bond purchases are taken from the ECB website.

**Figure 1: Cumulative net purchases of PSPP and PEPP**



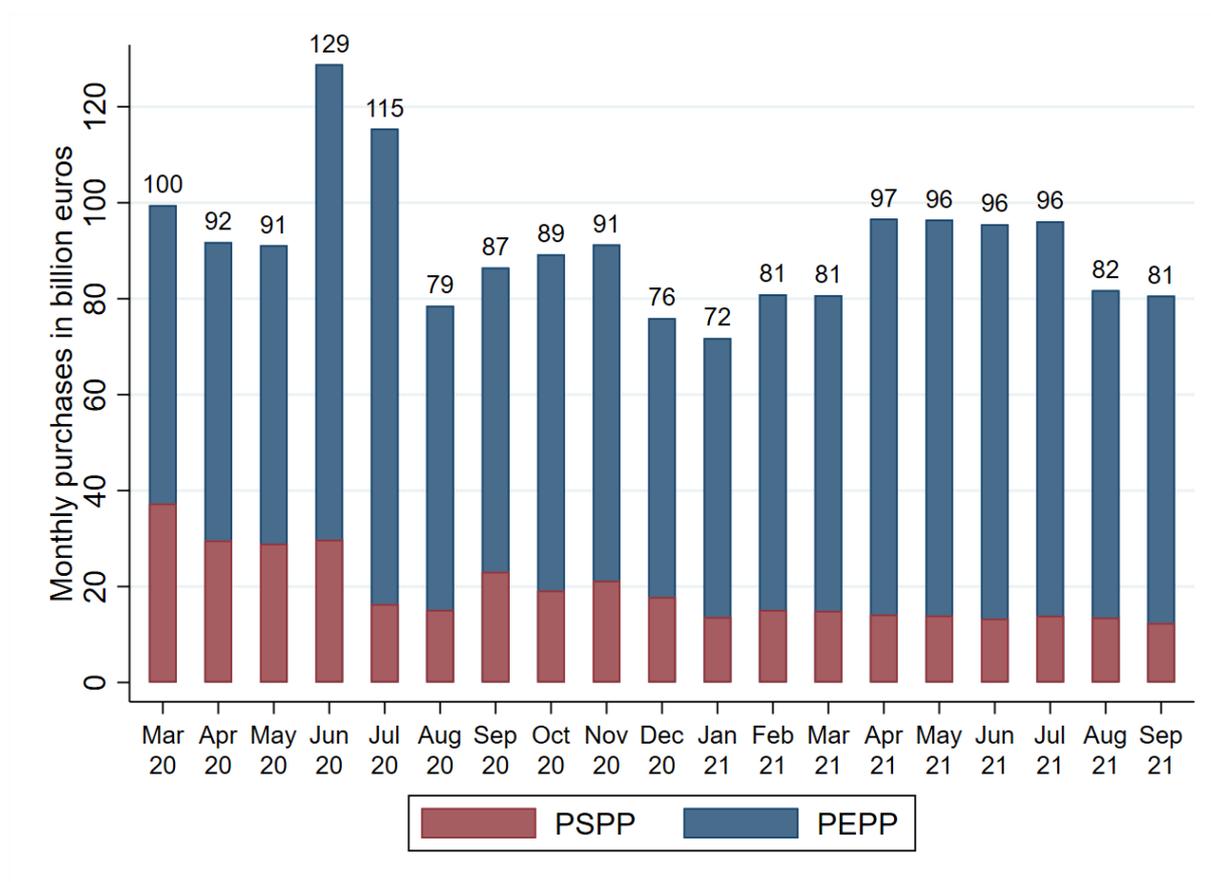
Notes: All data on PSPP and PEPP purchases are taken from the ECB website.<sup>5</sup> The depicted PEPP figures only include public sector securities.

Figure 2 shows the speed of net purchases for both programs from March 2020 to September 2021. Since the ECB publishes data for PSPP purchases on a monthly basis but PEPP data only on a bimonthly basis, the graph presents precise monthly data for PSPP, whereas data for PEPP are depicted as two-month averages. The data show a peak of interventions in June and July 2020 with a subsequent decline that was again slightly reversed in summer 2021. Average monthly PEPP purchases were roughly equal in 2020 (€71 billion) and 2021 (average for January to September: €73 billion), PSPP purchases declined from a monthly average of €24 billion (March to December 2020) to €14 billion (January to September 2021).

<sup>5</sup> PSPP purchases: [www.ecb.europa.eu/mopo/implement/omt/html/index.en.html](https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html)

PEPP purchases: <https://www.ecb.europa.eu/mopo/implement/pepp/html/index.en.html>

**Figure 2: Monthly net purchases of PSPP and PEPP**

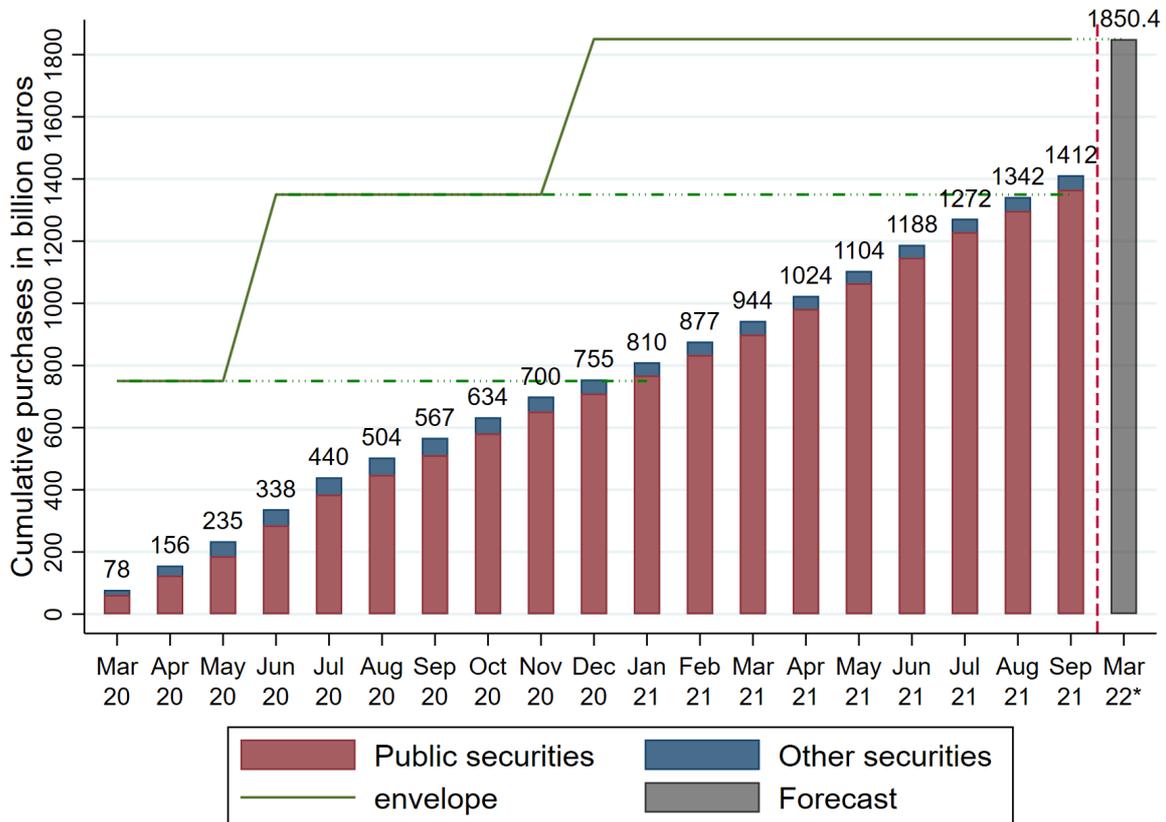


Notes: All data on PSPP and PEPP purchases are taken from the ECB website. The depicted PEPP figures only include public sector securities.

The currently announced upper limit for PEPP purchases amounts to €1,850 billion. Figure 3 shows the PEPP accumulation of public and private sector securities since its onset relative to the initial envelope of €750 billion and the increased envelopes of €1,350 (since June 2020) and €1,850 billion (since December 2020). End of September 2021 the sum of net purchases under PEPP had reaches €1,412 billion. Assuming the same speed of purchases as in the first nine months of 2021 the PEPP will precisely reach its maximum envelope end of March 2022.

In a scenario in which the recent pandemic setback and its negative economic consequences would lead to higher financial market uncertainty and newly increasing spreads over the winter months, the PEPP with its current envelope would not offer any leeway to react. However, if markets stay calm the programme seems to be on course to a precision landing by March 2022.

Figure 3: Cumulative net purchases of PEPP relative to envelopes



Notes: All data on PEPP purchases are taken from the ECB website.

### 3. CAPITAL KEY DIVERGENCE - PEPP

Figure 4 (a) displays the deviation of a country’s PEPP share in total PEPP purchases from the national shares in the ECB capital in percentage points and Figure 4 (b) in percent.<sup>6</sup> The divergence is presented for the period March 2020 to September 2021, and for the purchases in 2020 and 2021, separately. The countries are ordered according to the size of the divergence indicator for the entire period.

Since its onset the PEPP shows the largest upward divergence for Italy (+8.1% relative to capital key), Spain (+4.2%), Greece (+3.8%), and Portugal (+3.1%). Countries bought far below the capital key share are the Baltic states, Malta, Luxemburg, Slovakia, and Cyprus. From the large countries, France is also significantly underweighted (-3.7%) under the PEPP. The overweight of Greece and Portugal is remarkable given that, for both countries, official loans from the European Stability Mechanism (ESM) and bilateral loans (in case of Greece) finance a large share of government debt with the consequence

<sup>6</sup> When calculating country shares in total sovereign purchases, we exclude purchases of supranational securities (e.g. European Union, European Investment Bank, European Stability Mechanism). Hence, 100% represent the purchases of national jurisdictions’ and agencies’ securities.

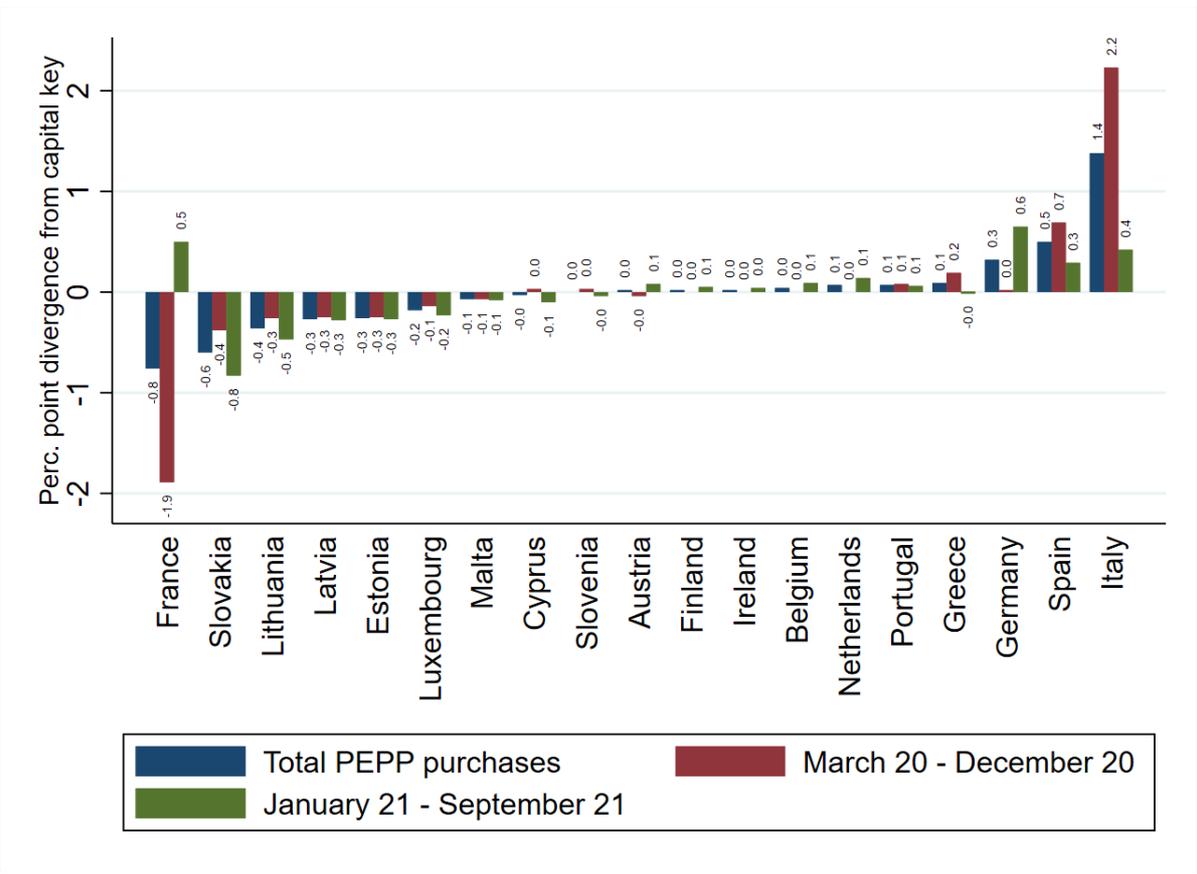
that bond financing plays a more limited role. Given the scarcity of tradable bonds for both countries, purchases above the capital key indicate an even larger importance of Eurosystem purchases for these two countries.

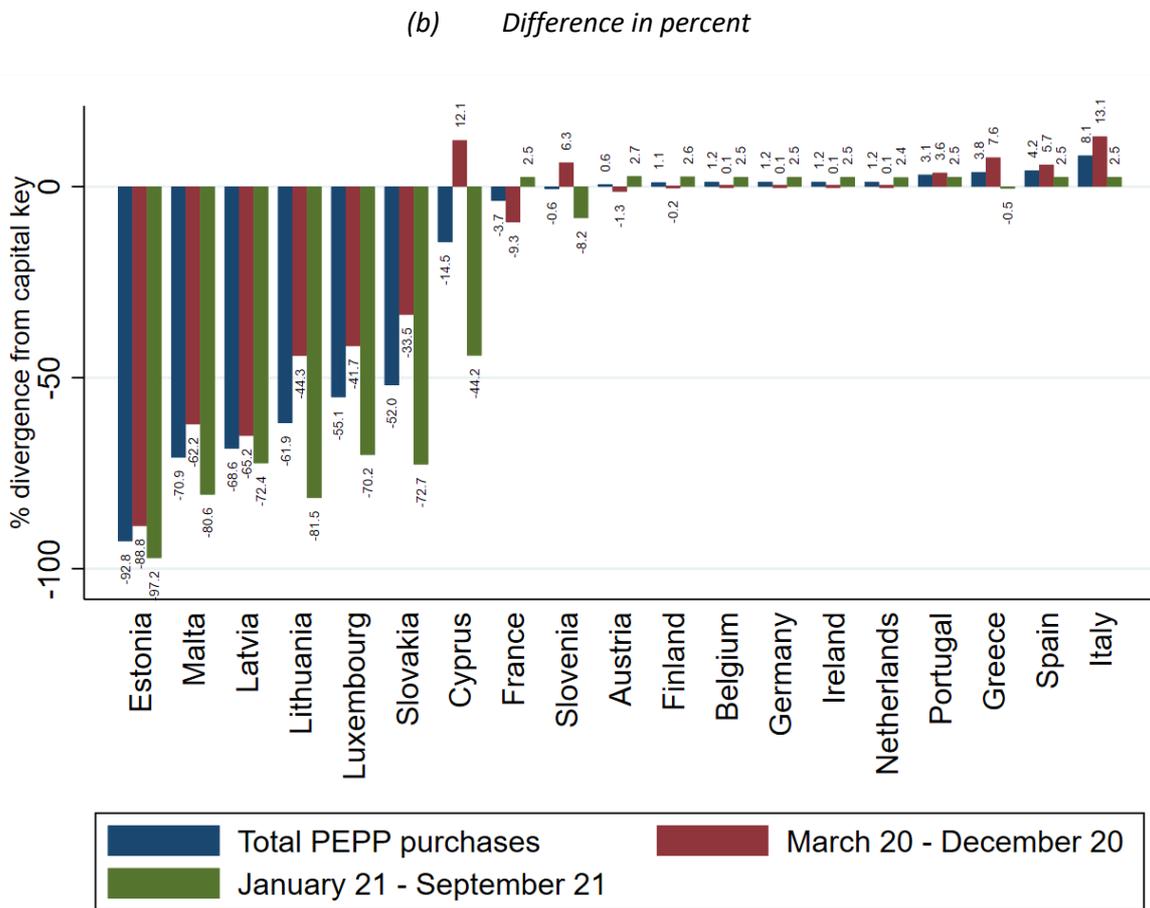
An interesting development of the divergence indicator is observable from 2020 to 2021. PEPP purchases have approached the ECB capital key for the Southern European countries in the second year. While the divergence for Italy was +13.1% in 2020 it declined to +2.5% in 2021. An opposite effect is true for Germany and France that are both bought above proportion in 2021 (+2.5%) but were underweighted (France) or bought roughly in proportion (Germany) in the first year of the pandemic.

Overall, this development indicates that the Eurosystem took advantage of the larger flexibility of the PEPP in the crisis situation of 2020 in particular, but was able to continue with a more proportionate approach in 2021 when the economic situation became more stable.

The heavy underweighting of countries like the Baltic states is a natural outcome of the fact that these countries have only a very low level of public debt and their sovereign bonds markets therefore lack the material that could be purchased by the national central banks.

**Figure 4: Divergence of PEPP net purchases March to September 2020 from capital key**  
 (a) *Difference in percentage points*





Notes: All data on PEPP purchases and the capital keys are taken from the ECB website.

## 4. CAPITAL KEY DIVERGENCE – PSPP AND PEPP COMPARED AND COMBINED

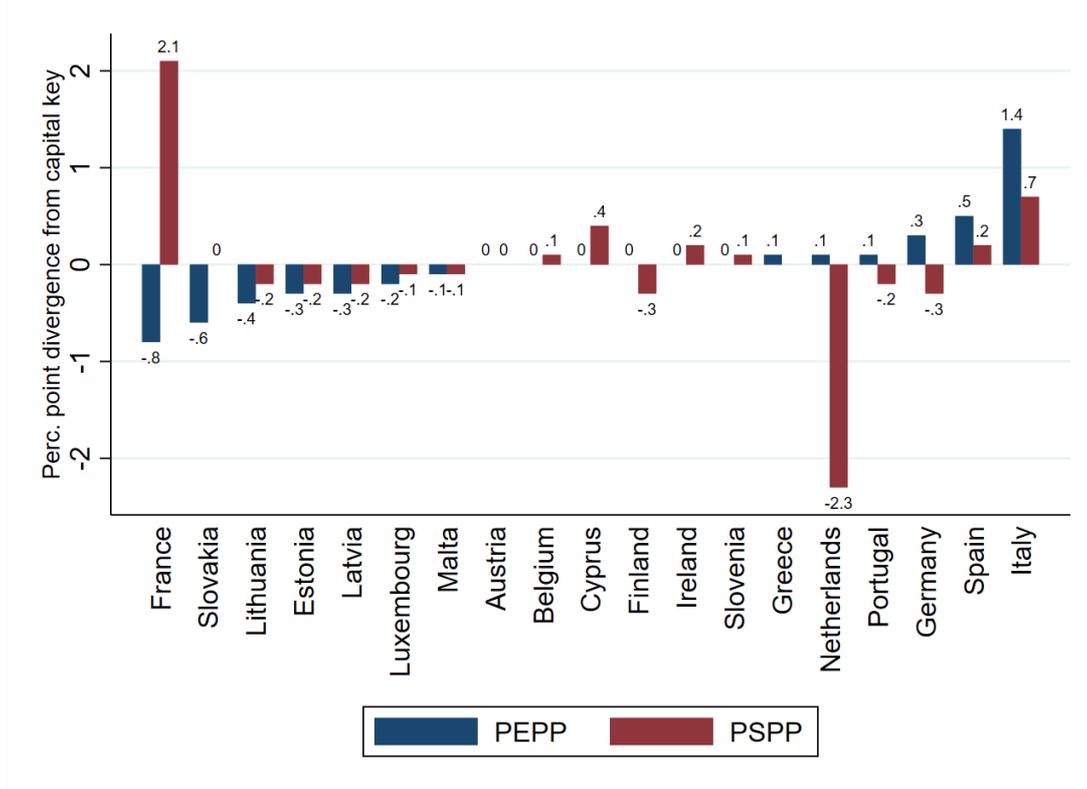
Given the explicit downgrading of the capital key orientation, the expectation would be that the PEPP shares show a larger divergence from the capital key than the PSPP. However, as mentioned in the introduction, in 2020 the divergence from capital keys for the Southern European countries was even larger under the PSPP than under the PEPP and, hence, stood in contrast to programme rules that require a higher proportionality for the PSPP.

In Figure 5, we explore, which of the programmes was conducted with a stricter capital key orientation between March 2020 (the start of PEPP) and September 2021. The graph depicts the difference in each countries' shares of programme purchases relative to the capital key. Country order follows the PEPP divergence.

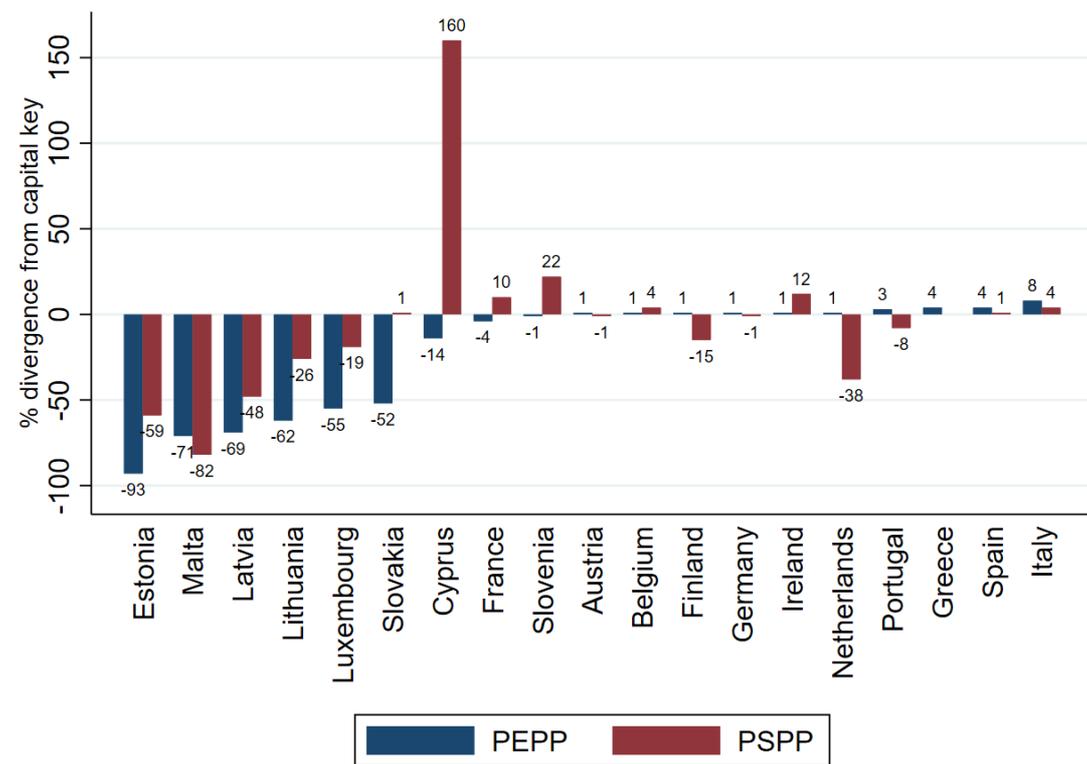
The comparison returns a mixed result. For Italy and Spain, the PSPP is indeed the more proportionate programme compared to the PEPP. For several other countries, the PSPP is less proportionate than PEPP, for example for Cyprus, France, Slovenia, Belgium, and Ireland the PSPP shows a larger divergence from the capital key than the PEPP.

**Figure 5: Divergence of PSPP and PEPP separate net purchases March 2020 to September 2021 from capital key**

(a) *Difference in percentage points*



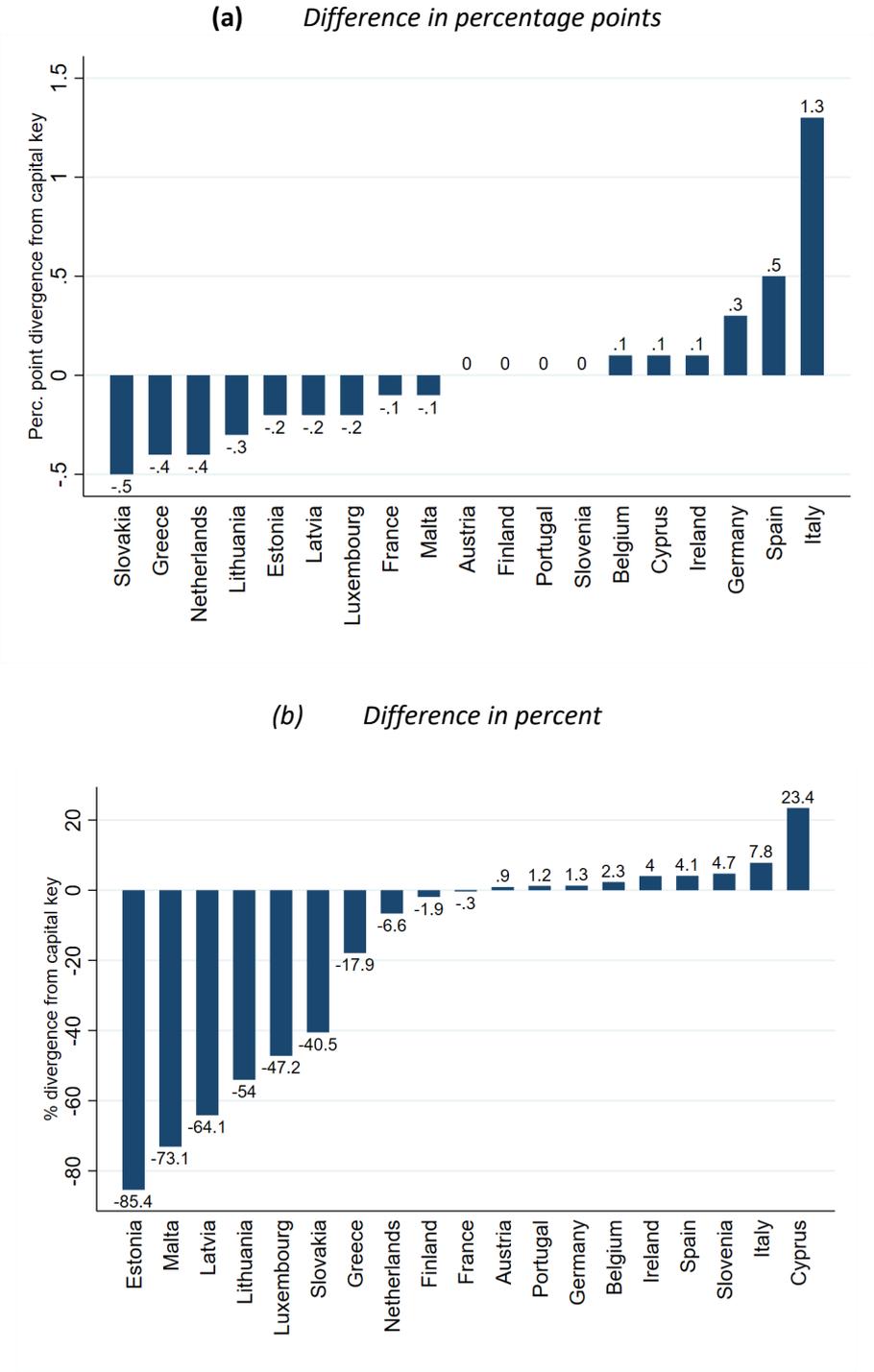
(b) *Difference in percent*



Notes: All data on PEPP purchases and the capital keys are taken from the ECB website.

A meaningful comprehensive analysis of the divergence of country allocations from the capital key requires the examination of combined purchases under PSPP and PEPP. Therefore, Figures 6 (a) and (b) show the divergence of the sum of PSPP and PEPP net purchases between March 2020 and September 2021 from capital keys. As Figure 6 (b) shows, the divergence reaches a maximum of +23% for Cyprus and +8% for Italy. Countries with an overweight of between 4 and 5% are Slovenia, Spain, and Ireland.

**Figure 6: Divergence of PSPP and PEPP combined net purchases March to September 2020 from capital key**



Notes: All data on PEPP and PSPP purchases and the capital keys are taken from the ECB website.

## 5. CAPITAL KEY DIVERGENCE – TREND SINCE 2015

Given the longer existence of the PSPP that dates back to 2015, it is possible to assess long-term trends in the divergence from the capital key for this program. In the following section, we calculate how the PSPP's breakdown of accumulated stocks across countries in the euro area compares to the capital key over the years.<sup>7</sup>

Figure 7 provides an overview of how the accumulated stocks of PSPP have diverged from the ECB capital key at the end of 2015, 2018, and most recently in September 2021. Country ordering follows the size of the divergence in 2021.

Over all three points in time, Spain, Italy and France had positive and growing deviations from the capital key, i.e., PSPP purchases of their government bonds exceeded the shares that were intended (the Belgian and Austrian upward trend ended in 2018). The German positive deviation in 2015 and 2018 turned into a negative one in 2021. The different position of Portugal as compared to other high-debt countries is explainable by the fact already mentioned above: For Portugal, the available material in the market is limited as a consequence of the ESM borrowing. This explains the underweighting for this country, which is however declining.

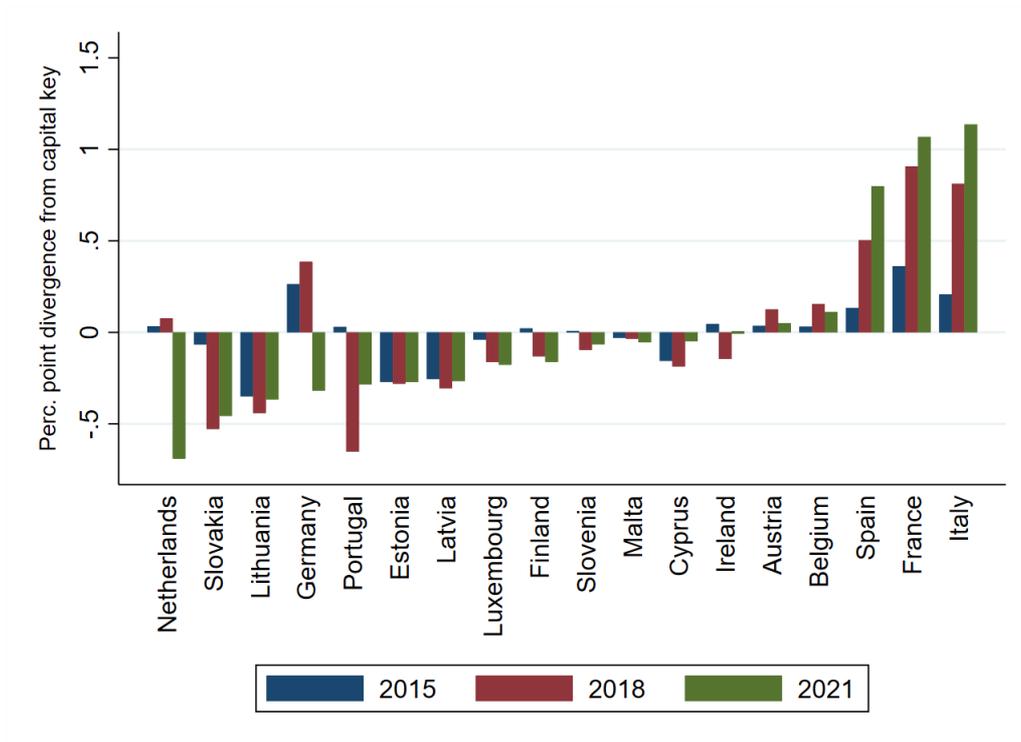
This analysis of the PSPP ultimately shows that the Eurosystem has not been successful in steering the program in line with capital keys. The systematic upward trend and the growing distance of shares from the capital key for high debt countries such as Spain, Italy, and France demonstrates that the divergence is not merely a temporary phenomenon of flows but describes the trend for the resulting stocks. The special circumstances and need for intervention in the Covid-19 pandemic cannot explain this tendency, as this development clearly began way before the pandemic and was already pronounced when the ECB temporarily discontinued purchases at the end of 2018. However, it is important to note that the divergence of PSPP stocks from the capital key has seen an even further increase over the years of the pandemic for Spain, Italy, and France.

---

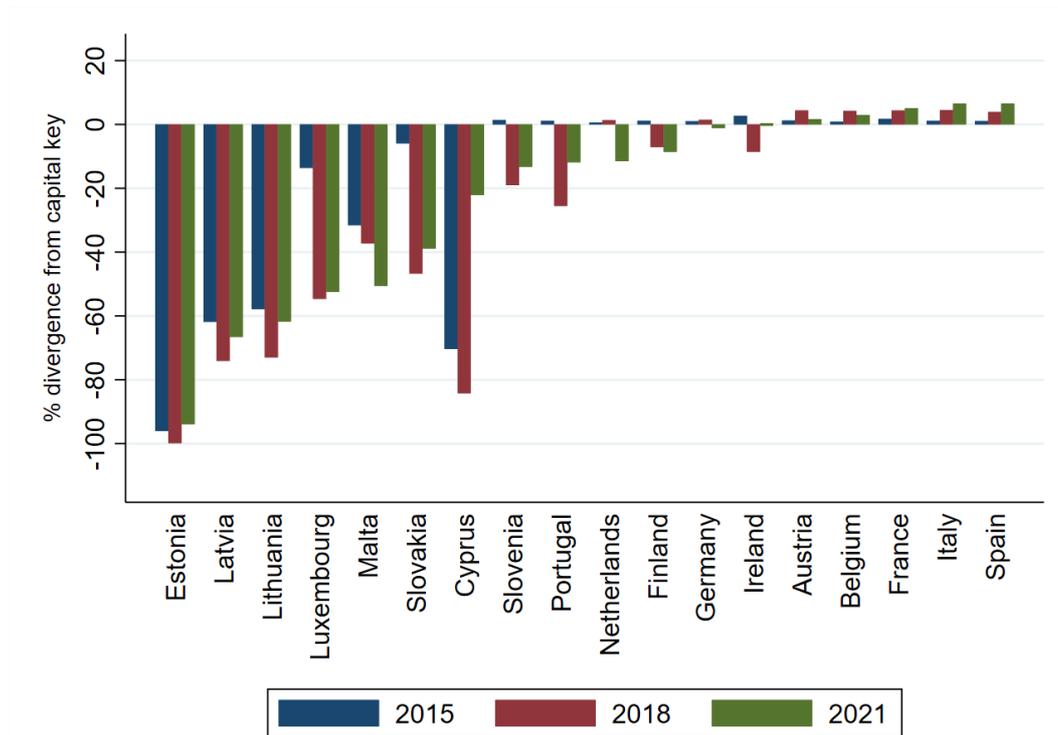
<sup>7</sup> Greece is non-eligible for the PSPP. Hence, we adjust the capital key analysis by focusing on the remaining 18 countries in the euro area. In the following, our reference capital share is each euro area NCB's share in the total capital share of these 18 countries. Cyprus was non-eligible in the beginning but became eligible after a rating-upgrade in September 2018: <https://greece.greekreporter.com/2018/09/28/ecb-begins-cyprus-bonds-purchases-following-investment-grade-upgrade/>.

**Figure 7: Divergence of PSPP stock from ECB capital key**

**(a) Difference in percentage points**



**(b) Difference in percent**

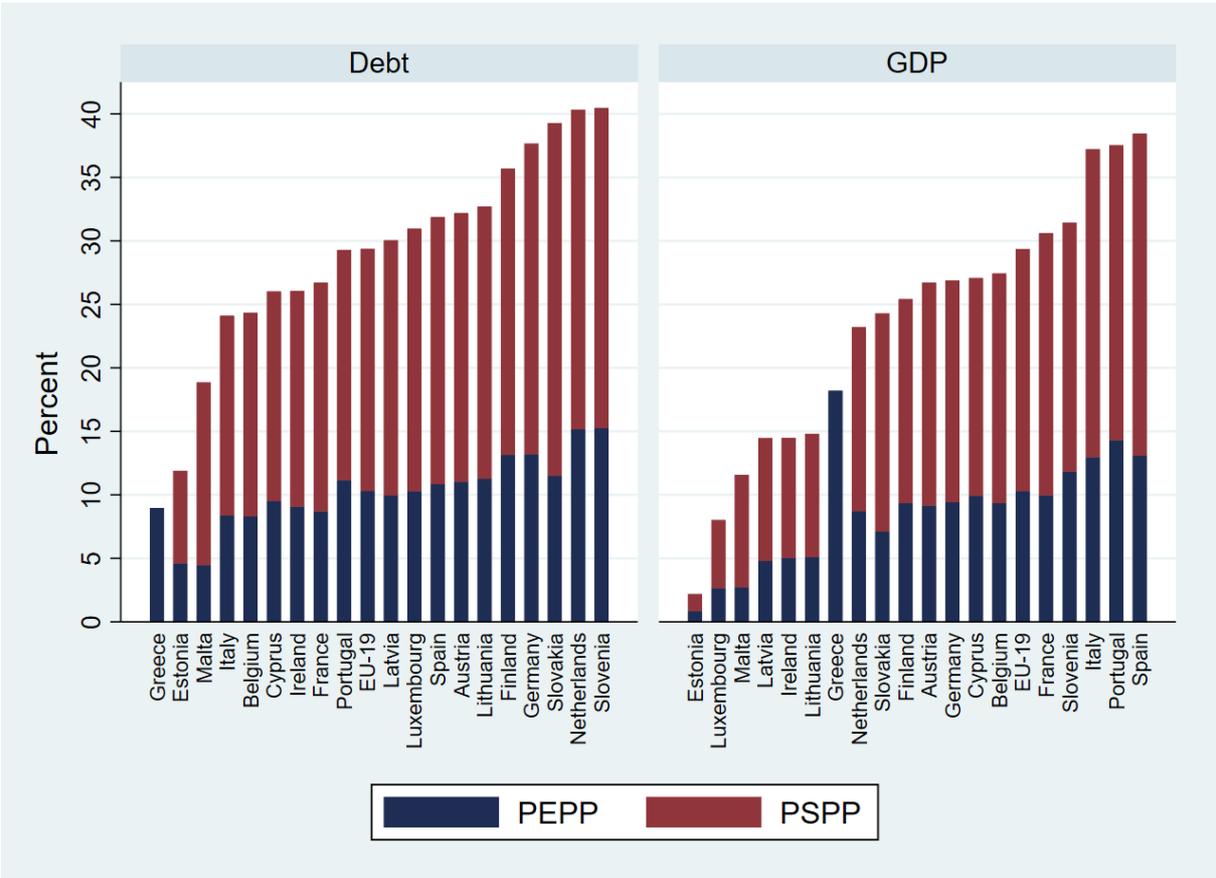


Notes: All data on PSPP purchases and the capital keys are taken from the ECB website. Data refer to total stocks end of year for 2015/2018 and to September 2021. The calculations take account of the adjustment of the capital key in 2019.

# 6. MACROECONOMIC MAGNITUDES

Finally, we look at the magnitude of PSPP and PEPP relative to macroeconomic indicators. Figure 8 shows the ratios of PSPP and PEPP stocks at the end of September 2021 over government debt and GDP as projected for 2021. National differences in the relative importance are huge. In Spain, Portugal, and Italy, total cumulated PSPP and PEPP purchases until September 2021 are approaching 40% of GDP. By contrast, for the Baltic states, Luxemburg, Malta, and Ireland, combined PSPP and PEPP stocks are below 15% of GDP. The Greek PEPP to GDP ratio with 18% is remarkable as it exceeds any other countries' by far and suggests a crucial role for the small Greek sovereign bonds market. This large Greek dependence on the PEPP seems to signal that the country still lacks the reputation to finance itself without massive assistance in the markets. But also the PEPP-GDP holdings for Portugal, Spain, and Italy are far above the Euro area average. Relative to total government debt, we observe the highest share of total PSPP/PEPP holdings to public debt for Slovenia, Netherlands, Slovakia, Germany, and Finland. For most of these countries, relatively moderate public debt levels explain the higher ratios. The results show that the Eurosystem's involvement is substantial, even relative to the exceptionally high borrowing requirements in 2020/2021.

**Figure 8: PEPP and PSPP stocks (September 2021) as a share of government debt and GDP 2021**



Notes: Data on debt and GDP are taken from the AMECO database by the European Commission. The underlying GDP variable is defined as GDP at current prices. The variable debt is defined as general government gross debt. All data on PSPP and PEPP purchases are taken from the ECB website.

## 7. CONCLUSIONS

This analysis has provided insight into the allocation trends of the Eurosystem's sovereign bond purchases prior the ECB Council's decision on the future of PEPP.

The data shows that country allocations for the PEPP seem to reflect the decreasing market pressure in 2021 as compared to 2020, since the large overweighting of Southern European countries in the programme's first year was reduced over 2021.

Still, the analysis of the combined purchases under both the PEPP and the PSPP reveals an asymmetric use of the programmes with a stronger role for high-debt euro countries. The results also indicate that the ECB applies a large amount of discretion to the allocation of purchases in both programmes, although the PSPP is officially bound by stronger constraints. For the PSPP, the increasing divergence from capital keys is an empirical trend that started well before the pandemic and thus stands in an increasing tension with the PSPP rules.

The increasing tension between the carried out purchases and the PSPP rules also becomes evident with respect to the programme's issue and issuer limit. With a share of almost 30% of total euro area government debt in the hands of the Eurosystem, the central banks have become a crucial investor for euro area countries and have already surpassed the 33% ratio for several countries with their combined PEPP-PSPP purchases.

The issue and issuer limit of the PSPP is set at 33% for national bonds. This threshold corresponds to the existing Collective Action Clauses (CACs) and their majority rules for a collectively agreed debt restructuring. Since the standardized CACs of euro area governmental issuance define a blocking minority of 33 %, this threshold is set to precisely avoid a decisive role of the ECB in any debt restructuring negotiations. In countries, for which the Eurosystem holdings surpass this threshold, a debt restructuring is no longer possible against the veto from the ECB. For this consequence it does not play a role whether bonds are purchased under the PSPP or the PEPP. With such a strategic position, the legal risks for a possible non-compliance with the ban of monetary financing (Art. 123 TFEU) clearly increase.<sup>8</sup>

For the upcoming decision of the ECB Council, these results and considerations point towards difficult trade-offs. It is highly uncertain whether the euro area sovereign bond markets could remain stable without a continuation of the massive financing support from the Eurosystem for the high-debt countries.<sup>9</sup> However, the massive monetary policy support for the financing of high government

---

<sup>8</sup> For details also of the legal discussion see: Havlik, Annika and Heinemann, Friedrich (2021), Sliding Down the Slippery Slope? Trends in the Rules and Country Allocations of the Eurosystem's PSPP and PEPP, *Credit and Capital Markets*, 54(2): 173-197.

<sup>9</sup> Empirical evidence indicates that the currently very low spreads for high-debt countries are the result of the PEPP with its large flexibility for targeted purchases of critical countries: Corradin, Stefano, Grimm, Niklas and Schwaab, Bernd (2021), Euro Area Sovereign Bond Risk Premia During the Covid-19 Pandemic, ECB Working Paper 2561; Havlik, Annika, Heinemann, Friedrich, Helbig, Samuel and Nover, Justus (2021), Dispelling the

deficits, the increasingly asymmetric use of PSPP already before the pandemic, and purchases approaching or exceeding important thresholds, all this signals movement into legally risky territory.

#### AUTHORS

##### **Carlo Birkholz**

ZEW – Leibniz Centre for European Economic Research  
Mannheim GmbH  
L 7, 1  
Tel.: +49 (0)621 1235-160  
68161 Mannheim  
[carlo.birkholz@zew.de](mailto:carlo.birkholz@zew.de)

##### **Prof. Dr. Friedrich Heinemann**

ZEW – Leibniz Centre for European Economic Research  
Mannheim GmbH  
L 7, 1  
Tel.: +49 (0)621 1235-149  
68161 Mannheim  
[friedrich.heinemann@zew.de](mailto:friedrich.heinemann@zew.de)