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Go Big or Go Home? The ECB's Asset Purchase Programmes in Macroeconomic Perspective

Policy Department for Economic, Scientific and Quality of Life Policies
Directorate-General for Internal Policies
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Abstract

Until this year, governments in the single currency area appeared to be 'missing in action'. There is belated recognition that monetary and fiscal policies must coordinate especially in crisis conditions. The euro area has experienced crisis or near crisis conditions for over a decade. Lessons are being learned late but there continue to be several gaps that the euro area and its members need to close. The paper highlights these and the continuing threats to the single currency area.

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LIST OF ABBREVIATIONS

APP	Asset Purchase Programmes
AUT	Austria
BE	Belgium
BIS	Bank for International Settlements
CA	Canada
COVID-19	Coronavirus disease
CY	Cyprus
DE	Germany
ECB	European Central Bank
EFA	Economic and Financial Affairs
ELB	Effective Lower Bound
EMU	European Monetary Union
EP	European Parliament
ES	Spain
EE	Estonia
EU	European Union
EA	Euro Area
Fed	U.S. Federal Reserve Board
FI	Finland
FR	France
G4	Group of Four Economies (USA, GBR, JPN, EUR)
G7	Group of Seven Economies (CAN, DEU, FRA, GBR, ITA, JPN, USA)
GBR	The United Kingdom of Great Britain and Northern Ireland
GDP	Gross Domestic Product
GFC	Great Financial Crisis
GRC	Greece
HICP	Harmonized Index of Consumer Prices
IMF	International Monetary Fund
IE	Ireland
IT	Italy

JP	Japan
LIBOR3M	London Inter-Bank Offer Rate, 3 months maturity
LTRO	Long-Term Refinancing Operations
LT	Lithuania
LU	Luxembourg
LV	Latvia
MEP	Member of European Parliament
MRO	Main Refinancing Operations
NCB	National Central Banks
NL	The Netherlands
NIRP	Negative Interest Rate Policy
NSP	Non-Standard Policies
OMT	Outright Monetary Transactions
OECD	Organisation for Economic Cooperation and Development
PEPP	Pandemic Emergency Purchase Programme
PT	Portugal
PSAPP	Public Sector Asset Purchase Programme
QE	Quantitative Easing
R*	Short hand for the 'natural' or equilibrium real rate of interest
SDC	Sovereign Debt Crisis
SPF	Survey of Professional Forecasters
SK	Slovakia
SI	Slovenia
TEU	Treaty on Economic Union
TFEU	Treaty on teh Functioning ot eh European Union
UMP	Unconventional Monetary Policy
UK	United Kingdom
US	United States
VIX	Financial market's expectations of aggregate stock price volatility (US-based). Used as an indicator of market sentiment.
WEO	World Economic Outlook

ZEW	Zentrum für Europäische Wirtschaftsforschung (Leibniz Centre for European Economic Research)
ZLB	Zero Lower Bound

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EXECUTIVE SUMMARY

- **GDP growth in the euro area has been disappointingly low and the ECB has under-performed in reaching its own inflation target for several years**. Since the single currency area was created real GDP growth and inflation rates have converged although important divergences remain, especially when it comes to expectations of future growth and inflation.
- **There was a gathering economic storm even before COVID-19**. The pandemic merely exacerbated forces already at play though it would offer the ECB an opportunity to lead by example.
- **Concerns over asset purchase programs by central banks are global and are not new**. Indeed, they can be traced back to the 1990s in Japan. Concerns are two-fold: the size of these interventions and their scope. The latter give rise to worries that monetary and fiscal policies become blurred, and with good reason.
- **The paper examines the record of the ECB since 1999 but focusing on three episodes**. They are: the global financial crisis, the euro area sovereign debt crisis, and the period since non-standard policies, also referred to as unconventional monetary policies, were implemented. The last period can also be said to include the ongoing pandemic crisis.
- **Over the series of crises, some lessons have been learned**. Overall, the ECB's response has improved. The impact of its increasingly frequent and large interventions has arguably become more muted over time. The most important lesson, not completely digested, is the critical need for fiscal and monetary policies to operate in harmony. This need not require a single fiscal policy; it does, however, require a fiscal response from Member States. It also requires better coordination among the sovereign Member States.
- **Legal, policy, and practical threats to good practice in the conduct of monetary policy in the euro area remain**. Missing is a more aggressive attempt by the ECB to engage with the public to counter some of the external pressures faced by the institution.
- **The sharp divide between Northern and Southern Europe over the net benefits of collective action in the euro area could stand a closer look at some of the evidence**. Some of the loudest critics of ECB policy appear to see only costs when there have also been beneficiaries among members who believe a single monetary policy has penalised their economies.
- **Bank centred financing continues to be a threat to economic resilience and recovery and it also has implications for the conduct of monetary policy**. In particular, we do not yet know the full fallout from the ongoing pandemic on the banking system.
- **The record of asset purchase programs in the euro area is mixed**. There is clear evidence that long-term yields have declined but the record at the shorter end of the term structure is less successful. At the macroeconomic level, the best that can be said is that ECB interventions have softened the economic blows from successive crises. However, this is not a recipe for the long-term success of monetary policy.
- **Talk of exit from non-standard monetary policy is premature**. Instead, a clear roadmap of conditions under which the ECB's monetary policy stance would return to some 'new normal' is essential. Together with better fiscal-monetary coordination and greater public engagement, these are the pre-conditions for achieving a more optimistic future for the euro area.

1. INTRODUCTION

Only recently the euro area celebrated its 20th anniversary (2019). It is perhaps an understatement to point out that the past two decades have been economically eventful. Christine Lagarde, at the time Managing Director of the IMF and now President of the ECB, pointed out that "…at age 20, the euro area is more mature – battle-scarred yes,…" (Lagarde, 2018). Only ten years earlier EMU was declared "…a resounding success…" (EFA, 2008). Since then two financial crises, a continuing and controversial programme of non-standard policies (NSP), and an ongoing global health crisis have intervened. EMU conferences on both occasions noted the challenges faced by the single currency area at the same time they were celebrating its achievements. Unfortunately, reminiscent of the epigram "plus ça change, plus c'est la même chose", the challenges remained largely unaddressed from one decade to the next. Especially relevant for the purposes of the analysis below are the incomplete integration of financial markets in the euro area and inadequate fiscal risk-sharing. These challenges can also be seen though the wider lens of macroeconomic performance, as discussed later.

When policy makers were celebrating EMU@10, the global financial crisis (GFC) was still considered an event that originated elsewhere although there was recognition that the forces of globalisation required a response beyond the US's borders.[1] Unfortunately, the introduction of the euro, in the era of the Great Moderation (Bernanke, 2004), has since been followed by a series of crises with lasting implications which have yet to be fully understood.

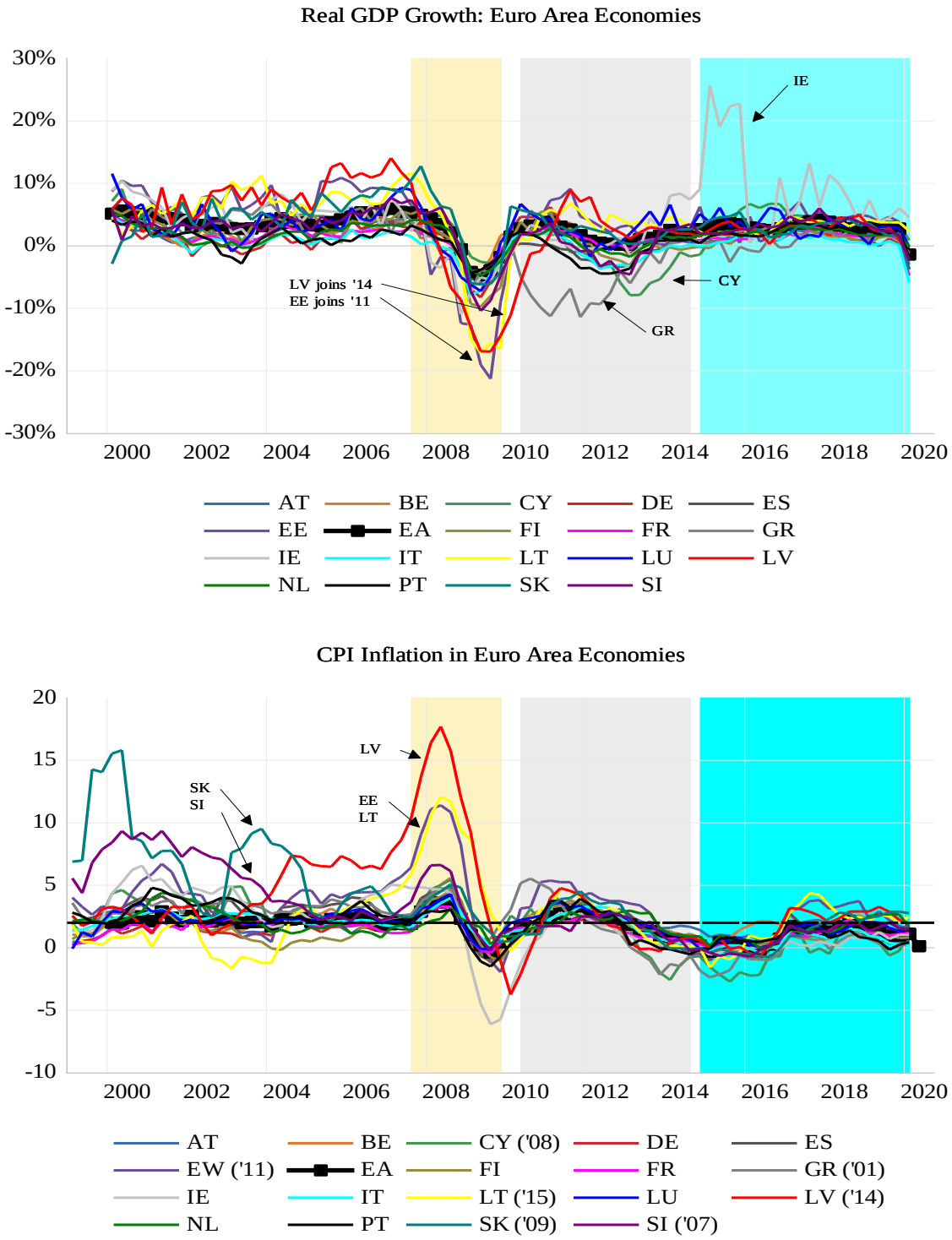
It is useful, as noted above and to set the stage for what is to come, first to consider the overall macroeconomic picture in the euro area. Figure 1 plots real GDP growth and inflation, respectively, for the euro area as well as member economies since the single currency area's inception.[2] The GFC and sovereign debt crisis (SDC) clearly bent the curve on both variables in a negative direction. Stability of sorts appears to emerge in the era of NSP, at least until the first indications of the economic rupture created by the COVID-19 pandemic seen at the very end of the sample (also, see Figure 2). Equally clear, however, is the uneven distribution of the negative shocks. Even in countries with a single currency but several jurisdictions, as in a federation, monetary policy cannot finely tune its impact to regional economic conditions. However, it cannot be entirely insensitive to them.

Former ECB President Trichet long ago indicated the importance of being alert to the "…structural peculiarities…" of the euro area and that these "…have played an important role in positioning the stance of monetary policy…" (Trichet, 2007). Presumably, senior officials in the ECB must surely be aware that the impact of their decisions may well influence divergences within the single currency area. Therefore, while monetary policy is destined to be calibrated for the euro area as a whole, persuading citizens of the net benefits or value added of a single currency area cannot be left to monetary policy alone. This bears repeating, as we shall see, in evaluating the impact of successive ECB APP programmes over the years.

[1] As a member of the Executive Board of the ECB at the time, González-Páramo (2007) said at the time: "…the turmoil originated in a relatively small segment of the US economy – the sub-prime segment of the mortgage market – that has no obvious relationship with the Eurosystem's sphere of interest."

[2] Not all countries shown joined the euro area in the same year. The plot for inflation indicates in parenthesis the membership year if this took place after 1999.

Figure 1: Core macroeconomic indicators: real GDP growth and inflation



Sources: International Monetary Fund, International Financial Statistics, and author's calculations. The shaded areas represent the GFC (2007Q3-2009Q4), the SDC (2010Q2-2014Q3), and NSP (2014Q4-) periods, in that order. The years shown indicate when the euro is introduced. Otherwise, all begin in 1999. Years in parentheses refer to when countries joined the euro after 1999. The long-dashed line is drawn at 2% just above the ECB's stated objective.

A salient feature of the euro area is that its members are sovereign countries. Nevertheless, on the positive side and with few exceptions, a considerable narrowing of the differentials in economic growth and inflation within the single currency area is also evident from Figure 1. More worryingly, but equally striking, however, is that most member countries' inflation rates have been persistently below the ECB's stated inflation objective since the time the euro area was dealing with the SDC.[3]

Of course, the survival of the euro are rests partly on perceptions about the ability of the ECB to deliver on its promise to keep inflation low and stable and, together with the individual policies of sovereign member economies, ensure the conditions necessary to generate adequate economic growth. Stated differently, if past performance is a guide, it is what the future is expected to hold that is a truer harbinger of the longevity of a policy regime. If we examine the five largest economies then, as shown in Figure 2, it is difficult, even before the 2020 pandemic, to conclude that the record has been a stellar one. Figure 2 also highlights the fact that while forecasters disagree for a variety of reasons (e.g., see Siklos, 2013; 2019) they often agree on the broad direction of future growth and inflation.

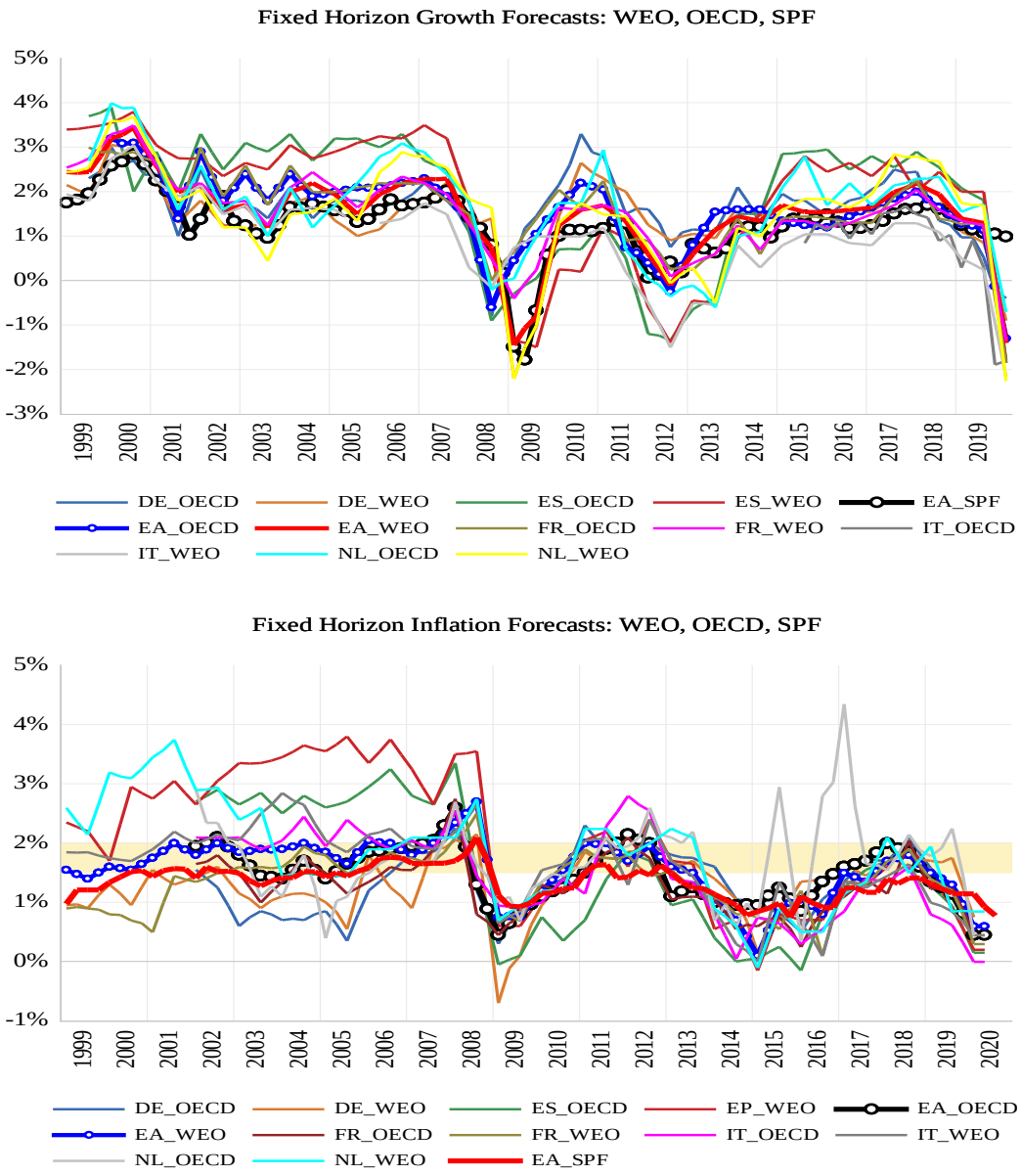
To be sure, growth and inflation expectations have narrowed but, since the GFC, perceptions of economic performance have slowed, and inflation has typically been seen as missing the target the ECB has set for itself. While there is a common element to some shocks, as in 2008-9 and again during the SDC, the differential sensitivity of these expectations to the various economic shocks over time is also noticeable. These divergences no doubt also contribute to differing perceptions within the euro area about the effectiveness of monetary policy, and interventions of the kind that APP represent.

According to most definitions of credibility (e.g., see Bordo and Siklos, 2017), these results point to a loss with a resulting negative impact on the ECB's reputation. Even before the COVID-19 crisis, the continued implementation of NSP, begun in 2015, could not seemingly prevent the gathering storm of negative macroeconomic signals. Still focusing on the five largest euro area economies, Figure 3 reveals that, since early 2018, both real GDP growth and inflation forecasts were pessimistic, at least in the short run.[4] In other words, trouble was brewing even before the events that have gripped the global economy since March 2020. Once again, the indications are less clear when the aggregate euro area alone is examined than when individual economies are considered.

[3] "The Governing Council of the European Central bank aims to keep inflation below, but close to, 2% over the medium term." https://www.ecb.europa.eu/ecb/tasks/monpol/html/index.en.html.

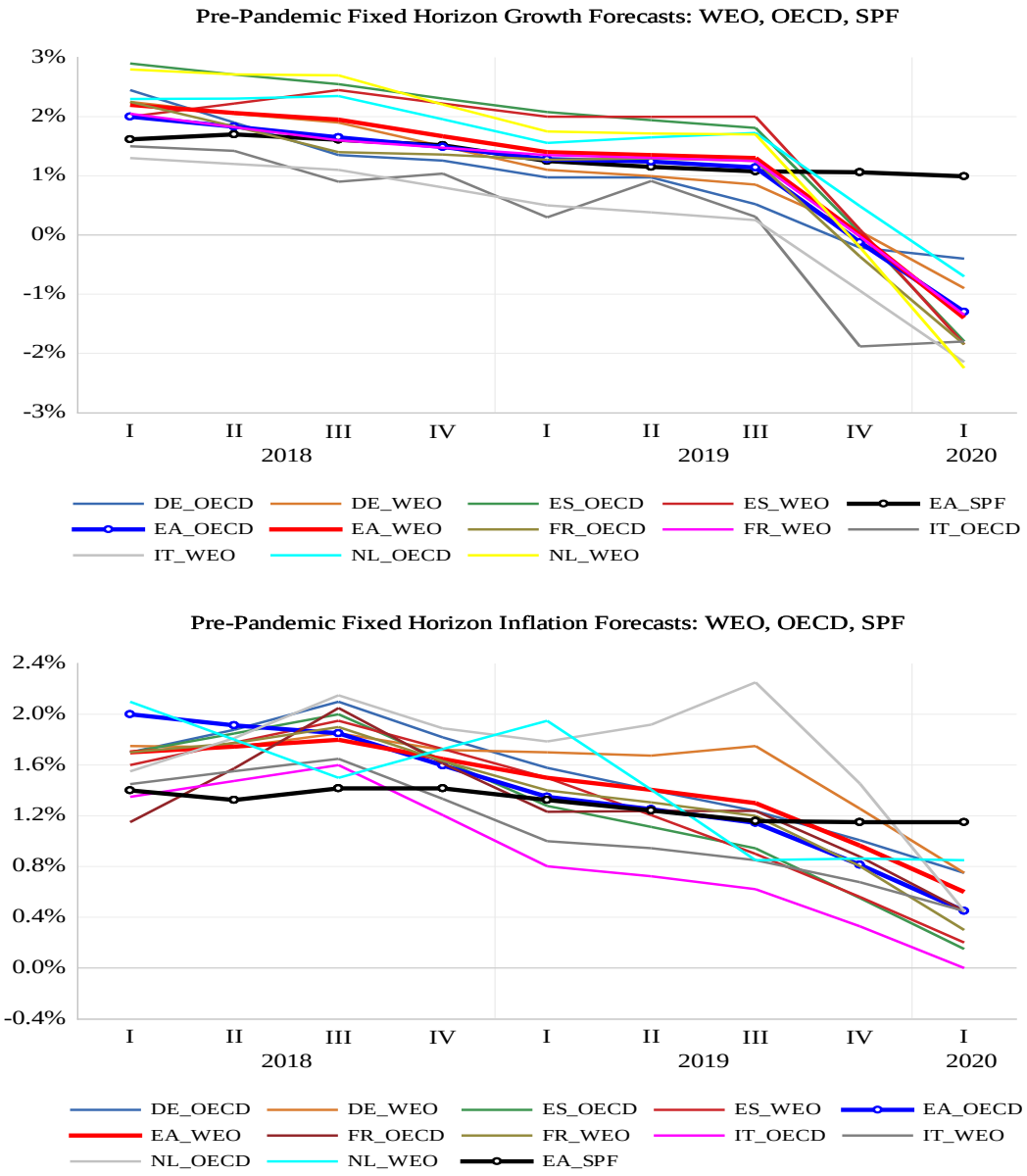
[4] Longer-run expectations are arguably more important in the present context. However, as central bankers are fond of pointing out, the profession still has a relatively poor understanding of expectations. Since it is likely that longer term expectations are influenced by many more factors than short-run expectations, it is likely we know even less what drives them. In any case, some recent evidence (e.g. Corsello et al., 2019) finds that long-term inflation expectations are sensitive to short-run surprises. This represents a further challenge to ECB credibility.

Figure 2: Selected one-year ahead macroeconomic forecasts for growth and inflation



Sources: International Monetary Fund, World Economic Outlook, OECD, ECB Survey of Professional Forecasters, and author's calculations. The shaded horizontal area highlights inflation between 1.5-2% which proxies the ECB's price stability objective.

Figure 3: Macroeconomic forecasts on the eve of the pandemic



Source: Same as Figure 2.

I discuss the aims of APP-style programmes, the rationale behind the pandemic emergency purchase programme (PEPP), the set of challenges surrounding the introduction and implementation of unconventional monetary policy (UMP) more generally, as well as providing an overall evaluation of NSP in the following section. Section 3 assesses the empirical evidence around the impact of APP. Section 4 then examines the macroeconomic impact of APP drawing attention to the distinction between global and domestic considerations, as well as the importance of trying to identify the most important sources of shocks that need to be considered in evaluating this kind of policy. The paper concludes by drawing on lessons learned and the way ahead for ECB APP. I conclude, as I began, by underscoring an old lesson. Regardless how fiscal policy is managed in the euro area, a question that is beyond the scope of the paper, it must be compatible with and broadly support the broad direction of monetary policy. The euro area has made progress in this direction. However, as is true elsewhere, it is

difficult to see how an economic reckoning of sorts can be avoided unless a new understanding of the role of monetary policy is developed and the respective roles and functions of monetary and fiscal policy are reconsidered. In the foreseeable future this will, of course, not be possible until the pandemic has passed. In the meantime, the ECB needs to be clearer in communicating the aims of the PEPP and challenge the fiscal authorities to be less passive.

2. ASSET PURCHASE PROGRAMMES: AIMS, CHALLENGES, AND EXIT

2.1. Aims and a brief chronology: reducing frictions versus stimulus

By international standards, the ECB was a late comer to the group of central banks engaged in UMP (Lombardi et. al., 2018). Perhaps to make clear that the original aims of UMP were a return to the *status quo ante*, interventions in financial markets via the purchase of financial assets was called non-standard. Hence, the acronym NSP which has been used ever since alongside QE. Unlike the US and the UK experiences before it, the ECB was in a relatively better position to signal a departure from the international practice of setting the stance of monetary policy solely via the setting of a policy rate instrument. The reason is that, in the years before QE began in 2015 in the euro area, the ECB intervened by ensuring that financial markets operated smoothly via injections of liquidity. These effectively amounted to subsidising banking systems in order to facilitate lending. In a crisis, financial institutions find that sources of funding can dry up. However, at the same time, lenders do not trust the creditworthiness of borrowers thereby restricting lending. We return to the implications of this phenomenon later.

In contrast, as the GFC erupted in the UK and the US, policy makers were initially confronted with the difficulty of deciding whether the financial turmoil they were facing was a liquidity or a solvency crisis. The resulting identification problem is perhaps most easily understood by the failure of former Fed chair Ben Bernanke to convince the profession, and the public more generally, of the distinction between credit and quantitative easing (Bernanke, 2015: 418). The former is meant to ease credit frictions of the kind just described while the latter represents an attempt to boost economic activity via an expansion of the money supply. Part of the difficulty is that all of these forms of policy easing can impact a central bank's balance sheet. Add the policy of forward guidance, a form of qualitative easing intended to guide investors and the public regarding the expected future path of interest rates, usually conditional on information known to policy makers at the time decisions are made, and it becomes clear that the neat separation of the impact all of these policy tools is difficult to achieve. More recently, negative interest rates have been added to the toolkit and, like many of NSP, remain controversial. Of course, as we shall see below, studies have sought to identify the relative importance of each NSP tool, but these are dependent on possibly questionable assumptions. The challenges alluded to above can also be seen from plots of the asset and liability composition of the ECB's balance sheet (e.g., see Bhattarai and Neely, 2018, Figure 4). Beyond these features is the concern that monetary and fiscal policy become blurred thereby overturning decades of orthodoxy about the role of monetary policy.

As a result, chronologies of NSP in the euro area (Hammermann et. al., 2019; Gambetti and Musso, 2017 are two excellent recent examples) tend to focus on the timing of events and interventions by the ECB. In contrast, Table 1 below highlights the distinction between QE and credit easing if only to highlight the different intentions of these policies. As we shall see below, since legal and institutional aspects of APP play an outsized role in the euro area, the distinction can be useful.

Table 1: QE versus credit easing and forward guidance in the euro area: 2008-2020

Policy Type	Policy Name	Time Period
Forward Guidance	n/a: Qualitative	July 2013-present
Negative Interest Rates	NIRP	June 2014-present
Quantitative Easing	Public Sector Purchase Programme	January 2015-Present
	Pandemic Emergency Purchase Programme	March 2020 - present
Credit Easing	Securities Market Programme	May 2010-September 2012
	Outright Monetary Transactions	September 2012-present
	Asset Backed Securities Purchase Programme	September 2014-present
	Covered Bond Purchase Programme	July 2009-June2010; November 2011-October 2012; October 2014-present
	Corporate Sector Purchase Programme	June 2016-present
Subsidised Lending to Banks	Longer-term refinancing operations (LTRO) and Targeted LTRO	6 months: March 2008-March 2010; August 2011; 12 months: May 2009-December 2009; October 2011; 3 years: December 2011; 4 years: June 2014; March 2016;

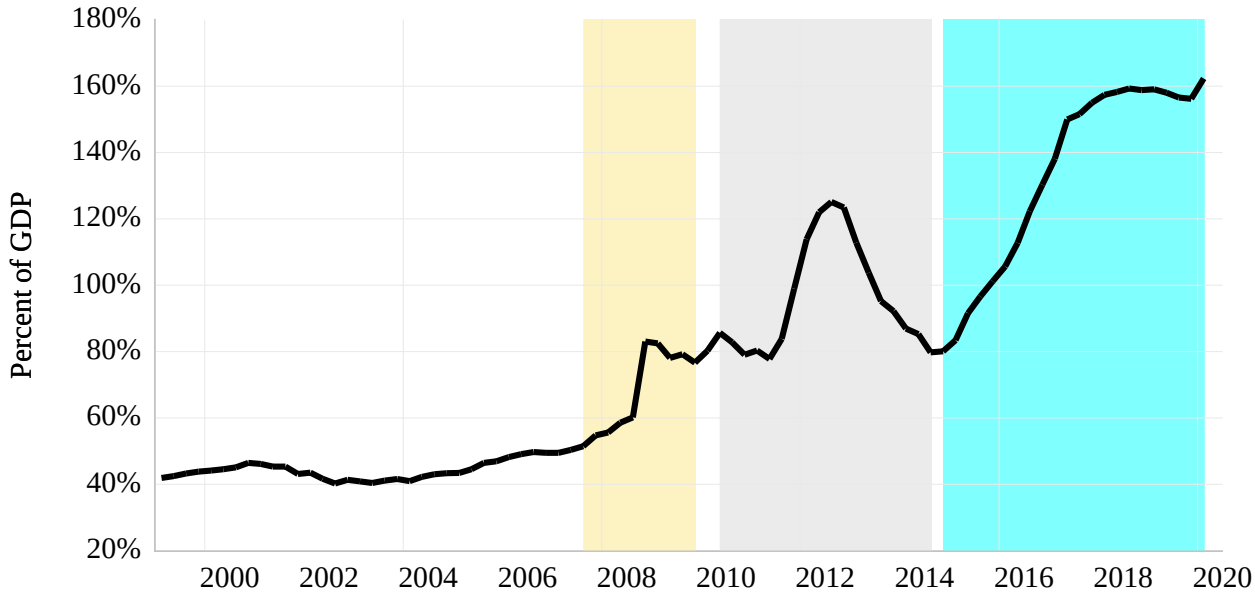
Sources: adapted from Lombardi et. al. (2018) and ECB.

The SDC put paid the idea that the euro area was immune to the responses that led to significant increases in the balance sheet, as a percent of GDP, of the Federal Reserve and the Bank of England. The latter merely followed in the footsteps of the Bank of Japan which paved the way for a similar path in monetary policy at least a decade earlier (e.g., see Siklos 2020a, and references therein).

As shown in Figure 4, the ECB responded with a delay to the unfolding of the GFC. Similarly, the response was deferred as the SDC worsened. Indeed, perhaps as a reflection of the concern that QE-

style policies are outside the ECB 's mandate (see section 2.2.2. below), the central bank reversed course. Interestingly, the Bank of Japan also reversed course during its earlier QE experiment though the ECB's retrenchment brought the central bank's assets to GDP ratio back to mid-GFC state. In the Bank of Japan's case the reversal was due to fiscal and monetary policies no longer operating in tandem (Koo, 2008, 2015) while, in the case of the ECB, no doubt pressures on the institution were also at play (see section 2.2.2. below). Since QE was introduced the rise has dwarfed levels attained by the Fed and the Bank of England but fall short of the ones reached by the Bank of Japan. Superficially, since economic growth in both Japan and the euro area fell behind ones attained in the USA and the UK, this does not augur well in evaluating the success of NSP. Of course, there are also other factors to consider before reaching a conclusion about the value-added of NSP, but we are once again required to return to the role of expectations and fiscal policy, neither which underpinned the ECB's efforts, at least until the COVID-19 pandemic.

Figure 4: ECB assets as a percent of euro area GDP



Sources: ECB, Figure 1, and author's calculations. The shaded areas are defined in Figure 1.

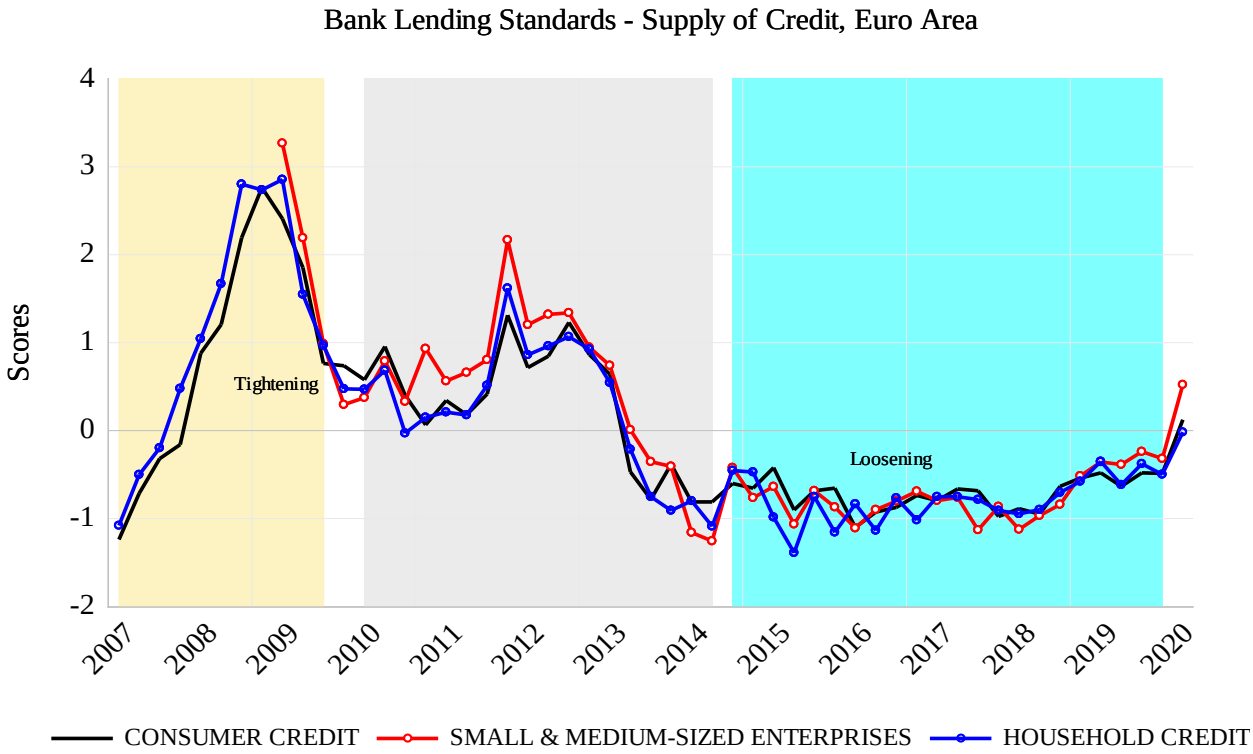
As discussed above, the twin aims of NSP are difficult to disentangle (see, however, section 3 below). Limitations of an institutional nature add to the challenges faced by the ECB. One area where the ECB is unquestionably able to intervene is to reduce financial frictions. Figure 5 displays the results of a survey of lending conditions in the euro area in the markets for consumer credit, credits to small and medium-sized enterprises and household credit. Senior loan officers are asked on a quarterly basis to indicate whether they perceive lending conditions to be tightening or loosening. There is considerable evidence that central banks rely on these surveys to interpret financial conditions and that these have real and monetary implications (e.g., see Filardo and Siklos, 2020 and references therein). Data are published for individual euro area countries. To obtain the data shown in Figure 5, a model that linearly combines individual country estimates is used.[5] To conserve space, the focus is on the supply of credit

[5] More precisely, a factor model is used to extract the most important (in a statistical sense) common factor for the surveys conducted in AT, BE, CY, DE, ES, FI, GR, IE, IT, LU, and PT. Raw data are obtained from https://www.ecb.europa.eu/stats/ecb_surveys/html/index.en.html. The basic approach (i.e., use data for the full sample) followed in Siklos (2020b) is used to obtain the factor scores.

since an important aim of NSP is to prevent an excessive tightening of the supply of credit especially during crisis conditions.[6]

The data suggest, other than in the early stages of the GFC and toward the end of the SDC, that credit conditions tightened and remained tight. Even before QE was introduced in 2015, the supply of credit began to loosen and remained loose until the emergence of the pandemic. Hence, to the extent that ECB interventions intended to loosen lending conditions these were partially successful. Yet, it is also worth pointing out that a tightening bias became evident even as NSP continued to remain in place (see Table 1) and conditions became tight at the end of the sample. Hence, casual observation suggests that QE has its limits.

Figure 5: Select euro area bank lending standards



Source: ECB and Figure 1. Backward-looking indicator of conditions in the three previous months at the time the survey is taken. The scores are defined in such a manner that values above zero signal a tightening of conditions and the reverse interpretation holds when scores are below zero.

Although I return, in section 4, to investigating the aggregate economic effects of NSP in the euro area, ostensibly the other dimension of ECB financial interventions is to stimulate economic activity.

Questions have recently been raised about the usual narrative whereby, other things equal, lower nominal interest rates translate into more economic activity by stimulating aggregate demand. Nevertheless, most central banks still make the case that greater monetary accommodation is beneficial especially when there is slack in the economy. Doubts (e.g., see Woodford and Xie, 2020) have surfaced because interest rates have reached zero and, in a few cases, have breached the so-called

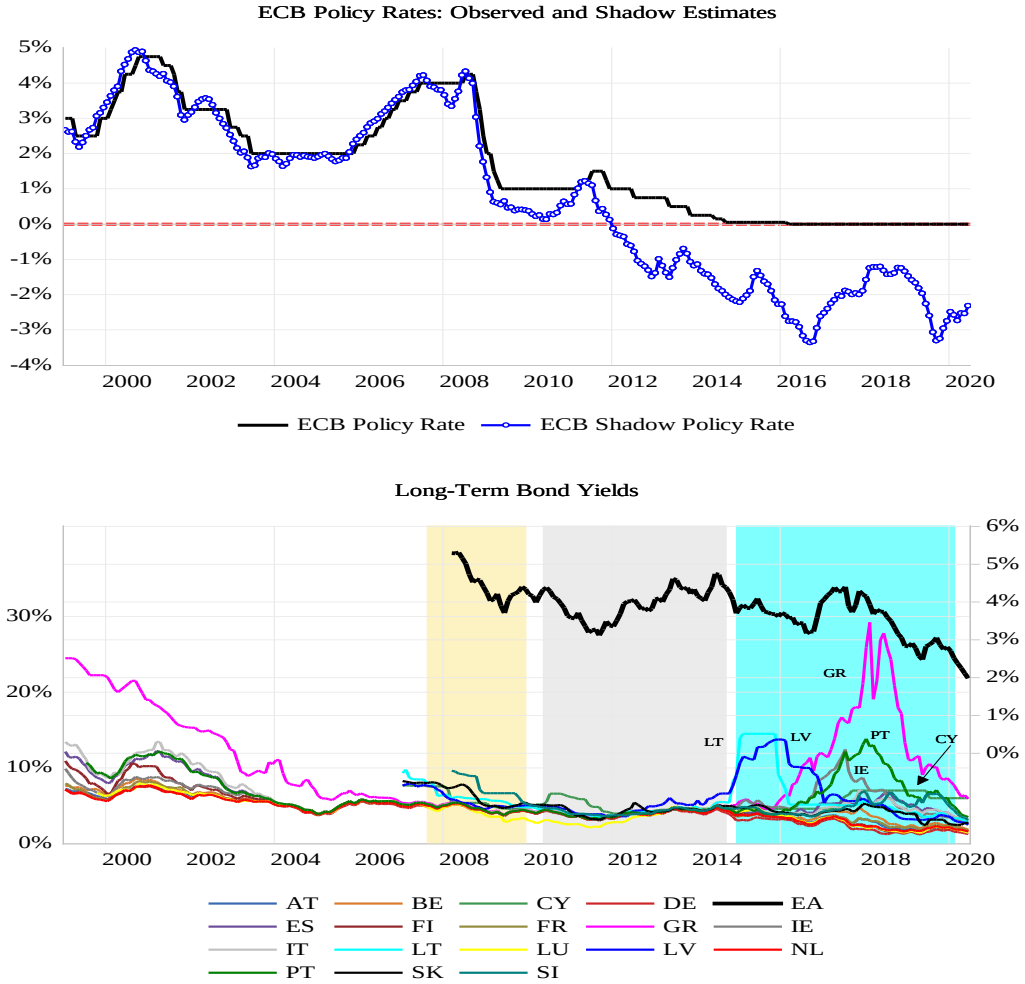
[6] Both forward looking (i.e., expected conditions three months ahead) and backward-looking conditions are surveyed. In addition, surveys have expanded to include demand for loans. Resort to these data would not have altered significantly the interpretations that follow.

zero lower bound (ZLB; also see Table 1). As a result, several central banks, notably in Denmark, Switzerland, Sweden, and Japan, have not only reached the ZLB but are close to reaching the effective lower bound (ELB), that is, a negative policy rate beyond which it is believed that any beneficial effects are reversed (Brunnermeier and Koby, 2019). The ECB has also ventured into negative interest rates when it set the interest rate on its deposit facility to -0.10% in June 2014. As this is written, the same interest rate stands at -0.50%. Related doubts also include the contribution of ZLB and ELB to raising pessimism in financial markets, especially about the ability of the central bank to maintain inflation expectations close to its stated objective. A novel element of the ECB's NIRP, beginning this year, is that the interest rate spread between borrowing rates from the ECB (negative and, hence, subsidised by the ECB) and lending rates to enterprises (still positive but, in principle could also be subsidised and negative) has widened thereby encouraging more lending. However, the ECB is not able to guarantee that the additional loan generated will go to enterprises likely to be able to pay back the principal or support ones that, unfortunately, may not survive the fallout from the crisis. The latter phenomenon is suggestive of the 'zombie' firms that contributed to the 'lost decades' in Japan (e.g., Banerjee and Hofmann, 2018). Finally, the ECB is placed in this position in part because the euro area is so heavily dependent on banks relative to other systemically large economies (e.g., the USA; see also below).

Figure 6 provides some clues about the ECB's ability to ease monetary conditions thereby providing conditions that ought to stimulate economic activity. The top portion of the figure shows the ECB's policy interest rate, namely the interest rate on main refinancing operations (MRO). However, as explained above, the impact of various NSP are not easily observed or easily translated into interest rate developments. Nevertheless, borrowing from the finance literature, it is possible to estimate a shadow policy rate which aims to quantify the impact of QE on the ECB's policy rate. Figure 6 reveals that, when the GFC began in 2008, both the official and shadow policy rates declined sharply. Moreover, even before QE was launched in earnest in 2015, policy was easing no doubt in response to the SDC. While QE served to further ease monetary conditions there is seemingly little evidence that QE did anything other than prevent an excessive tightening of conditions. This is worth remembering again when the more institutionally related challenges the ECB faces are considered in section 2.2.3 below.

Economic activity, however, is not only influenced by short-term interest rates of the kind implied by the top portion of Figure 6. Long-term interest rates are crucial. Since NSP are designed to ease financing conditions it is expected that long-term interest rates may also be impacted. As shown in the bottom portion of the figure QE has indeed noticeably reduced long-term interest rates in the euro area. Of course, as before, what is true at the level of the single currency area does not always carry through to individual Member States. While there is evidence, toward the end of the sample, of some convergence within the euro area, long-term interest rates remain considerably higher in several of the countries highlighted in Figure 6. Monetary policy is, of course, neither the only nor even the most important determinant of interest rates. Changes in productivity, the global savings 'glut' (Bernanke, 2005), and structural factors more generally (Fisher, 2016), play major roles and might explain a 'new normal' for interest rates. This has given rise to the challenge posed by secular stagnation to which I turn next.

Figure 6: Monetary and financial conditions in the euro area



Sources: ECB, Krippner (2015, updated), and author's calculations. The estimates for the euro area are weighted averages of individual euro area Member States shown with the weights given by the relative size of each economy (i.e., GDP as a proportion of euro area GDP). Individual euro area Member States' interest rates are plotted against the left hand axis; the euro area proxy is plotted against the right hand axis.

2.2. Challenges

Beyond the challenge of navigating the tension between relieving financial market frictions during a crisis as well as providing economic stimulus, potentially exacerbated by institutional idiosyncrasies of the ECB (see section 2.2.2. below), there is a longer run phenomenon that has emerged that is also global in nature.

2.2.1. Secular stagnation

Pre-GFC monetary policy was governed by the theory that excessively low interest rates would be inflationary. Of course, the presumption was that the economy was operating at near capacity. Hence, an overly loose monetary policy would lead to a rise in inflation. This line of thought was perhaps most clearly articulated by Milton Friedman in his influential essay published in 1968 (Friedman, 1968). A concern that continues to pre-occupy many policy makers to this day is that monetary policy ought to be restrained lest inflation become excessive. As Friedman wrote: "…we are in danger of assigning to

monetary policy a larger role than it can perform, in danger of asking it to accomplish tasks that it cannot achieve…" (op.cit., p. 5).

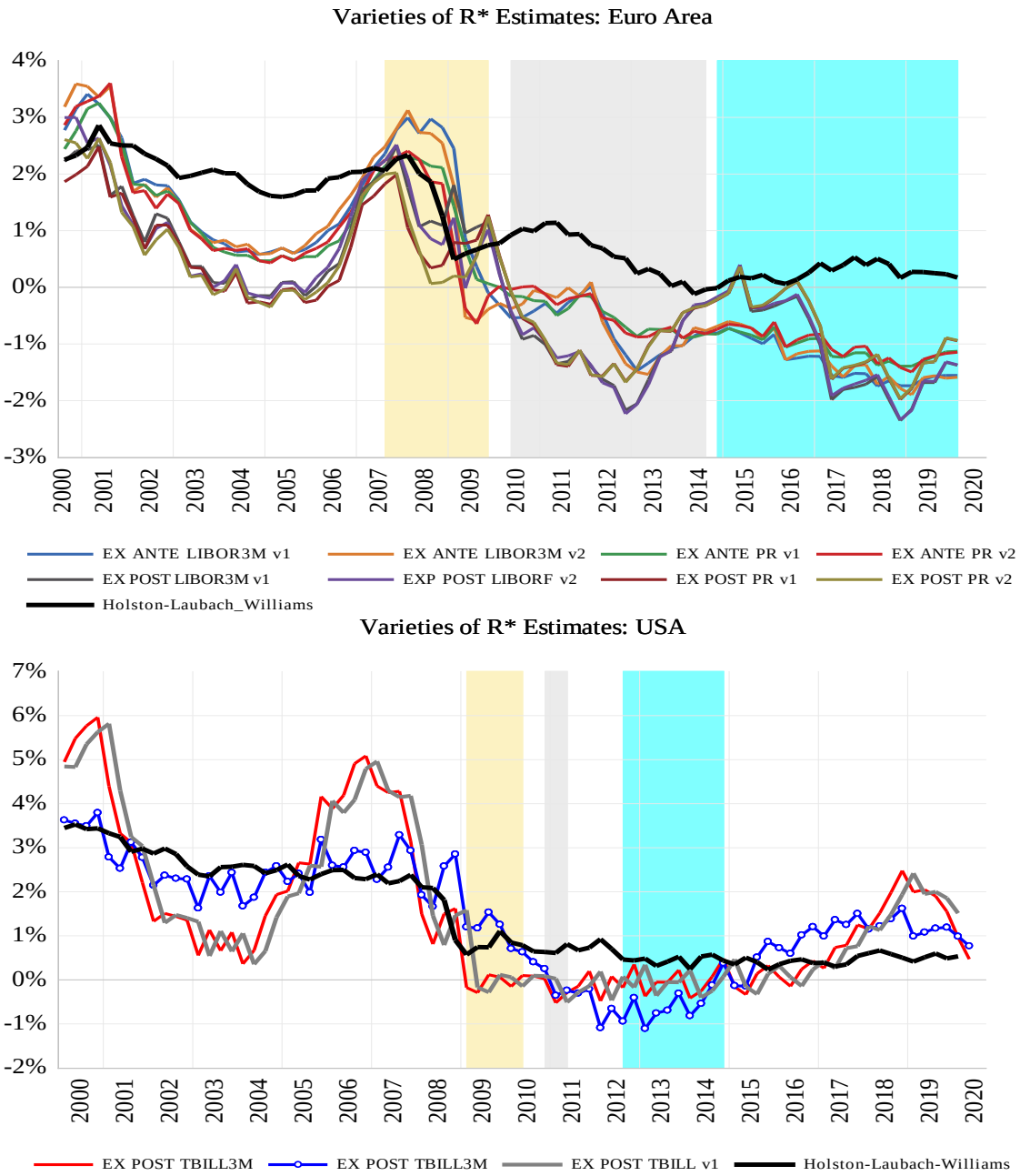
The foregoing implication was further elaborated in another article that had a profound impact on the profession, namely that friction between fiscal and monetary policy objectives would also produce excessive inflation (Kydland and Prescott, 1977). Both of these developments contributed to institutional changes that led to greater central bank autonomy, greater transparency (and accountability), as well as a preference for monetary regimes geared toward inflation control. Although the theory behind assigning a narrow role for monetary policy rested on the absence, in equilibrium, of a trade-off between inflation and output (or unemployment) hypothesised by the Phillips curve, it is sometimes forgotten that Friedman and others also expressed their views in terms of another concept that has been much discussed in recent years, namely the 'natural' or equilibrium interest rate. For the purposes of what follows it is sufficient to think of the equilibrium interest rate as the real interest rate, that is, the interest rate less expected inflation that is consistent with the economy operating at capacity.[7]

If the economy becomes less productive and demographic forces also contribute to reduce the potential growth rate of the economy then monetary policy is powerless to close any slack in the aggregate economy. The result has been expressed in a revival of another old idea by Summers (e.g., see Rachel and Summers, 2019), namely secular stagnation. Whether these forces can explain recent aggregate economic performance is open to debate. Nevertheless, irrespective of the forces that have driven poorer aggregate economic performance, as first shown in Figure 1, the implications for monetary policy are clear. If we could observe the natural real rate, commonly defined as R*, then an estimated rate that is too high relative to what is actually observed translates into a monetary policy that is tighter than is necessary. Stated differently, if a measured real interest rate is above R*, the real rate that would keep the economy at potential, the tighter is monetary policy and the larger the gap between observed and potential output.

As is often the case in economics, these critical concepts rely on variables that are not observed. A real interest rate is not only affected by the chosen financial instrument it is, more importantly, impacted by how inflation expectations are measured. As already shown in Figure 2, these expectations vary considerably not only across Member States of the euro area but they also differ according to the forecaster in question. Similarly, estimates of R* will also be sensitive to how they are estimated. While technical details are outside the scope of this study, there is mounting evidence that R* has declined for some time in the industrialised world and the single currency area is no exception. Even if there is a consensus that R* has declined, this only serves to justify the view that observed nominal interest rates are destined to remain lower for longer. However, there is still the matter whether the stance of monetary policy set by the ECB is conducive to supporting economic growth.

[7] The concept is an old one and goes back to Wicksell who is also cited by Friedman.

Figure 7: The evolution of the 'natural' or R* real interest rate: selected estimates



Sources: See Figures 1, 5 and author's estimates. TBILL3M is the 3-month Treasury bill rate. Ex post means that observed, and contemporaneous, HICP inflation is subtracted from LIBOR3M or the TBILL3M rates. Ex ante means that the one year ahead mean fixed horizon inflation forecast from the Survey of Professional Forecasters is used. Only ex post estimates were considered for the USA. PR means central bank policy rate. Holston, et. al. (2016, updated) is the source of one set of estimates of R*. v1 and v2 are explained in the text.

Figure 7 contains a thought experiment. Consider a variety of estimates of R*. Two versions are estimated depending on the sophistication of the model used to generate the estimates. They are labelled v1 and v2 in the Figures.[8] Estimates using USA and euro area data were generated. For the

[8] Version 1 estimates (v1) are based on a so-called state space model where $R_t = R^*_t + u_t$ and $R^*_t = R^*_{t-1} + v_t$ is latent (i.e., unobserved) and is assumed to follow a random walk (i.e., only the immediate past value helps forecast its future value). The observed interest rate, R, fluctuates around R^*. In version 2 (v2), R^* is driven in addition by an estimate of the output gap. Estimates generated by Holston et. al. (2016, updated), assumed to be the estimates ECB policy makers rely on, are used.

euro area, the nominal 3-month LIBOR interest rate is used to estimate the real interest rate for the euro area. For the USA, the nominal 3-month Treasury bill rate is used to calculate the real rate for the USA. Assume that both central banks treat the estimates generated by Holston et. al. (2016; Holston-Laubach-Williams in Figure 7) as the ones that guide setting the stance of monetary policy. If the actual estimates of R* are any of the ones shown in Figure 7, other than the Holston-Laubach-Williams estimates, then the ECB is overestimating the 'true' value of R* and monetary policy as a result is tighter in the euro area than necessary. Turning to USA data, where all versions of R* are estimated in the same manner, we observe that the Fed's view of the correct policy stance is compatible with alternative interpretations since all of the estimates of R* are close to each other. Therefore, R* used by policy makers in the USA is suggestive of a policy that is closer to what is required to support economic activity in remaining close to potential. Notice that successive QE policies in the US, identified by the vertical shaded areas, aid in ensuring this state of affairs. In contrast, the ECB has not been able to close the gap despite its QE policy.

Needless to say, the thought experiment is fraught with potential problems. Fundamentally, the R* concept is unobserved and can be highly sensitive to assumptions made in constructing it. Indeed, the ECB's Chief Economist, Lane (2020b) also highlights the lack of precision in estimating R*. Nevertheless, the striking difference between the USA and euro area experience is unlikely to be an accident. Monetary policy in the euro area has contributed to easing policy but there remains a missing ingredient. Can institutional factors be part of the story?

2.2.2. Institutional frictions and conflict

There is a long history of pressures on monetary policy (e.g., see Siklos, 2002). While central bank autonomy has waxed and waned throughout history so long as the policy horizon central bankers and government have in mind differs, as does their respective positions on the net benefits and costs of higher inflation, opportunities to interfere with the conduct of monetary policy will be a constant.

One of the characteristics that makes the ECB's position different from other central banks are the high profile legal cases that call attention to certain articles of Treaties that govern the mandate and strategy of the ECB and, more importantly, limits placed on its ability to intervene in financial markets in pursuit of the price stability objective (Article 127 of the TFEU). It is also worth repeating that, unlike most central banks, the ECB was left to its own devices in defining price stability which is the subject of an ongoing review.

Until 2020, the most widely publicised case concerned the legality of the OMT policy that emerged when former ECB President Mario Draghi made the remark in July 2012 to do whatever is necessary to preserve the euro. Later that summer what came to be known as the Outright Monetary Transactions (OMT) policy set the stage for the ECB to intervene in financial markets but in a highly conditional manner and restricted to secondary bond markets. Even this, seemingly clever solution around the restrictions in Article 123 of the TFEU did not prevent a court case from originating in Germany. The case was eventually decided in favour of the ECB (Court of Justice, 2015) because the central bank's actions represented an economic policy compatible with the work of monetary policy. To an economist, it is difficult to identify one type of measure from another but the point made by the Court, namely that the ECB should have broad discretion, because no legislation is able to foresee all contingencies, seems plainly obvious. Nevertheless, as is often the case, even if the actions of the ECB are defensible, how its decisions are communicated can be questioned. For example, the technical features of the OMT mention the compatibility of the programme with its monetary policy mandate, not explicitly specified, but does not defend the decision as compatible with the TEU and TFEU. As Andy Haldane, Bank of England Chief Economist said recently (Haldane, 2017) a little more

conversation, that is, greater effort at communicating policy actions, can go a long way to improving the delivery of monetary policy. Others (e.g., Macklem 2020) have called for greater public engagement on the part of central banks. The ECB has at least begun to understand the role of directly communicating with the public by following in the footsteps of other central banks such as the Fed and initiating the 'ECB Listens' campaign. Such a strategy is essential for the ECB to counter the pressures and costs generated by legal and political challenges to its ability to fulfil its Maastricht Treaty obligations.

A similar set of circumstances prevailed in the most recent court case involving the APP and, hence, is more germane to the issues covered in this paper, where the German Constitutional Court played a larger role. The medium-term implications of the most recent case have yet to unfold but, at its root, the Court (Federal Constitutional Court, 2020) refers to an article in the Protocols of the Treaty (see Box 1). The manner in which the original APP was implemented by the ECB led to the purchase of securities in proportion to the share of Member States' capital of the ECB, subject to an upper limit that was raised 6 months after the original PSPP was introduced. This is known as the capital key which can change according to relative population and GDP size. If changes are large enough this could, in principle, have an impact on the voting rights of the NCB members that make up the ECB's Governing Council.[9]

Among the German Constitutional Court's concerns was the possibility that Articles 123 and 127 (see Box 1) might be violated by the ECB because Member States' sovereignty was being encroached as well as the principle of proportionality that is intended to further protect individual country sovereignty from unwarranted interventions by EU institutions. As the text regarding proportionality suggests (see Box 1) qualitative and quantitative indicators are expected to be used to justify the requirement that a policy meets this standard. There is no explicit account for spillover effects that can emerge both within the single currency area or from external sources. Even if the Court correctly reaffirms the principle that monetary policy orthodoxy supports, namely that monetary policy should do no harm, it appears not to admit that economies are dynamic and that when facts change so should policy. Furthermore, since there can be only a single monetary policy in a monetary union, some collective action that may appear not to satisfy the proportionality principle today may nevertheless yield net benefits for all and effectively became proportional in future. No wonder some observers (e.g., Wolf, 2020) commented that the German Court's decision amounted to ignoring basic economic principles.

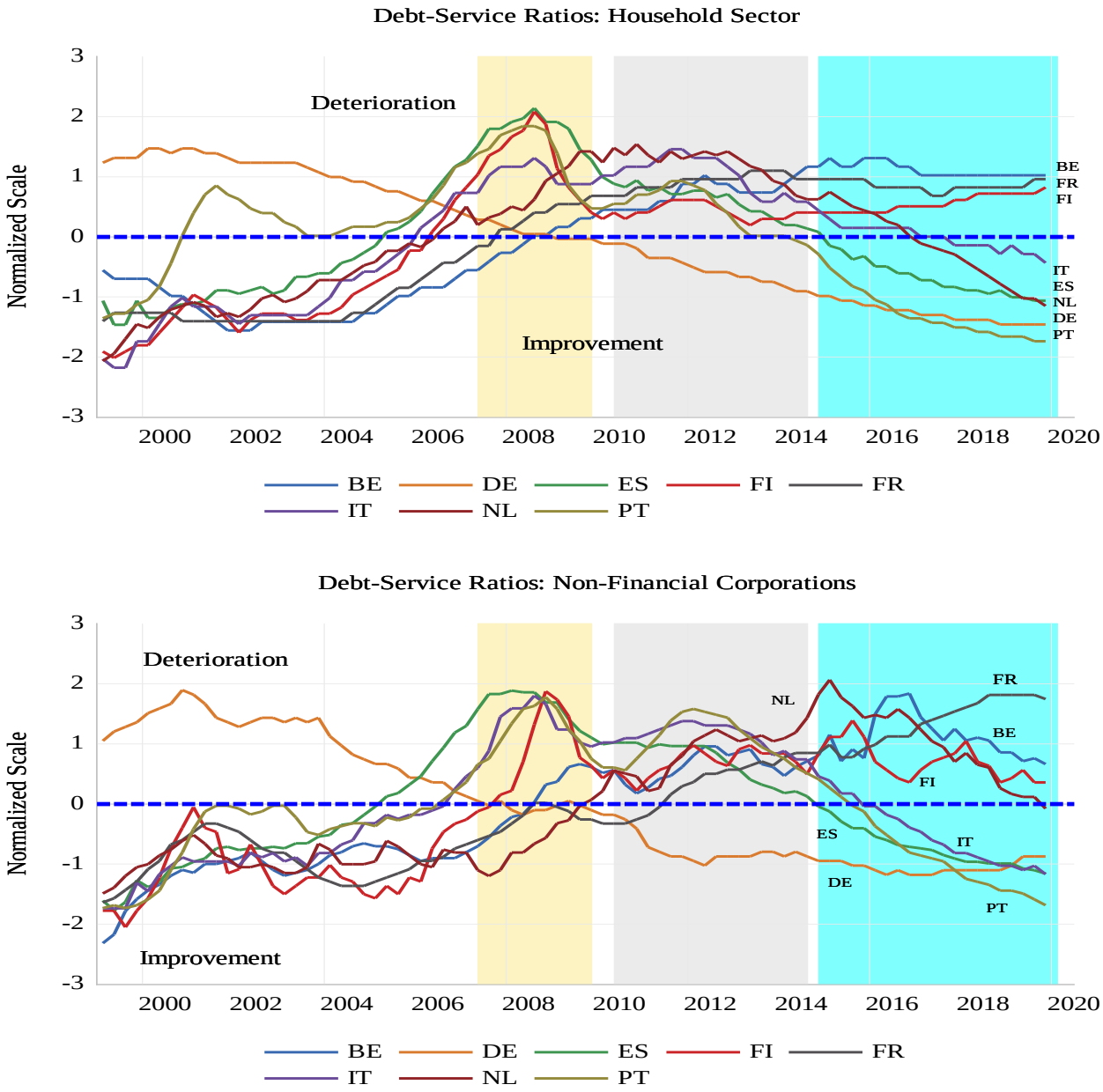
In the spirit of providing some additional quantitative evidence about APP more generally, consider Figures 8 and 9 below. A common theme of some earlier figures, notably Figures 1 through 3, is that monetary policy, and its spillovers, will have differential effects within the single currency area and that this will change over time.

Figure 8 considers debt-service ratios in the household and non-financial corporations sectors. Debt service ratios are considered an important indicator of financial stability since they measure capacity to take on loans. There are a few striking features that may be highlighted. Consider first the household sector. There are two broad trends with some countries showing a deterioration in debt-service ratios while another group experiences persistent improvements in the same ratio, including Germany and the Netherlands. Indeed, several of the countries most directly impacted by the SDC see improvements (i.e, ITA, ESP, PRT). Second, to the extent that QE was beneficial, it can be said to have contributed to bending the curve on debt-service ratios so that while not all countries may have seen the same improvements at least the deterioration seen in the early 2000s ceased.

[9] The latest capital key change took place in December 2018, https://www.ecb.europa.eu/press/pr/date/2018/html/ecb.pr181203.en.html.

Turning to the non-financial sector, many of the same countries as in Figure 8 see improvements in their capacity to take on debt. Nevertheless, unlike the household sector, there is less evidence that QE has produced outcomes as clear as for the household sector though, with the exception perhaps of France, deteriorations seen in the early 2000s have moderated.

Figure 8: Debt-service ratios in the euro area

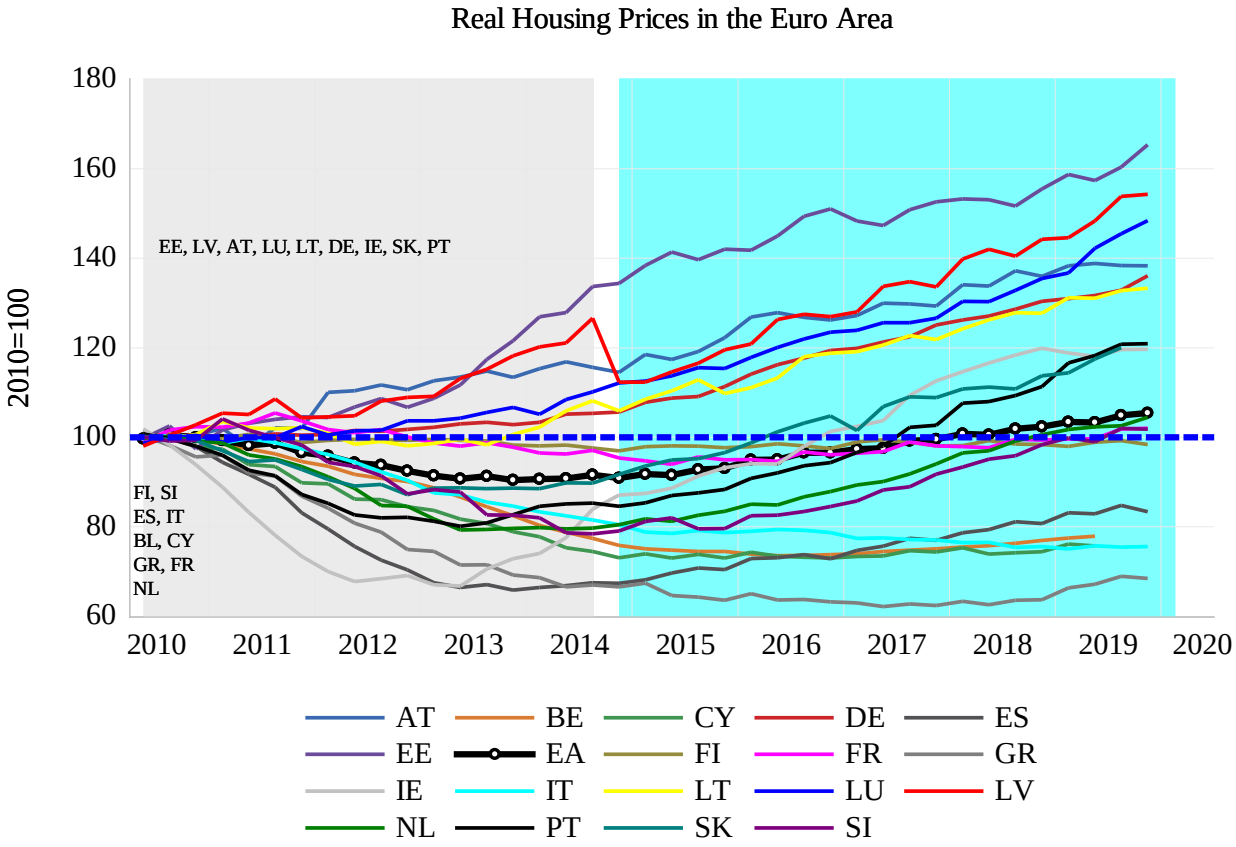


Sources: Figure 1, BIS and author's calculations. The original figures were normalised (index divided by the standard deviation of the series) to facilitate comparability.

Figure 9 plots real housing prices in individual euro area economies. It is often stated that APP-style policies, and QE more generally, inflate asset prices (see section 3). While it is clear that the SDC had a negative impact on some of the largest euro area economies until around 2014, what is also clearly visible is how QE has lifted real housing prices in all parts of the euro. Germany, once again is a beneficiary over the sample. While the outcomes shown in the Figure need not be due entirely to

monetary policy, it can be argued that ECB interventions did not produce a decline in housing prices. The resulting wealth effect may well be stimulative though, again, there are differences of opinion on the subject.

Figure 9: Real housing prices in the euro area



Sources: Figure 1, BIS and author's calculations. See Figure 1 for the year some member countries joined the euro area.

I conclude this section with a discussion of the PEPP by speculating whether this programme will be a new source of tension in the euro area. After all, one of the features of the PEPP is that it has fewer restrictions than the other APP introduced before the pandemic. Moreover, the PEPP expands the number of assets that can be purchased such that any risks and, therefore, potential costs if unsuccessful, both to NCB and the ECB, are potentially higher. Not surprisingly then, some concerns about the programme have already been raised (Arnold, 2020a, 2020b). Interestingly, the road to the introduction of the PEPP follows a path not too dissimilar to the adoption of OMT. ECB President Christine Lagarde, echoing her predecessor, declared that "…there are no limits to our commitment to the euro…" (Lagarde, 2020a).

In principle, the aims of the PEPP are the same as the ones used to implement APP, namely improve market functioning (i.e., reduce financial market frictions) and stimulate the economy. The ECB has already made the case for each (e.g., see Lane 2020a, 2020b). The ECB has also sought to explain how the standard of proportionality is being met (Lagarde, 2020b; Schnabel 2020c). As this is written it is, of course, too early to tell how the PEPP will eventually contribute to euro area economic conditions. Nevertheless, the lines between a pandemic and the conditions that required APP policies in the first place need to be drawn far more clearly than has previously been the case. Whereas emphasis on market conditions and a "proactive" approach (Lane, 2020c) is understandable, the ECB has not sufficiently clearly communicated that a health crisis of the COVID-19 variety requires the central bank

to act as a kind of insurance provider (of last resort), that is, prevent the collapse of financial markets and assist with preventing an economic downturn that is already proving to be among the largest on record. An illustration of failing to adequately draw this distinction is found in the ECB's Vice-President's June 2020 speech (de Guindos, 2020). In the speech emphasis is placed on the PEPP's role to "…provide a significant degree of additional monetary easing…" and to "…safeguard monetary policy transmission…". Another example comes from Lane (2020d). Other than a reference to how policy is intended to assist firms there is too little communication about the role of policy in a pandemic relative to other types of crises. Even if the sentiments contained in some ECB communications are correct, they do not adequately convey the rather distinct nature of the health crisis and distinctions between APP in general and the PEPP in particular. As Mark Carney, former Governor of the Bank of Canada at the time pointed out, a crisis requires a different communication strategy (Carney, 2010). The corollary is that different types of crises may well require different playbooks to deal with them. Indeed, the issue of proportionality, now an increasingly frequent component of ECB communication, seems out of place in a pandemic that need not follow the same rules.

2.3. Exit? What exit?

Even as the GFC was receding from view, but poor economic performance lingered (e.g., see Siklos, 2017), there was pressure on the Fed to exit the alphabet soup of quantitative and credit easing programmes. Bernanke (2010) outlined the exit from the historic increase in the size of its balance sheet. Exit refers to the end of the "…extraordinary degree of policy accommodation in place…" (English et. al., 2011, p. 12) and was rooted in the dual objectives of the central bank. Hence, recommendations could be couched in terms of overall economic outcomes. A particular concern was how exit from various programmes would be communicated (English et. al., 2011; Appendix). Eventually, this translated into the data-dependent approach to monetary policy which emphasised that monetary policy could not be pre-determined even as the Fed sought to provide guidance. Indeed, the Fed would eventually combine gradual increases in the policy rate, beginning at the end of 2015, with modest contractions in the size of the balance sheet (e.g., see Yellen, 2015; Bhattarai and Neely, 2018).

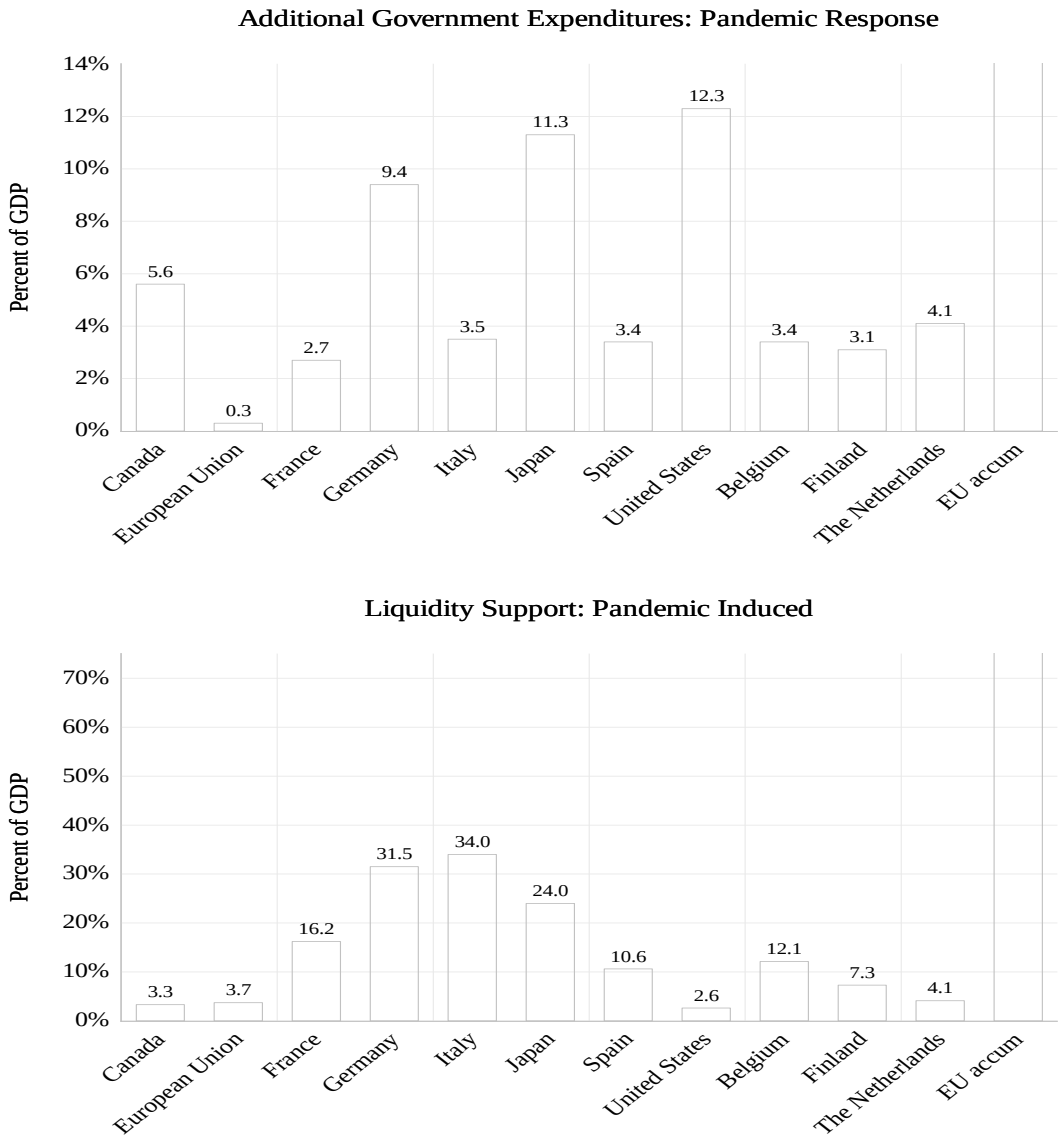
The ECB's exit strategy was formulated even earlier. Then ECB President Trichet (2009), shortly before the SDC erupted, but while the GFC was ongoing, outlined the ECB's exit strategy. First, and foremost, achieving medium-term price stability as defined by the ECB (see note 3). Second, allowing pre-announced interventions to end when their term expires. Third, to maintain institutional credibility. Unfortunately, Trichet recalls the decision to raise the policy rate in July 2008 when oil prices were rising very quickly but there were, at the time, few convincing indications that expectations were about to become unanchored and the GFC was set to erupt in a few months' time. Moreover, his successor, Mario Draghi, would reverse course almost immediately. The policy rate increases engineered by Trichet were, arguably, the most heavily criticised of his tenure.

In general, central banks should have resisted the call for an exit strategy in the midst of, as Trichet put it: "…., the most severe crisis the developed world has witnessed for more than sixty years." (Trichet, 2009). First, since central bankers themselves reiterated the uncertainty of the economic environment it hardly adds to credibility to indicate how one will exit a regime of NSP when it is unable or unwilling to define what is normal. Is normal the *status quo ante*? Second, the middle of a crisis is likely not the time that financial markets, let alone households, will be attentive to the process by which extraordinary interventions will be unwound. Third, a look back suggests that the last attempt at an exit, beginning in 2012, was with the benefit of hindsight premature. Nevertheless, it is worth recalling that the same criticism was raised about Bank of Japan policy in the early 2000s (see Siklos, 2020a, and references therein). It may well be appropriate for an institution to internally plan for an exit but, once

made public, it is only a matter of time until financial markets begin to ask about the precise timing of any tightening of monetary conditions. The onset of the pandemic brings additional challenges for an exit. The good news, in light of the remarks above, is that there is little discussion of an exit strategy for the time being.

As noted above, central bankers in the industrial world were not keen on referring to the state of the world pre-March 2020 as normal. How else to understand indications of some reversals in QE given the signs policy makers were clearly aware of, as illustrated in Figure 3? Additionally, as shown in Figure 10, the sheer scale of the fiscal interventions measured as a percent of each economy's GDP, over and above the monetary ones, bring into focus the issue raised earlier, namely that large increases in fiscal expenditures, intended to soften the blow of the pandemic's economic effects, will not easily be reversed and must consider a much longer horizon than politicians are used to. There is a rare opportunity for the policy horizon of central banks and Treasuries, at least for a time, to come closer than ever to each other. I return, in the conclusions, to the implications of this result.

Figure 10: Monetary and fiscal responses to the pandemic: selected estimates



Sources: International Monetary Fund (https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19) and author's calculations. Estimates (as a % of GDP) are given above each bar. Estimates for the EU add individual estimates for the European Union, France, Germany, Italy, Spain, Belgium, Finland, and the Netherlands.

Consider then the implications of the estimates in Figure 10. Individually, at the time of writing, most euro area countries' fiscal expenditures in response to the pandemic are dwarfed by those in the United States and Japan. Combined, the euro area response is substantially larger although is worth keeping in mind that the data are incomplete. The liquidity support in the euro area combined, again noting the same caveats as before, is even more impressive.

The glass half full way of thinking suggests that the combined euro area response met well the challenge of the pandemic, at least in fiscal and monetary terms. The glass half empty attitude, however, would focus on the paltry response at the level of EU institutions.[10] As I will explain in the conclusions, this goes some way to explain the first part of the title of the paper.

[10] As this is written, EU leaders agreed, in July 2020, on a EUR 750 billion recovery fund with the opportunity for the European Commission to borrow collectively for the first time. The European Parliament has yet to agree to the plan. See https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/recovery-plan-europe_en.

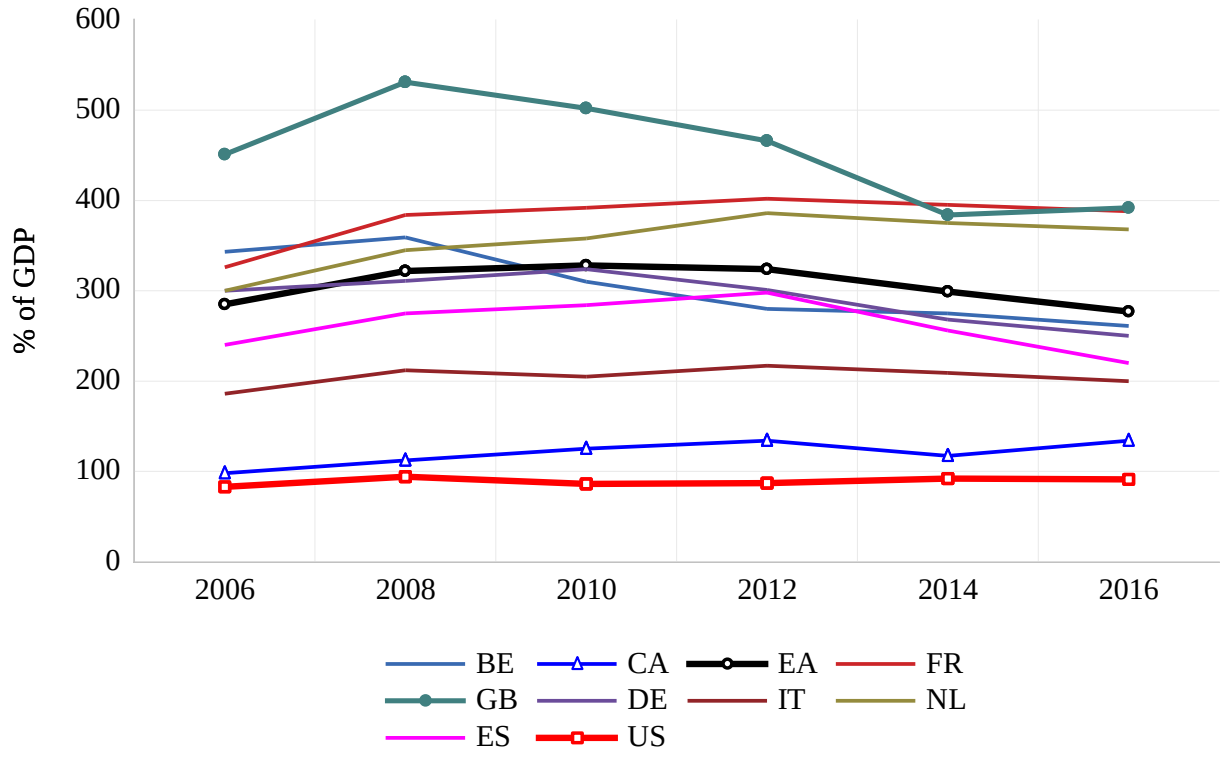
3. ASSET PURCHASE PROGRAMMES: ASSESSING THE EVIDENCE

3.1. A stumbling block?

Beyond the supranational feature that separates the ECB from other central banks is another idiosyncrasy of the European financial system with implications for monetary policy and economic performance in the euro area more generally. Figure 11 displays in graphical form the size of bank assets to GDP for select euro area economies as well as a few advanced economies. The vertical axis gives the size of the banking sector as a percentage of GDP in countries other than the USA whose banking sector size is measured on the horizontal axis. There is no weighting applied (e.g., population size, number of banks) so all the bubbles are of the same size. As discussed below, the plot is meant to highlight an important distinction in the relative size of banks in North America versus the euro area and Europe more generally.

Since 2006, the size of banks has not changed much (indicated by the size of the bubbles). However, other than for the UK, bank assets to GDP in the euro area are considerably higher than in the USA (horizontal axis) or Canada (vertical axis). This illustrates the much greater dependence of banks on sovereigns, and vice-versa, that gave rise to the so-called 'doom-loop' wherein the risks that banks carry on their balance sheets is dependent on the risks they carry from holding of sovereign debt. Dealing with this issue is an ongoing concern (see, for example, Alogoskoufis and Langfield, 2019). Nevertheless, the mutual dependence between banks and sovereigns is a long standing one (see Filardo and Siklos, 2020) that goes beyond the scope of this paper but it presents yet another challenge especially since the amount of debt being issued was impacted by the SDC and is now being exacerbated by the pandemic.

Figure 11: The size of the banking sector: selected global and euro area estimates (bank assets to GDP)



Sources: BIS and author's calculations. Data are bi-annual for the period 2002-2016.

As Morris et al. (2020) point out since we do not yet know the financial fallout for banks from the pandemic it is not possible to state how banks will eventually cope with the adjustments to their business model once state support is withdrawn. In any case, just as institutional limits potentially place constraints on the ability of the ECB to respond to any crisis so does the large role played by banks in European finance.

3.2. Pollyannas and ostriches?

Taking a step back, to an overview of responses by policy makers, many academics and other interested observers to QE-style monetary policies can be placed into roughly two groups, namely pollyannas and ostriches. The former see QE as essential and, in spite of worries about the potential distortion of asset prices, a problem of the 'kicking the can down the road' variety, is essentially seen as always beneficial. Ostriches view the shift away from sole reliance on the policy rate instrument to interventions that increase the size of central bank balance sheet as akin to taking the 'road to perdition'. QE policies cannot undo structural and other policy changes required to meet the challenges raised by crises, financial or otherwise. This is not the place for a detailed account of the various positions (see, however, Siklos, 2017). Nevertheless, it is worth highlighting because, as is often the case, the truth lies somewhere in between the two camps.

Returning to the twin motivations of the APP, the monetary authorities have tended to emphasise the importance of maintaining order in financial markets, that is, ensuring that buyers can transact at some agreed to price. In other words, there is a difference between providing liquidity and funding. Indeed, this is the implicit motivation behind the addition of some of the articles in the TFEU highlighted earlier. Controversy and debate then centre more on the second motivation of APP-style programmes, namely whether they can stimulate economic activity (i.e., higher inflation and real economic growth). The most obvious way to do so is to lower interest rates. For a given inflation rate this translates into a lower real interest rate which ought to incentivise more economic activity. However, one also needs to consider how interest rates are influenced along the term structure. After all, motivations for borrowing and lending short-term and long-term are not the same.[11]

Lombardi et. al. (2018) review the impact of QE-style policies in both the advanced and emerging market economies in view of the attendant global spillovers these policies have generated. Drawing on over 60 studies since at least 2009, the authors summarise the interest rate effects on long-term yields as shown in Figure 12 below. The focus here is on long-term yields since these are likely to have the greatest consequences for aggregate economic activity. Another explanation for this focus is that central bank policy rates are traditionally believed to have their greatest impact on the short-term end of the term structure of interest rates.

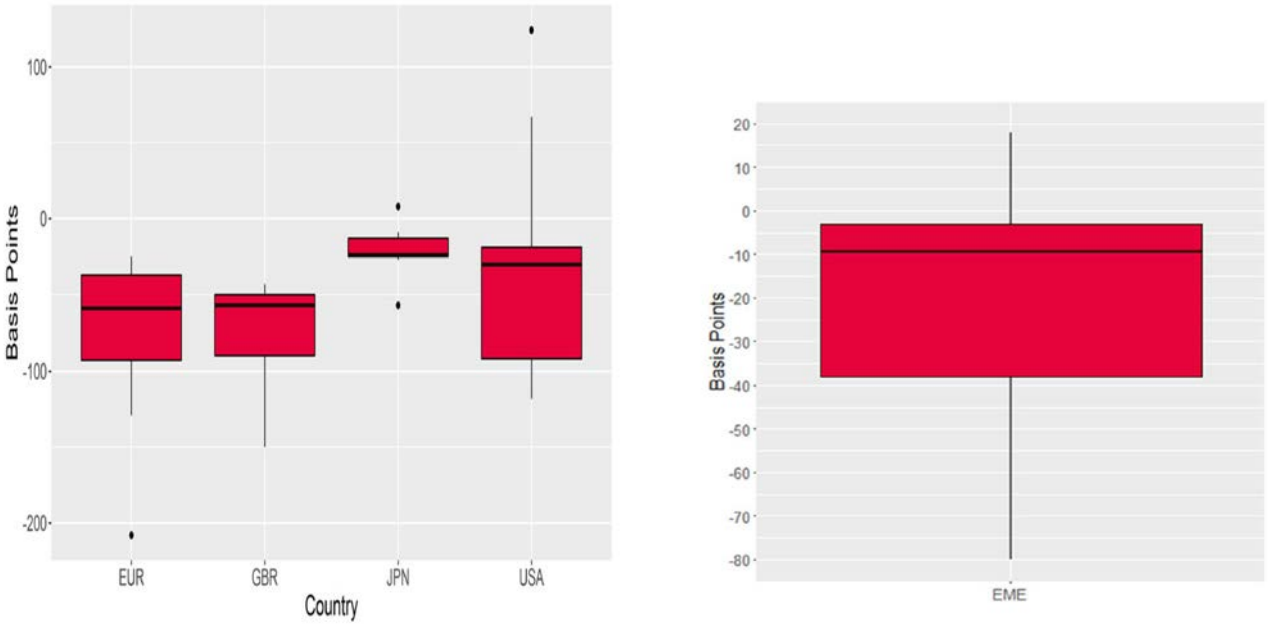
It will not be surprising to readers that different studies reach different results. After all, estimated models, sampling frequencies, and estimation samples can differ widely. Consider first the left-hand side box plots. While there is disagreement about the impact of APP in the euro area all estimates are negative and statistically significant. Hence, the direction of change in long-term yields has decidedly been in the correct direction. Indeed, the bulk of the impact on long-term yields has been negative in all four economies where QE has been implemented for some time. The US stands out for the sheer variation in estimates, some of which are in the wrong direction if one only considers tail estimates. Estimates for Japan, arguably the country with the longest experience with QE, are notable because of the very small range of estimates. Since Lombardi et. al. (2018), newer studies do not appear to generate estimates of the impact of APP in the euro area that are outside the boxed areas shown in

[11] In what follows, for simplicity, I will ignore the distinction between holding period return and the yield to maturity.

Figure 12. For example, Eser et. al. (2019) report that yields on 10-year instruments in the euro area declined by 95 basis points so within the shaded area displayed in Figure 12.

The box plot on the right is notable because, in contrast to complaints raised by some that advanced economies' QE policies amounted to a form of 'beggar thy neighbour' strategy to deal with the GFC and SDC, available estimates suggest that long-term yields in emerging markets also declined. Hence, at least at the long-term end of the term structure, spillover effects appear to have been globally positive.

Figure 12: The impact of quantitative easing: global evidence



Source: Lombardi, Siklos, St. Amand (2018), Figures 2 and 3. Data for EUR (EA), GBR (UK), JPN (JP), and USA (US) based on 65 studies between 2011-2018. Data for EME based on 24 studies between 2013-2018. The impact on long-term yields (10Y and longer) in basis points is measured on the vertical axes. The horizontal line inside the shaded are is the median estimate. The top and bottom edges of the box are the 1st and 3rd quartiles, respectively. The vertical lines are values up to +/-3 times the inter-quartile range. The dots are values that exceed the vertical lines and are considered 'outlier' estimates.

It was noted earlier that central banks in advanced economies that introduced QE would soon also apply a form of forward guidance (FG) to influence interest rate expectations. Since these are also thought to negatively influence yields (e.g., by repeating the 'lower for longer' mantra for policy rates) not all the estimates shown in Figure 12 can be attributed to APP style programmes. Hubert and Labondance (2019), and Böck et. al. (2020), are two studies supporting the finding that FG contributed to the reduction of yields in the euro area. However, a critical caveat is that FG works mainly during crisis times and their impact, as is true of APP-style policies, may decline over time the more frequently they are applied.

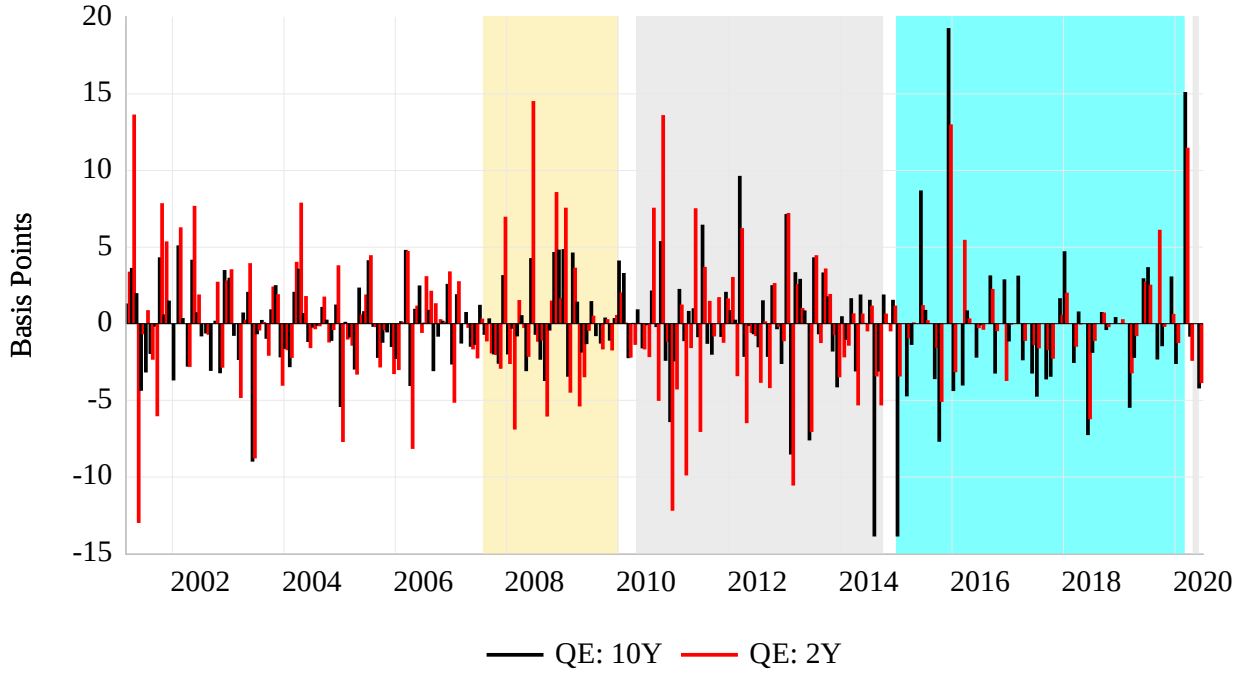
Evaluations of QE must also consider the shorter end of the yield structure. Even if the evidence is clear that monetary policy is able to lower long-term yields, and even if central bank policy rates are at the ELB, the situation is less clear cut for short-term interest rates. For example, Lombardi et. al. (2019) report that central bank interventions of the QE variety are more likely to influence yields throughout the term structure when there is both turmoil in financial markets and policy rates are perceived to be near the ELB. Otherwise, the impact on short-term yields in small to negligible. However, unlike the

existing literature which assumes that all monetary policy surprises are contained in observed price movements, the authors demonstrate that what central banks communicate, via press releases and the publication of the minutes of monetary policy committee meeting, is a missing ingredient in attempts at providing a more complete assessment of the impact of QE.

Altavilla et.al. (2019), prepared before the COVID-19 era, illustrates some of the foregoing points for the euro area. It is also extremely helpful because the authors continue to update the data. Hence, we can obtain a few glimpses about the immediate impact of PEPP. As explained earlier, yields on financial instruments respond to policy 'surprises', that is, to unexpected changes in the stance of monetary policy that prompts financial markets to revise their views about the current and future course of interest rates.

Figure 13 plots Altavilla et. al.'s (2019) estimates of surprises since 2002 for the euro area updated to include estimates in the early phase of the pandemic. It also includes data updated until June 2020 at the time data are downloaded (July 2020). The shaded areas highlight, as before, the three periods that are the focus of this paper (see Figure 1). The height of each bar indicates the impact, either positive or negative, on two sets of sovereign bonds, namely ones with 2 or 10 years to maturity. Generally, prior to the APP era (the right most shaded area), short term yields were more impacted than long-term yields. Visually, one is also able to observe that the size of monetary policy surprises are smaller, in absolute terms, pre-GFC and SDC periods. Indeed, policy surprises appear to become more volatile during the SDC than at any other time since 2002. On balance policy surprises tend to be negative more often, and smaller, during the QE era than prior to 2015. All of these results provide additional support for the broader findings summarised in Figure 12 above. Finally, since the onset of the pandemic (the very end of the sample), the available data suggest that all ECB Governing Council meetings produced declines in both short and long-term yields.

Figure 13: Monetary events and monetary surprises in the euro area



Source: Altavilla et. al. (2019, updated).

A somewhat less flattering picture emerges when individual euro area economies are examined. Table 2 provides a summary of the evidence. The data reveal considerable variation across countries and over time as well as between 2 and 10 year sovereigns. Notice also that while all euro area countries shown experienced substantial declines in short-term yields, the results are dramatically different at the long end of the term structure for 10-year yields. Instead, one must look to the SDC era to see a reversal of sorts with 10-year yields falling in all four euro area economies, and not only where the SDC had its greatest effects (i.e., ESP and ITA in the present case). Finally, declines at the long end continue throughout the QE period while short term yields experience very mixed effects for the 2-year yield. The latter results provide more support for the interpretation of Figure 13 above. More importantly, the results in Table 2 reveal details that are not immediately observable when data are aggregated at the euro area level (i.e., as in Figure 12).

Table 2: The cumulative impact of ECB NSP (basis points)

	2Y yields			10Y yields		
	GFC era	SDC era	QE era	GFC era	SDC era	QE era
DE	**-22**	12.16	10.66	4.1	**-21.36**	**-23.41**
ES	**-14.7**	**-25.65**	**-26.2**	12.65	**-36.7**	**-36.95**
FR	**-15.8**	19.64	18.04	**-0.10**	**-22.32**	**-24.17**
IT	**-18.05**	**-17.6**	**-18**	1.80	**-7.96**	**-9.01**

Source: Altavilla et. al (2019, updated) and author's calculations. 2Y and 10Y are two, and ten, years yields on government bonds. QE is the short-hand expression for the APP.

The evidence to date, while broadly consistent with the view that monetary policy continues to be effective, even in the euro area where additional constraints of an institutional nature must be considered, is only half of the story. The more difficult question about the aggregate economic impact of APP style policies remains unanswered. I turn to some evidence in the following section.

4. THE MACRO QUESTION: ASSET PURCHASE PROGRAMMES AND THE EURO AREA ECONOMY

There are two dimensions to consider in providing an assessment of APP on aggregate economic activity. First, there is the global angle, that is, the extent to which the euro area economy is linked to the global economy. While the GFC interrupted the relative importance of global factors, for example, by reducing trade in goods, services and commodities, on the eve of the pandemic the trade fallout was not expected to be much more than a temporary interruption (e.g., see Ademuyiwa and Siklos, 2019).[12] As this is written, however, and especially in global trade, there are far greater fears that a form of de-globalisation will gather pace (e.g., see Irwin, 2020). The size of the euro area, as well as the trading patterns of its members, may well provide some protection against shocks from abroad but, as in many other situations mentioned already, these external shocks are unlikely to be evenly distributed throughout the single currency area.

Similarly, domestically induced shocks will also be transmitted unequally within the euro area. Ultimately, however, there can only be a single monetary policy and, since the euro floats against world currencies, there is little that monetary policy can do to ensure that external shocks are transmitted equally to all euro area member countries. However, to the extent the aphorism 'a rising tide lifts all boats' is valid, a finding that APP-style programmes contributed to raising GDP growth as well as assisting the ECB in meeting its inflation objectives a focus on the entire euro area is justified if the benefits are seen all across the EU, even if the positive effects are unevenly distributed.[13]

What follows illustrates the potential impact of ECB policies since the SDC when the ECB ceased to rely on the policy rate alone to set the stance of monetary policy. Moreover, in the interests of simplicity, while it is not possible to assume that the results to follow capture the impact of ECB policies alone, it is reasonable to assume that the broad direction of the effects to be considered were, in large part, supported by the actions taken by the central bank. Finally, it would be preferable to examine a more complete model that allows for real, monetary and financial variables to interact (e.g., as in Siklos, 2020b). However, the object of the exercise below is to illustrate a useful concept that may be employed in future to assess the value added of any ECB intervention and not to provide a definitive estimate of the net benefits of APP.

I consider three variables constructed to capture a wide variety of economic indicators of real economic activity, the stance of monetary policy, and the degree of ease in financial conditions. The approach is the same as the one used to illustrate lending standards (Figure 5). The approach is also one that has frequently been used to capture in as parsimonious a manner as possible the combined impact of a large number of indicators that are used to measure macroeconomic conditions. In the case of the real economy, I use observed and forecasted inflation and real GDP growth as well as the euro area unemployment rate and oil prices. In the case of the stance of ECB monetary policy, I use the shadow policy rate (Figure 6) since, in principle, this captures some of the impact of the wide variety of ECB interventions that have taken place since the GFC. Also included is the growth rate of the M3 monetary aggregate since the ECB still purports to include a monetary pillar. Finally, since the shadow rate is an imperfect measure, the size of central bank assets (ECB and national central banks) to GDP is also

[12] Indeed, the upward trend in financial globalisation slowed but was not reversed. Trade globalisation appears to have impacted China the most and, in any case, evidence that it was slowing down began well before the GFC.

[13] Returning to Figure 1, a model of the kind used to combine individual member country lending standards (see Figure 5 and footnote 5) finds that economic growth within the euro area is very highly correlated over the 1999-2020 period. The only exceptions are PT, GR, and IT, though the GFC, the SDC and QE periods play an important role in this finding. The same result holds for inflation though, interestingly, the relationship among euro are member countries is not as close as it is for GDP growth. On the other hand, no country stands out except for LT, LV, and SK but these are relative late comers to the single currency area.

included. Finally, the financial factor consists of the currency to GDP ratio, the VIX, a three months interest rate (LIBOR3M), a ten year yield (see Figure 6), and real housing prices (see Figure 9).[14]

The resulting factor model estimates yields scores which, when suitably normalised, provide a kind of indicator of real, monetary and financial market performance. To provide a simple and illustrative assessment of the impact of APP, I proceed as follows. Obtain estimates of the indicator for each one of the three factors over the 1999-2010 period, that is, the available data until the start of the SDC. Next, assume that the relative weights estimated and used to generate the factor scores remain unchanged until the end of the sample and in spite of the introduction of APP. This is a simple and convenient way of asking what would have happened to each one of the factors if the relative importance of its components did not change after 2010Q1. Hence, I am conducting a 'what if' type of exercise. Finally, the counterfactual estimates of the real, monetary, and financial indicators, are compared with estimates for the full sample (1999Q1-2020Q1). The indicators are defined in such a manner that a rise in the indicator means an improvement in real economic conditions and a tightening of monetary and financial conditions.

Figure 14 shows the estimates of the (normalised) factor scores, while Table 3 provides additional insights into the changing behaviour of the factors over time. Beginning with Table 3 the sign of the estimates of the weights, referred to as factor loadings, indicates whether they raise or lower the factor scores when they change, while their size provides an indication of the relative importance of each component. If we examine the real factor we observe, as expected, that a rise in the unemployment rate produces a deterioration in the real factor as does a rise in oil prices. Increases in inflation or real GDP growth in various forms improve aggregate economic conditions. Moreover, the relative importance of these variables dwarfs the remaining ones in terms of their relative contribution to overall real economic activity. Equally interesting is that inflation, both observed and expected, contributed far more to real economic conditions over the full sample than when only the pre-SDC period is considered. Turning to monetary conditions, all three components play important roles in determining the stance of monetary policy. Relative to the full sample, the shadow rate's relative importance was lower pre-SDC. This is consistent with the enhanced role played by the introduction of UMP since 2015 and is also gleaned from the rising gap between the observed and shadow policy rates (see Figure 6). The same is true of central bank assets to GDP while money growth's relative importance appears to have decreased over time.

Finally, if one examines the financial factor, the following stylised facts are observed. Rises in interest rates and in real housing prices tighten financial conditions. It is notable that real housing prices have a much smaller weight over the full sample than in the pre-SDC period. Credit to GDP plays a relatively large role in both samples while the weight of interest rate changes rises substantially since the SDC. Finally, a rise in the VIX, a proxy of uncertainty sentiment, is associated with a tightening of financial conditions in the full sample but contributes to a very small deterioration in financial conditions.

The salient results from Figure 14 are easily summarised. Policies introduced during the SDC softened the decline in economic activity, but these also appear to have slowed the recovery thereafter. This is seen from the fact that the decline in real economic performance, especially in 2012, was lower in the full sample estimates than when the counterfactual estimates are considered. The situation is then reversed until APP are introduced. Indeed, economic activity is relatively higher under the counterfactual than when all the data are employed. Thereafter, the results are mixed and there is little to distinguish the counterfactual from the full sample estimates.

14 I would have liked to include data from the ECB Bank Lending Survey (see Figure 5). However, since the data begin in 2006, it was not practical to include the relevant data.

Matters are somewhat clearer when monetary conditions are examined (middle graph). Monetary conditions are looser under the full sample estimates than if there were essentially no interventions in place, that is, if pre-SDC conditions prevailed. Thereafter, that is, since 2017, monetary conditions are tighter on the basis of full sample estimates than in the counterfactual case where pre-SDC conditions remain in place. By 2019 the two estimates are virtually identical. One interpretation then is that APP eased monetary conditions relative to the do-nothing case, but the ECB appears to have tightened conditions too quickly, at least relative to the counterfactual experiment. Finally, financial conditions reveal a notable change in the period since APP were introduced. Prior to 2015, financial conditions are tighter in the full sample case than when pre-SDC conditions are assumed to have remained unchanged. Around the end of 2015, the situation is reversed with financial conditions based on actual data become looser, and remain so until the end of the sample, than if pre-SDC conditions had not changed. Clearly, these results highlight that the impact of APP require going beyond just the impact on the real economy and monetary conditions. Unfortunately, however, the results also suggest that reaching a conclusion about the net value added of non-standard policies is not straightforward. While there are indications that UMP can yield beneficial results, what is left unanswered are the potentially cumulative effects of distortions of the kind mentioned above. As emphasised in the final section, policy makers will need to estimate and propose policies to deal with the resulting economic and financial distortions.

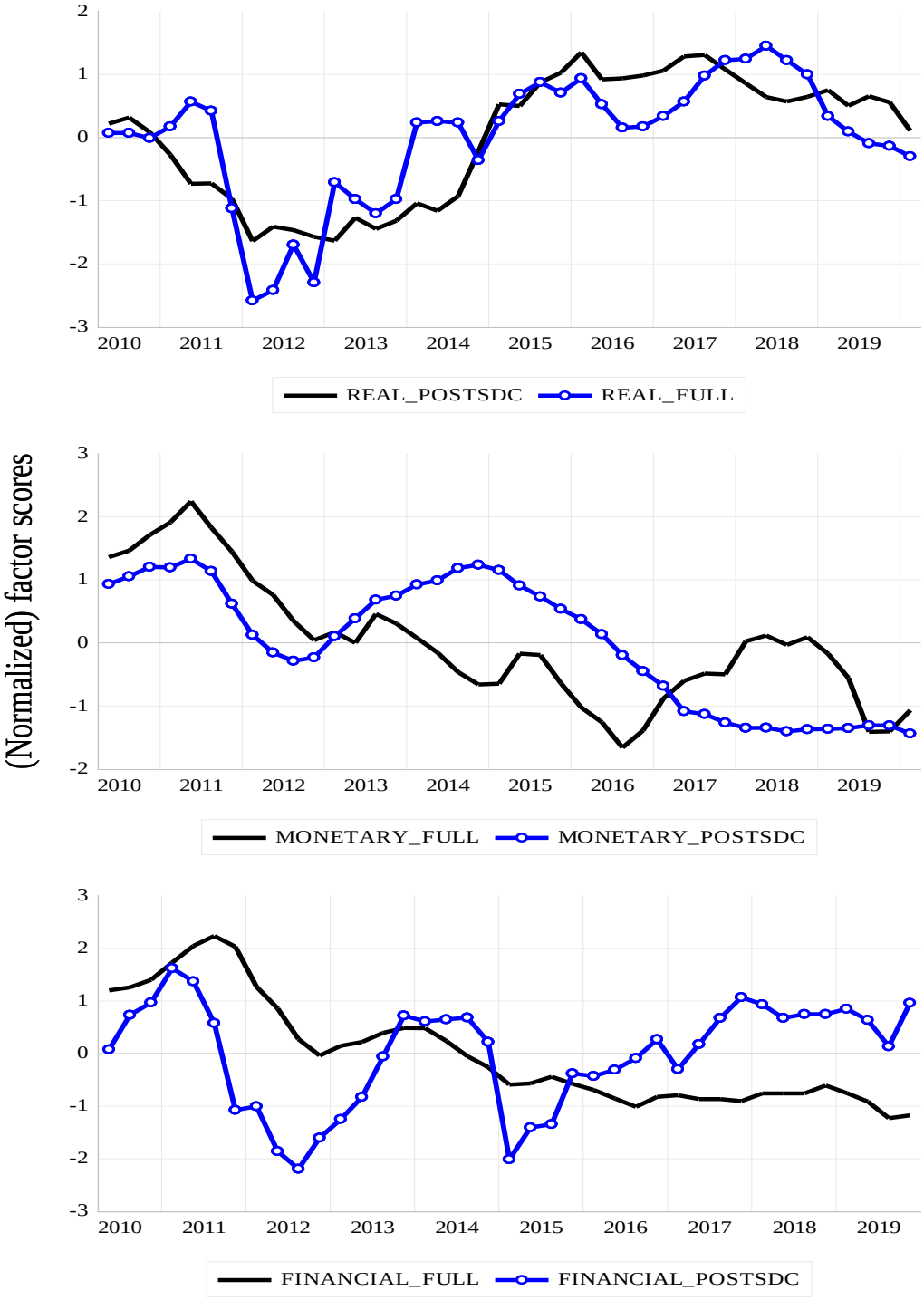
Table 3: Real, monetary and financial conditions in the euro area and their components

	Variables					
REAL	**Inflation**	**GDP growth**	**Expected Inflation**	**Unemployment rate**	**Oil Prices**	**QE**
Full sample	0.27	0.89	0.29	1	-0.34	-0.36
Pre-SDC	0.59	0.97	0.60	0.96	-0.39	-0.14
MONETARY	**Shadow rate**	**M3 growth**	**Central Bank assets/GDP**			
Full sample	1	0.54	-0.84			
Pre-SDC	0.83	0.72	-0.56			
FINANCIAL	**Credit to GDP**	**VIX**	**LIBOR3M**	**Euro 10Y**	**Real House prices**	
Full sample	-0.84	0.42	0.95	0.88	0.23	
Pre-SDC	-1	-0.16	0.35	0.57	0.75	

Note: The figures show the so-called factor loadings, that is, the weights of each component which, when aggregated, produces the indicators shown in Figure 14. If the estimate is positive the component raises the indicator, and the reverse holds when the sign is negative. Estimates were obtained by imposing the assumption that there is a single common factor and via maximum likelihood. Inflation is HICP inflation in the euro area; real GDP growth is the same as in Figure 1. Oil prices

are Brent prices per barrel. The full sample is usually 2000Q1-2020Q1, after transformations (e.g., taking growth rates) and data availability for some series. The pre-SDC sample ends in 2010Q1 (also see Figure 1).

Figure 14: How did the SDC and APP impact the euro area? A counterfactual



Source: Author's calculations. Three factors are considered: real, monetary and financial. Each factor consists of several variables. For REAL, inflation, real GDP growth, inflation forecasts (SPF), growth forecasts (SPF), unemployment rate, and oil prices. For MONETARY, the shadow ECB policy rate (Figure 6), growth in the M3 monetary aggregate, and central bank assets to GDP ratio. For FINANCIAL, credit to GDP ratio, VIX, LIBOR3m, 10 years yield for the euro area (see Figure 6), and the growth rate of real house prices (Figure 9). Data are from the ECB, BIS, and Federal Reserve Bank of St. Louis. FULL means estimate if the full sample is used. POSTSDC means using estimates for the pre-SDC sample period alone to estimate the post-SDC period estimates.

5. CONCLUSIONS: WHERE DO WE GO FROM HERE?

We are now well over a decade into non-standard monetary policies. Policy regimes with a comparable life span can easily be found (e.g., Bretton Woods). It is worth asking, therefore, whether monetary instruments introduced since 2008 have stood the test of time and ought to remain part of the toolkit available to the monetary authorities. The answer is a qualified yes.

Resort to extraordinary measures, particularly when there is a growing body of experience and lessons learned, is necessary but, just as with fire alarms or medication, should be used sparingly and only as directed. First, because the evidence is not overwhelming that the set of NSP employed to date are successful in all respects. Beyond the evidence shown here and the extant literature that continues to debate the merits of UMP, success as measured by the impact of NSP on interest rates suggest that it has a hit and miss element to it. Second, and equally important, while the autonomy of central banks, together with their mandate for price stability, justified large scale interventions in financial markets, compatibility with fiscal policy was often given short shrift. Central banks were left, perhaps willingly, to do the heavy lifting even if, arguably, some of the conditions that gave rise to the SDC cannot be attributed to ECB actions or constraints on its ability to intervene.

As the pandemic develops and, hopefully, becomes a distant memory, developments at the European level suggest an understanding of the need for monetary and fiscal policies to support each other. Of course, this is an old lesson that needs to be learned again. Finally, if NSP is a treatment, it must surely end if only because it risks become less and less effective over time, as the US experience has shown (e.g., see Rogers et. al., 2014). Central bank credibility (e.g., see Bordo and Siklos, 2017) plays an important role here. Not only is the maintenance of credibility essential to support the public's belief that the current monetary regime of inflation control will remain in place, but credibility will also assist the unwinding of extraordinary measures when this is appropriate. Economic history (also see Bordo and Siklos, 2016) suggests this the best way to deal with fears of excessively high future inflation as debt levels rise quickly in response to the global pandemic.[15] More importantly, the accumulated impact of NSP are sure to have distorted financial markets. After all, NSP are an attempt to partially administer financial asset prices and history is not kind to attempt to undermine the workings of markets. Indeed, all sorts of spillovers from the application of NSP are unavoidable, both inside the euro area as well as globally. Moreover, such policies bring monetary policy much closer to becoming a form of fiscal policy. Once again, history is not kind to such attempts that go on for too long.

Where then do we go from here? In no order of importance, I would suggest the following implications from the foregoing analysis. Policy makers must quantify more precisely the economic impact of the distortionary effects of NSP. Central bank interventions have spread or are spreading to the full length of the term structure and across more sectors of the economy. It is no accident that prolonged interventions by central banks, well intentioned as they are, are not substitutes for reforms that can raise productivity and economic growth and, hence, ensure that the 'unpleasant' debt arithmetic does not take hold.[16] Japan is sometimes thought of as an object lesson for the risks in question (e.g., see Siklos, 2020a).

Given the size of the interventions, magnified for understandable reasons because of the ongoing pandemic, there is already pressure to think about an exit strategy. Senior ECB officials are at pains to point out that existing interventions can be reversed. However, the public has been told this story before, while a return to the *status quo ante* before the events of 2008 never really took hold. It might

[15] Broadbent (2020) essentially concurs based on the U.K. experience. For a broader analysis of the issues in question see, for example, Reis (2019).

[16] This is a reference to the proposition that, if the real cost of carrying debt exceeds economic growth, debt levels can rise without limit.

be more credible for central banks to argue, and with a sufficient degree of clarity and precision, the kind of economic conditions, beyond just a return to price stability, required before exit actually takes place. And, if NSP remain part of the ECB's toolkit, to provide the public with an indication of the size and composition of its post-NSP balance sheet. Equally important, these steps must be taken in a manner that is coherent with fiscal policies in the euro area. If this is not done, then central bank credibility will be further eroded. At the risk of repeating the obvious, what makes the euro area unique is the combination of a single monetary policy for disparate and sovereign states. It is ironic now that Brexit has taken place that the words of a former U.K. Prime Minister, Harold Macmillan, uttered in 1960, should remain relevant in this connection. "It is the basic principle…that we respect each other's sovereignty in matters of internal policy. At the same time, …in this shrinking world…the internal policies of one nation may have effects outside it. We may sometimes be tempted to say to each other, 'Mind for your own business'. But in these days I would myself expand the old saying so that it runs, "Mind your own business, but mind how it affects my business, too." (George-Brown, 1980, p. 210).

Just as monetary policy became successful not only because it pursued price stability but was carried out in a forward-looking manner, so must the fiscal authorities adopt some of the strategies developed by the monetary authorities. This means that central banks are not the only ones that will have to come up with an exit strategy. The fiscal authorities should eventually be pressed to do the same.

None of the foregoing suggestions are straightforward to carry out if only because the time horizon of the monetary authorities will eventually conflict with the ones the fiscal authorities have in mind. In addition, there are likely institutional implications for the future conduct of monetary policy that are beyond the scope of this paper, but daunting nonetheless.

Underscoring the continuing conflict between fiscal and monetary policies is the recurring legal tension between the Treaties that bind the various Member States of the euro area and the almost natural reaction to 'do whatever it takes' when a crisis of some kind erupts. While economists' prescriptions may not fit nicely with legal language that governs how European-wide institutions should behave, one cannot forget the view that the single currency is also a political project. Resolving this tension is essential. Indeed, it comes as no surprise that a legal challenge to the PEPP has originated from Germany (Colitt, 2020). The planned European Recovery Fund is intended to be temporary; it is not meant to be a euro area maintenance and sustainability fund.

Beyond the various arguments marshalled for or against NSP, one clear lesson, clearly learned as COVID-19 spread around the globe, is that interventions of the APP and PEPP varieties stand a far better chance of being successful when they are very large. As Bernanke, Geithner, and Paulson (2019) suggested in their retrospective of their time managing the GFC in the US, those responsible for managing crises must be given "…the authority they need to respond with overwhelming force" (op.cit., p. 122). Therefore, if the toolkit of the ECB is to be expanded is must be with the sentiment expressed in the first part of the title of this paper.

Box 1: Extracts from the TEU and TFEU

The ECB operates as a supra-national institution in a monetary union of many sovereign states. Accordingly, its institutional structure does not have exact parallels elsewhere in the world. Yet, the aims and strategy of monetary policy strategy are similar to ones followed by many central banks. Since the current predicament the ECB finds itself in partially reflects institutional considerations and has been the subject of legal battles, as explained in section 2.2.3., it is worth repeating some of the passages from the respective Treaties that govern the existence and tasks of the ECB used by supporters and detractors of the central bank to support their respective cases. Of course, in doing so, it must be recognized that my interpretation of the pressures faced by the ECB is one that an economist would make and cannot be construed as a legal opinion.

Treaty on European Union

From PREAMBLE

RESOLVED to achieve the strengthening and the convergence of their economies and to establish an economic and monetary union including, in accordance with the provisions of this Treaty and of the Treaty on the Functioning of the European Union, a single and stable currency,

Article 5 (ex Article 5 TEC) **1.** The limits of Union competences are governed by the principle of conferral. The use of Union competences is governed by the principles of subsidiarity and proportionality; …**4.** Under the principle of proportionality, the content and form of Union action shall not exceed what is necessary to achieve the objectives of the Treaties.

Treaty on the Functioning of the European Union

From PREAMBLE

ANXIOUS to strengthen the unity of their economies and to ensure their harmonious development by reducing the differences existing between the various regions and the backwardness of the less favoured regions,

Article 119 (ex Article 4 TEC) **1.** For the purposes set out in Article 3 of the Treaty on European Union, the activities of the Member States and the Union shall include, as provided in the Treaties, the adoption of an economic policy which is based on the close coordination of Member States' economic policies, on the internal market and on the definition of common objectives, and conducted in accordance with the principle of an open market economy with free competition. C 326/96 EN Official Journal of the European Union 26.10.2012 **2.** Concurrently with the foregoing, and as provided in the Treaties and in accordance with the procedures set out therein, these activities shall include a single currency, the euro, and the definition and conduct of a single monetary policy and exchange-rate policy the primary objective of both of which shall be to maintain price stability and, without prejudice to this objective, to support the general economic policies in the Union, in accordance with the principle of an open market economy with free competition. **3.** These activities of the Member States and the Union shall entail compliance with the following guiding principles: stable prices, sound public finances and monetary conditions and a sustainable balance of payments.

Article 123 (ex Article 101 TEC) **1.** Overdraft facilities or any other type of credit facility with the European Central Bank or with the central banks of the Member States (hereinafter referred to as 'national central banks') in favour of Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments.

Article 127 (ex Article 105 TEC) **1.** The primary objective of the European System of Central Banks (hereinafter referred to as 'the ESCB') shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union. The ESCB shall act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 119.

Protocols on the application of the principles of subsidiarity and proportionality Article 5

Draft legislative acts shall be justified with regard to the principles of subsidiarity and proportionality. Any draft legislative act should contain a detailed statement making it possible to appraise compliance with the principles of subsidiarity and proportionality. This statement should contain some assessment of the proposal's financial impact and, in the case of a directive, of its implications for the rules to be put in place by Member States, including, where necessary, the regional legislation. The reasons for concluding that a Union objective can be better achieved at Union level shall be substantiated by qualitative and, wherever possible, quantitative indicators. Draft legislative acts shall take account of the need for any burden, whether financial or administrative, falling upon the Union, national governments, regional or local authorities, economic operators and citizens, to be minimised and commensurate with the objective to be achieved. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A12008E%2FPRO%2F02.

REFERENCES

- Ademuyiwa, I., and P. Siklos (2019). The Global Interplay Between Trade, Geopolitical and Commodity Shocks. CIGI papers No. 229, October.
- Altavilla, C.L., L. Brugnolini, R. Gürkaynak, R. Motto, and G. Ragusa (2019). Measuring Euro Area Monetary Policy. *Journal of Monetary Economics* 108: pp. 162-79.
- Arnold, M. (2020a). ECB Dissenters Resisted Christine Lagarde's 'No Limits' Virus Response. *Financial Times*, 9 April.
- Arnold, M. (2020b). ECB Predicted to Beef Up Asset Purchases with Shift into Junk Bonds. *Financial Times*, 26 April.
- Banerjee, R., and B. Hofmann (2018). The Rise of Zombie Firms: Causes and Consequences. BIS *Quarterly Review*, September, pp. 67-78.
- Bernanke, B.S. (2004). The Great Moderation. Remarks at the meetings of the Eastern Economic Association, 20 February.
- Bernanke, B.S. (2005). The Global Savings Glut and he U.S. Current Account Deficit. Remarks at the the Sandridge Lecture, Virginia Association of Economists, Richmond, VA., 14 April.
- Bernanke, B.S. (2015). *The Courage to Act*. New York: W.W. Norton.
- Bernanke, B.S., T.F. Geithner, and H.M. Paulson (2019). *Firefighting: The Financial Crisis and Its Lessons*. New York: Penguin.
- Bhattarai, S., and C. Neely (2018). An Analysis of the Literature on International Unconventional Monetary Policy. Federal Reserve Bank of St. Louis working paper 2016-021C, October.
- Bordo, M., and P.L. Siklos (2017). Central Bank Credibility before and After the Crisis. *Open Economies Review* 28(1): pp. 19-45.
- Bordo, M., and P. Siklos (2016). Central Bank Credibility: An Historical and Quantitative Exploration. In *Central Banks at a Crossroads: What Can We Learn from History?* Edited by M. Bordo, Ø. Eitrheim, and M. Flandreau. Cambridge, Mass.: Cambridge University Press, pp. 62-144.
- Broadbent, B. (2020). Government Debt and Inflation. Speech at the 2020 Central bank Research Association Conference, via videolink, 2 September.
- Brunnermeier, M., and Y. Koby (2019). The Reversal Interest Rate. Working paper, Princeton University.
- Colitt, R. (2020). ECB Targeted by German Far-Right Party Over Coronavirus Response. *Bloomberg*, 18 June.
- Corsello, F., S. Neri amd A. Tagliabracci (2019). Anchored or De-Anchored? That is the Question. Banca d'Italia Occasional Papers no. 516, October.
- Court of Justice of the European Union (2015). Press Release No. 2/15. Opinion on case C-62/14, 14 January.
- De Guindos, L. (2020). Euro Area: Economic Outlook and Financial Stability During the Pandemic Crisis. Remarks given to the Institute for European and International Affairs, Dublin, 10 June.

- Economic and Financial Affairs (2008). EMU@10 – Successes and Challenges After Ten years of Economic and Monetary Union. *European Economy* 2/2008, European Commisssion, Economic and Financial Affairs Directorate General.
- English, B., B. Nelson, and B. Sack (2011). Exit Strategy. FOMC Secretariat, 19 April.
- Eser, F., W. Lemke, K. Nyholm, S. Raddle, and A. Vladu (2019). Tracing the Impact of the ECB's Asset Purchase Programme on the Yield Curve. ECB working paper 2293, July.
- Federal Constitutional Court (2020). Opinion of the German Court. 5 May.
- Filardo, A., and P.L. Siklos (2020). The Cross-Border Lending Channel and Lending Standards. *Journal of International Financial Markets, Institutions and Money* 67 (July) 101206.
- Fisher, S. (2016). Why Are Interest Rates So Low? Causes and Implication. Remarks at the Economic Club of New York, 17 October.
- Friedman, M. (1068). The Role of Monetary Policy. *American Economic Review* 58 (March): pp. 1-17.
- Gambetti, L., and A. Musso (2017). The Macroeconomic Impact of the ECB's Expanded Asset Purchase Programme (APP). ECB working paper 2075, June.
- George-Brown, Lord (1980). *The Voices of History*. New York: Stein and Day Publishers.
- Gonzáles-Páramo, J. M. (2008). Globalization, Macroeconomic Stability and Monetary Policy At a Time of Financial Turmoil. Speech at the FCAVN Seminar on "Globalization in the XXI Century: Challenges and Dilemmas", San Sebastián, 5 September.
- Haldane, A. (2017). A Little More Conversation A Little Less Action. Speech given at the Federal Reserve Bank of San Francisco, Macroeconomics and Monetary Policy Conference, 31 March.
- Hammermann, F., K. Leonard, S. Nardelli, and J. von Landesberger (2019). Taking Stock of the Eurosystem's APP After the End of Net Asset Purchases. ECB *Economic Bulletin*, vol. 2.
- Holston, K., T., Laubach, and J. Williams (2017). Measuring the Natural Rate of Interest: International Trends and Determinants. *Journal of International Economics* 108 (Supplement, May): S39-S75. Data updated from newyorkfed.org/research/policy/rstar.
- Hubert, P., and F. Labondance (2018). The Effect of ECB Forward Guidance on the Term Structure of Interest Rates. *International Journal of Central Banking* (December): pp. 193-222.
- Irwin, D. (2020). The Pandemic Adds Momentum to the Deglobalization Trend. Realtime Economic Issues Watch, Peterson Institute for International Economics, 23 April.
- Koo. R. (2008). *The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession*. Singapore: John Wiley & Sons (Asia).
- Koo. R. (2015). *The Escape from Balance Sheet Recession and the QE Trap*. Singapore: John Wiley & Sons (Asia).
- Krippner, L. (2015). *Zero Lower Bound Term Structure Modelling: A Practitioner's Guide*. London: Palgrave-Macmillan, data updated at ljkmfa.com.
- Kydland, F. and E.C. Prescott (1977). Rules Rather Than Discretion: The Inconsistency of Optimal Plans. *Journal of Political Economy* 85 (June): pp. 473-92.
- Largarde, C. (2018). Euro 2.0: Past, Present, and Future of Euro Area Integration. Opening remarks at the 'Euro at 20 Conference, Dublin, 25 June.

- Largarde, C. (2020b). Hearing At the Committee on European on Economic and Monetary Affairs of the European Parliament: Introductory Statement. 8 June.
- Lane, P. (2020a). The Market Stabilisation Role of the Pandemic Emergency Purchase Programme. ECB Blog, 22 June.
- Lane, P. (2020b). The Monetary Policy Toolbox: Evidence from the Euro Area. Keynote speech at the 2020 U.S. Monetary Policy Forum, New York, 21 February.
- Lane, P. (2020c). "Remarks" at the panel 'Crisis Management in the COVID-19 Economic Shutdown', At the "Navigating the Decade Ahead: Implications for Monetary Policy", Jackson Hole Economic Policy Symposium, 27 August.
- Lombardi, D., P. Siklos and S. 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(5): pp. 1229-1256.
- Lombardi, D., P. Siklos, and S. St. Amand (2019). Asset Price Spillovers From Unconventional Monetary Policy: A Global Empirical Perspective. *International Journal of Central Banking* (June): pp. 43-74.
- Macklem, T. (2020). "Remarks" at the panel 'Crisis Management in the COVID-19 Economic Shutdown', At the "Navigating the Decade Ahead: Implications for Monetary Policy", Jackson Hole Economic Policy Symposium, 27 August.
- Morris, S., O. Walker, and L. Noonan (2020). Banks Braced as Pandemic Poses Biggest Test Since Financial Crisis. *Financial Times,* 10 August.
- Rachel, L., and L.H. Summers (2019). On Secular Stagnation in the Industrialized World. *Brookings Papers on Economic Activity*, Spring: pp. 1-54.
- Reis, R. (2019). Can the Central Bank Alleviate Fiscal Burdens? In D. Mayes, P. Siklos and J.-E. Sturm *The Oxford handbook of the Economics of Central Banking.* Oxford: Oxford University Press, pp. 131-170.
- Rogers, J.H., C. Scotti, and J.H. Wright (2014). Evaluating Asset-Market Effects of Unconventional Monetary Policy: A Multi-Country Review. *Economic Policy* 29 (October): pp. 749-799.
- Schnabel, I. (2020b). The ECB's Policy in the COVID-19 Crisis – A Medium-Term Perspective. At an online seminar hosted by the Florence School of Banking and Finance, 10 June.
- Siklos, P.L. (2002). *The Changing Face of Central Banking.* Cambridge, U.K.: Cambridge University Press.
- Siklos, P.L. (2013). Sources of Disagreement in Inflation Forecasts: An International Empirical Investigation. *Journal of International Economics* 90 (1): pp. 218-231.
- Siklos, P.L. (2017). *Central banks Into the Breach.* Oxford: Oxford University Press.
- Siklos, P. L. (2019). "What Has Publishing Inflation Forecasts Accomplished? Central Banks and their Competitors", in *The Oxford Handbook of the Economics of Central Banking*, edited by J-E. Sturm, D. Mayes, and P.L. Siklos. Oxford: Oxford University Press, pp. 737-778.
- Siklos, P.L. (2020a). Looking Into the Rear-View Mirror: Lessons from Japan for the Eurozone and the U.S.? Institute of Monetary for Monetary and Economic Studies Discussion Paper 2020-E-2, Bank of Japan, March.

- Siklos, P.L. (2020b). Real and Financial Factors, Commodity Prices, and Monetary Policy: International Evidence. *Economic Systems* (forthcoming).
- Trichet, J.-C. (2007). The Euro Area and Its Monetary Policy. Address at the Conference "The ECB and Its Watchers IX", Frankfurt am Main, 7 September.
- Trichet, J.-C. (2009). The ECB's Exit Strategy. Speech at the ECB Watchers Conference, Frankfurt, 4 September.
- Wolf, M. (2020). German Constitutional Court Decides to Take Control with ECB Ruling. *Financial Times*, 12 May.
- Woodford, M., and Y. Xie (2020). Fiscal and Monetary Stabilization at the Zero Lower Bound: Consequences of Limited Foresight. NBER working paper 27521, July.
- Yellen, J. (2015). Normalizing Monetary Policy: Prospects and Perspectives. Remarks at the "The New Normal Monetary Policy" Conference sponsored by the Federal Reserve Bank of San Francisco, 27 March.

Until this year, governments in the single currency area appeared to be 'missing in action'. There is belated recognition that monetary and fiscal policies must coordinate especially in crisis conditions. The euro area has experienced crisis or near crisis conditions for over a decade. Lessons are being learned late but there continue to be several gaps that the euro area and its members need to close. The paper highlights these and the continuing threats to the single currency area.

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