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Investment Institute Macroeconomics

ECB Quantitative Tightening: Navigating a treacherous path

Gauging the potential short and medium-term market opportunities

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Key points

- Following 2022's meteoric rise in inflation - and after years of ultra-loose monetary policy – the ECB is about to start a prudent quantitative tightening
- The scale of tightening looks relatively modest against the very significant net issuance of European government bonds planned this year. But investors should note that June and September could be catalysts for enhanced market stress
- Our analysis suggests further upside in 10-year sovereign yields, peaking in the third quarter before receding alongside core inflation. Investors should be mindful of upside risks to the model's forecast if there were to potentially be a faster balance sheet unwind
- However the quantitative tightening process is highly uncertain. We find it useful to consider why it may not be symmetrical to quantitative easing

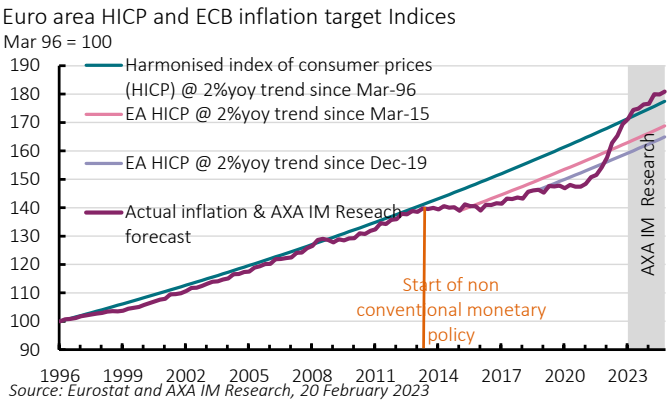
Several good reasons for prudent QT

The European Central Bank (ECB) started deploying its suite of non-conventional monetary policy measures in the summer of 2013. First it introduced rate forward guidance (July 2013), followed by a negative interest rate policy (June 2014), before going into its large-scale Asset Purchase Programme (APP, September 2014)[1]. These all aimed to anchor short- and medium-term interest rates at the lower bound to spur inflation, which had started diverging from the ECB's target on a consistent basis (Exhibit 1).

Only 18 months of inflation being above the ECB's target cancelled out the 16.5% gap which had accumulated since early 1996 between a targeted 2% year-on-year trend in headline inflation and actual inflation. This helps to contextualise the very sharp monetary policy normalisation. This started with the ECB ending its Pandemic Emergency Purchase Programme (PEPP) and APP net purchases in March 2022 and June 2022 respectively.

[1] Rostagno, M. and al., "Combining negative rates, forward guidance and asset purchases: identification and impacts of the ECB's unconventional policies", Working Paper, European Central Bank, June 2021

Exhibit 1: Euro area inflation diverging from ECB target



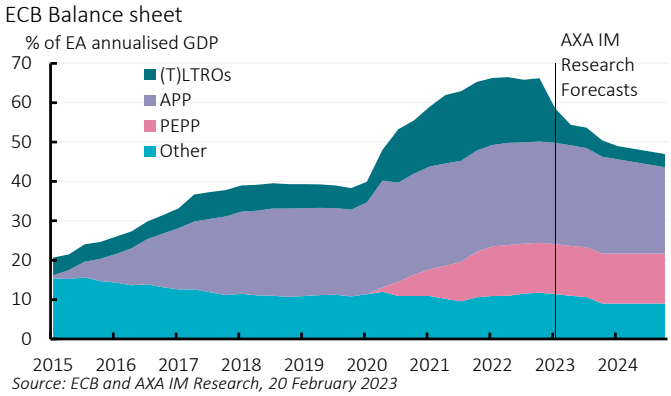
Source: Eurostat and AXA IM Research, 20 February 2023

Between July 2022 and February 2023, the ECB increased its policy rates by 300 basis points (bps). Six months after stopping its net asset purchases, it decided to reverse quantitative easing (QE) by committing to a partial (to start with) reinvestment of its APP holdings, therefore starting quantitative tightening (QT). By not reinvesting around €15bn (roughly 50%) of maturing assets on a monthly basis from March until the end of June – announced at the December Governing Council meeting – the €3.4tn (25% of Eurozone GDP) APP portfolio will start to shrink. Together with the repayment of targeted longer-term refinancing operations (TLTRO) financing, this will contribute to a notable reduction in the size of the ECB's balance sheet – though the TLTRO will be the dominant factor in doing so this year (Exhibit 2).

The ECB likely decided to reduce its APP holdings for several reasons. First, according to an analysis by the ECB[2], it is the tool that contributed the most to growth and inflation – boosting them by around 0.75 percentage points (ppt) and around 0.5ppt, cumulatively over a horizon of up to three years, when asset purchases are increased by 10ppt of GDP respectively. This was clearly no longer needed in terms of inflation. Second, it is the single largest portion of the ECB's assets (Exhibit 2). Third, flexible reinvestment of PEPP has been established as the first line of defence against financial fragmentation – the ECB's forward guidance confirms that PEPP maturing securities will be reinvested in full at least until the end of 2024. Fourth, the increase in policy rates above the yield received on these assets is now starting to be a substantial cost to national central banks.

It can be argued the ECB is following in the footsteps of other developed market central banks – including the Federal Reserve (Fed), Bank of England, Sweden's Riksbank and the Bank of Canada – some of which have moved into outright asset sales. However, we believe the ECB needs to tread carefully. Firstly, unlike in the US, there is no historical precedent to gauge market impact, all the more difficult since it is also shrinking other parts of its balance sheet at the same time. Second, this comes against a backdrop of the highest level of planned net issuance since 2008 amid intense financial fragmentation concerns last summer – with public debt-to-GDP ratios rising by around 20 points from before the pandemic. Third, there can be significant cross country differences in redemption and maturity profiles. Finally, the ECB's "gradual, measured, predictable" approach to QT needs to be understood in the context of what is likely to remain an upside trajectory in policy rates.

Exhibit 2: A gradual path to APP portfolio unwind



Source: ECB and AXA IM Research, 20 February 2023

Uncertainty may bring market adjustments

Early-year positive bond market dynamics have broadly faded, even before the ECB starts unwinding the APP from March. Upside surprises on the growth front, and thus tax revenues, may have eased concerns from late last year when budgets were finalised. That said, the very uncertain macroeconomic and market environment is likely to persist. We think it is worth being prepared for market adjustments, regardless of their origins, including swings in investor sentiment, unforeseen rate hikes, fiscal slippage and political developments.

Below, we lay out a monitoring framework for both the short and medium term. For the former, we look for potentially challenging financing gaps or stress which may occur in any particular month for the biggest four Eurozone sovereign issuers, including any potential role for the Transmission Protection Instrument (TPI). For both the short- and medium-term framework, we estimate 10-year government bond yield fair values using macro fundamentals and focus on the impact of the stock and flow of asset purchases.

Identifying months of possible market stress

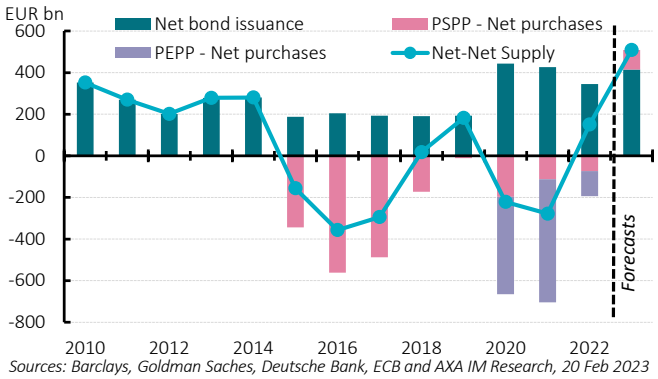
Planned net net issuance of European government bonds (EGBs) is expected to reach its highest level since the 2008 financial

[2] Altavilla, C. and al., "Assessing the efficacy, efficiency and potential side effects of the ECB's monetary policy instruments since 2014", European Central Bank, December 2021

crisis this year. Net issuance in the four largest economies in the European Monetary Union – Germany, France, Italy and Spain, known as the EMU-4 – is expected to reach around €415bn, very close to the record highs of 2020-2021. Furthermore, the partial unwind of the ECB's APP is likely to add a further €95bn – 19% of total issuance – bringing this year's total net issuance to a record since the global financial crisis (Exhibit 3).

Exhibit 3: Record net-net EGB supply in 2023

Net issuance of EMU 4 and net ECB QE/QT



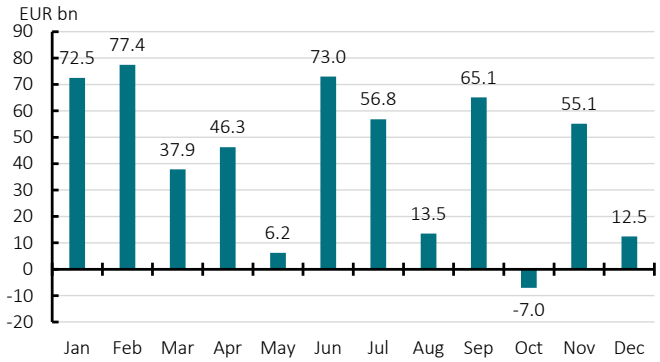
Sources: Barclays, Goldman Saches, Deutsche Bank, ECB and AXA IM Research, 20 Feb 2023

The ECB has published aggregated monthly redemption schedules for its public sector purchase programme (PSPP), but country details are lacking. Instead of using the capital key which remains approximate (it has been deviated from), we use the ECB's PSPP ownership of total outstanding eligible debt and apply these percentages to each country's redemption profile which we obtain from averaging sell-side estimates for the four largest member states. Simply put, the ECB currently holds 29.5% of German eligible debt through PSPP, so we assume that 29.5% of German bond redemptions will be made to the ECB this year[3] We then compute ECB reinvestments following the official ECB guidance that reinvestments of principal will be "distributed over time to allow a regular and balanced market presence" and "reinvestment amounts will be allocated proportionally to the share of redemptions across each constituent programme of the APP portfolio" and "across jurisdictions".

In line with the ECB's guidelines, we assume it will only reinvest around half of coming APP redemptions between March and June 2023. We expect it will decrease to one-quarter from Q3 until the end of the year (Exhibit 4 and 5).

Exhibit 5: Net-net monthly supply profile

Estimated monthly net-net EMU-4 supply in 2023



Source: Eurostat, Barclays, GS, DB and AXA IM Macro Research, 20 Feburary 2023

Our main conclusions are:

- PSPP partial reinvestment in itself matters but is minor in regards to the huge net supply that the market must digest this year

- The contrast is even larger if we compare this year's needs against net ECB QE monthly purchases in the last two years (Exhibit 6). More than the partial reinvestment, it's the end of QE itself which has been the big market mover. While investors may question the market's absorption capacity, so-called 'yield grabbing' may also continue to be a relevant market force

- Starting partial reinvestment from March makes sense as net-net supply was expected to be huge in the first quarter (36% of full-year net issuance took place in January and February). Should the ECB proceed with no reinvestment at all in 2024, Q1 may prove challenging

Exhibit 4: EMU-4: Net-net supply details

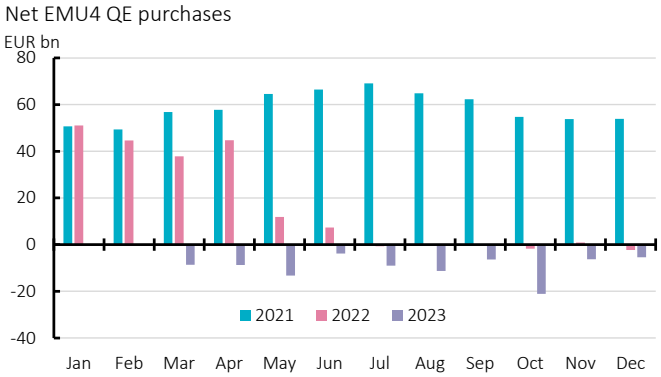
EMU-4	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Gross Issuance	109.5	108.0	103.1	103.3	104.4	98.9	98.8	63.7	92.3	90.1	86.7	34.1	1092.9
Redemptions	37.0	30.5	73.9	65.8	111.4	29.8	51.0	61.5	33.7	118.2	37.9	27.1	677.7
Reinvested by the ECB (PSPP+PEPP)	14.7	14.4	22.1	21.2	33.4	9.3	11.7	14.5	8.2	28.2	8.0	6.9	192.5
Reinvested by the Markets	22.3	16.1	51.8	44.6	78.0	20.5	39.3	47.1	25.5	90.0	29.9	20.1	485.1
Net issuance	72.5	77.4	29.2	37.5	-7.0	69.1	47.8	2.2	58.7	-28.1	48.8	7.0	415.2
Net QT	0.0	0.0	8.7	8.8	13.2	3.8	9.0	11.3	6.4	21.1	6.3	5.4	94.0
PSPP	0.0	0.0	8.7	8.8	13.2	3.8	9.0	11.3	6.4	21.1	6.3	5.4	94.0
Redemptions	9.0	8.2	17.3	17.5	26.5	7.7	12.0	15.0	8.5	28.1	8.4	7.3	
Reinvested	9.0	8.2	8.7	8.8	13.2	3.8	3.0	3.8	2.1	7.0	2.1	1.8	
PEPP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net-net EGB supply	72.5	77.4	37.9	46.3	6.2	73.0	56.8	13.5	65.1	-7.0	55.1	12.5	509.2

Sources: Barclays, Goldman Sachs (GS), Deutsche Bank (DB), ECB and AXA IM Macro Research, 20 Februarv 2023

[3] *Source: Deutsche Bank, as of December 2022.*

- Our analysis shows that some months such as June and September have large net net issuance. This does not mean that any sovereigns are expected to have funding difficulties with more debt for the market to absorb but simply that market conditions may be more fragile, especially taken in conjunction with other market stress event as mentioned above.

Exhibit 6 : Paradigm shift for bond investors



Source: ECB and AXA IM Macro Research, 20 February 2023

Our analysis suggests the impact of the ECB's QT should remain limited this year, in part thanks to the ECB's gradual and balanced approach. Consequently, we do not think it is likely to be a major driver of EGB yield increases. Indeed, we see the main drivers of higher yields – from a macro perspective – as likely to be inflation and the ECB's monetary policy response, according to our 10-year fair value model analysis.

What is the 'fair value' of 10-year yields?

We attempt to explain the evolution of 10-year sovereign nominal yields in Germany, France and Italy from macro fundamentals with a model based on monthly data using:

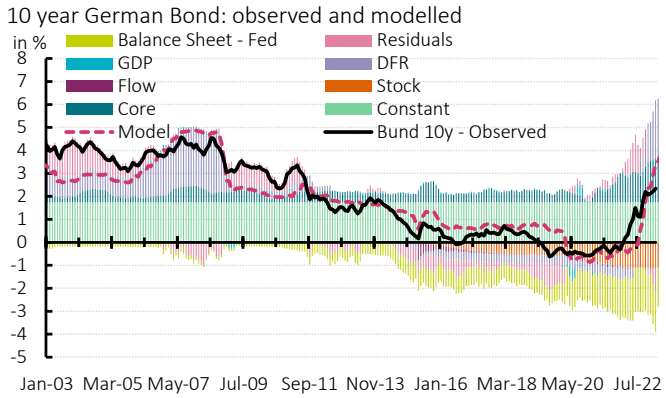
- Macroeconomic variables: Annual rate of core inflation and GDP growth[4]
- Monetary policy variables: Short-term interest rates – Deposit Facility Rate (DFR) and the ECB asset purchases (stock and flows)
- Financial/liquidity variables: We use the Fed balance sheet as a proxy for worldwide liquidity.

Despite this simplistic approach, 86% of the variance of the dependent variable is explained (Exhibit 7 and 8). It also has some echoes with the literature, reinforcing the strength of our analytical framework. Our main takeaways are below:

Exhibit 7: Econometric results on 10-year German Bund
Method: Least square with breaks
Frequency: Monthly / Sample: January 2005-November 2022
Dependant variable: 10-year nominal German yield

Variables	Coefficients
Constant	1.75***
Deposit Facility Rate	0.85***
Core Inflation (average of last 2 month)	0.35***
German GDP (monthlyized)	0.05**
German bonds held by the ECB in PSPP (Stock) (€tn)	-1.05***
PSPP Net purchases of Ge bonds/stock (Flows) (€bn)	-0.0021***
Fed balance sheet (Securities only) (€tn)	-0.34***
Adjusted R-Squared: 0.86	*p_values<1%=*** ; <5%:** ; <10%: ****

Exhibit 8: Macroeconomic variables are a good proxy for the 10-year German Bund yield



Source: Refinitiv and AXA IM Macro Research, 20 February 2022

- Core inflation and the DFR are significant drivers for long-dated bonds, explaining on their own 53% of dependent variable variance
- The stock of asset purchases has a much stronger impact than flows. This is consistent with the working paper studies[5]
- The elasticity of the domestic asset purchase programme is three times higher than the impact of the worldwide liquidity proxied by the Fed balance sheet (only US Treasuries purchases). But since the Fed bought five times more Treasuries than the ECB did of Bunds (in euro terms), the overall impact of the former is stronger. Based on our regression results, we estimate that the ECB's stock of APP plus PEPP removed the equivalent of 110bps[6] of premia on German Bunds. By comparison, Fed purchases of US Treasuries – which proxies worldwide liquidity – compressed Bund yields by 180bps.

[4] The quarterly GDP figure is used on a monthly basis by our model

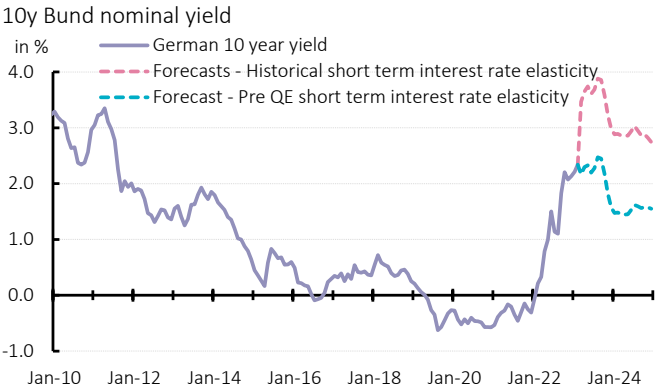
[5] Altavilla, C., Carboni. G. & Motto, R., "Asset purchase programmes and financial markets: lessons from the euro area", ECB Working Paper, November 2015; De Santis, R.A. & Holm-Hadulla, F., "Flow effects of central bank asset purchases on euro area sovereign bond yields: evidence from a natural experiment", ECB Working Paper, May 2017; D'amico, S. and King, T.B., "Flow and stock effects of large-scale treasury purchases: Evidence on the importance of local supply", Journal of Financial Economics, May 2013

[6] Altavilla, C. and al., "Assessing the efficacy, efficiency and potential side effects of the ECB's monetary policy instruments since 2014", ECB Occasional Paper Series, Dec 2021

- We ran a robustness test on DFR elasticity and found that the results can vary substantially. We take the historical elasticity estimated over the entire period (circa 0.85) but also on a pre-QE period (2005-2015) in order to adjust for a decade of QE (circa 0.42). We use both elasticities to generate an interval for our projections.

We calibrated the projections with our forecasts on core inflation, ECB interest rate path, and balance sheet reductions on both sides of the Atlantic to project nominal yields (Exhibit 9).

Exhibit 9: Model points to short term upside risk for 10-year German Bund yield



Source: Refinitiv and AXA IM Macro Research, 20 February 2023

According to our macro-based modelling exercise, there is still some upside risk to 10-year nominal Bund yields, despite the market having recently repriced further that the ECB has ground to cover, while inflation should remain elevated until this summer. Then, our model signals a fast drop as core inflation would reconverge to 2.5%. Overall, our model has a target range for the peak at 2.4%-3.8% and 1.5%-2.8% for the end of 2023. These results are subjects to many caveats, besides the simplistic nature of the modelling technology. First and foremost, they only reflect a selected number of macro variables, excluding valuation (e.g. yield grabbing), technical (e.g. scarcity), and sentiment aspects (e.g. TPI). As such, it does not account for what is already priced or not. On 10 February, ECB Governing Council member Isabel Schnabel said that "we would expect the effects of QE and QT to be largely symmetric". Prior to the start of the real life experiment we can see reasons why this may not be the case.

A key reason for overestimating QT impacts on yields from QE experience is that ECB QE had an important signalling effect, reinforced by the adoption of a negative interest rate policy and rate forward guidance. This contrasts with the intention to run QT in the background (gradual and predictable).

There are also reasons to suggest we might underestimate the QT impact on yields based on QE experience. First, the re-appreciation of risk especially in the most vulnerable countries - where non-linearities could adversely apply. Second, there could be additional adverse effects from withdrawing liquidity. Having reached the effective lower bound, money market rates were little moved by additional liquidity injections[7]. This is unlikely to hold true as liquidity is withdrawn. Finally, there is also a risk with most developed market central banks withdrawing liquidity at the same time, which could multiply the effect across jurisdictions. Along the same lines, economist Maurice Obstfeld's argument[8] – of too much coincident collective tightening – may also imply overadjustment in market rates.

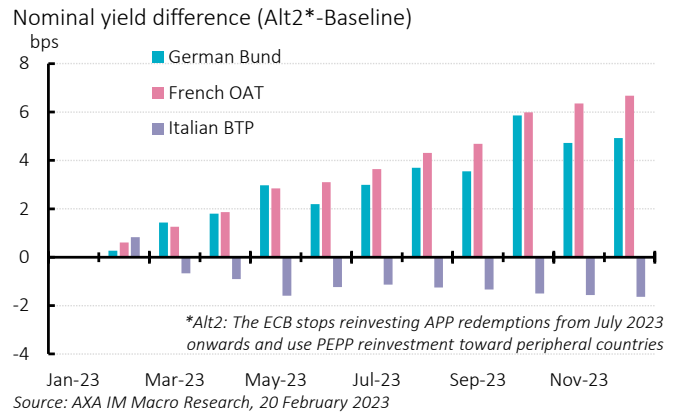
Calibrating alternative scenarios - A more aggressive ECB on Quantitative Tightening

The ECB explicitly intends to start the APP QT in a gradual way, aiming to remain "measured and predictable". Should the ECB decide to speed up its APP portfolio unwind, we have tested the ramifications in an alternative scenario assuming no more reinvestment from July 2023 onwards.

Our model generates only marginal differences at the very beginning (+1 to 2bps) but shows that this can grow rapidly as the stock declines further (close to +10bps versus baseline by the end of 2024). This is an additional risk for a country such as Italy.

Then, we add another assumption that the ECB will skew all PEPP reinvestments towards peripherals. In such a scenario, we estimate 10-year Italian government bond (BTP) nominal yields would be lower by approximately 2bps and Bund yields higher by around 5bps. In other words, the 10-year BTP-Bund spread would be lower by 7bps (Exhibit 10).

Exhibit 10: Impact of faster PSPP unwind and PEPP-skewed reinvestment



Source: AXA IM Macro Research, 20 February 2023

[7] The transmission of monetary policy, speech by ECB Executive Board member Philip Lane, 11 October 2022

[8] Obstfeld, M., "Uncoordinated monetary policies risk a historic global slowdown", Peterson Institute for International Economics, September 2022

The upshot

The ECB has responded to the inflation shock by quickly tightening its monetary policy stance, starting with policy rates, now moving to its balance sheet. The uncertain, vulnerable, fragmented macroeconomic outlook is likely to keep the ECB on a gradual, measured pace of APP portfolio unwind, even if it is likely to later speed up from the initial pace.

Our tracker of monthly net-net supply suggests that some months such as June and September have large net-net issuance. This does not mean that sovereigns will have funding difficulties, but simply that market conditions may be more fragile, especially taken in conjunction with any other market stress event – and investors should bear this in mind.

Core inflation and related ECB policy rate developments are key ingredients in our simple macro-based 10-year Bund model. It has a target range for the peak at 2.4%-3.8% and 1.5%-2.8% for the end of the year. Investors should be mindful of upside risks to the model's forecast if there were to be a faster balance sheet unwind.

APPENDIX: Details of estimate on French 10-year government bonds (OAT) and Italian BTP

Exhibit 11: Econometric results on 10-year OAT

Method: Least square with breaks
Frequency: Monthly
Sample : 2005 m01-2022m11
Dependant variable: 10 year Nominal French yield

Variables	Coefficient
Constant	1.78***
Deposit Facility Rate	0.38***
Core Inflation (average of last 2 month)	1.02***
French bonds held by the ECB in PSPP (Stock) (€tn)	-1.95***
PSPP Net purchases of Fr bonds/stock (Flows) (€bn)	-0.0013***
Fed balance sheet (Securities only) (€tn)	-0.39***

Adjusted R-Squared: 0.91
*p_values<1%=*** ; <5%:** ; <10%: **

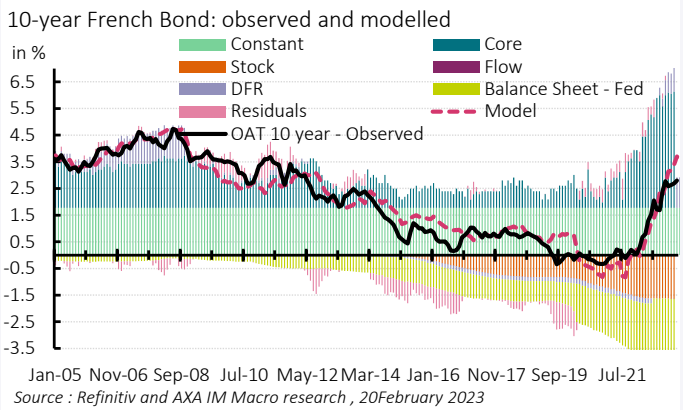
Exhibit 13: Econometric results on 10-year BTP

Method: Least square with breaks
Frequency: Monthly
Sample : 2010 m01-2022m11
Dependant variable: 10 year Nominal Italian yield

Variables	Coefficient
Constant	3.27***
Deposit Facility Rate	0.65***
Core Inflation (average of last 2 month)	0.94***
Italian bonds held by the ECB in PSPP (Stock) (€tn)	-1.29**
PSPP Net purchases of It bonds/stock (Flows) (€bn)	-0.0023***
Fed balance sheet (Securities only) (€tn)	-0.46***

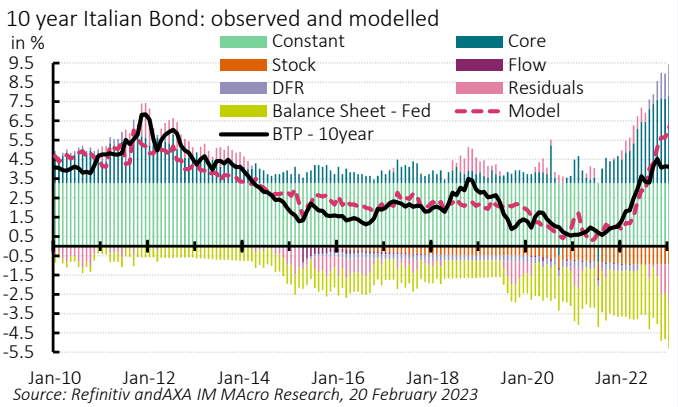
Adjusted R-Squared: 0.80
*p_values<1%=*** ; <5%:** ; <10%: **

Exhibit 12 Observed and modelled 10-year OAT yield



Source : Refinitiv and AXA IM Macro research , 20February 2023

Exhibit 14 Observed and modelled 10-year BTP yield



Source: Refinitiv andAXA IM MAcro Research, 20 February 2023

1 March 2023

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