



LEVERAGING MACRO FOR OPTIMAL FUNDING CURRENCY STRUCTURE

IN FOCUS: RESIDENTIAL REAL ESTATE SECTOR

TBC CAPITAL FX BUSINESS ECONOMICS SERIES, PART 1

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HOW WE MAKE DECISIONS



When deciding on optimal funding structure in residential real estate projects?



Market is in USD, also incorporating other judgment, and let's have a plan?

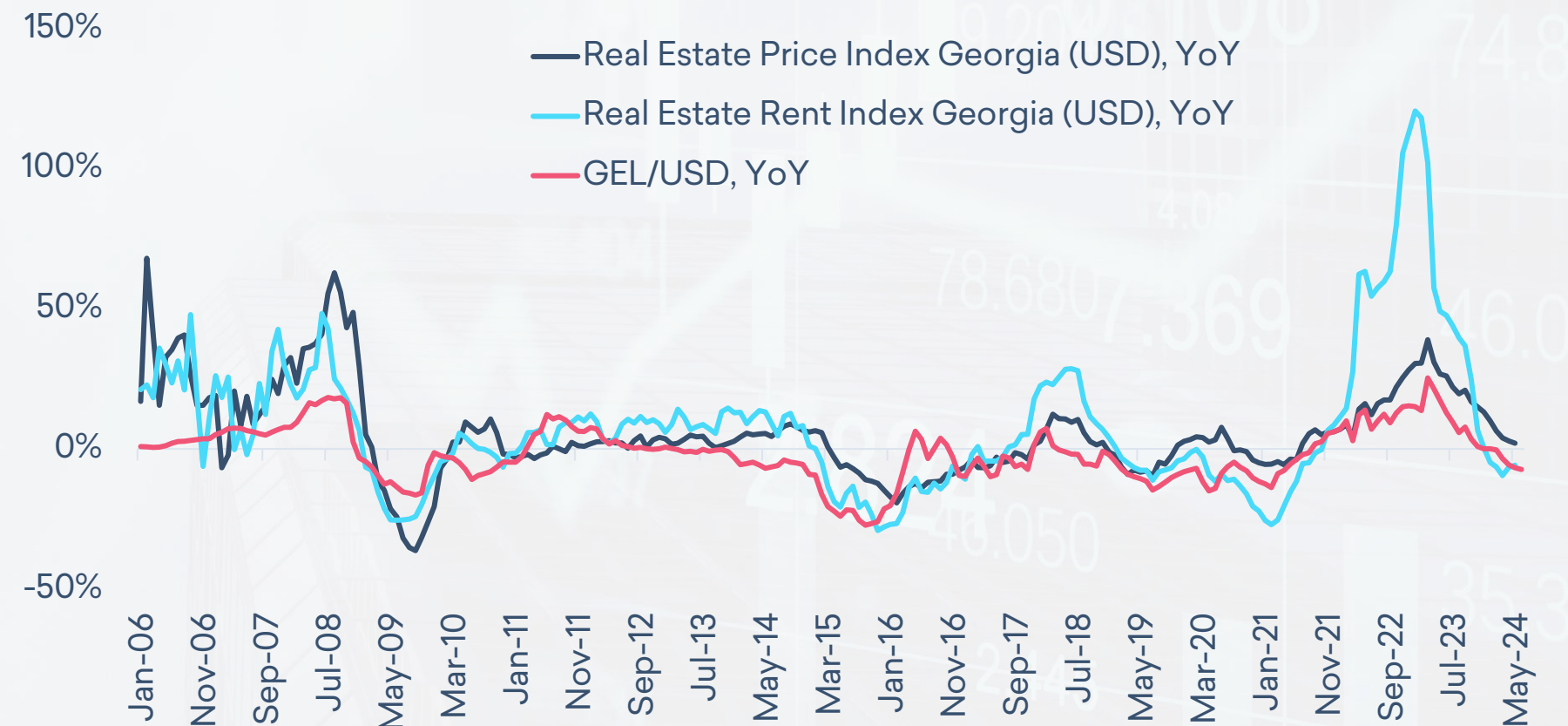
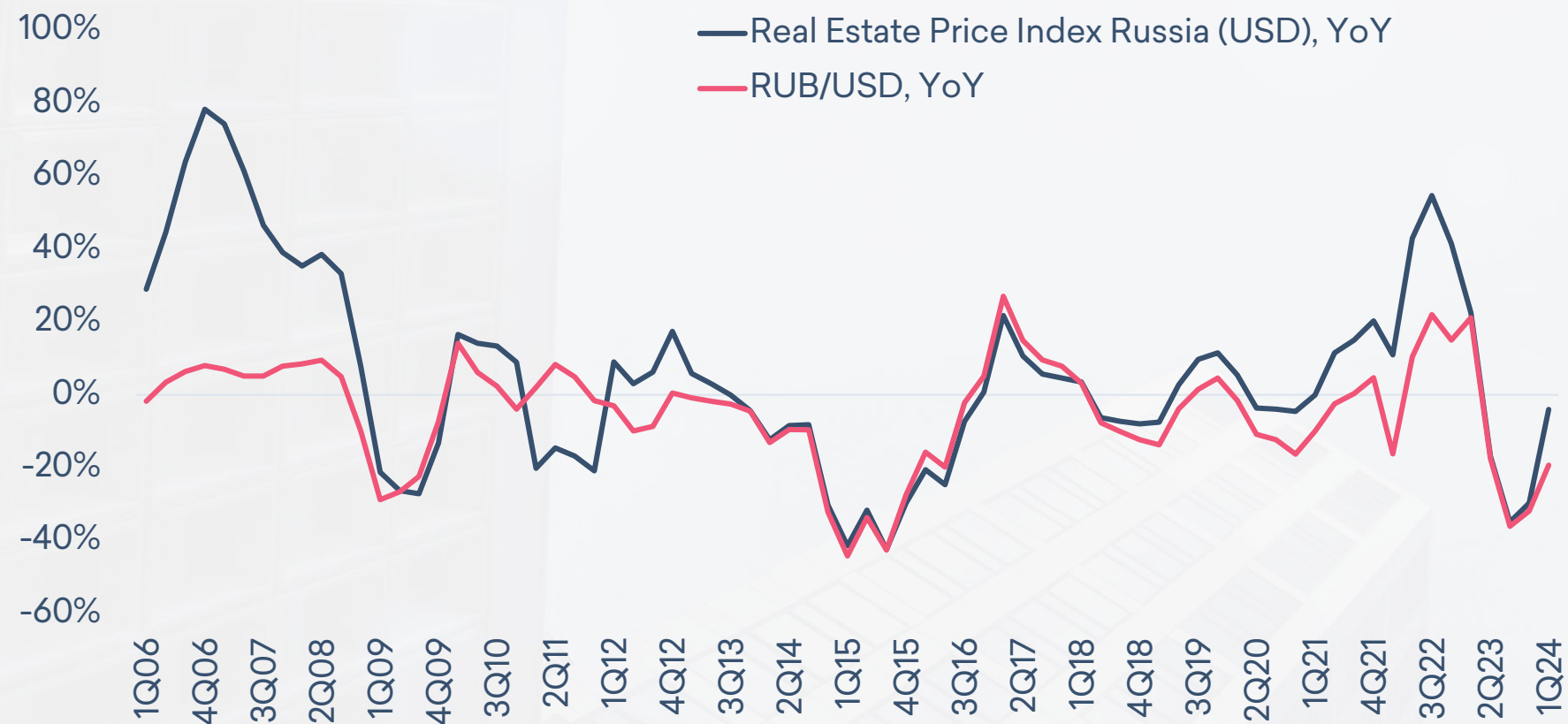
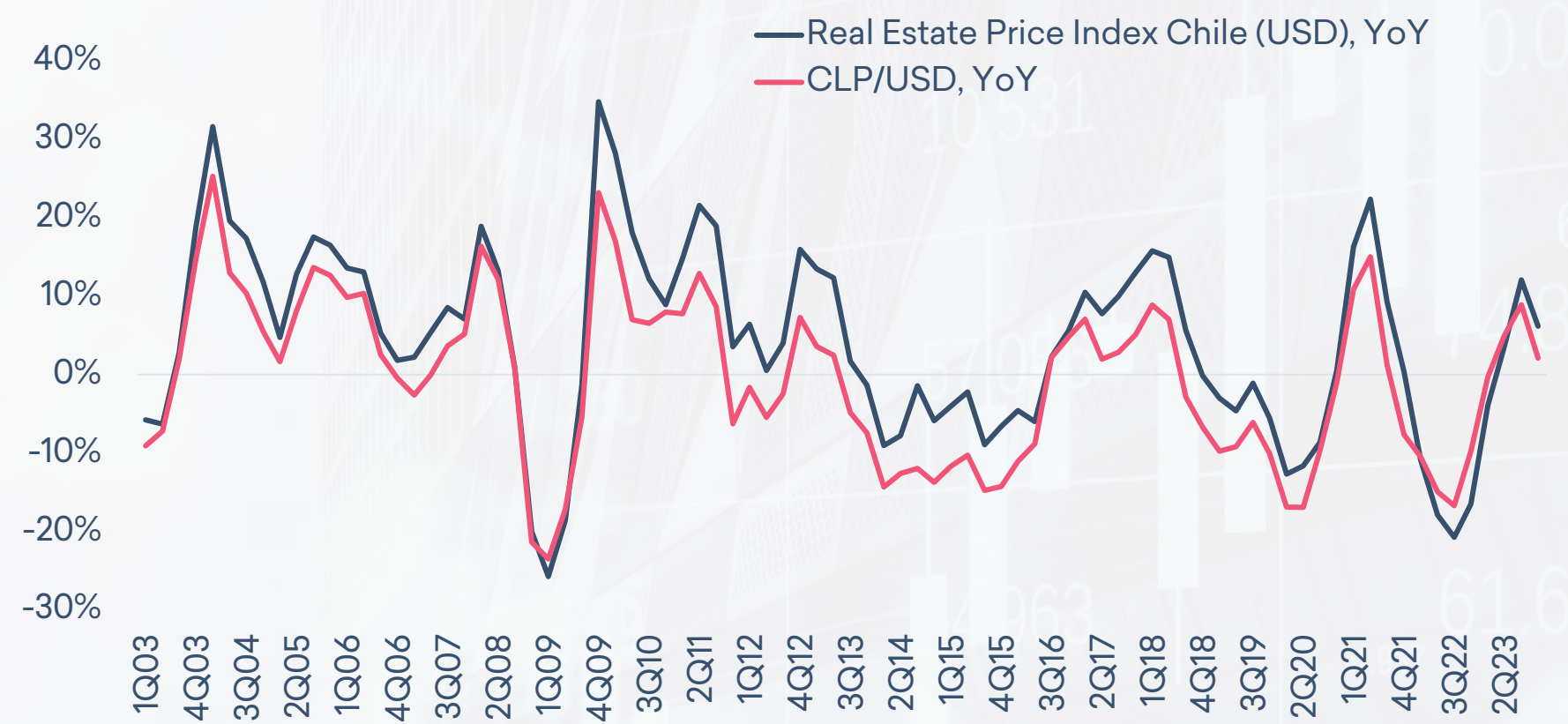
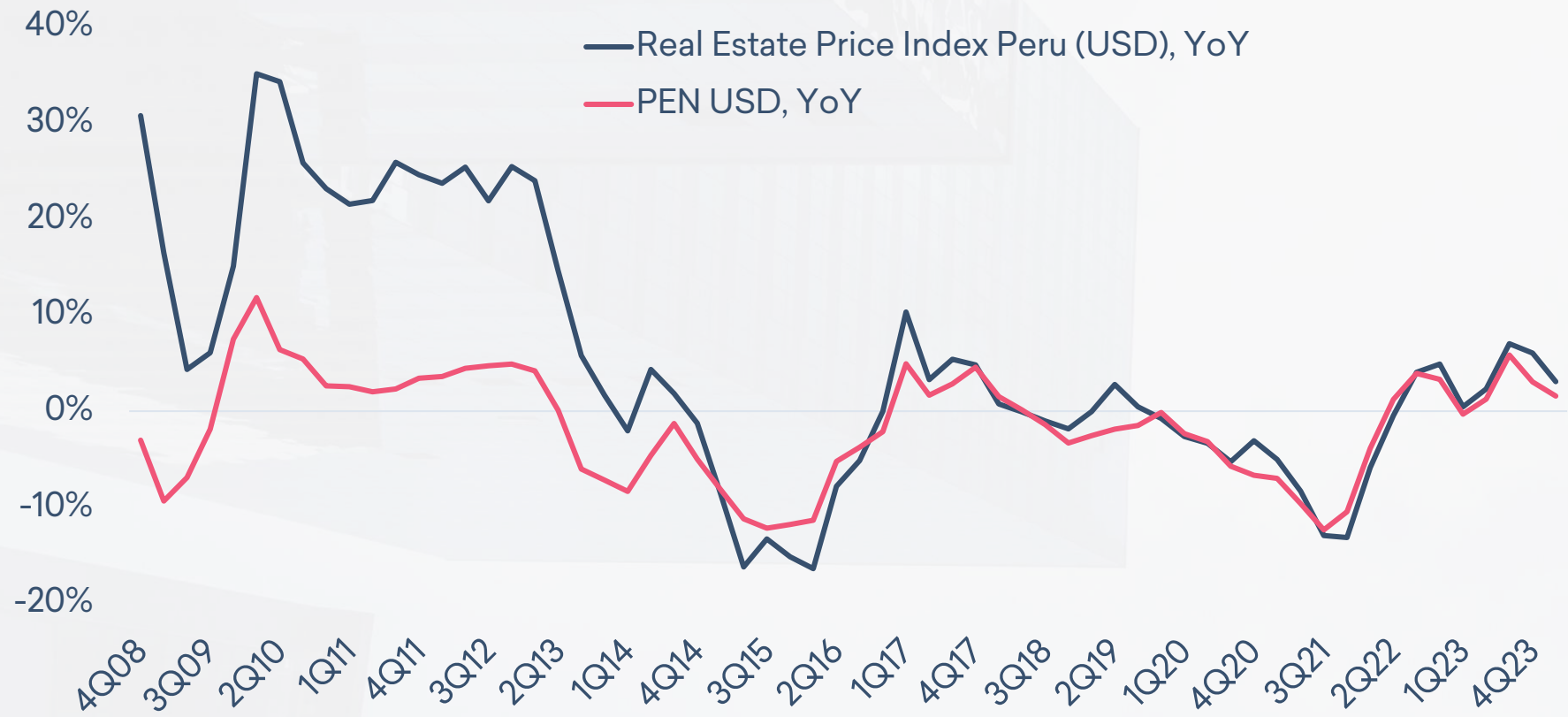


But as Roger Martin would argue, that would be a plan, not a strategy – “An integrative set of choices that positions you on a playing field of your choice in a way that you win”

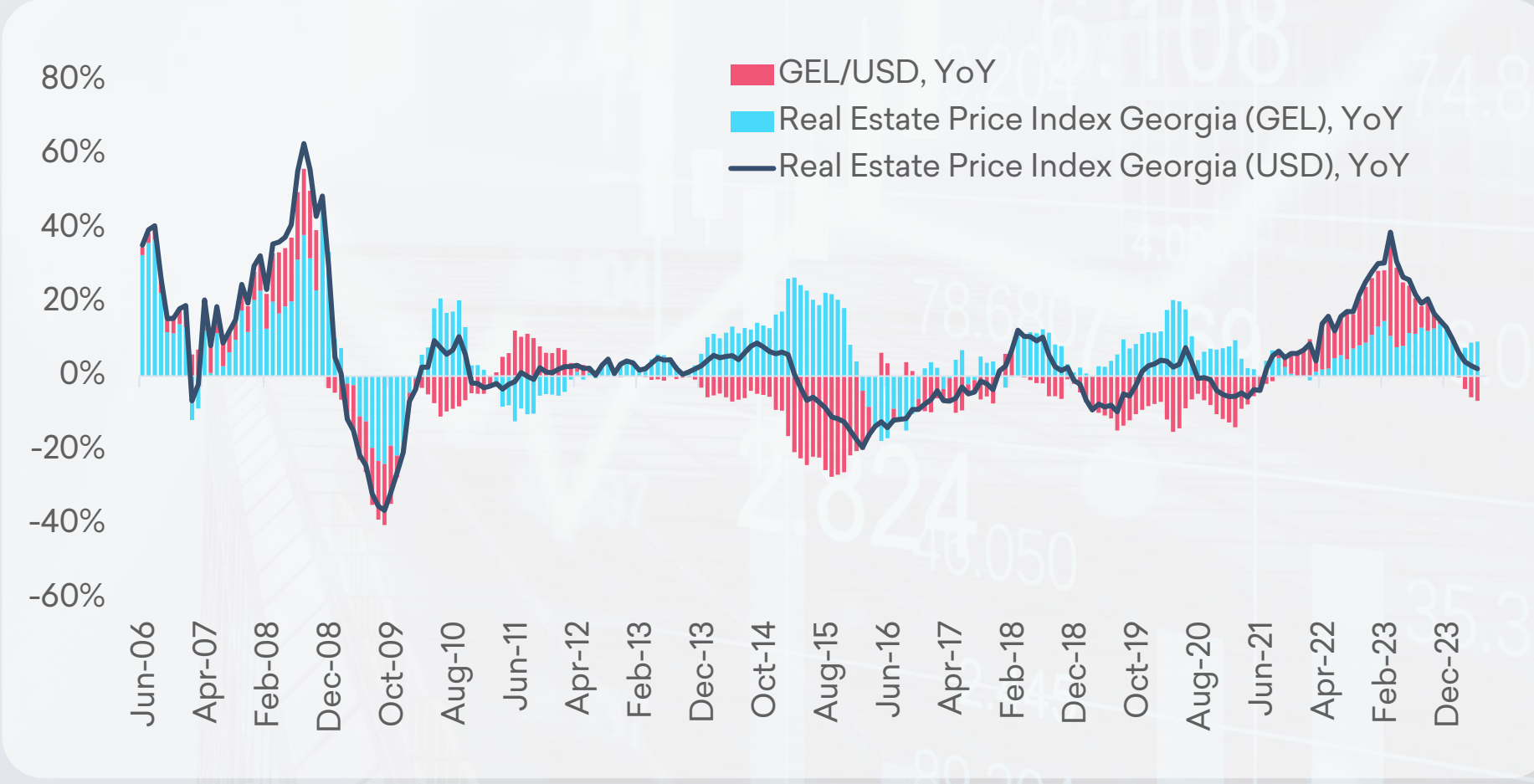
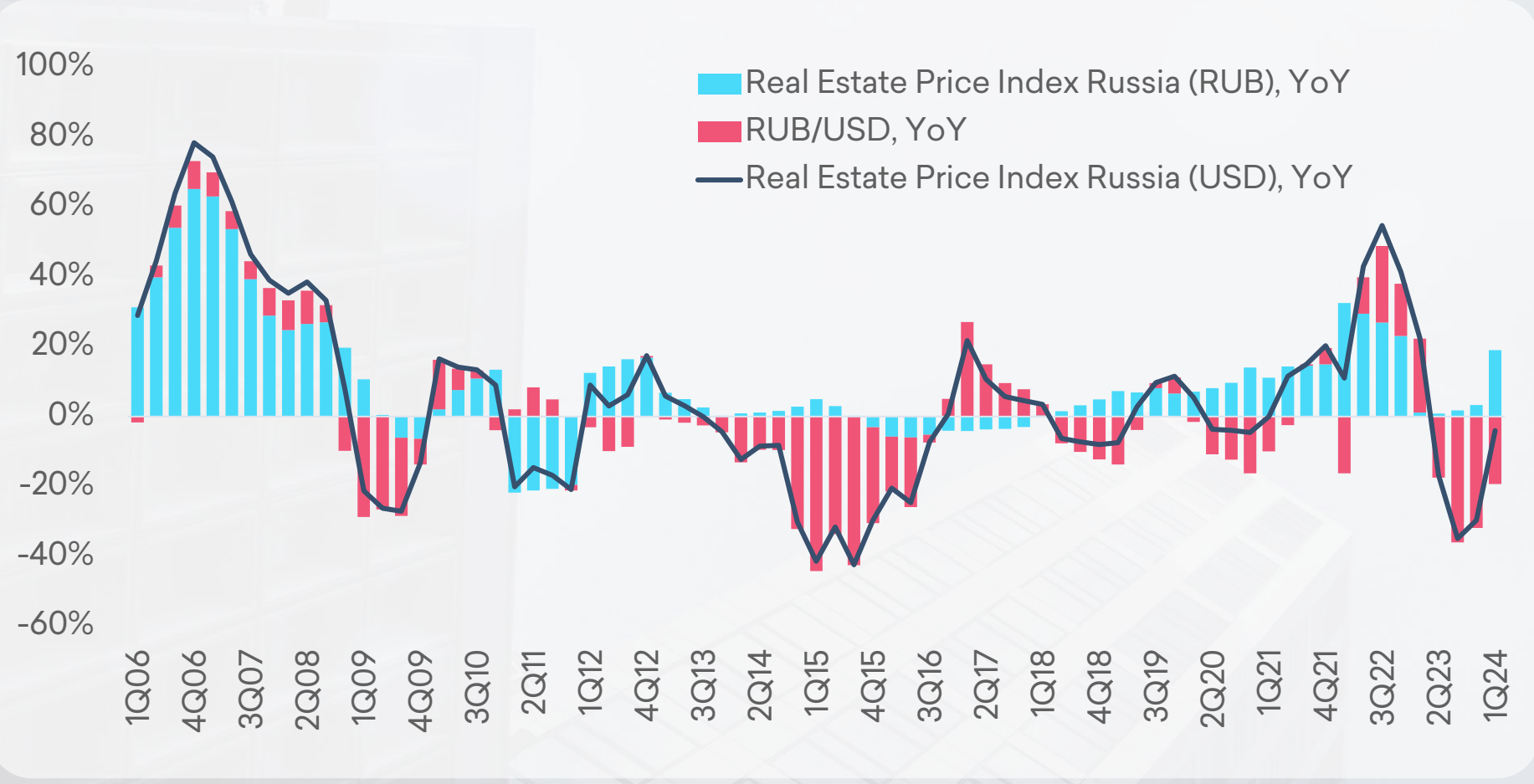
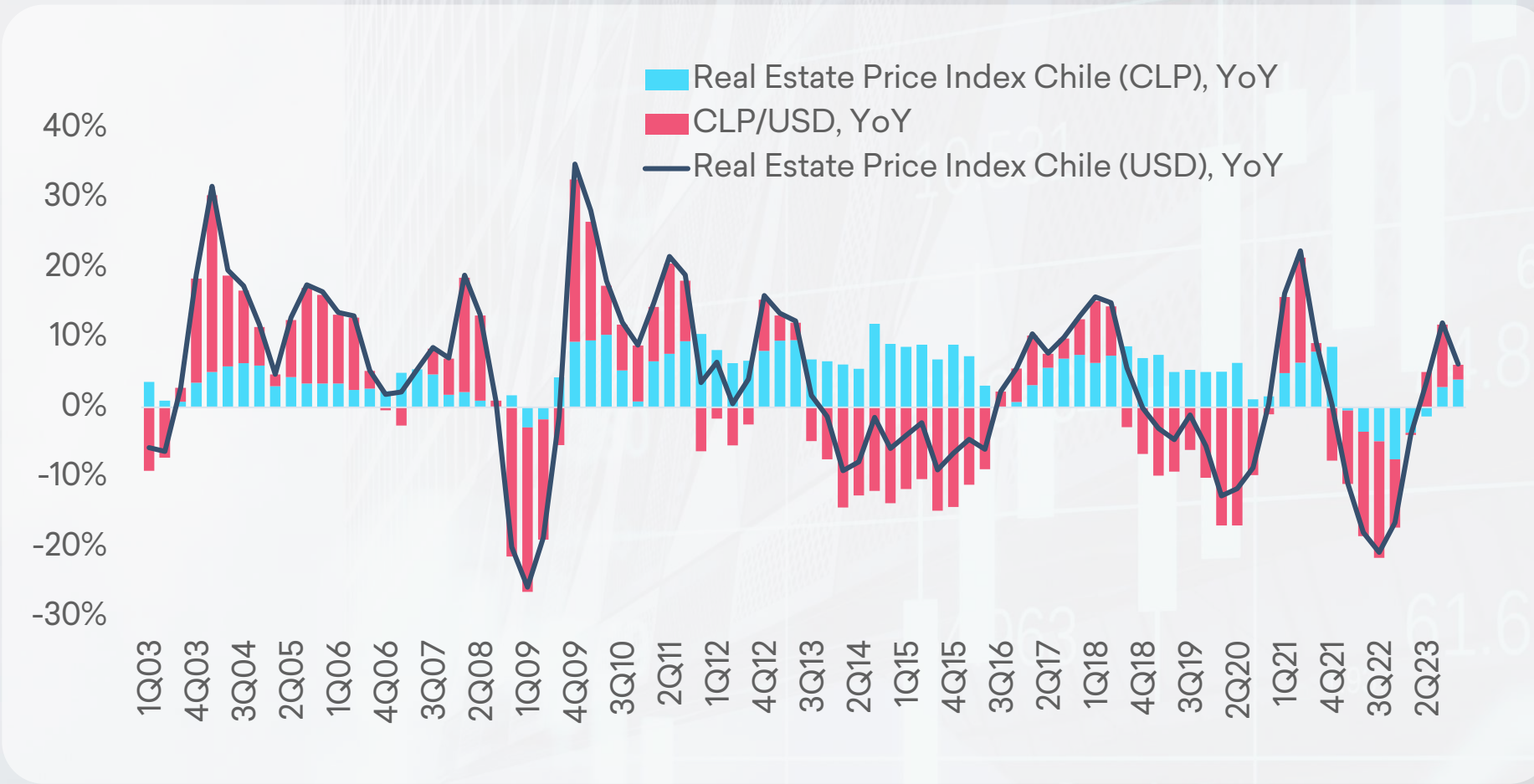
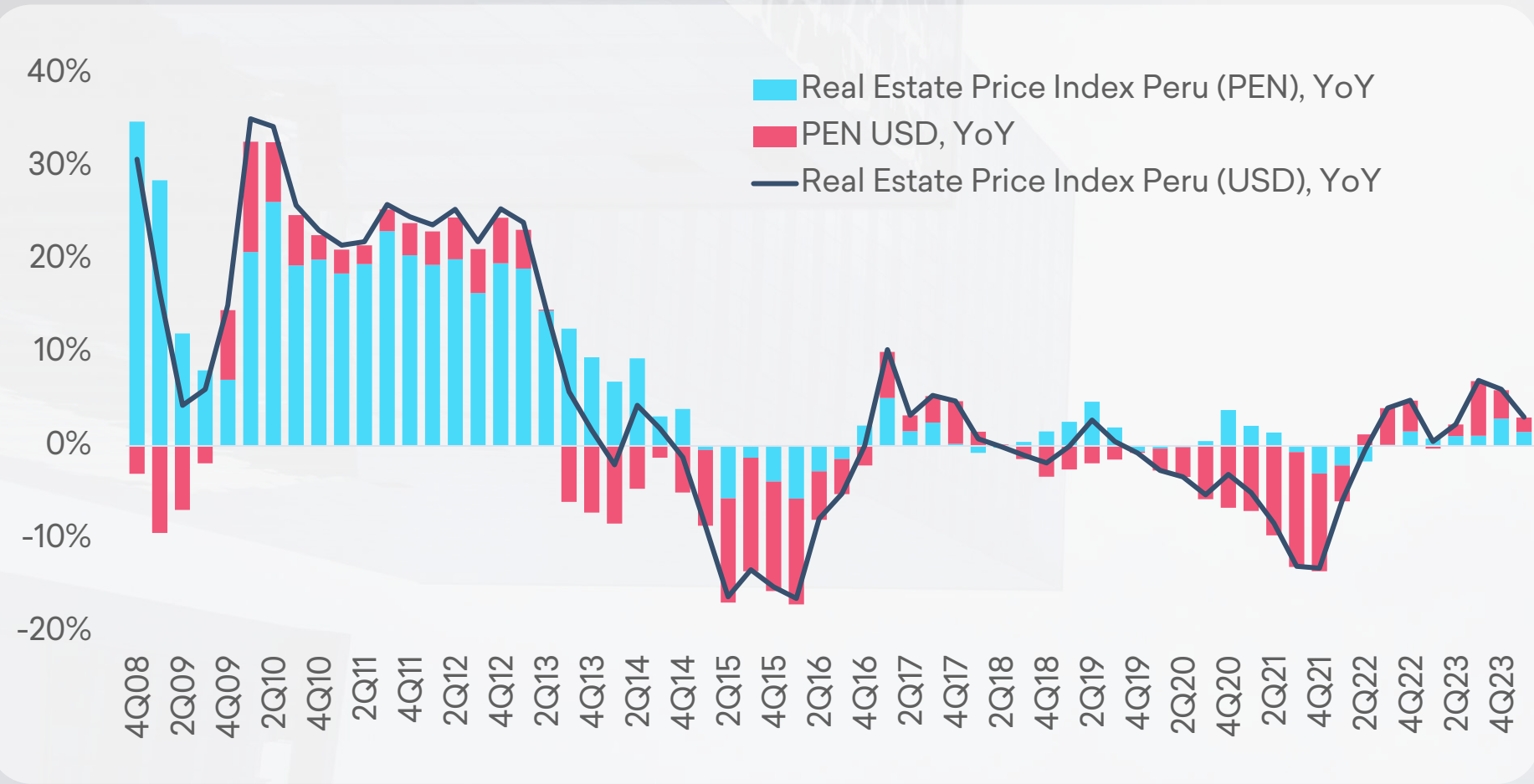


In this context, how to incorporate macro?

PASS-THROUGH FROM THE EXCHANGE RATE TO REAL ESTATE PRICES

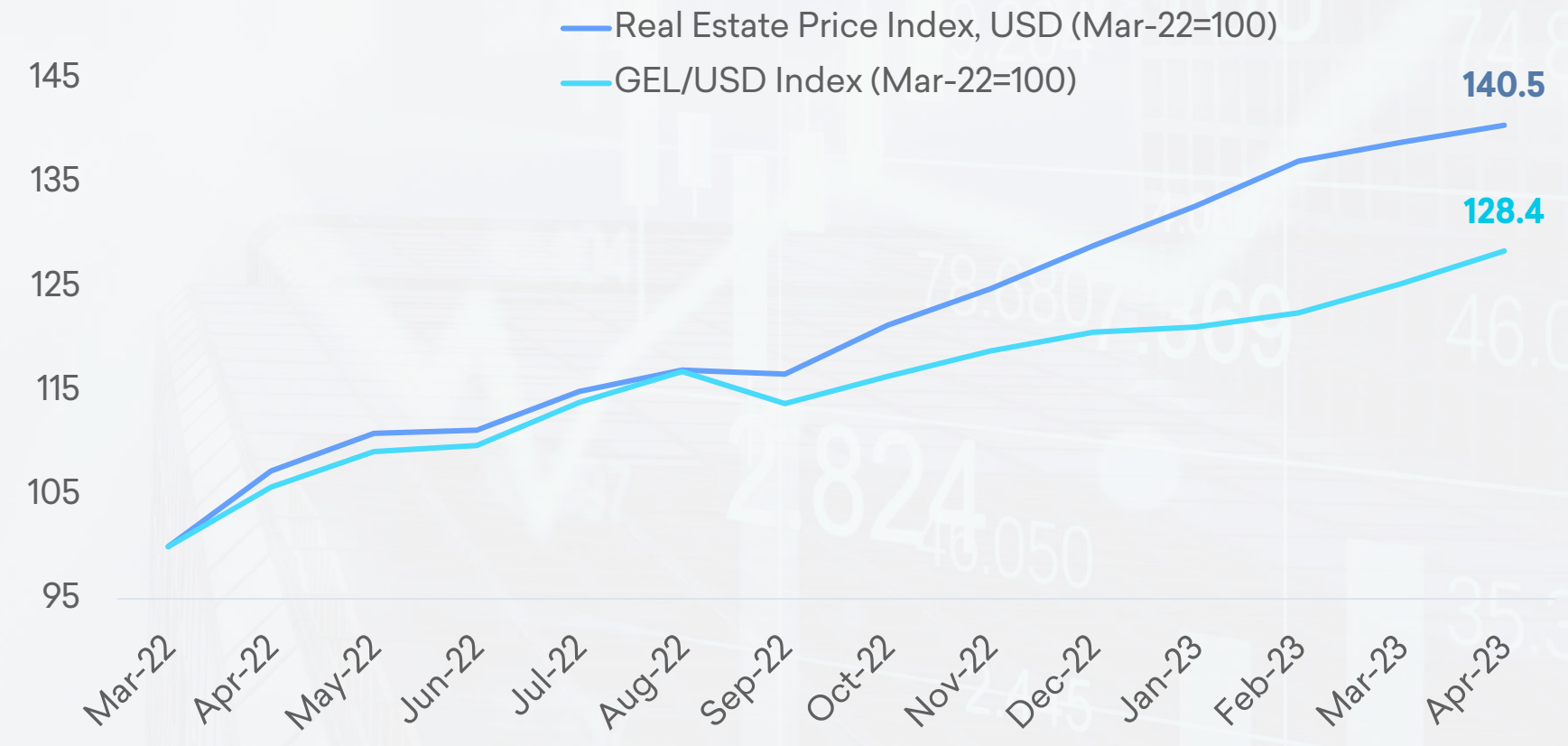
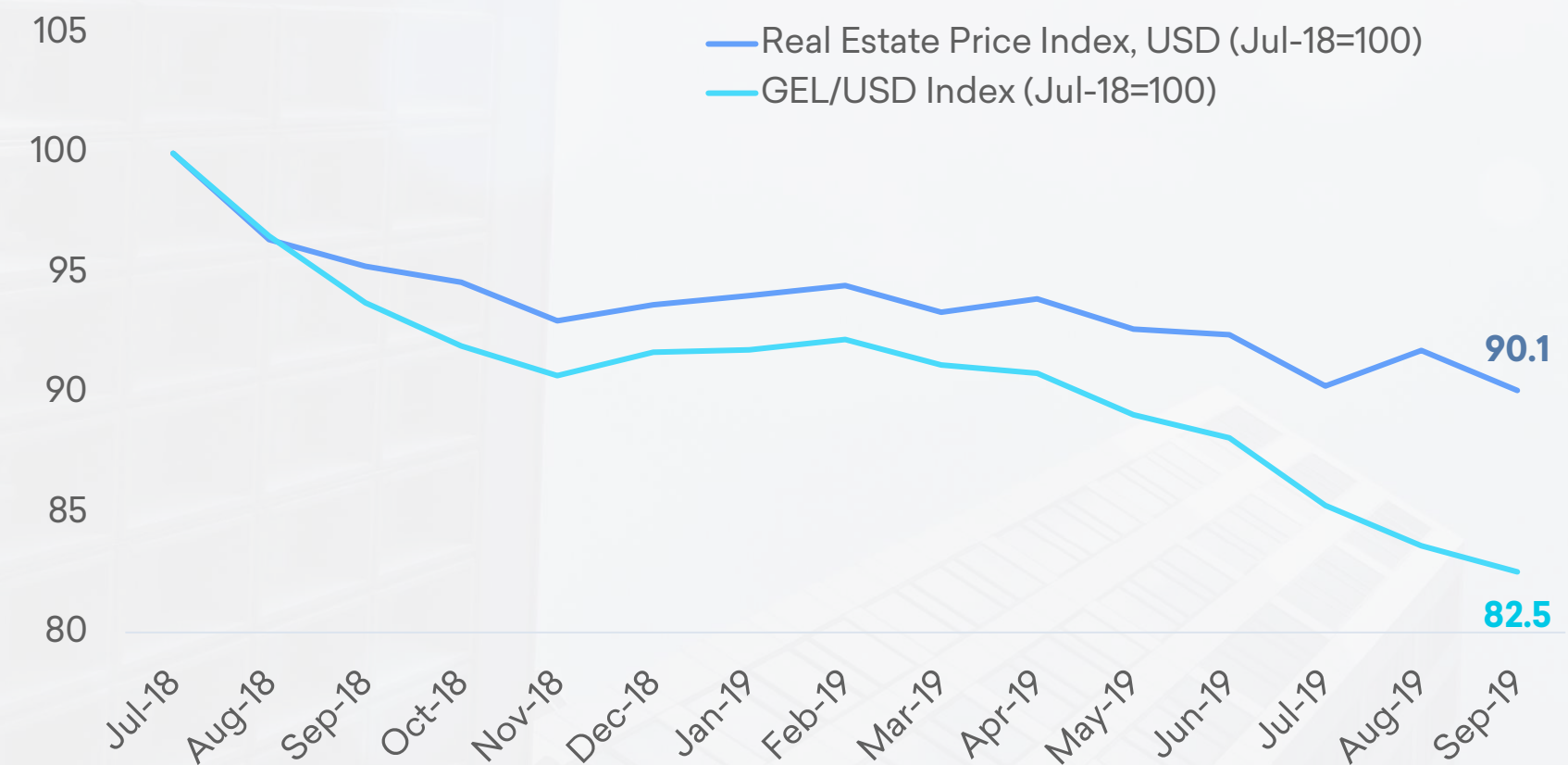
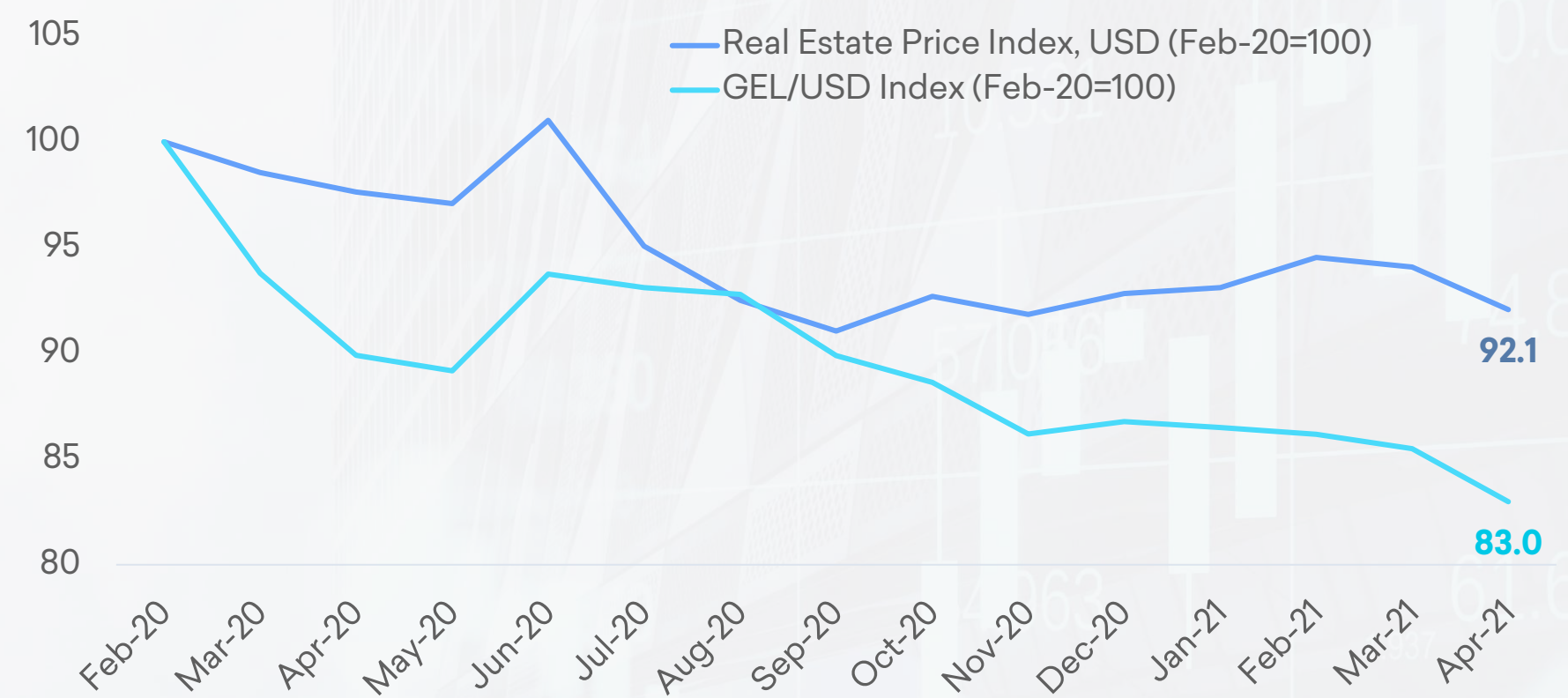
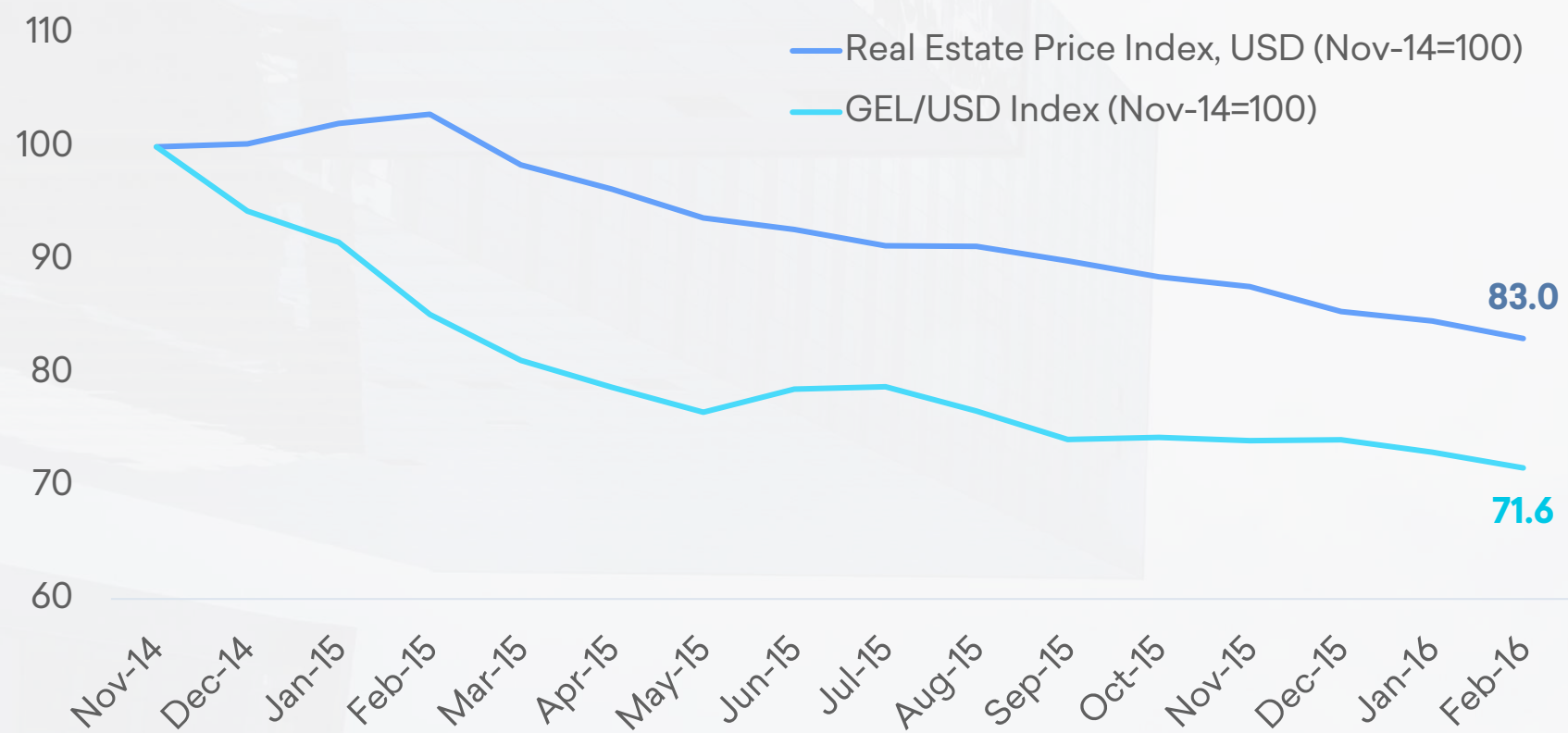


...WITH A SIGNIFICANT CONTRIBUTION



Source: Central Banks

SELECTED EPISODES FOR ILLUSTRATION



A CLOSER LOOK AT THE EXCHANGE RATE PASS-THROUGH IN GEORGIA

IMPACT OF GEL/USD ON REAL ESTATE PRICES IN USD*



RESPONSE OF REAL ESTATE PRICES TO A GEL/USD SHOCK*



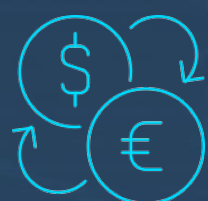
*The models are specified in annual log-difference terms and include GEL/USD, real estate prices (USD), real GDP growth rate and mortgage loans (constant currency). The seemingly unrelated regression (SUR) model controls for feedback effects. Nonlinear effects are based on the threshold regression, with thresholds chosen by the sequential method at 5% significance level. The SVAR is estimated in annual log difference form.

KEY FINDINGS

- We find strong evidence of a one-directional short-run causality from the exchange rate growth rate (depreciation/appreciation) to growth in real estate prices, across a range of estimation techniques
- The impact on real estate prices is non-linear: it is both largest and most strongly statistically significant during largest depreciation episodes
- The pass-through from the exchange rate to real estate prices is at c. 45% at peak impact, which occurs at around 8-9 months following the shock (c. 25% for USD/GEL)
- The shock impact is statistically significant for 14 months and conclusively dies out after c. 28 months, with the cumulative impact standing at c. 80% after 14 months (c. 45% for USD/GEL)
- The exchange rate explains over 51% of the total variance in real estate prices 13 months following the shock, after which the impact begins to decline
- Analysis for GEL/EUR and real estate prices in EUR reveals a similar response to the exchange rate shock with respect to the peak, direction and duration of the response, but there are two important differences: the overall elasticity is higher for EUR (0.3%) compared to USD (0.17%), and non-linear models indicate the impact is not statistically significant during GEL/EUR depreciation episodes, also reflecting the fact of GEL being relatively smoother against EUR



Now as we know that the underlying value of the residential real estate is not entirely in local currency, how to integrate this aspect in our strategy?



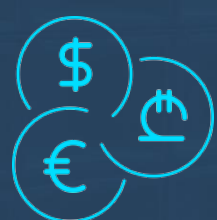
As there is up to 50% passthrough from FX (USD/GEL) to residential real estate prices in USD in Georgia, borrow 50% in GEL and 50% in USD?



And what about interest rates – higher in local currency? An argument for relatively lower GEL share in liabilities



As well as lower depreciation episodes with lower passthrough



Furthermore, if FX part is not USD only, but EUR/USD – another argument for lower GEL share due to the diversification and more aligned cycle of the GEL with EUR as compared with USD



And conversion fees if a considerable part of expenditures is in GEL – now argument for higher GEL share



What does that mean for the business?



Resilience during the stress episodes, but only?



If funding structure is hedged, the real estate developer should have higher leverage meaning higher IRR as cost of capital is higher than cost of debt



Furthermore, in many jurisdictions, additional capital requirements are in place for the banks to address the currency induced credit risk. Therefore, if an exposure is hedged, that would mean lower capital requirements for banks and consequently lower interest rates for the business. Based on our estimates, in several jurisdictions, the effect looks to be in the range of 0.5-1.0%



This implies, that if optimal funding structure for residential real estate project in Georgia is approximately – 35% GEL, 25% EUR and 40% USD, the business should have higher or at least same IRR even without the GEL depreciation scenario. However, this is derived from a medium to long-term perspective and, as residential real estate projects are usually up to 3 years, for the short-term, a higher share of the EUR and, possibly, the GEL should be considered

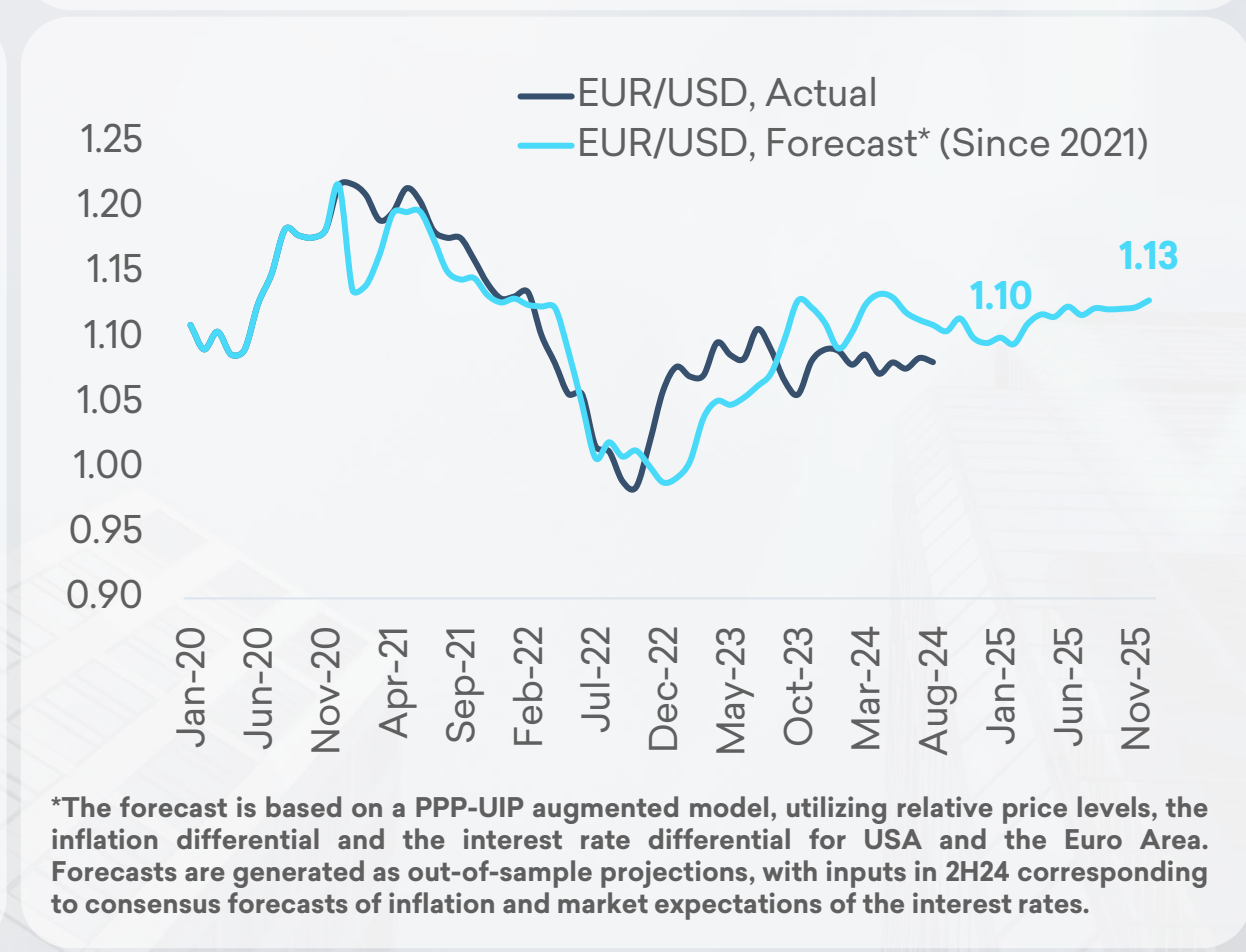
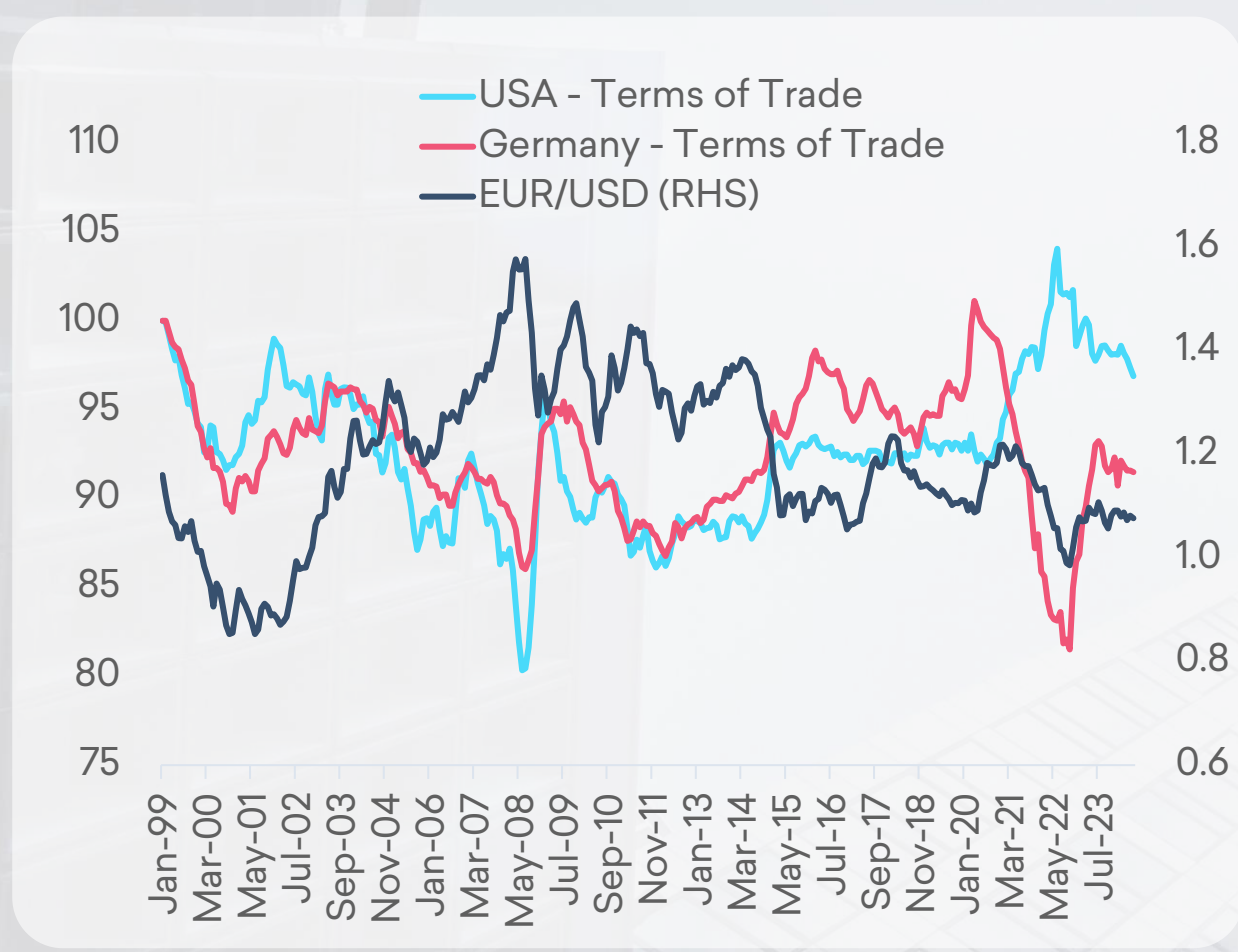
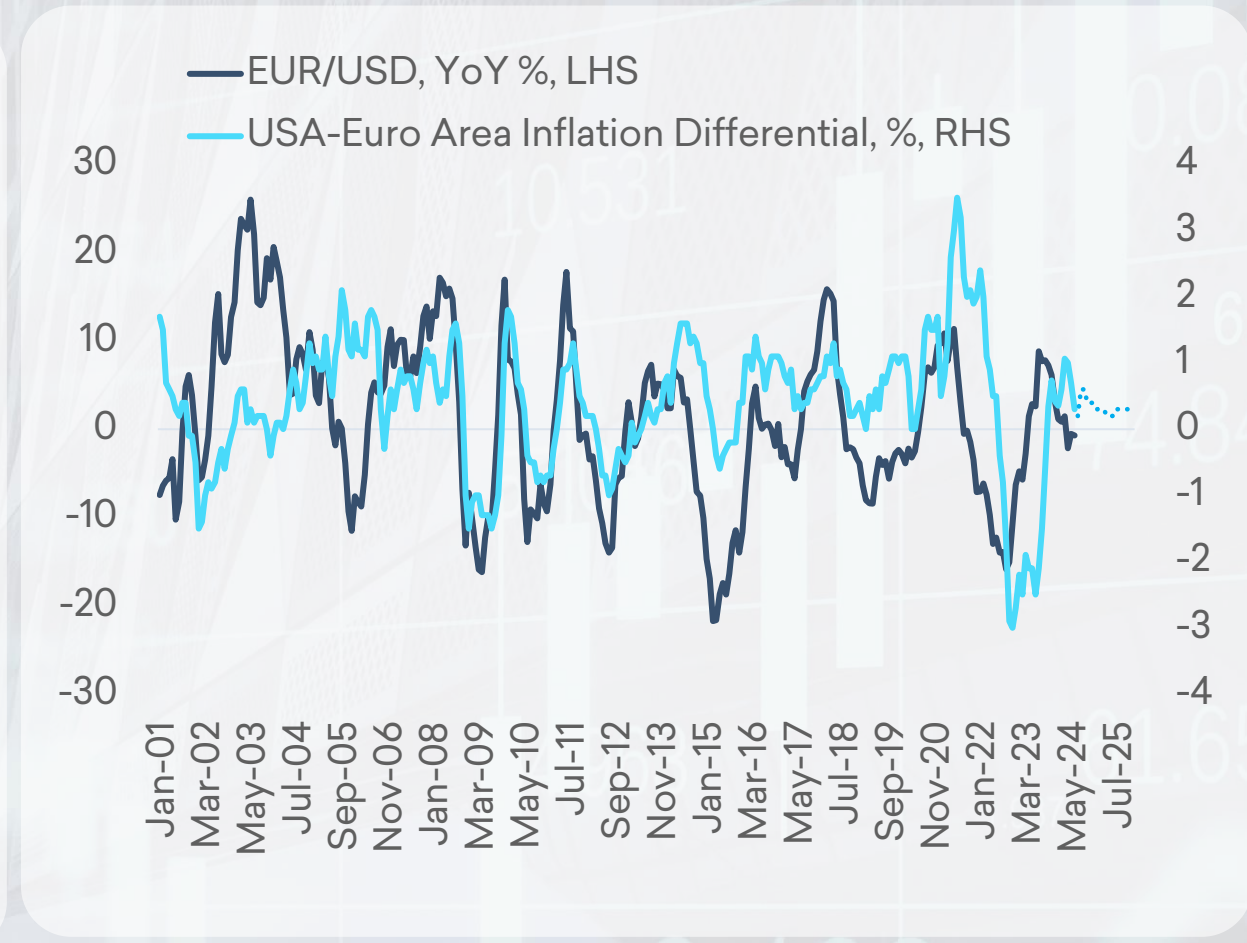
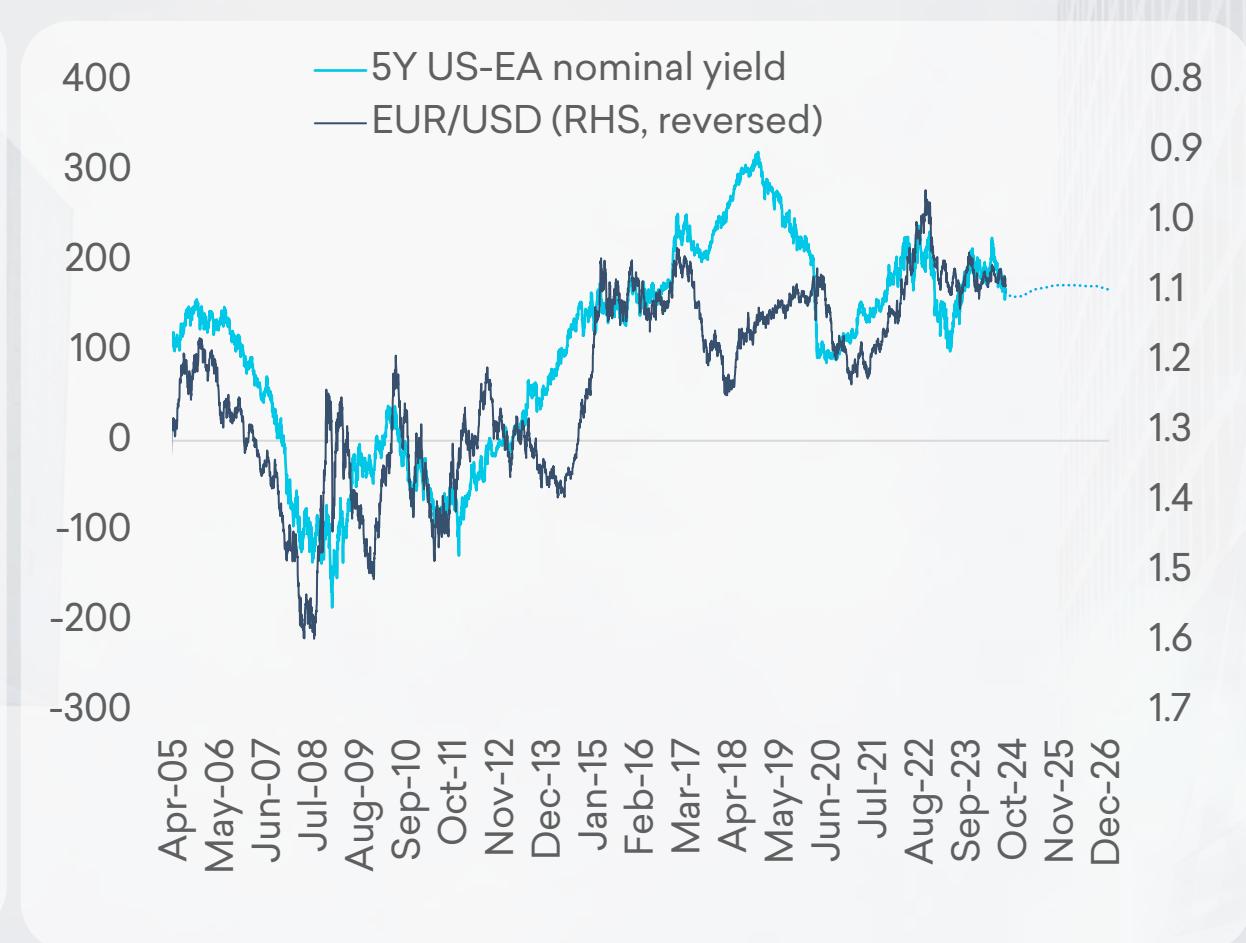
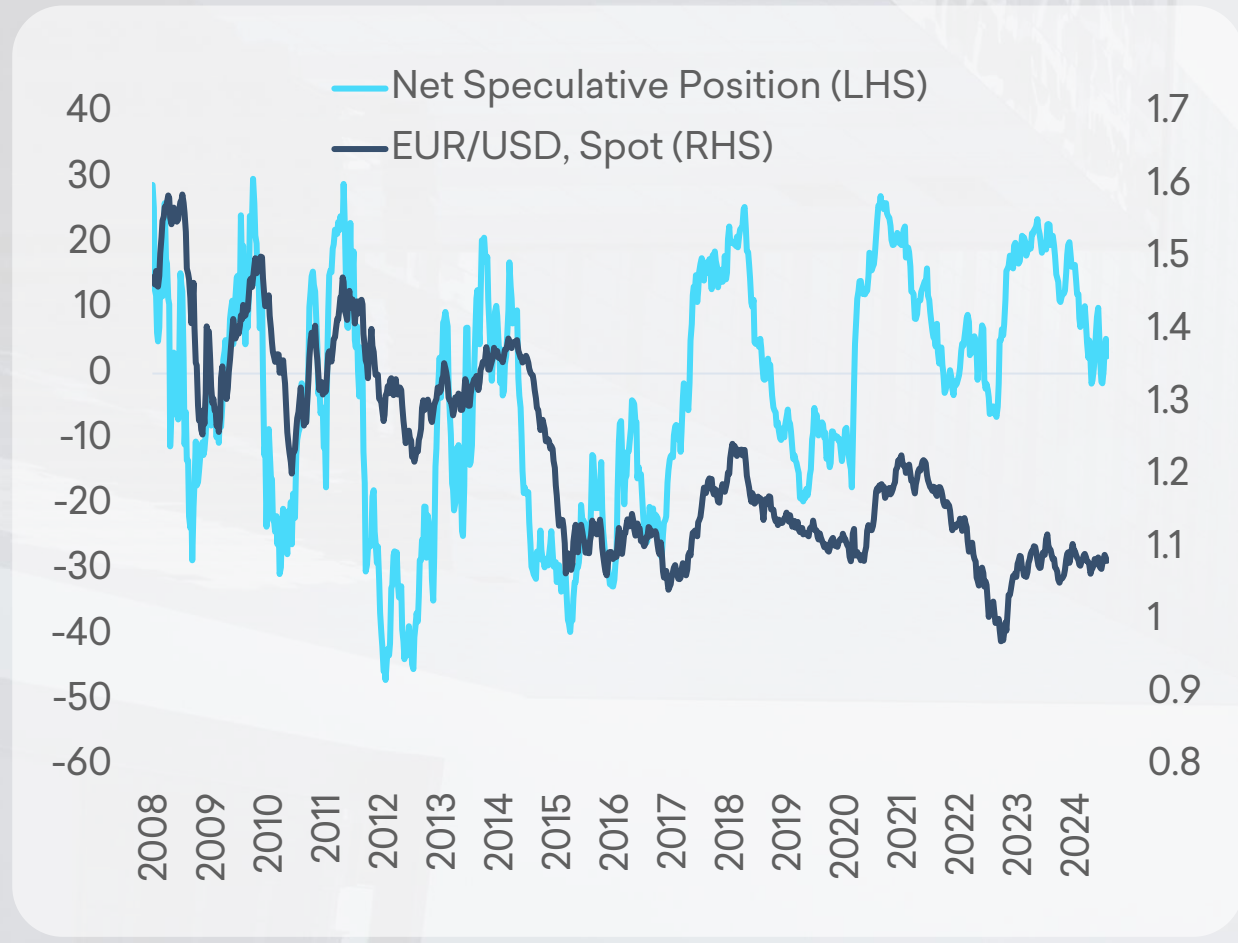


But how did we get this basket as an optimal funding structure?



CHOOSING BETWEEN EUR AND USD IF OPPORTUNITIES AND RISKS ARE EQUAL

KEY SHORT-TERM VARIABLES TO CONSIDER FOR THE EUR/USD



*The forecast is based on a PPP-UIP augmented model, utilizing relative price levels, the inflation differential and the interest rate differential for USA and the Euro Area. Forecasts are generated as out-of-sample projections, with inputs in 2H24 corresponding to consensus forecasts of inflation and market expectations of the interest rates.

USD POSITIVE:

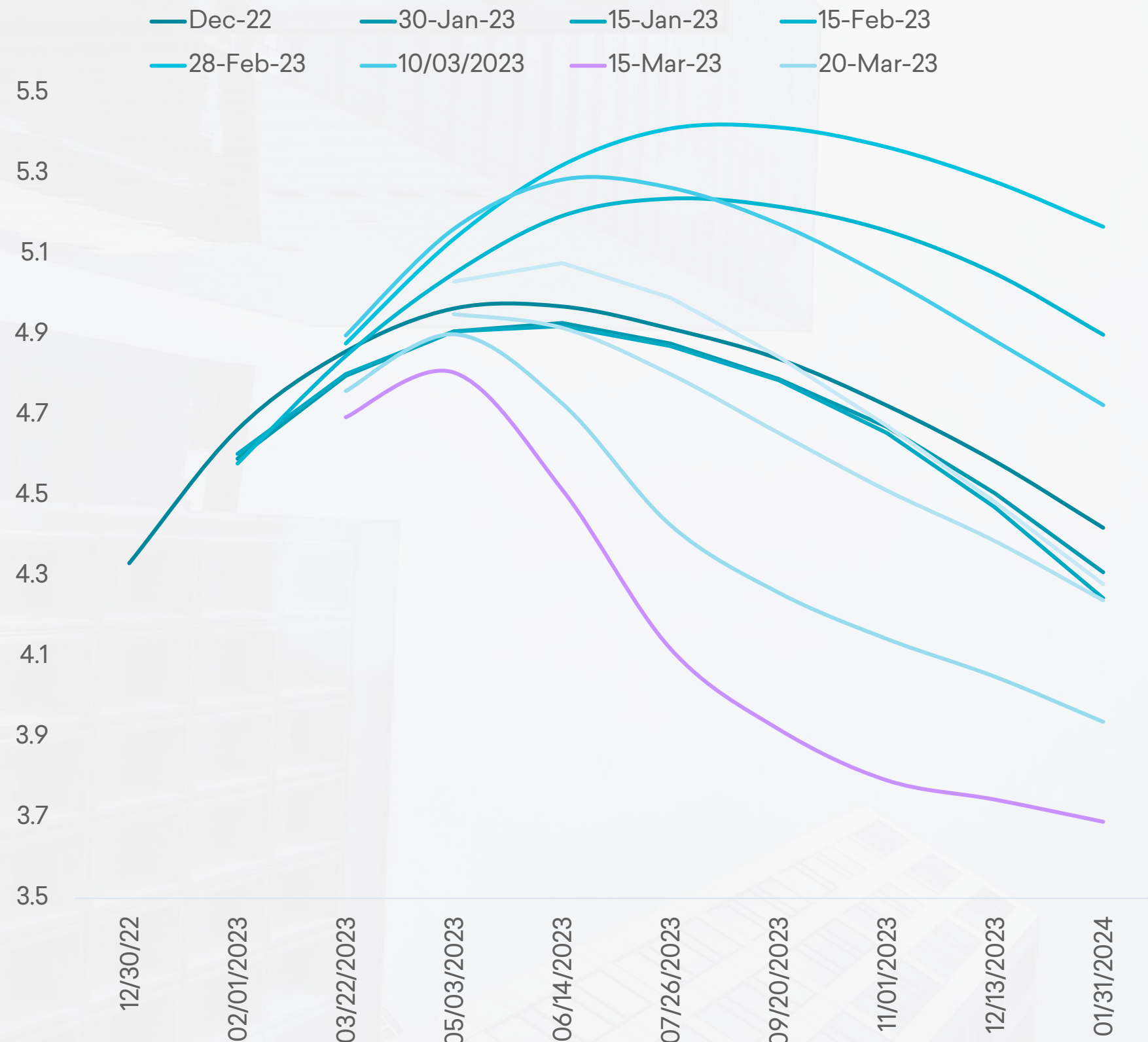
- Higher probability of “good” rather than “bad” cutting cycle;
- “Higher for longer” with potentially higher neutral interest rate levels;
- Potential tariffs and other protectionist policies;
- Relatively weak growth in the rest of the world
- Etc.

USD NEGATIVE:

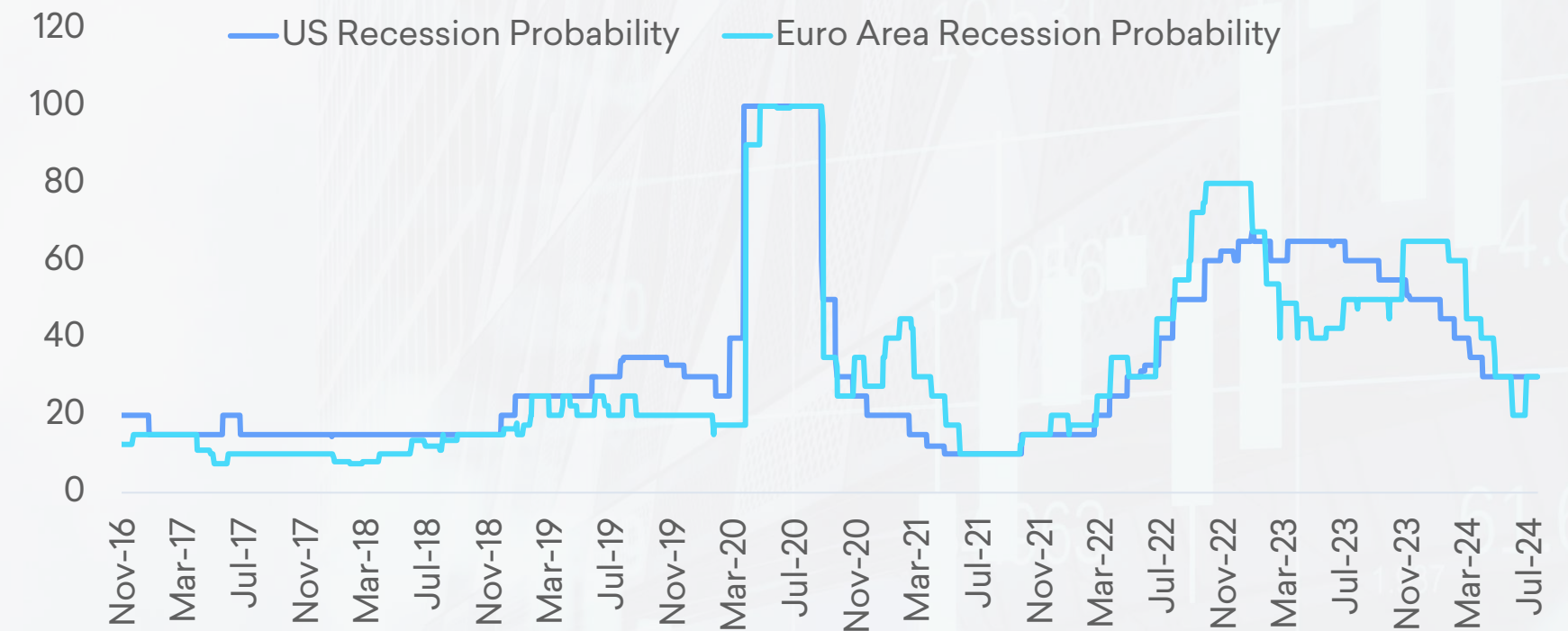
- A potential power struggle with FED;
- Expanding twin deficits and mounting debt;
- Materialization of downside risks;
- Lower global risk premium...
- Etc.

MARKETS ARE HIGHLY SENSITIVE TO NEWS

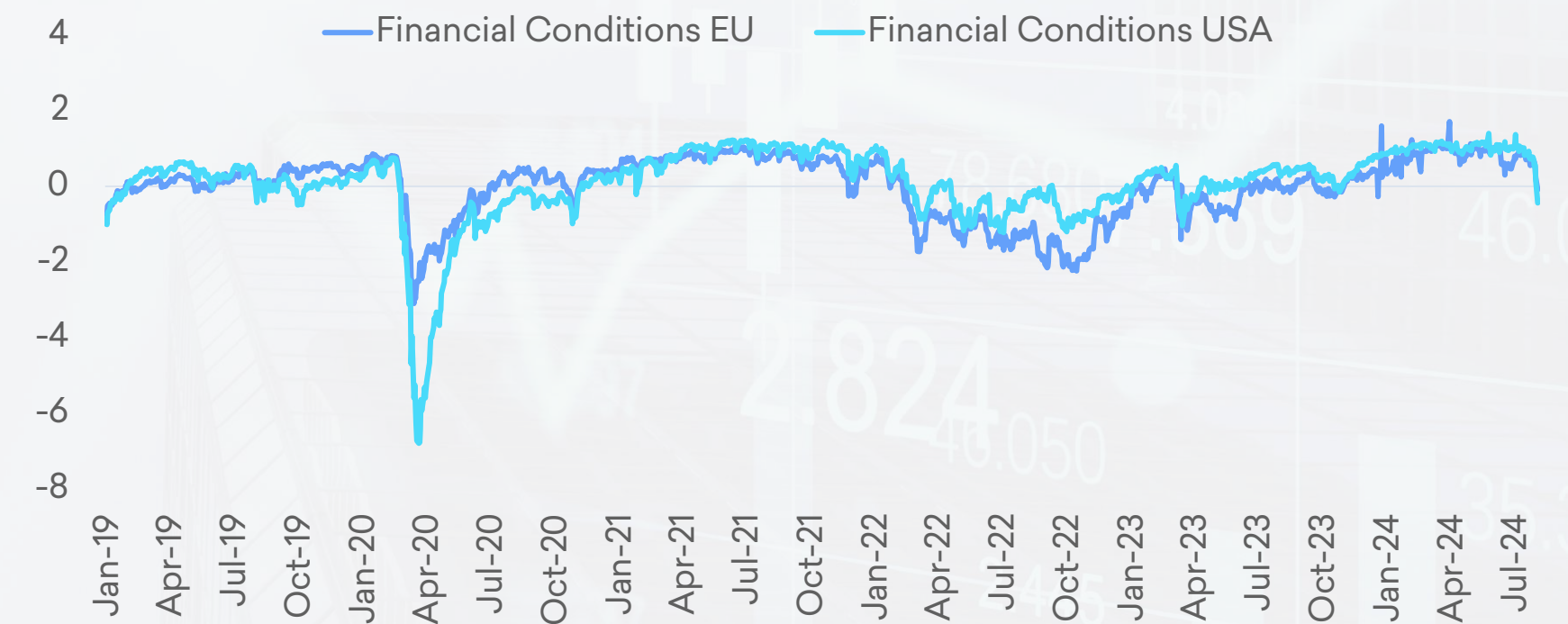
IMPLIED FED FUNDS RATE (FUTURES)



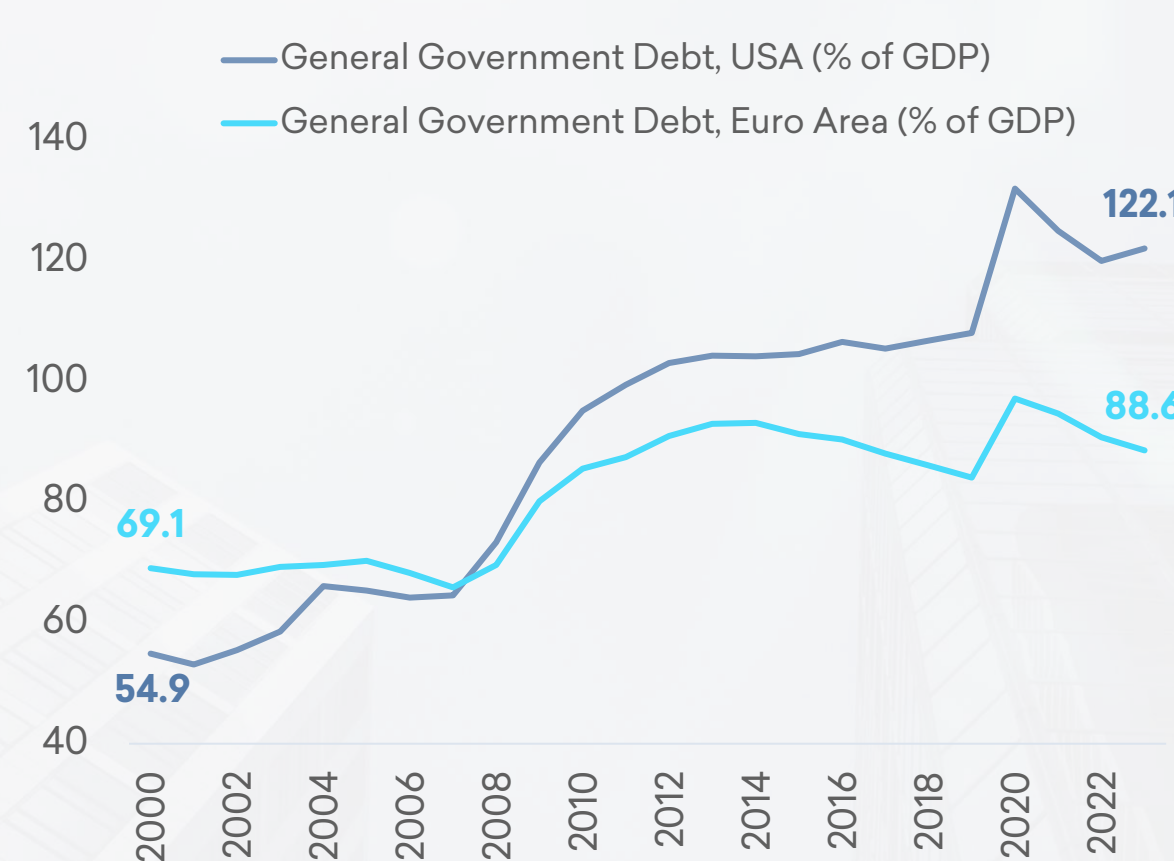
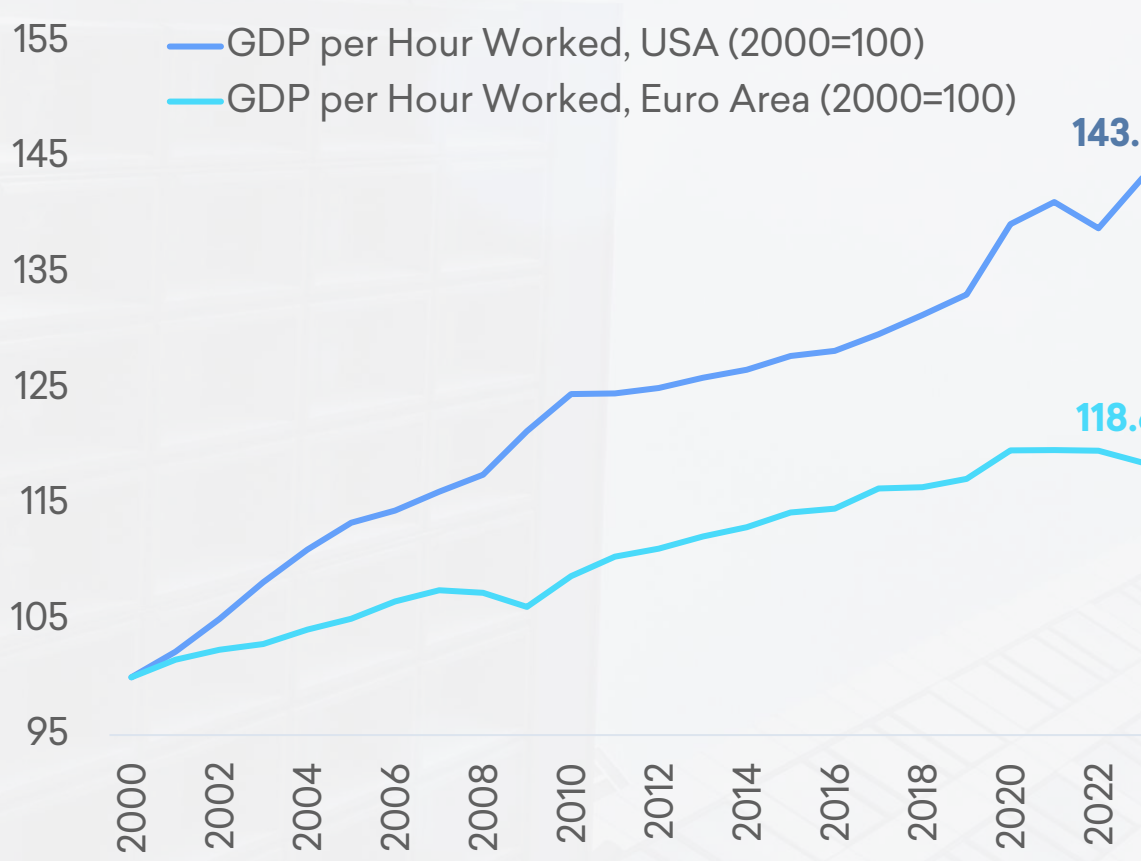
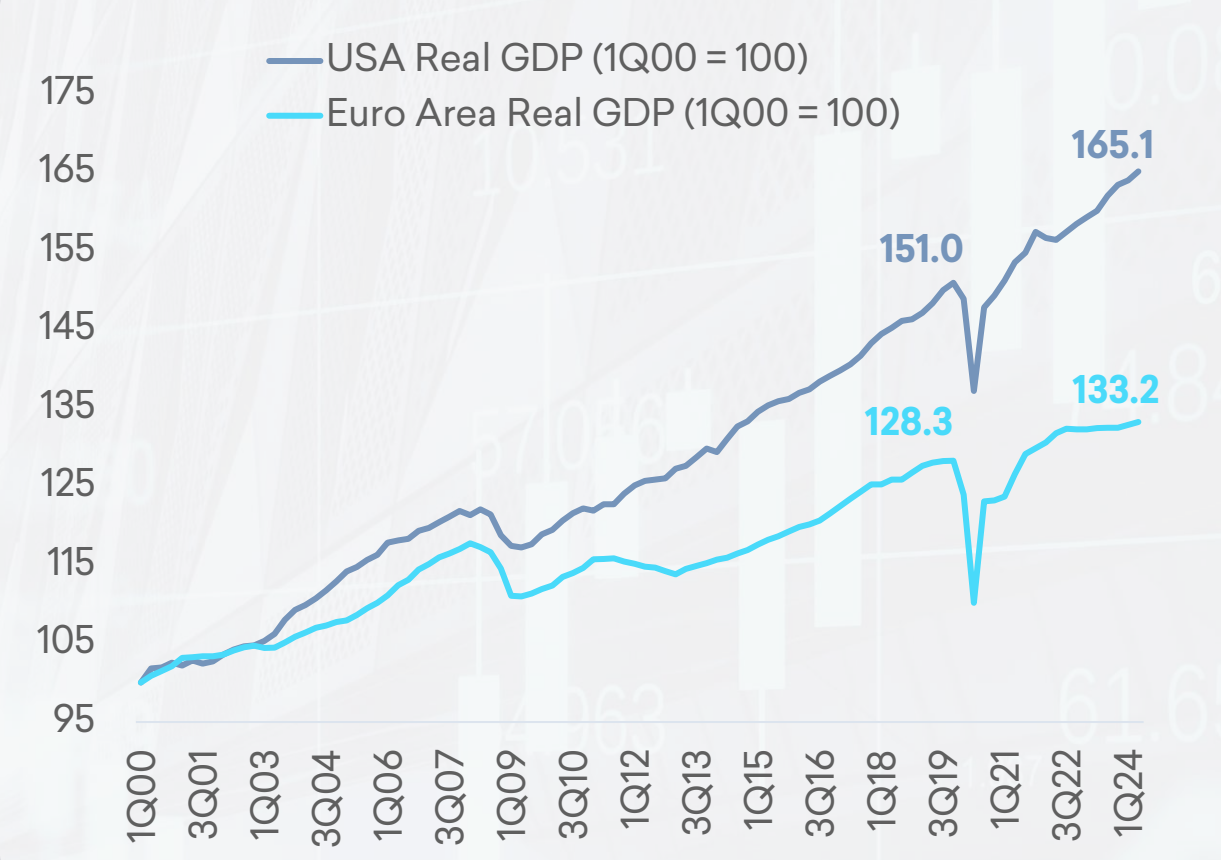
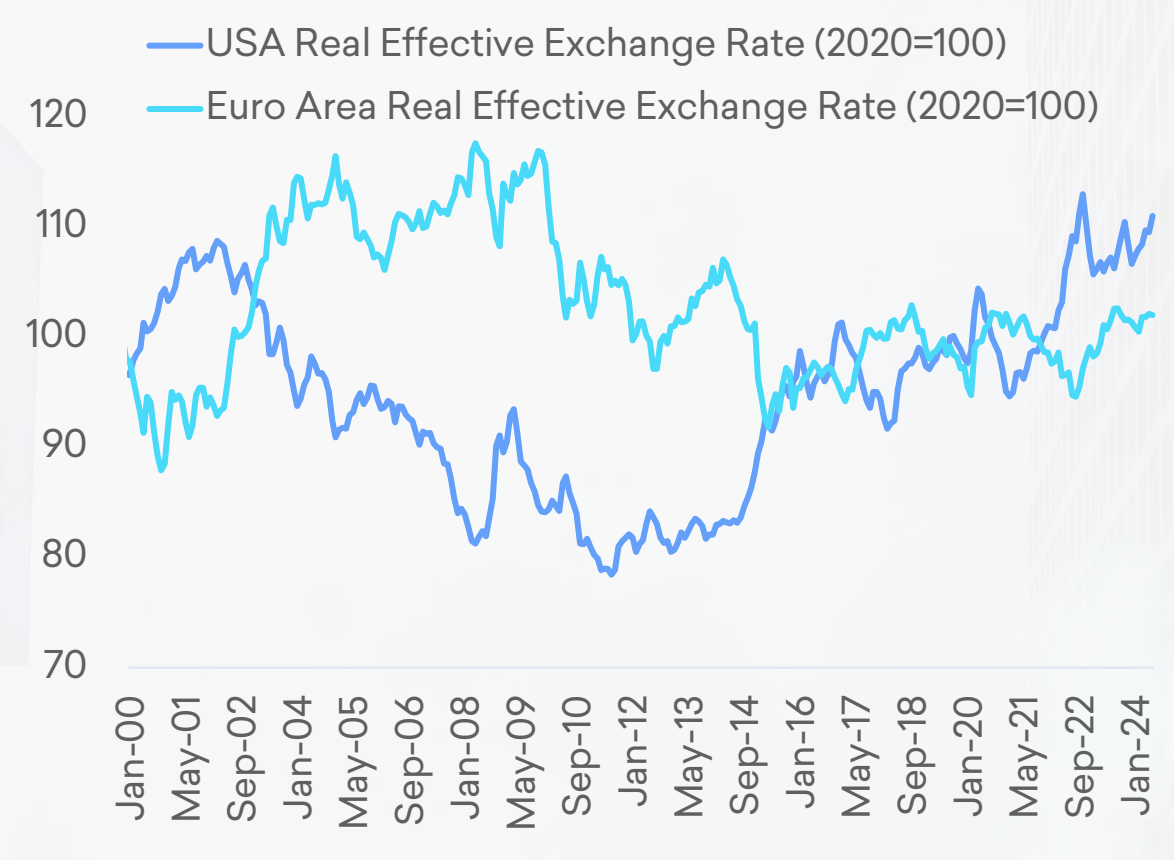
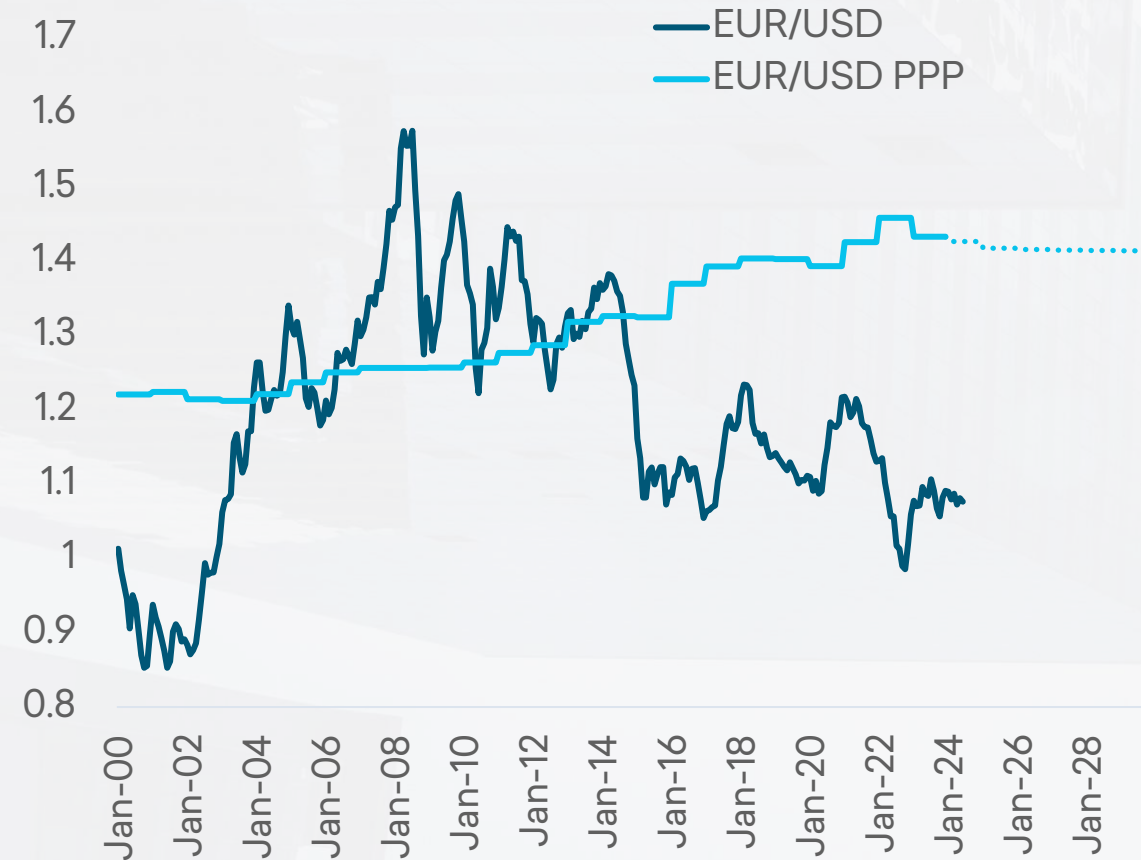
RECESSION PROBABILITY INDICES



FINANCIAL CONDITIONS INDICES (LOWER MEANS TIGHTER)



HOWEVER, MEDIUM-TO-LONG TERM DRIVERS ARE NOT NEWS-DEPENDENT

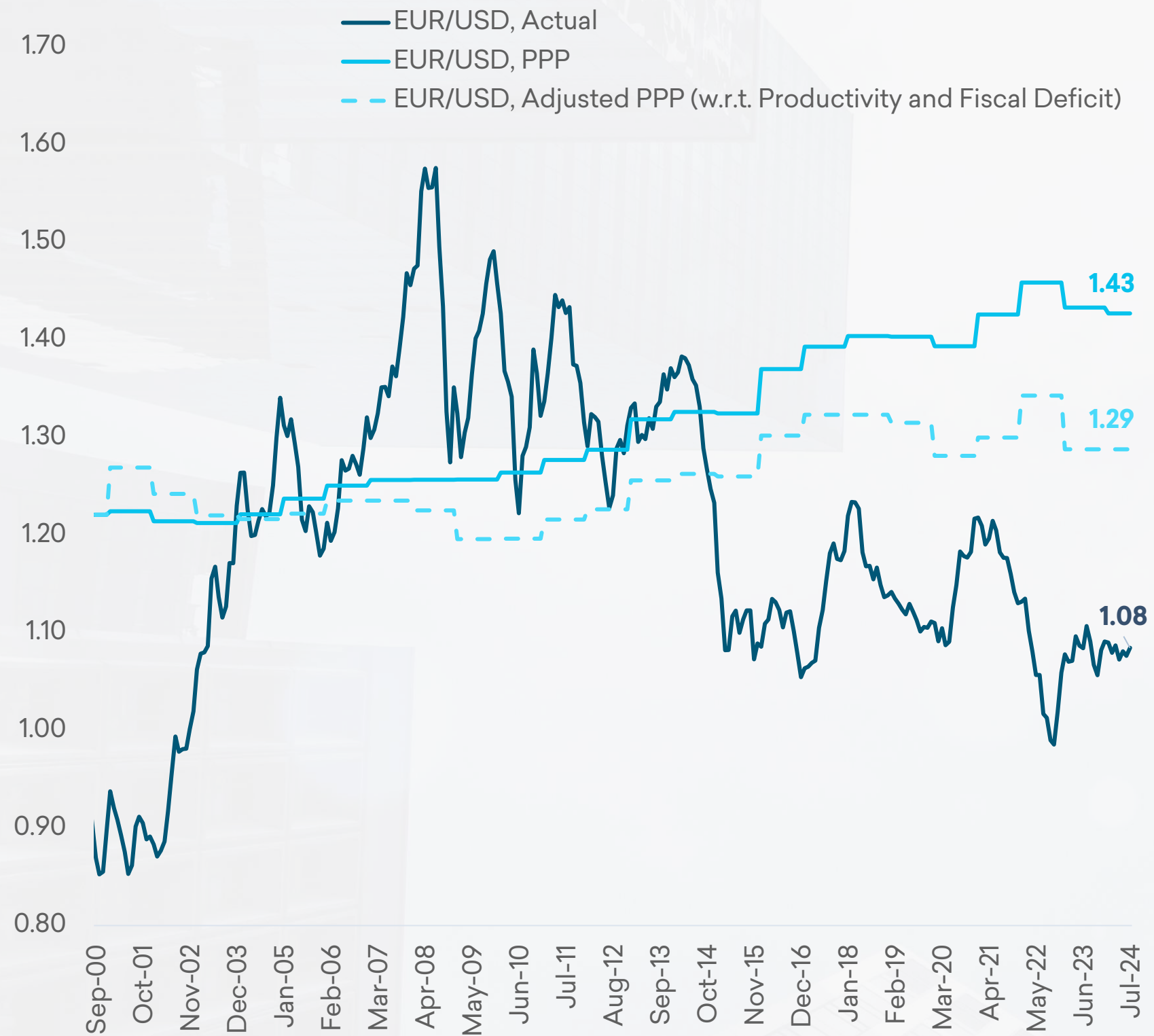


Other structural issues for the medium-to-long term:

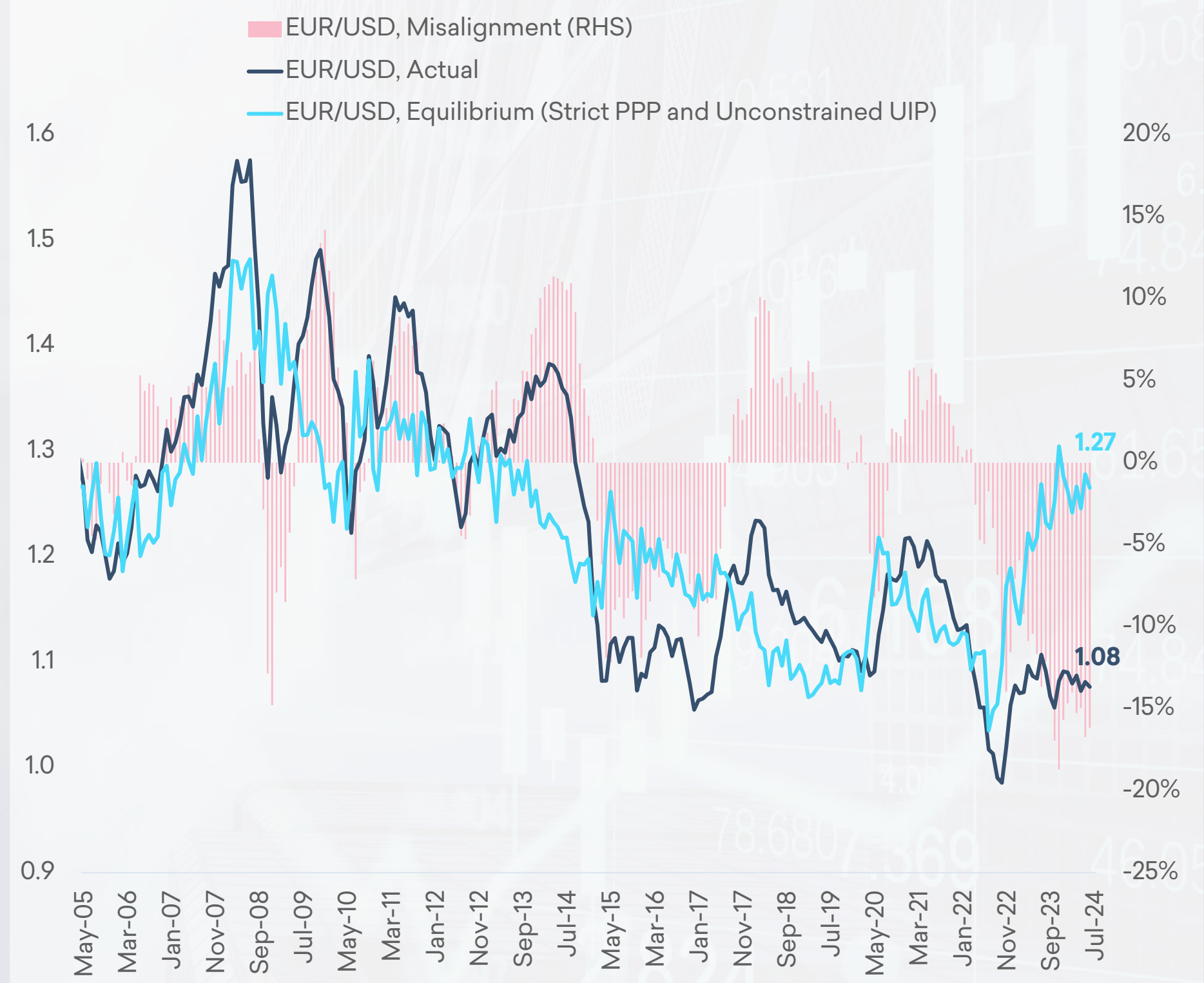
- Growing productivity differential between USA and the Euro Area, particularly with the emergence of AI;
- Low potential growth in the Euro Area and persistently negative output gaps;
- Weak convergence forces within the Euro Area (center vs periphery);
- High Euro Area exposure to geopolitical risks;
- Ageing demographics putting a strain on the welfare state model.

Source: IMF, OECD, FRED

ESTIMATES OF THE EQUILIBRIUM EXCHANGE RATE



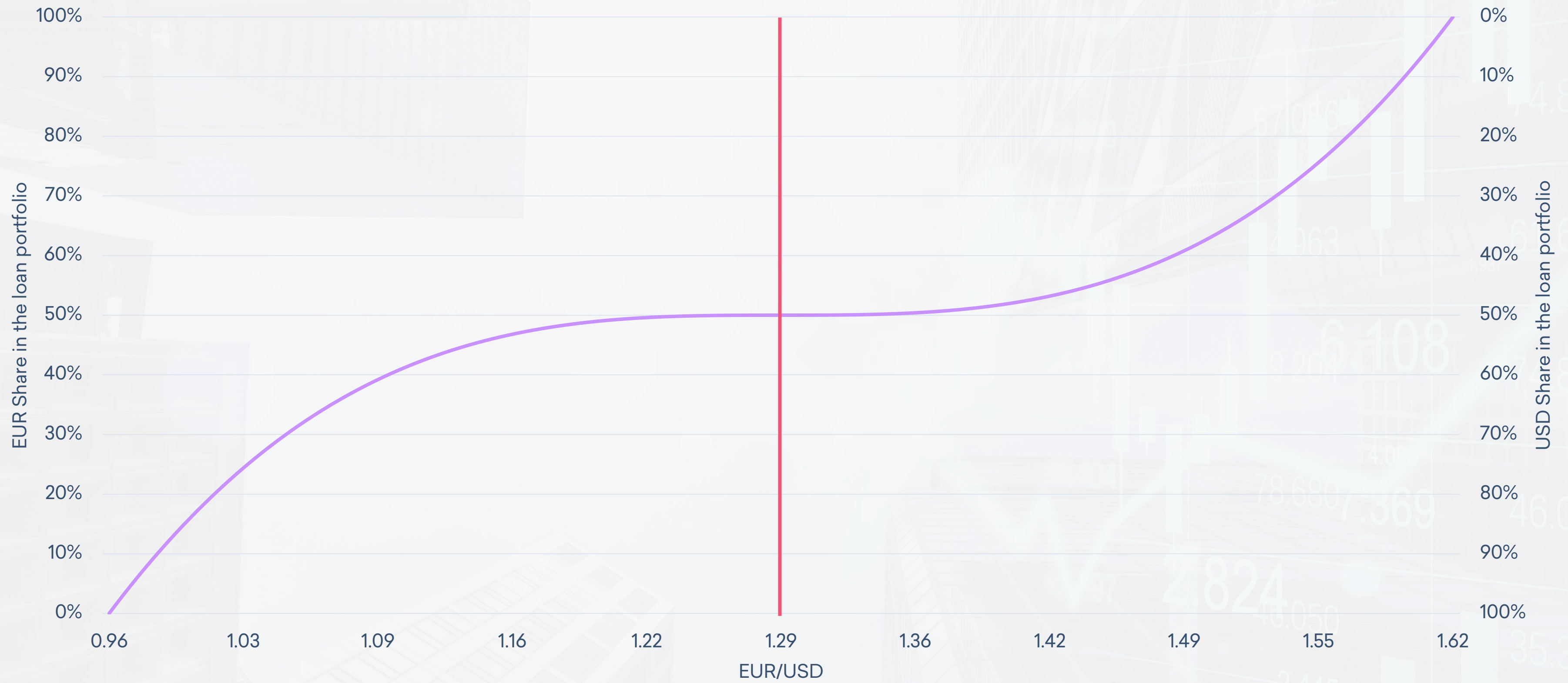
*The PPP exchange rate is adjusted with the productivity differential, defined here as real GDP (constant PPP dollars) per hour worked, per the Balassa-Samuelsion theory, [explained here by the Czech National Bank](#). The derived exchange rate is then adjusted with the fiscal balance (general government net lending/borrowing) differential, in order to account for debt-driven GDP growth, with cumulative long-run multipliers of 1.2 and 1.6 for the Euro Area and USA respectively, based on estimates of IMF and the Richmond FED.



*The estimates are based on a vector error correction model (VECM), fitting the exchange rate as a function of relative prices (absolute PPP) and the interest rate differential (UIP). We find strong evidence of cointegration, implying that there exists an equilibrium condition where the exchange rate co-moves with prices and interest rates in the long run. We further impose a coefficient unity restriction on PPP, as per theory, and allow the coefficients of UIP to be estimated freely. The cointegration vector (stationary with a mean of zero) indicates deviations from the long-run equilibrium, i.e. misalignment. Broadly similar to the [DBS DEER model](#).

WHAT IS THE OPTIMAL PORTFOLIO ALLOCATION IF OPPORTUNITIES AND RISKS ARE EQUAL?

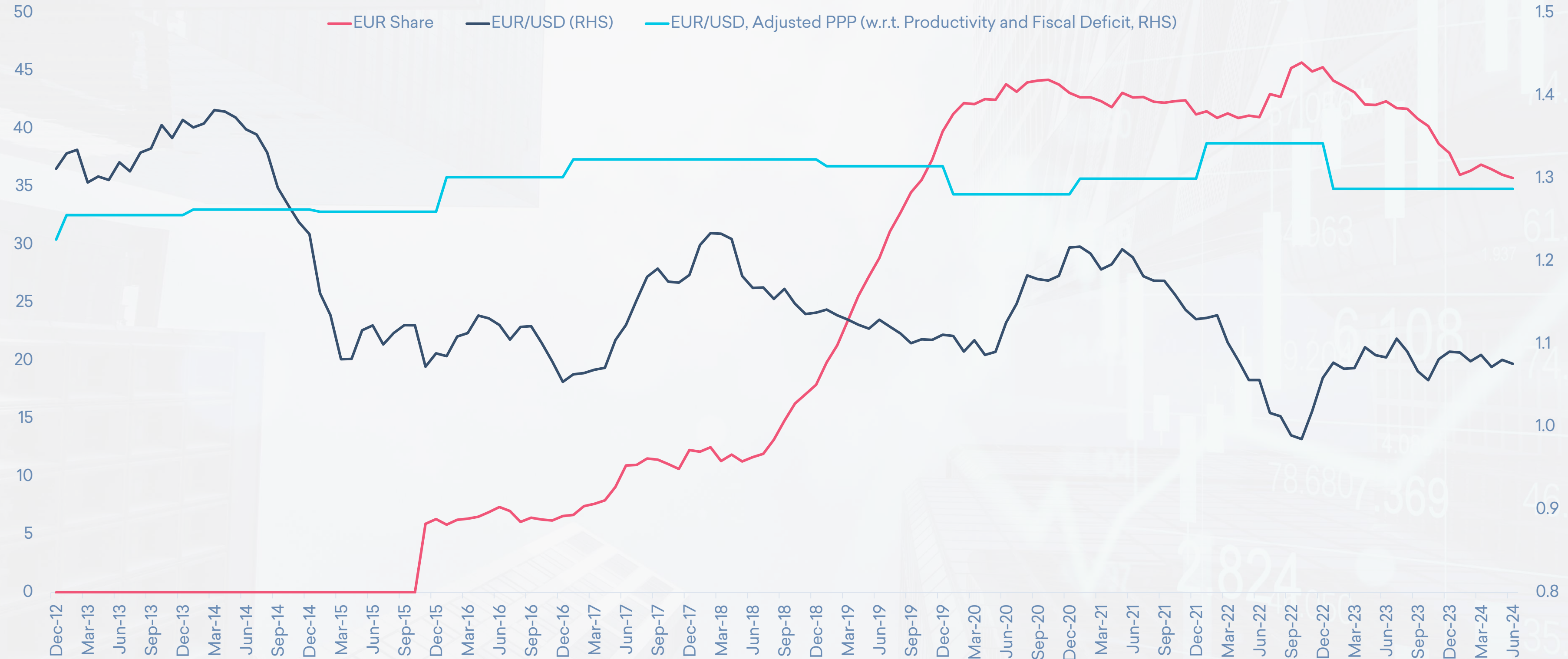
ESTIMATES OF POTENTIALLY OPTIMAL EUR/USD ALLOCATION WHILE TAKING UP FX RISK (LOANS)



PROBLEMS AND OPPORTUNITIES FROM THIS CHART?

EUR SHARE IN CORPORATE LOANS (CONSTANT EXCHANGE RATE) AND EUR/USD, ACTUAL AND PPP (END OF PERIOD)

POSSIBLY OPTIMAL LOAN PORTFOLIO STRUCTURE FIRST DISCUSSED BACK IN 2019 AND THEREAFTER, E.G. IN 2022



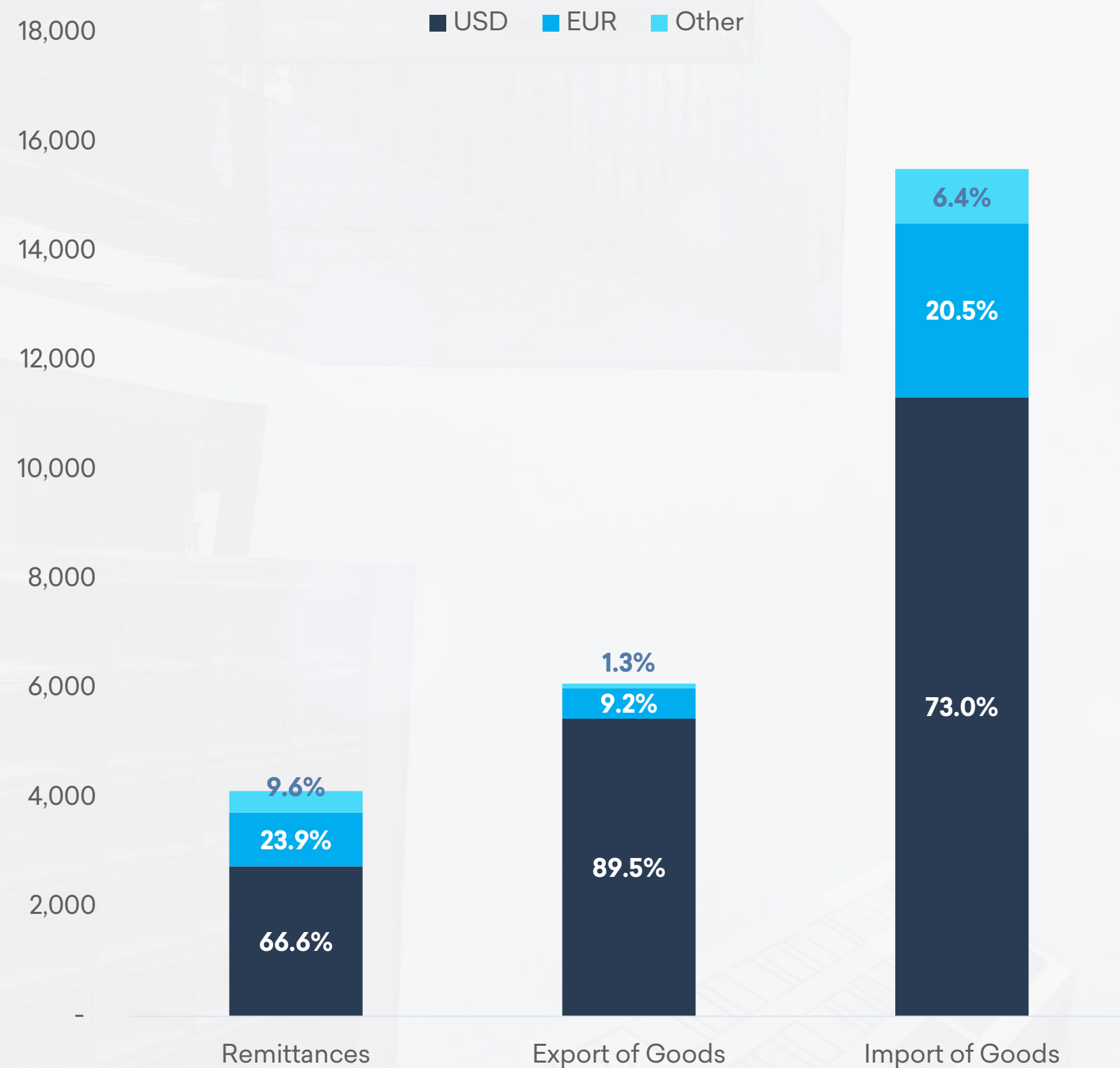
Source: NBG, Own Calculations



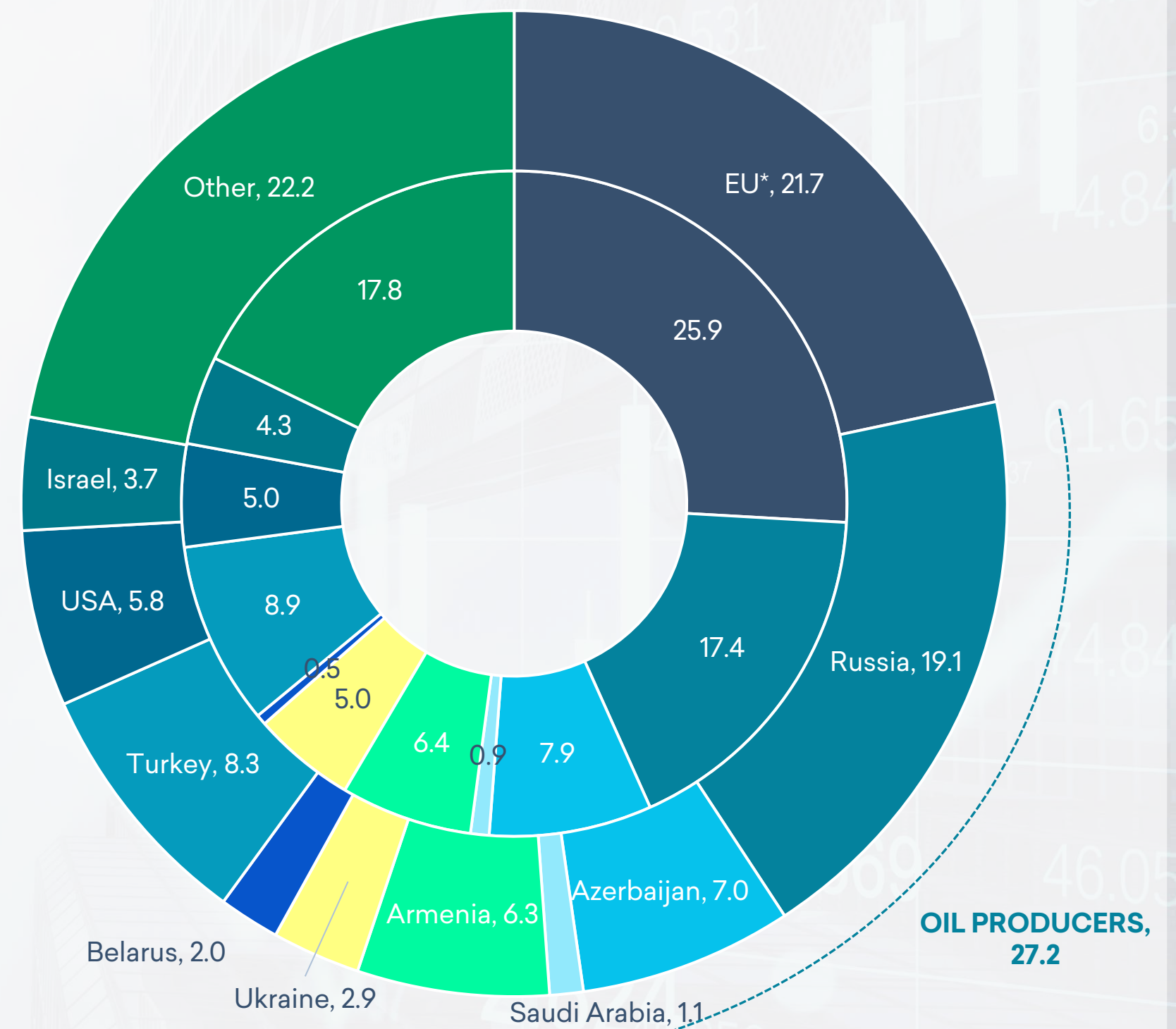
CHOOSING BETWEEN EUR AND USD IF OPPORTUNITIES AND RISKS ARE NOT EQUAL

UNDERLYING VS INVOICING CURRENCIES

CURRENCY DECOMPOSITION OF FX FLOWS (USD MN)



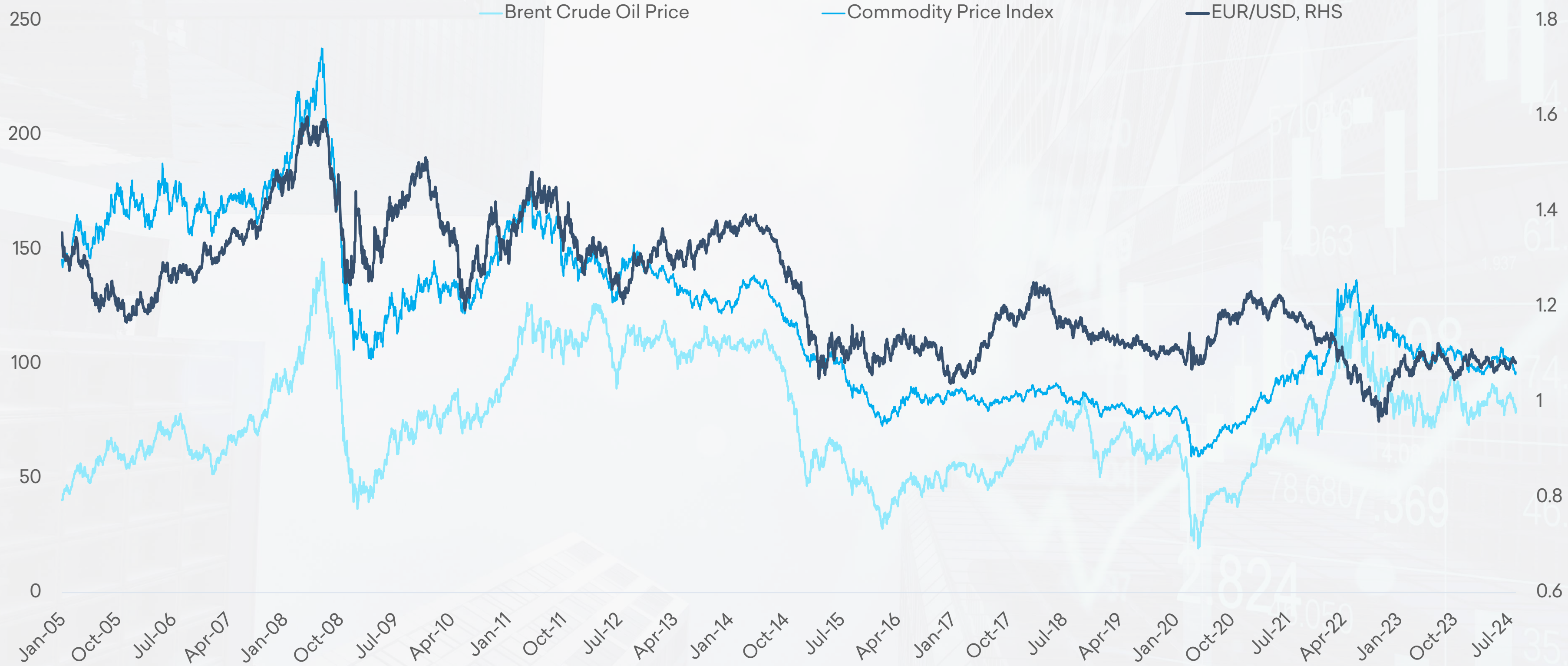
SHARE IN EXTERNAL INFLOWS, 2019 (INNER) VS 2023 (OUTER)



Note: TBC Capital estimates based on assumptions of share of migrants counted as residents according to NBG and the assumption that 70% of migrants from Russia do not receive income from Russia based on TBC Bank client survey; without relevant adjustments, if assuming all Russian citizen migrants' income source is Russia, the share of Russia in total inflows would stand at 20.7% instead of 19.1%;
*EU includes UK

STRONG HISTORICAL INVERSE RELATIONSHIP BETWEEN USD AND COMMODITY PRICES UNTIL RECENTLY

EUR/USD AND COMMODITY PRICES



*See the publication: [Is the Georgian Economy Largely Delta-Neutral?](#)

THE "DOLLAR SMILE"

USD Appreciation

Global recession risks; risk aversion; USD as safe haven

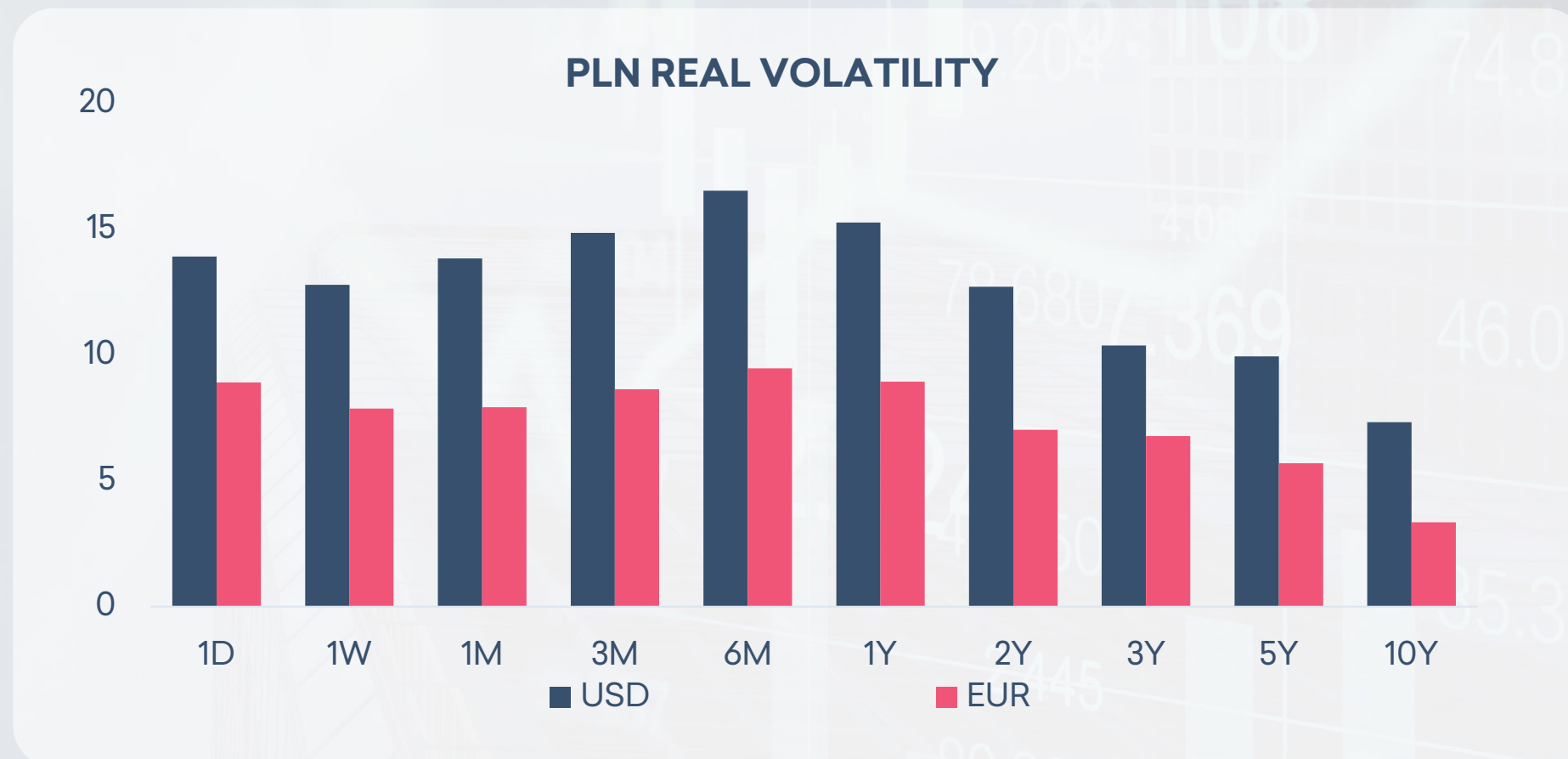
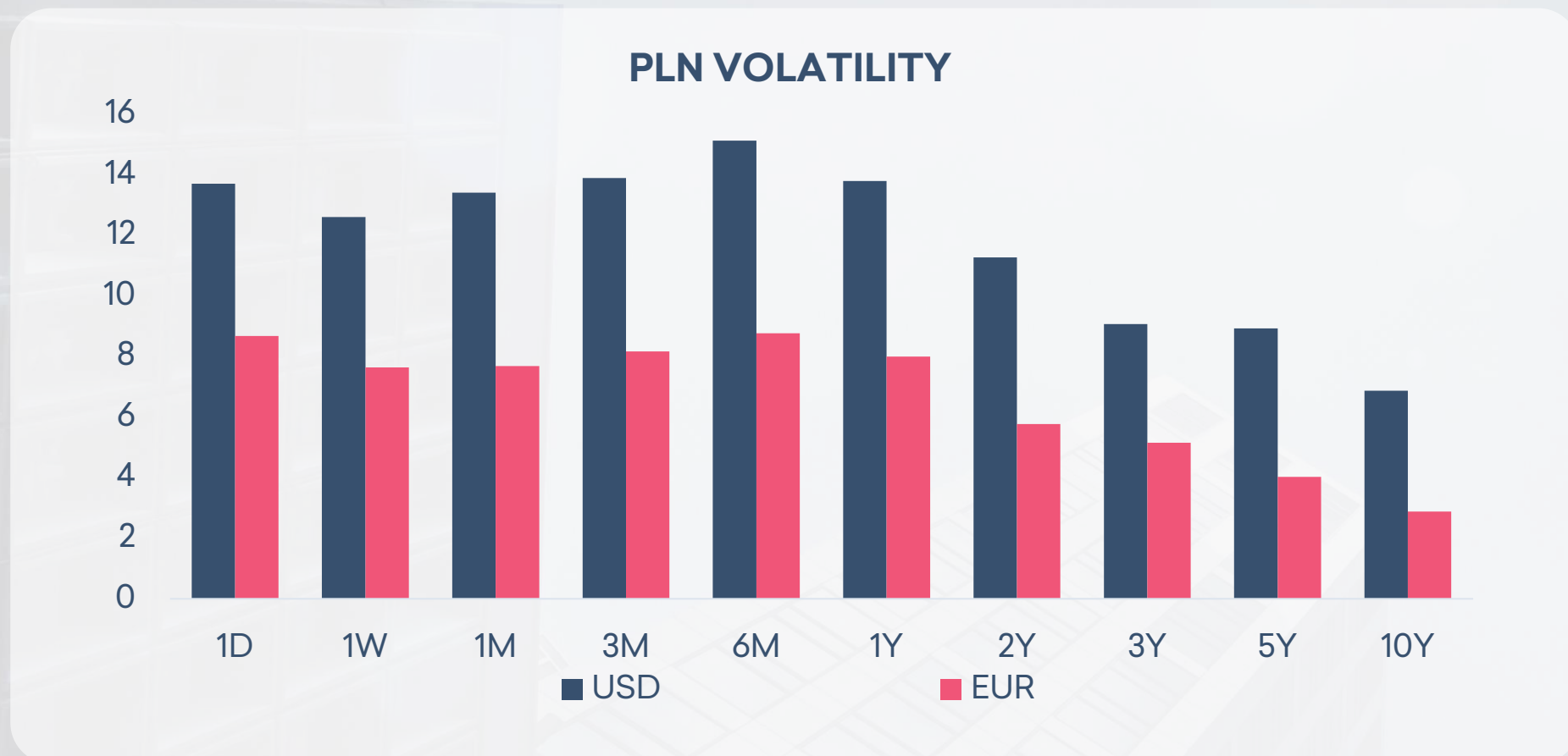
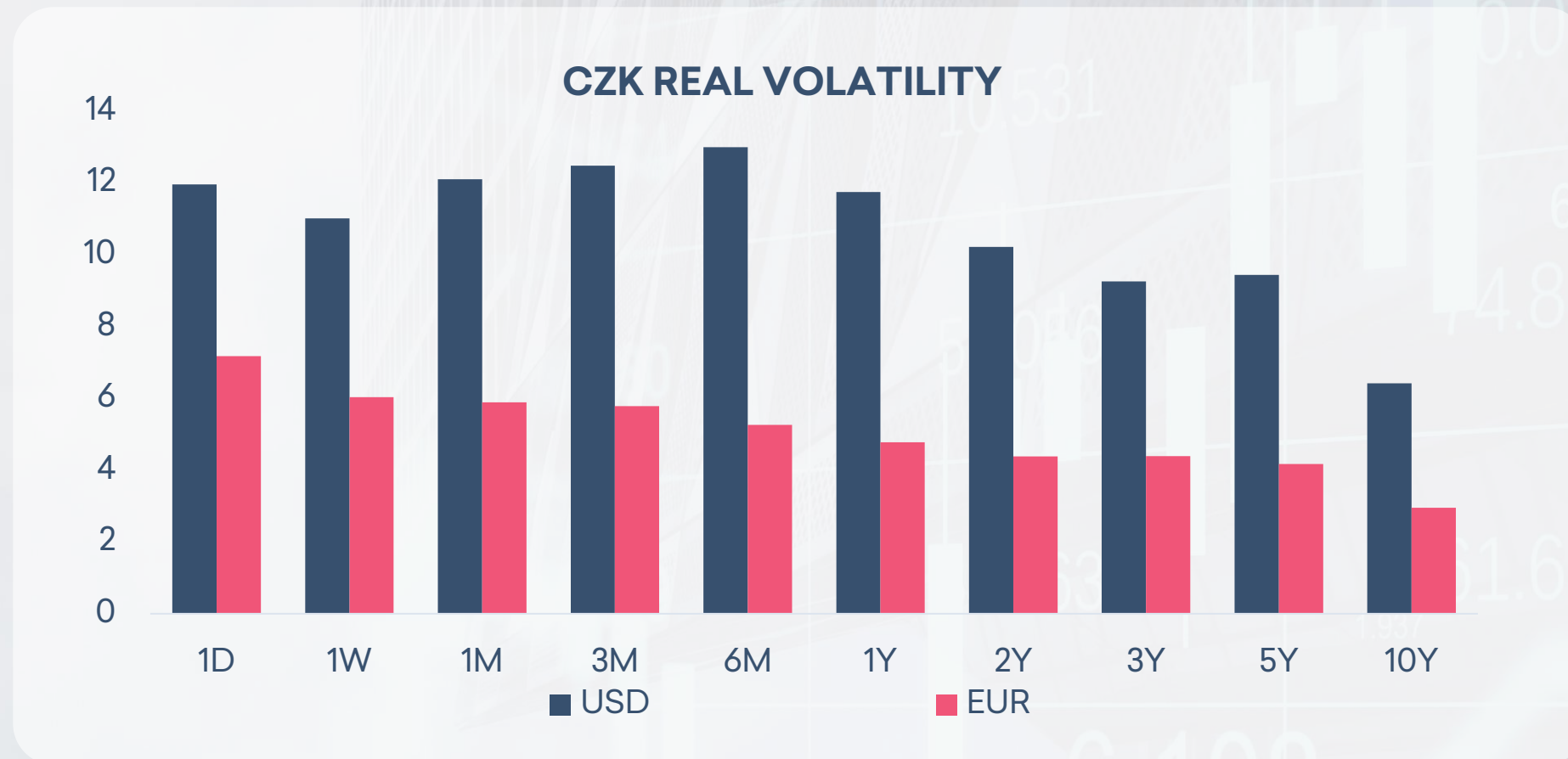
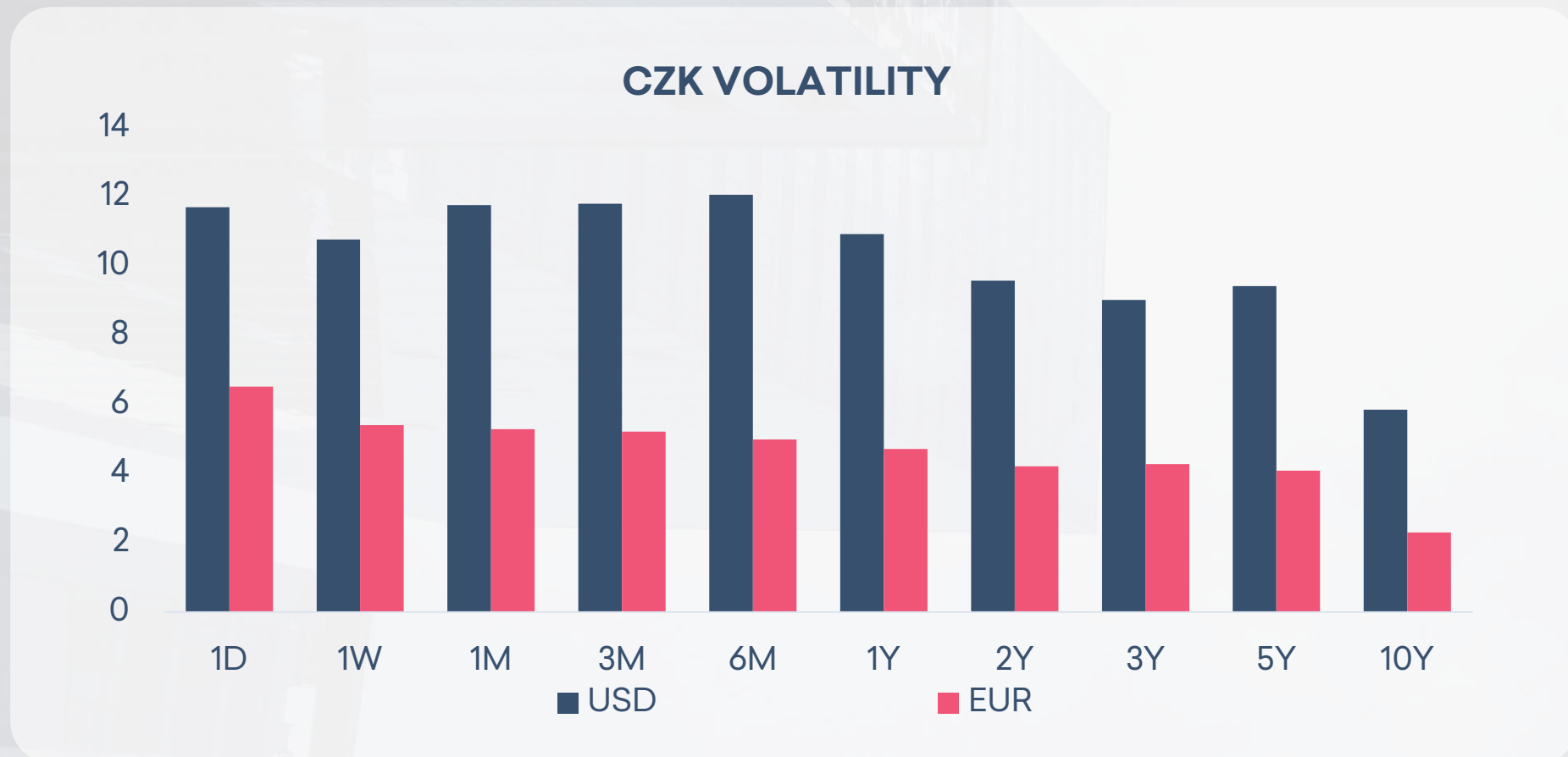
Stronger US growth vs rest of the world; hawkish Fed vs rest of the world

Strong global growth; high risk tolerance; dovish Fed vs rest of the world

USD Depreciation

MORE STABLE AGAINST EUR THAN AGAINST USD...

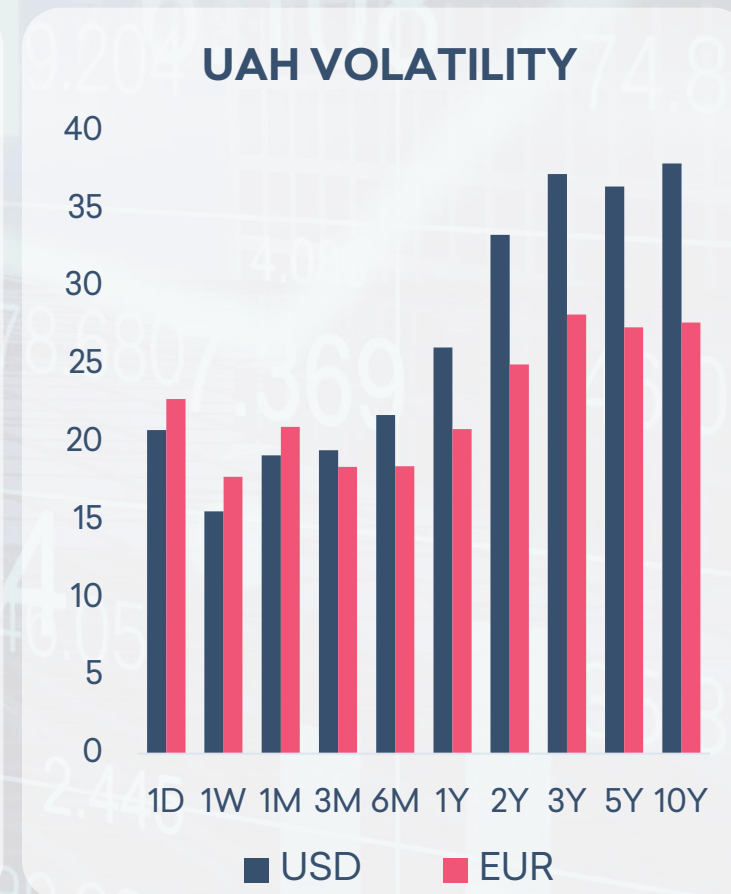
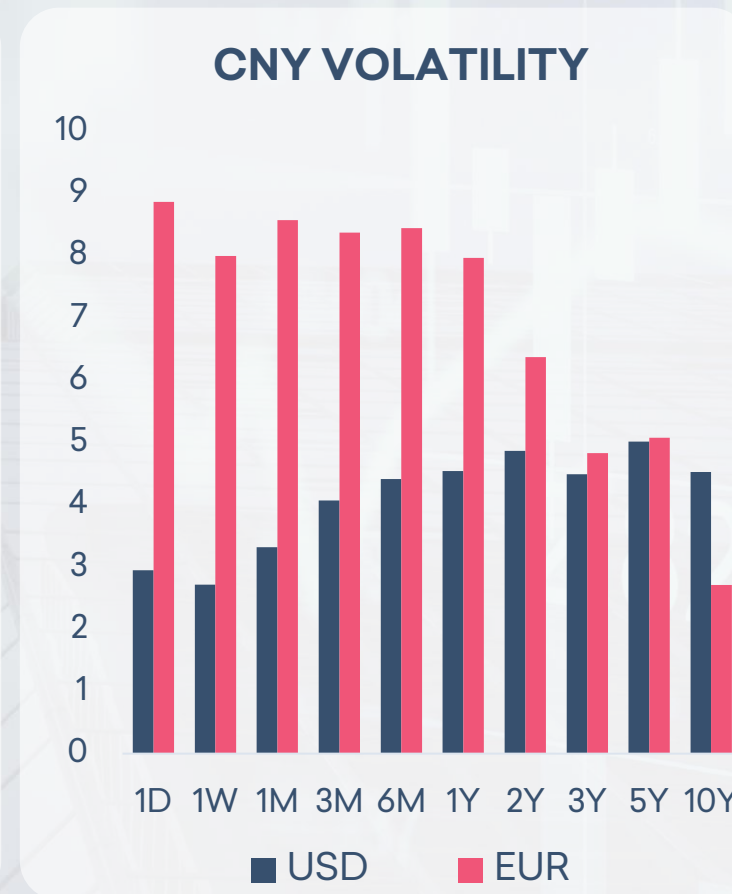
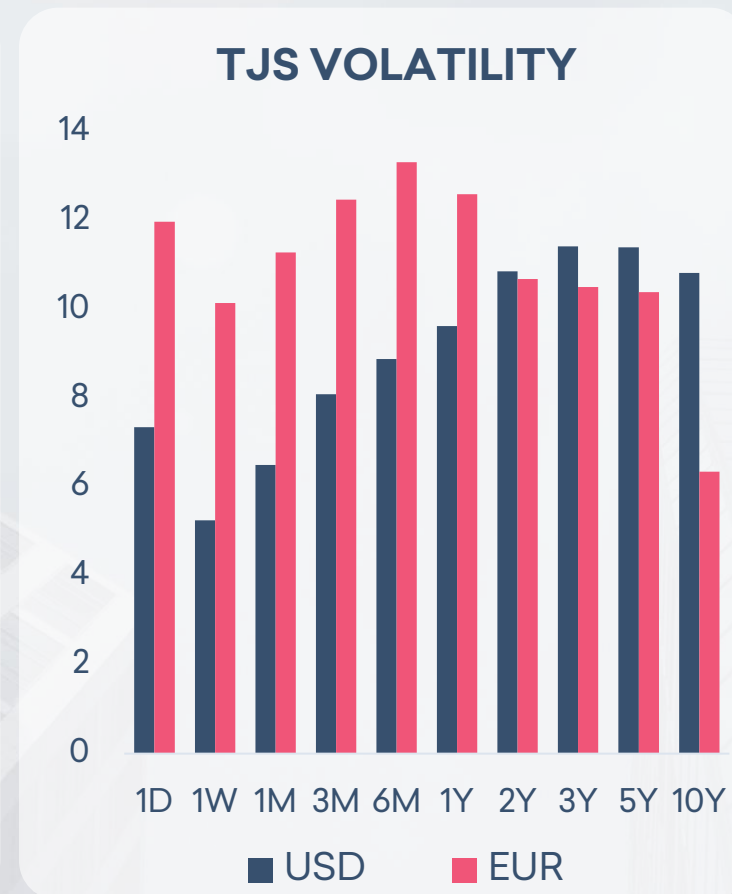
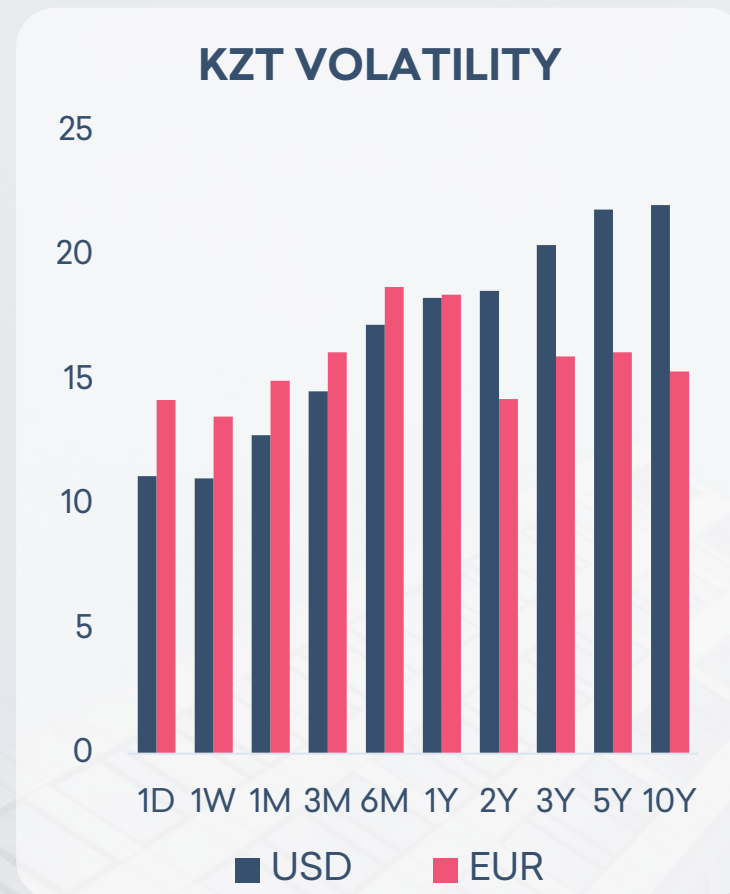
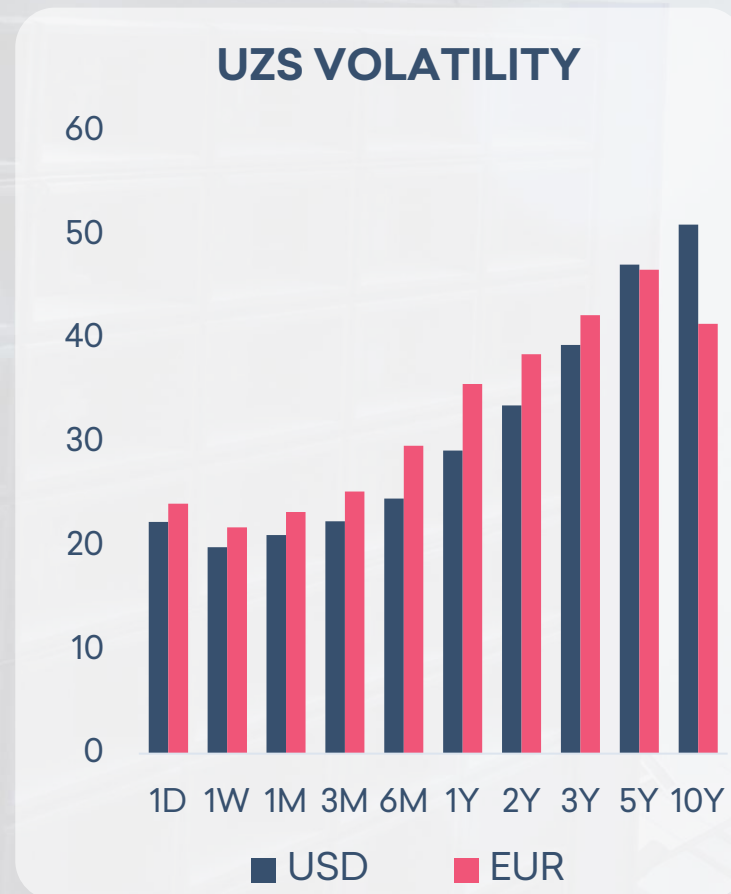
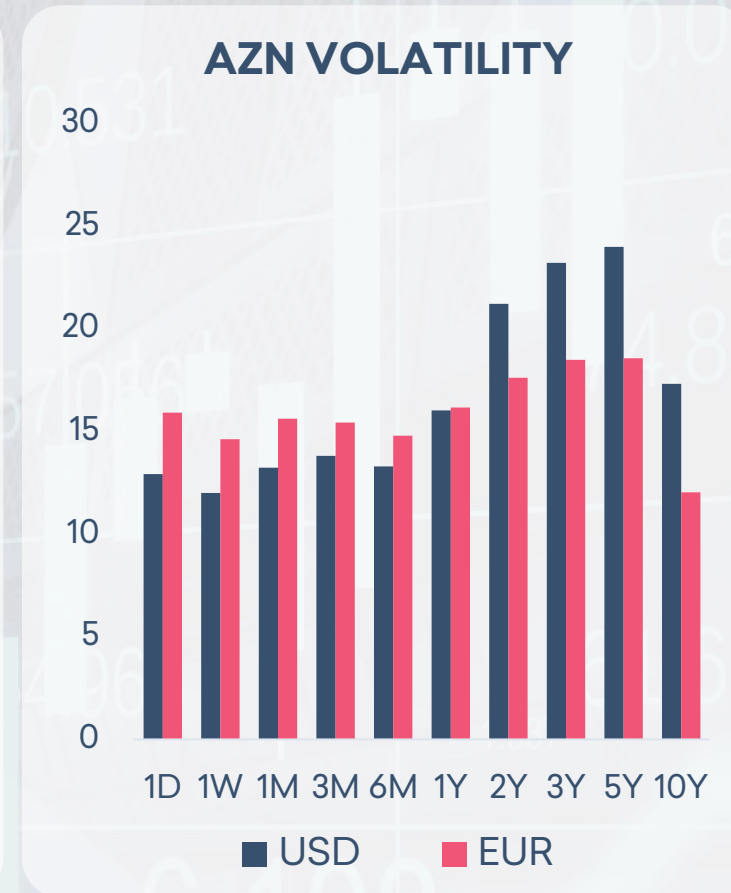
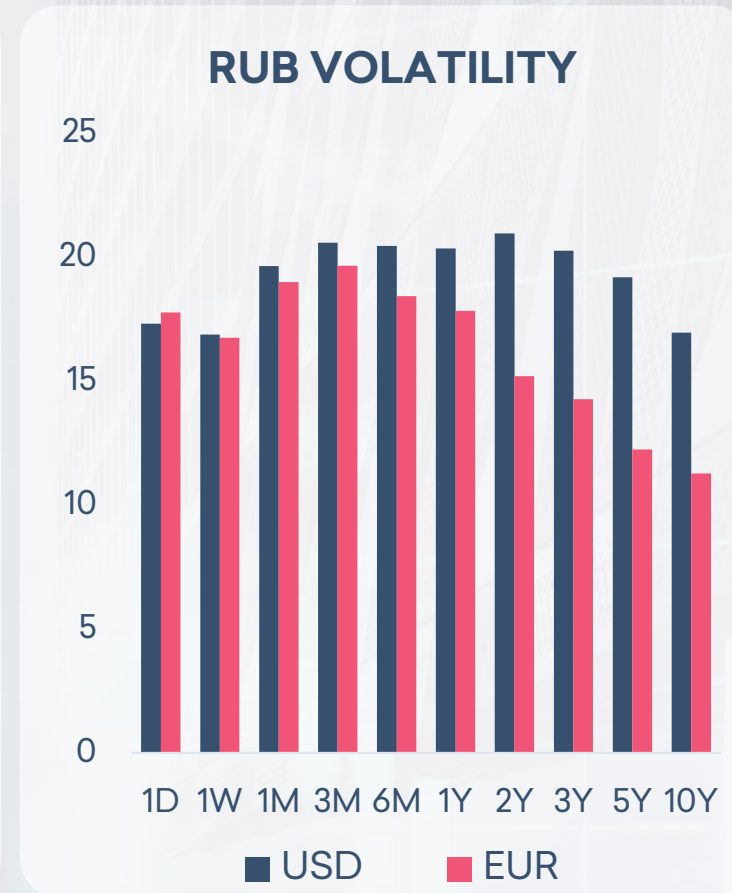
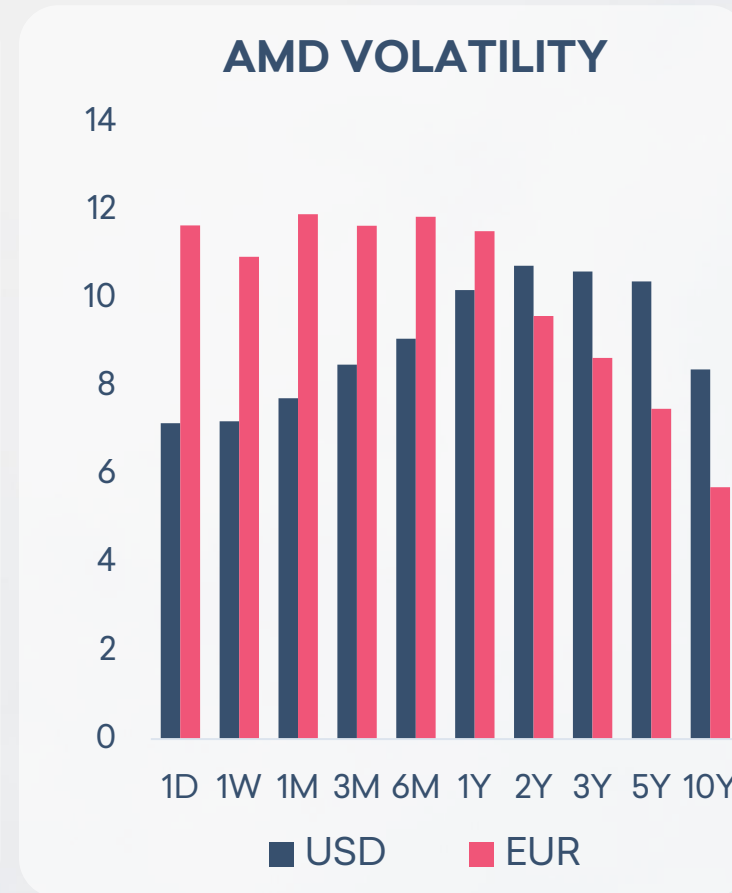
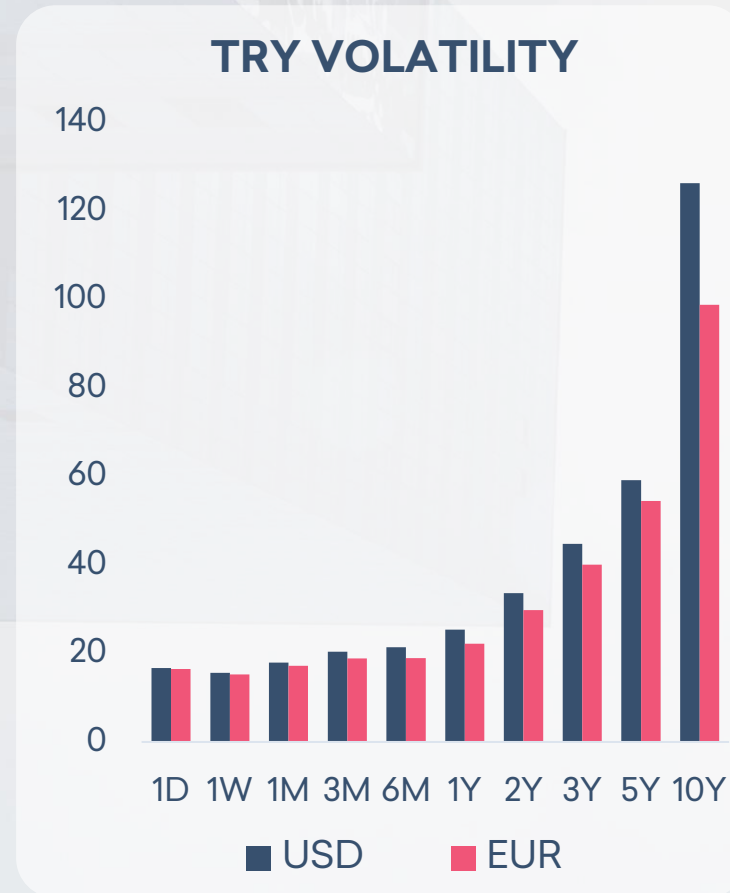
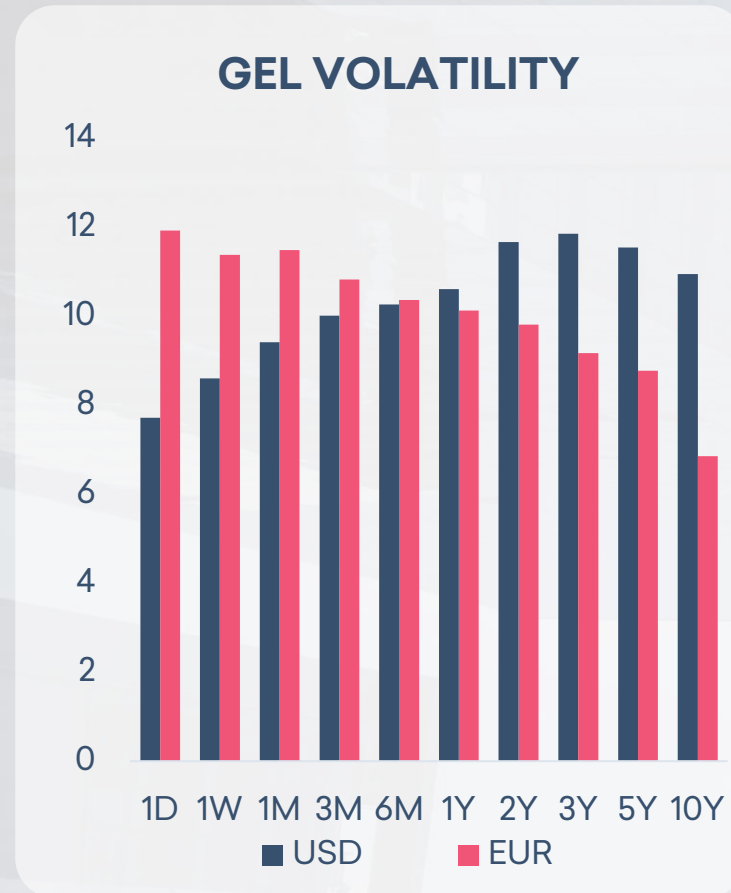
EXCHANGE RATE VOLATILITY AGAINST USD AND EUR (2003-2024-July, %)



Source: Central Banks, Own Calculations

...NOT ONLY FOR EU COUNTRIES

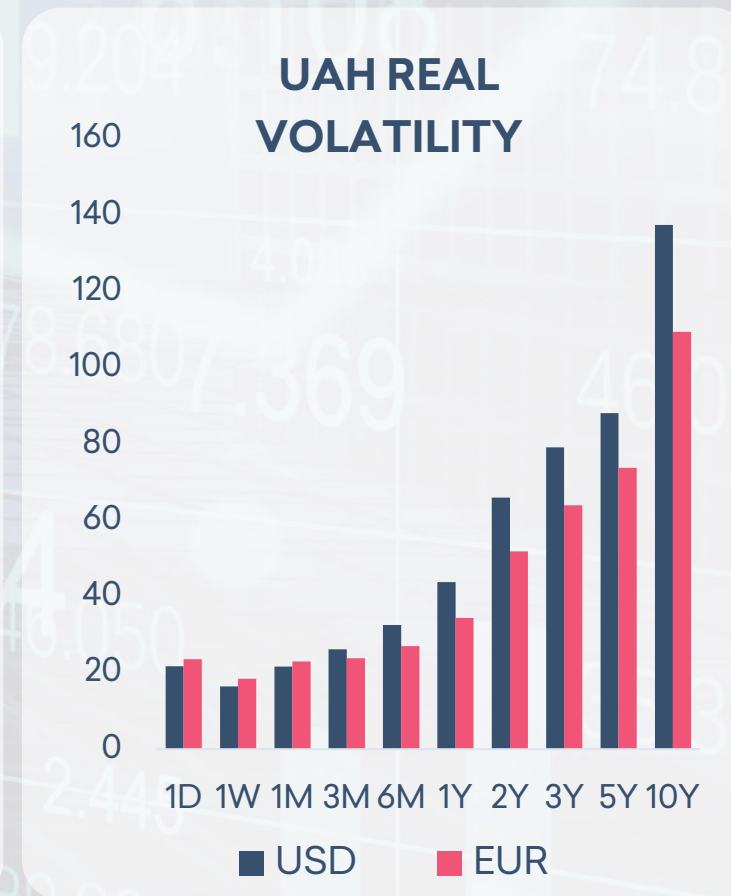
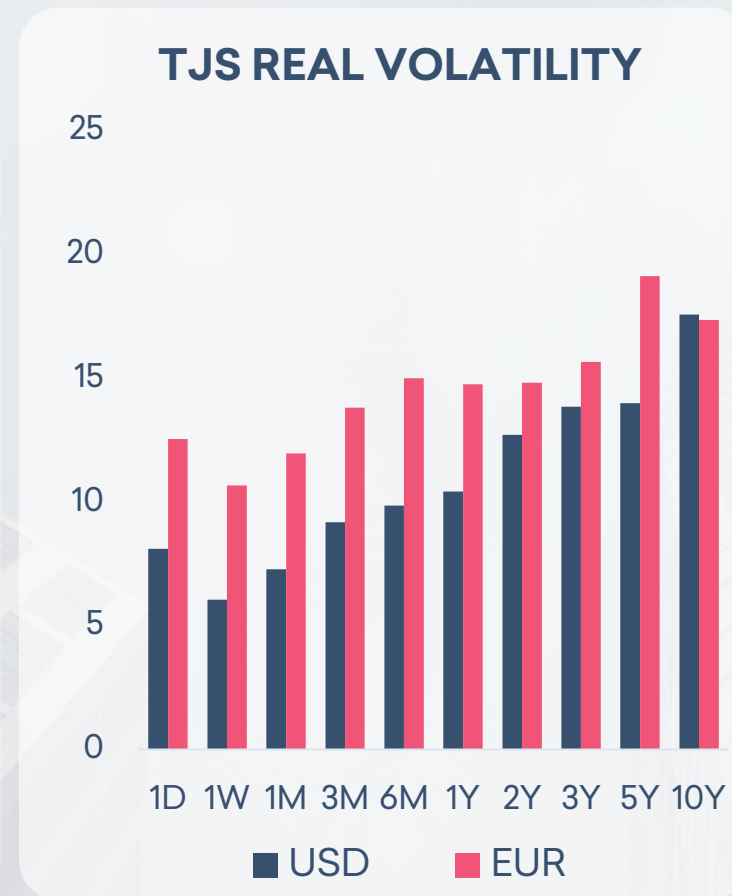
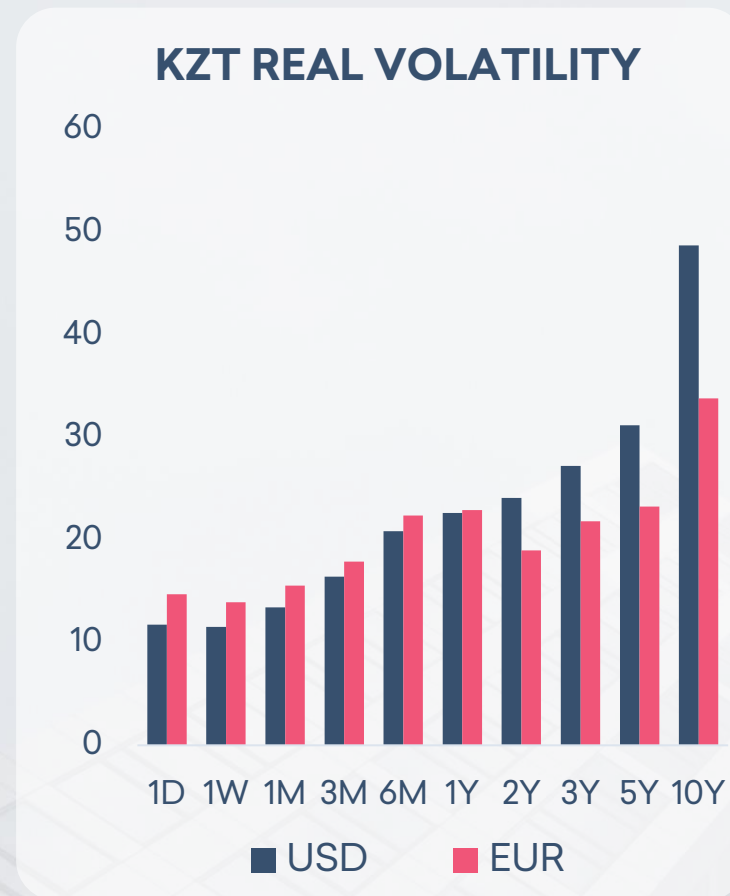
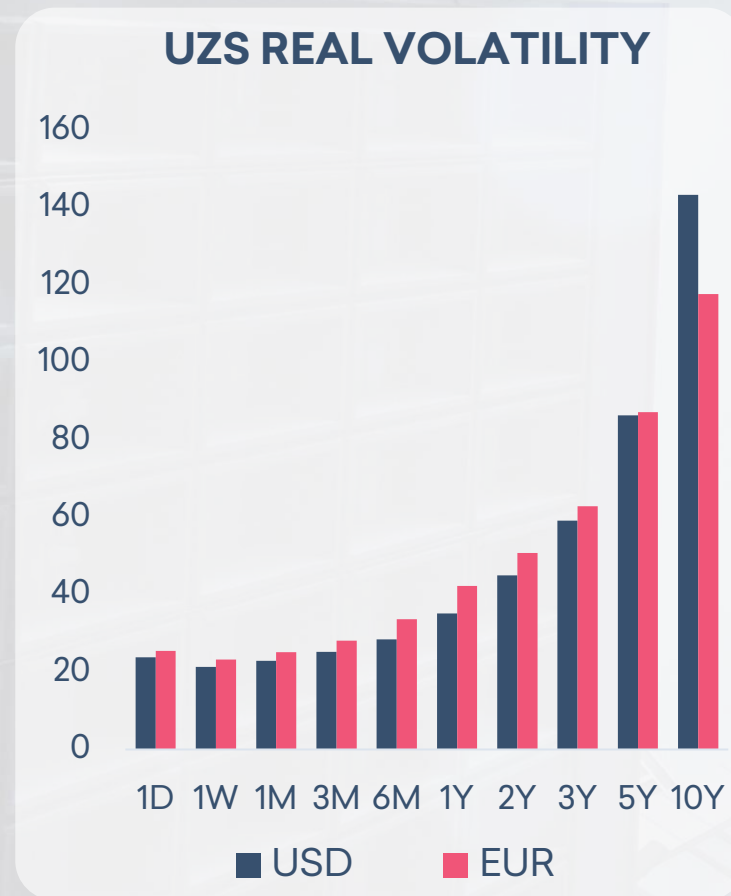
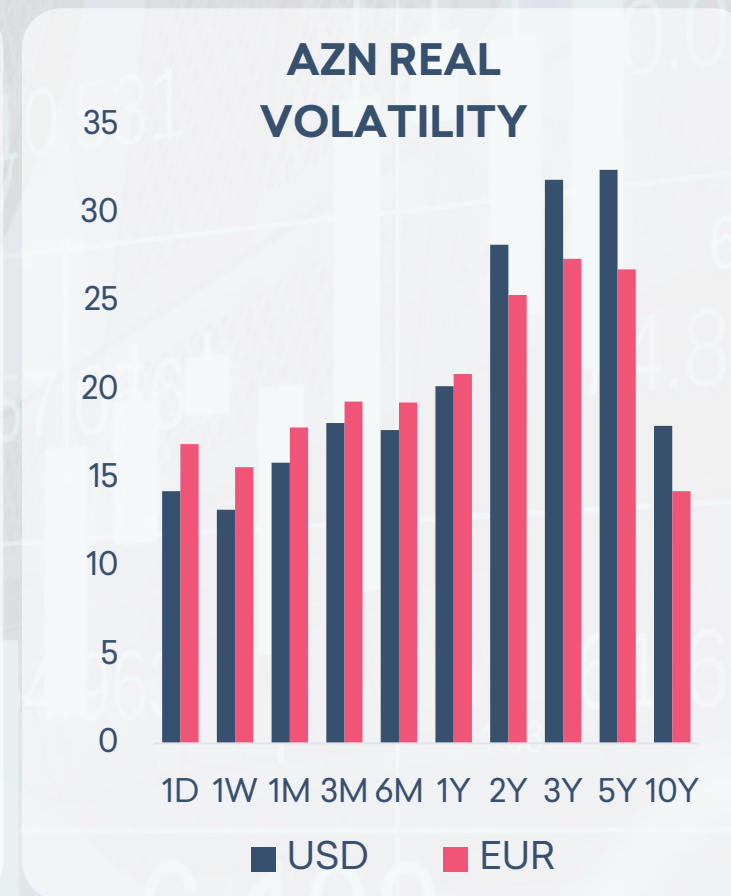
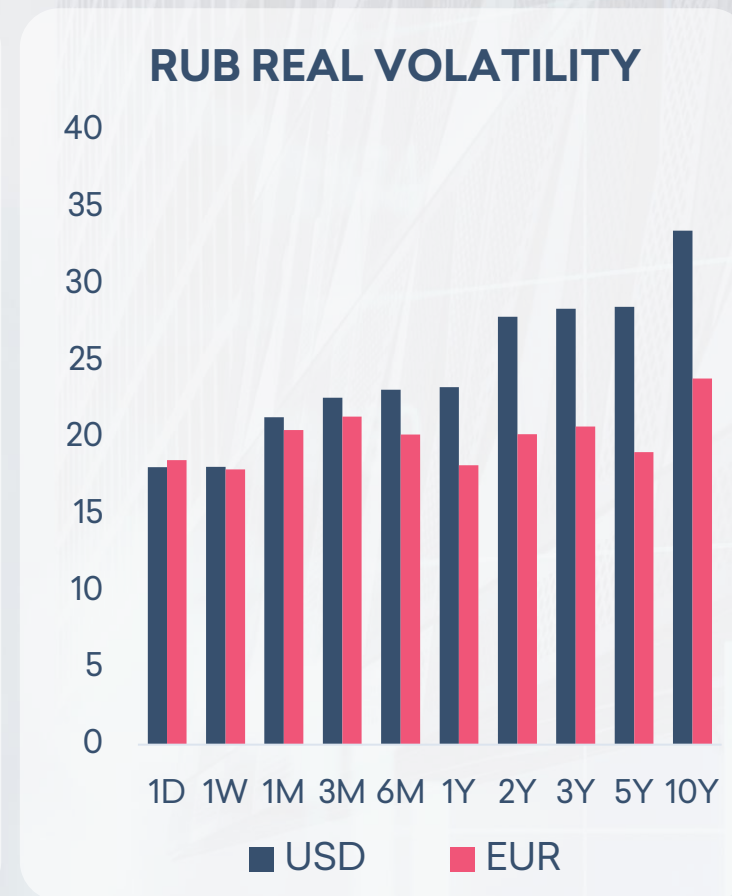
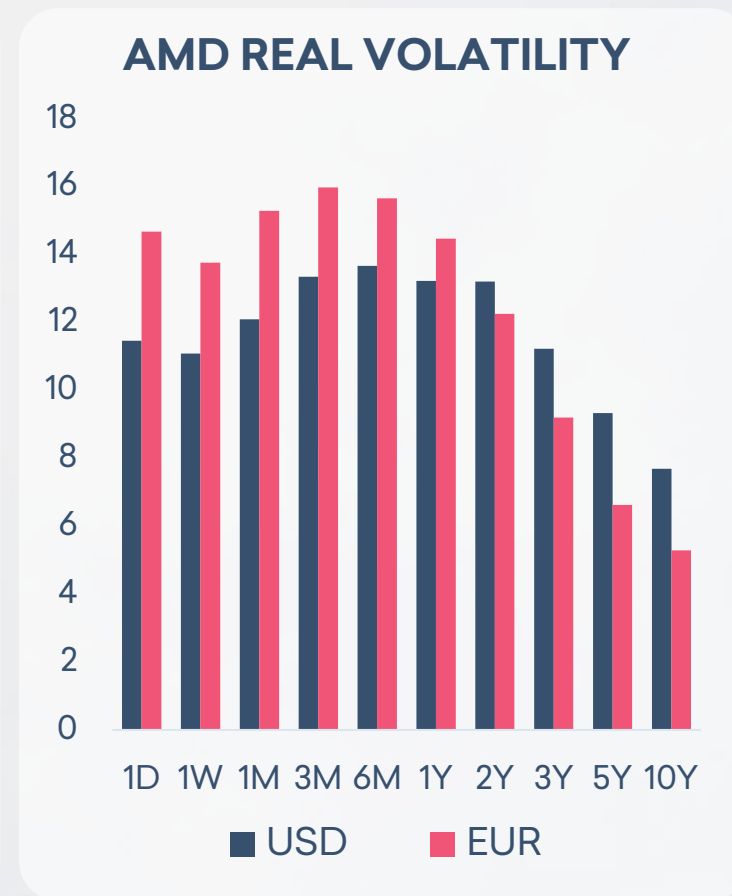
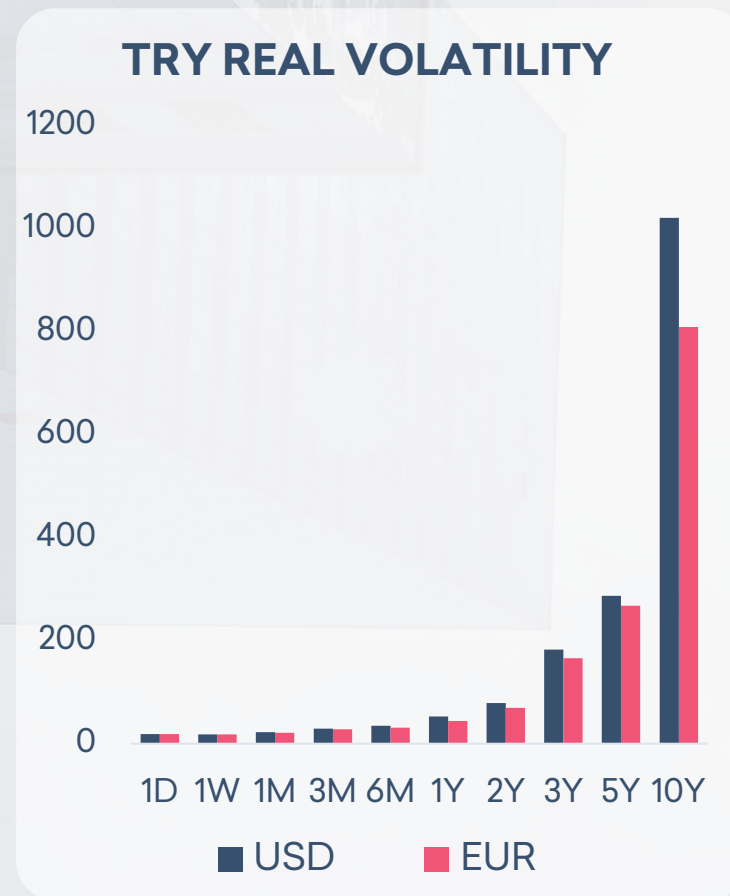
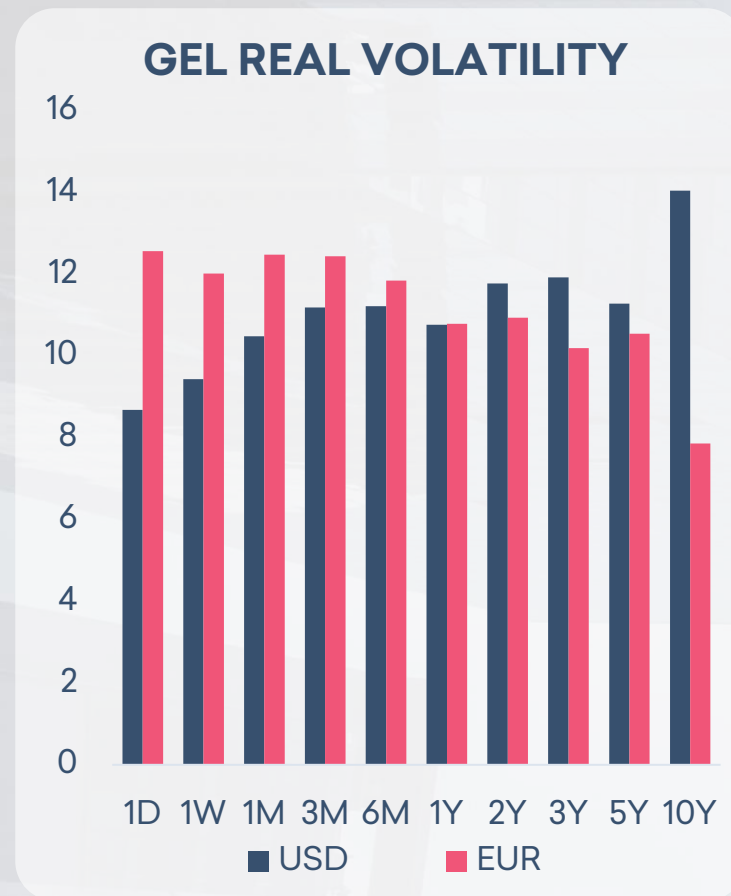
EXCHANGE RATE VOLATILITY AGAINST USD AND EUR (2003-2024-July, %)



Source: Central Banks, Own Calculations

...IN REAL TERMS AS WELL

EXCHANGE RATE REAL VOLATILITY* AGAINST USD AND EUR (2003-2024-July, %)

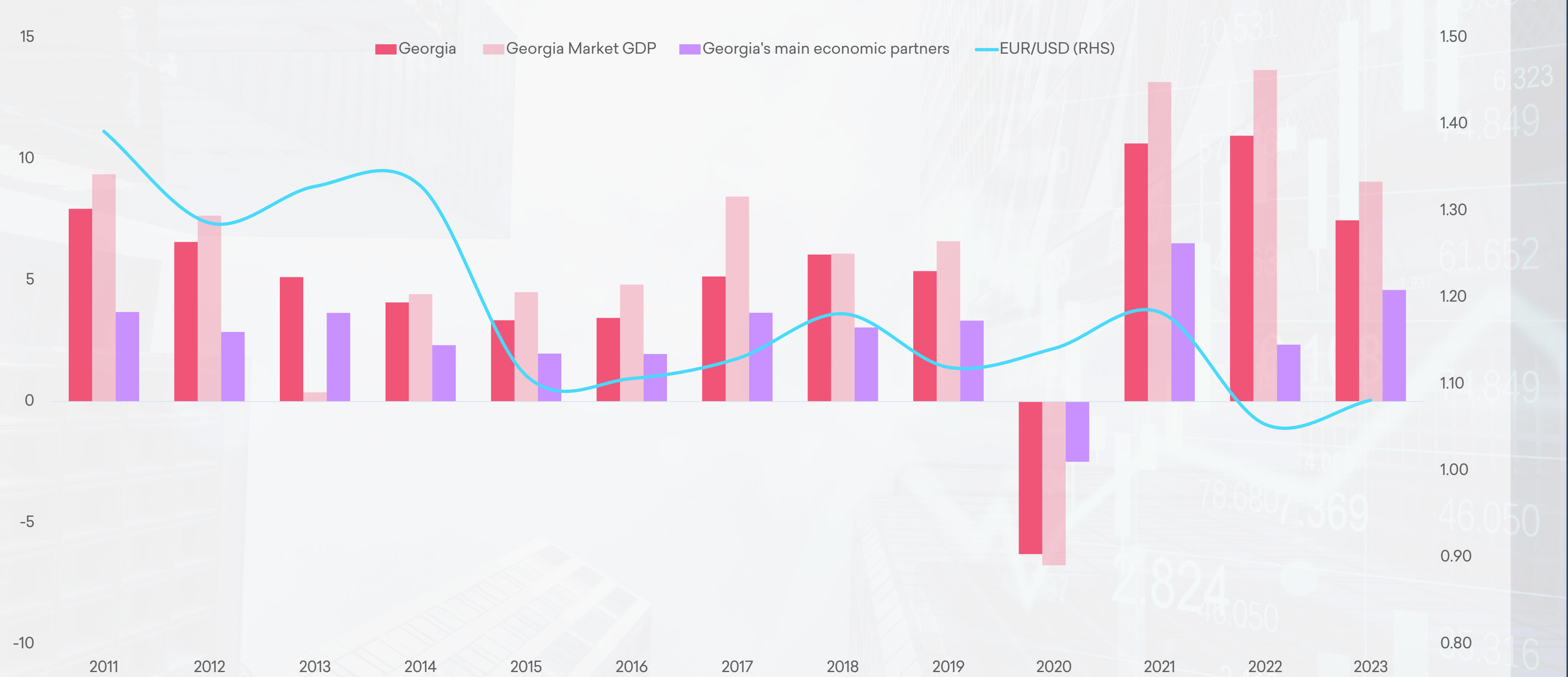


*Real volatility is calculated without US and Euro Area inflation.

Source: Central Banks, Own Calculations

...AND GROWTH

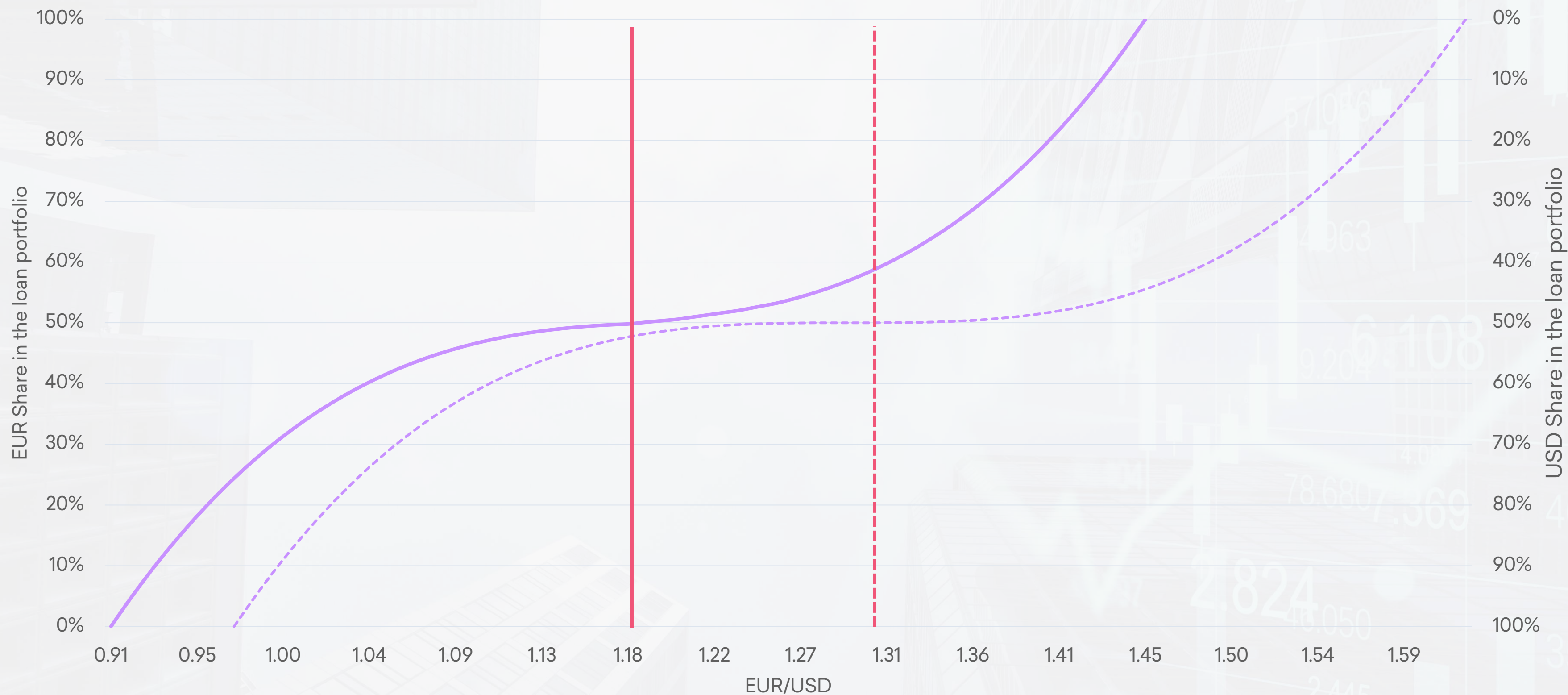
GDP GROWTH AND EUR/USD



Source: IMF, FRED, Geostat

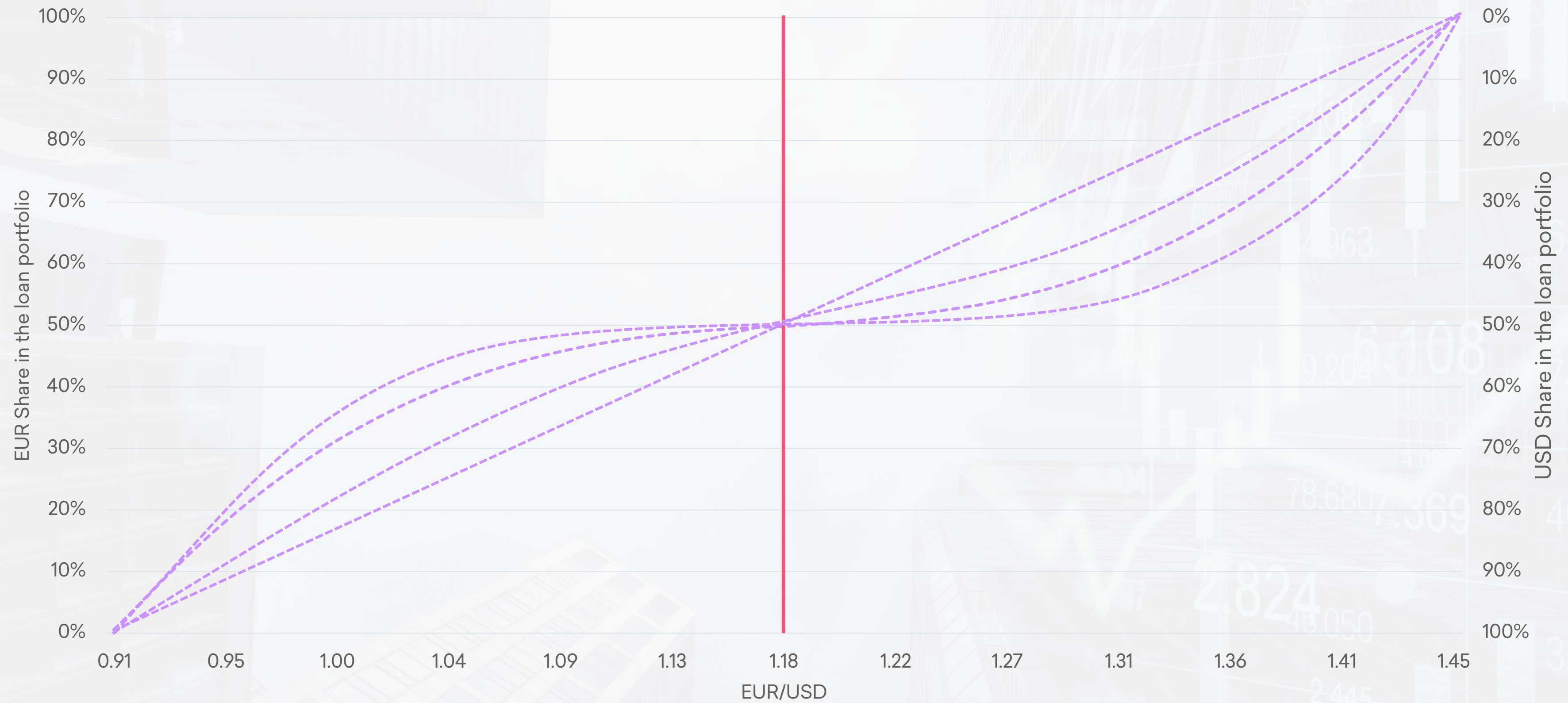
WHAT IS THE OPTIMAL PORTFOLIO ALLOCATION IF OPPORTUNITIES AND RISKS ARE NOT EQUAL?

ESTIMATES OF POTENTIALLY OPTIMAL EUR/USD ALLOCATION WHILE TAKING UP FX RISK IN GEORGIA (LOANS), ADJUSTED FOR GEL AND GROWTH



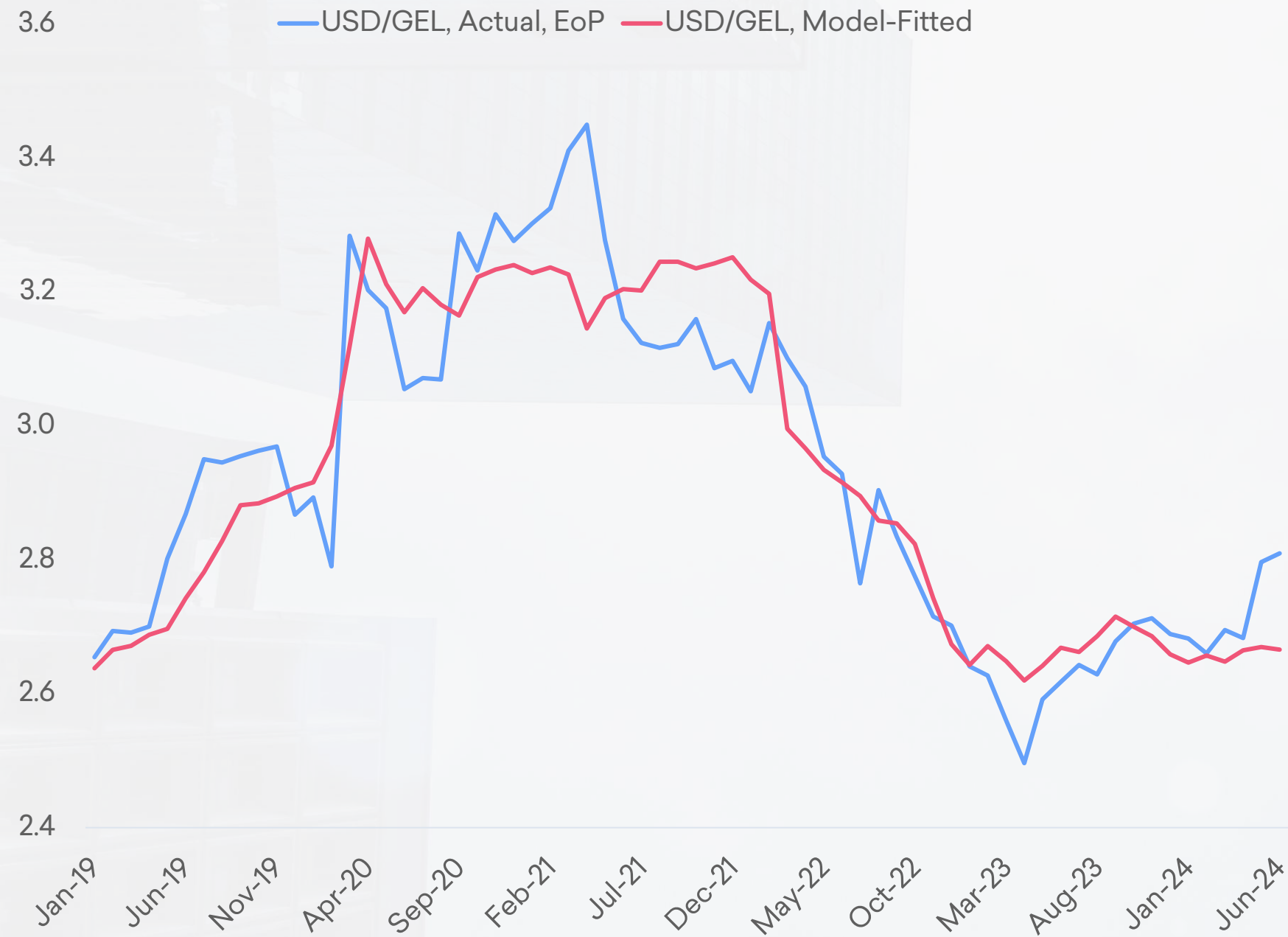
IT IS THE PRINCIPLE THAT MATTERS

ESTIMATES OF POTENTIALLY OPTIMAL EUR/USD ALLOCATION WHILE TAKING UP FX RISK IN GEORGIA (LOANS), ADJUSTED FOR GEL AND GROWTH



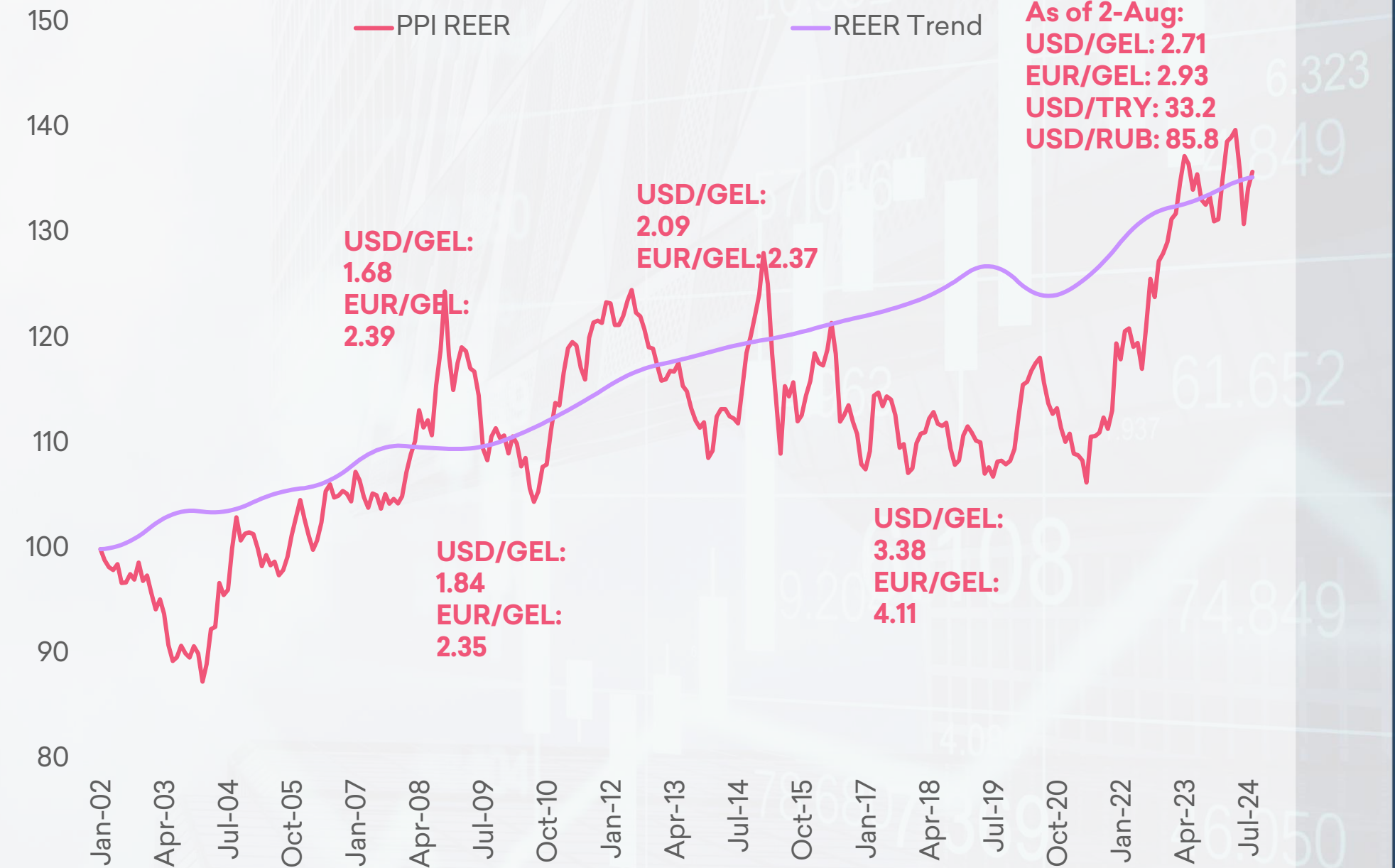
AND WHAT ABOUT THE GEL SHARE?

ACTUAL AND FITTED USD/GEL



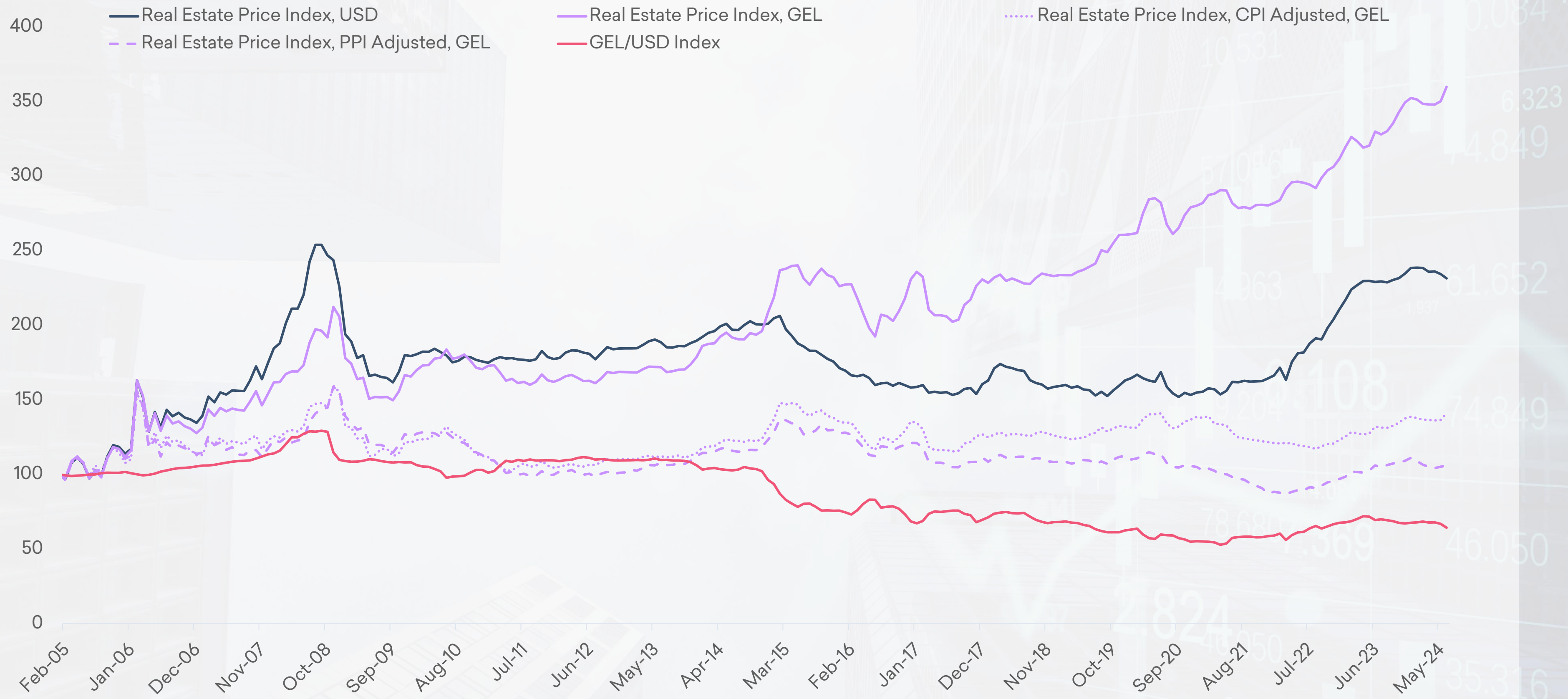
Model description: we estimate the USD/GEL exchange rate as a function of GEL and FX deposits and loans, foreign currency inflows (sum of merchandise exports, tourism revenues and remittances) and global USD dynamics (proxied by the DXY index, measuring the value of USD against a basket of global currencies). The model is estimated in log form by the seemingly unrelated regression (SUR) method, allowing error terms to be correlated across the equations. Using USD-only or the sum of USD and EUR deposits/loans, as well as net inflows instead of inflows, do not significantly alter estimates. Further robustness checks include using the generalized method of moments (GMM) estimator to account for potential endogeneity, and separate estimates for the model in levels and differences in addition to the full-sample model and a structural break post-February 2022.

GEL REER ACTUAL AND FITTED REER (increase means GEL appreciation)



Note: As of 2-Aug-24. PPI REER data is estimated from January 2013
 REER Trend is estimated based on GDP per capita growth differential between Georgia and its main trading partners using relative trade weights and adjusted for the share of non-tradable sector

GEL/EUR/USD OR JUST REAL GEL?



*See the publication: [Pricing GEL inflation-linked bonds using USD benchmark.](#)

WHAT ABOUT OTHER SECTORS – FOR THE FOLLOW UP



Commercial real estate - higher tenure and therefore more medium-to-long term value looks less passthrough on price



FMCG – less hedged, but also less cyclical

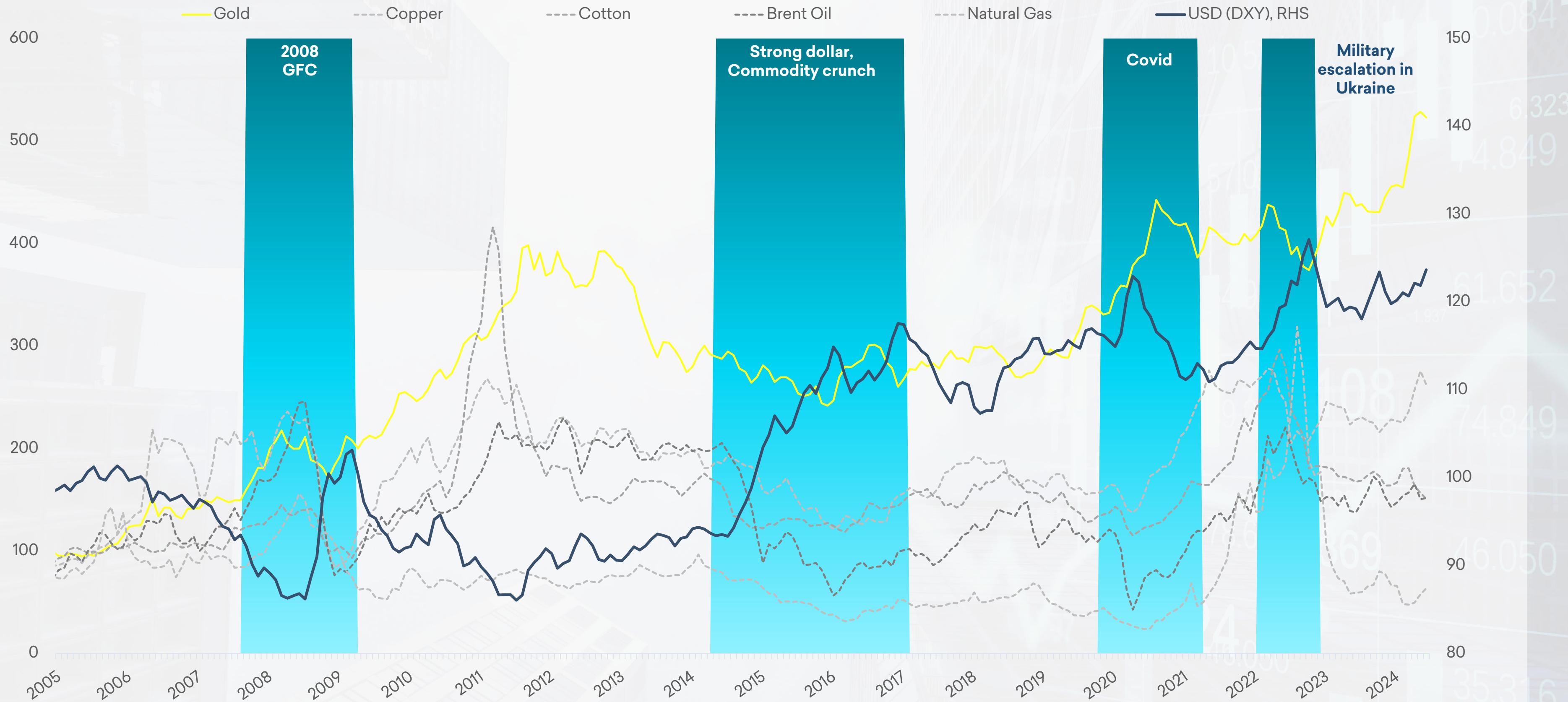


Export markets – underlying revenue currencies



Banks – manage on an exposure but also on a portfolio level

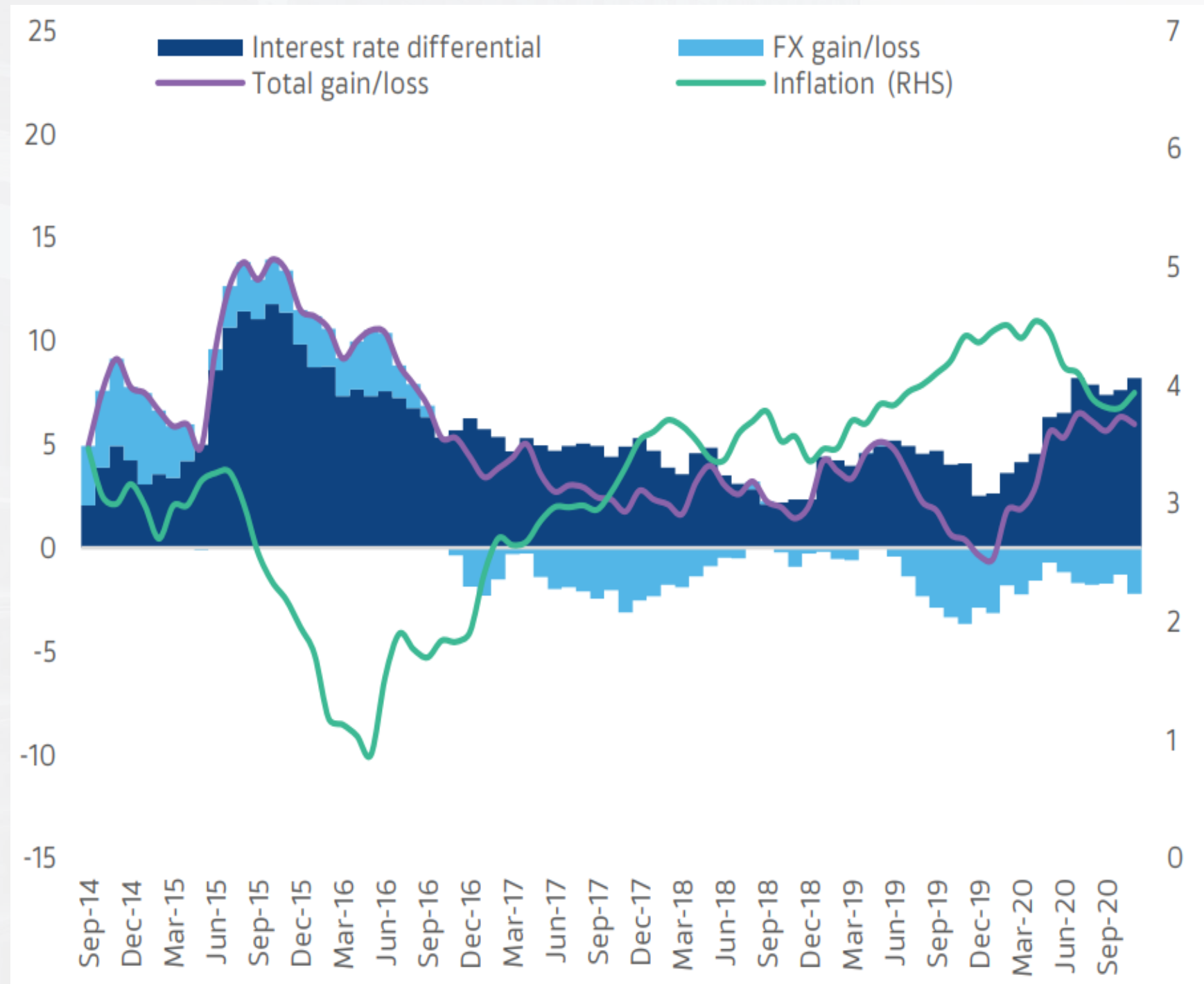
WHAT ABOUT OTHER COUNTRIES? – UZBEKISTAN



*See the publication regarding thematic insights - [Uzbekistan: The Three Pillars](#).

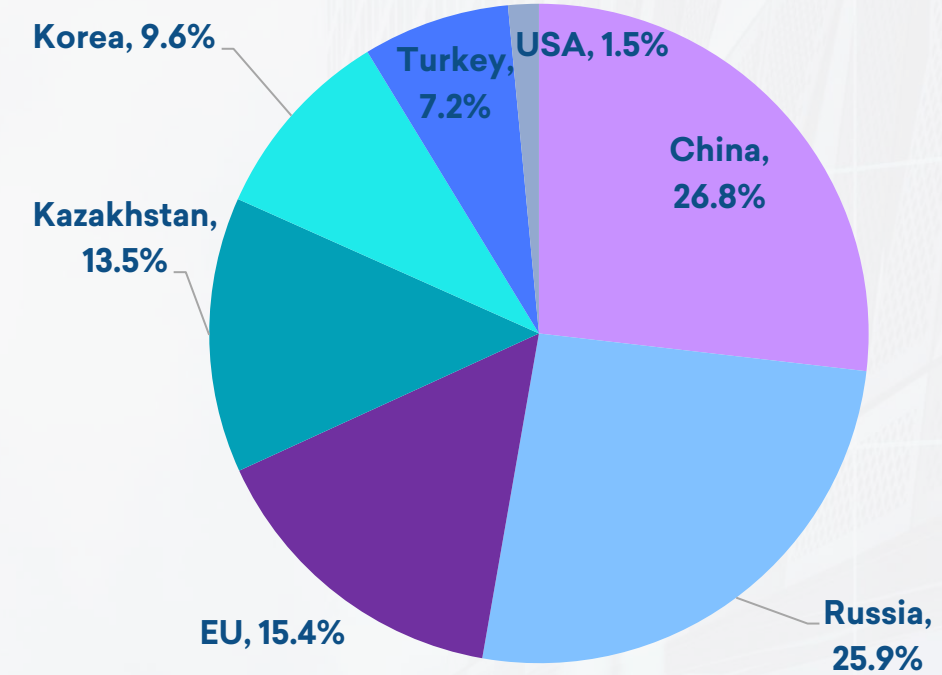
AND NOT ONLY LOCAL CURRENCY WITH EUR/USD

ANNUALIZED FX AND INTEREST RATE GAIN/LOSS RELATIVE TO A GEL LOAN FOR THE 5-YEAR HORIZON OF THE THREE-CURRENCY PORTFOLIO* (%)

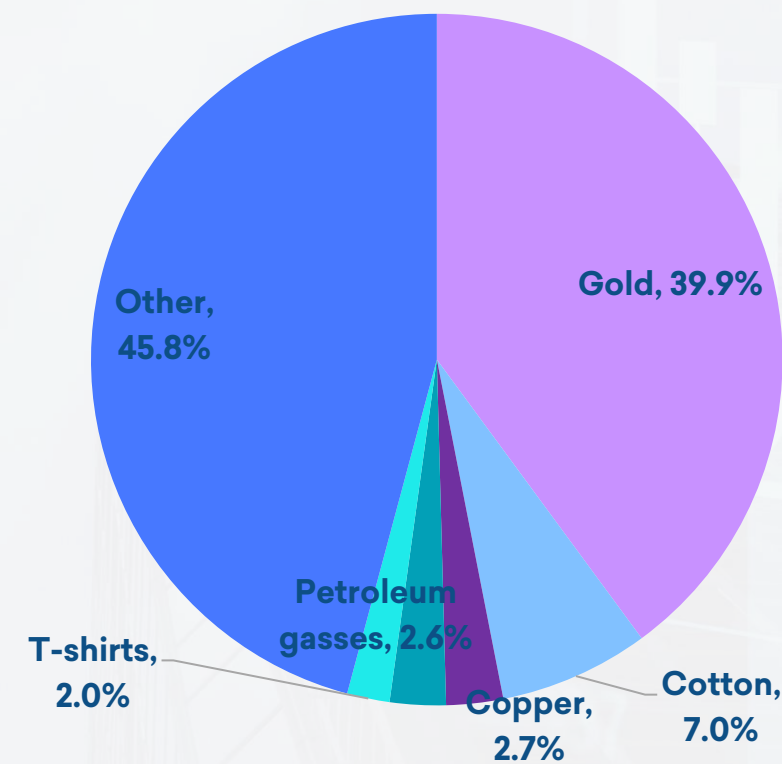


*See the [publication](#) for details.

UZBEKISTAN REER STRUCTURE, % SHARE



UZBEKISTAN EXPORTS BY PRODUCTS, 2023 (% SHARE)



SUMMING UP

- WE FIND EVIDENCE OF A SIGNIFICANT PASS-THROUGH FROM THE EXCHANGE RATE TO REAL ESTATE PRICES, UNDERLINING THE IMPORTANCE OF OPTIMIZING THE FX FUNDING STRUCTURE
- IN THE SHORT-TO-MEDIUM TERM, EUR APPRECIATION AGAINST USD LOOKS TO BE THE BASELINE SCENARIO
- STILL, SOME SHARE OF EUR IS RATIONAL, AS GEL AND ECONOMIC GROWTH IN GEORGIA ARE MORE STABLE IN EUR THAN IN USD
- ALL IN ALL, A BASKET OF GEL/EUR/USD LOOKS THE MOST OPTIMAL, WITH AROUND 35-25-40% SHARES RESPECTIVELY FROM THE MEDIUM TO LONG TERM PERSPECTIVE
- HOWEVER, AS RESIDENTIAL REAL ESTATE PROJECTS ARE USUALLY UP TO 3 YEARS, FOR THE SHORT-TERM, A HIGHER SHARE OF THE EUR AND, POSSIBLY, THE GEL SHOULD BE CONSIDERED
- AN OPTIMAL FUNDING STRUCTURE YIELDS NOT ONLY RESILIENCE DURING CRISES, BUT ALSO SPACE FOR HIGHER PROFITABILITY IN THE ABSENCE OF STRESS DUE TO HIGHER LEVERAGE OF BOTH THE BUSINESS AND THE BANK
- SPECIFIC ALLOCATION, APART FROM MACRO DRIVERS, DEPENDS ON BUSINESS CHARACTERISTICS
- THESE FINDINGS CAN BE APPLIED TO ADDITIONAL SECTORS AND COUNTRIES, TO BE FOLLOWED UP IN OUR FORTHCOMING PUBLICATIONS

THANK YOU

In practice it is very difficult to incorporate macro in business strategies and vice versa, but both business and economists should do their best as macro matters and sometimes matters the most!

TBC Capital macro [publications](#)

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