THE VIEW

Economic Research

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IN OR OUT? MEASURING THE EURO BREAK-UP RISK

EULER HERMES

Allianz

EXECUTIVE SUMMARY

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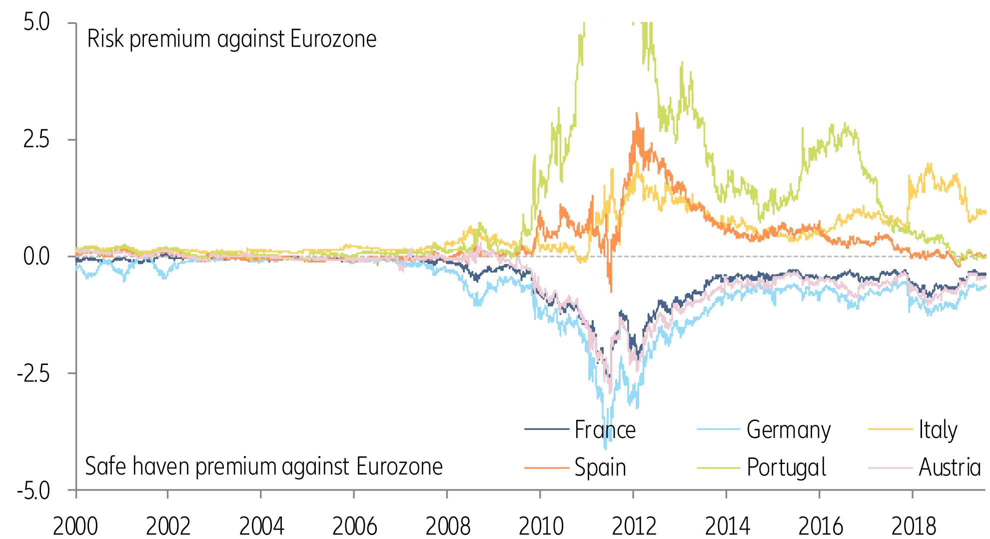
- As a legacy of the euro crisis, the reversibility of Eurozone membership has become a generally accepted risk, especially for euro government bonds. The European Central Bank bail-out commitment ("Whatever it takes" and Outright Monetary Transactions, OMT) has capped the risk below systemic levels – for now. But euro government bonds do include a premium for redenomination risk, i.e. the risk of being redenominated into a new national currency. Redenomination premia happen to be important drivers of euro sovereign yields, influencing the steepness of the curve and contributing to the low yield level in core Eurozone countries.
- Using the redenomination premia of 11 Eurozone countries, we introduce the "**Allianz Euro Fragility Index**" to capture the systemic tail risk of a Eurozone breakup. While it stands at 0.04, implying low overall risk currently, it is very likely that we will again experience phases of increased redenomination risk as its underlying causes, namely the perceived weakness of the euro architecture and political uncertainty, persist.
- Looking at the implied exit probabilities for each Eurozone member, **we find the probability of an Italian exit is currently around 6%. For France it is around 1% and for Germany around 2%.**

6%

PROBABILITY OF AN ITALIAN EXIT FROM THE EUROZONE

Italeave, Frexit, Oustria ... besides linguistic creativity, these neologisms indicate a general awareness of the Eurozone membership potentially being reversible. For capital markets, this implies that all euro-denominated assets should actually bear the risk of being "re-denominated", at least if they are issued under local law. This redenomination risk is most apparent for government bonds as they are most closely linked to the sovereign lex monetae1. In this paper, we extract the redenomination premium from euro sovereign spreads for the 2 year and 10 year maturities. We concentrate on the spreads against the volume weighted Eurozone yield curve2. This implies the survival of the Eurozone in one form or another. We therefore place ourselves in a scenario of a partial break-up (unlike when using the spread over German bunds, where the bilateral approach implies a total Eurozone break-up).

Figure 1: Evolution of euro sovereign spreads (10y vs Euro area, in pp)



Sources: Refinitiv, Allianz Research

[1] Principle according to which a sovereign state chooses by law the currency it uses for payments and to honor its contracts.
[2] As these are relative to the Eurozone, the respective premia are positive in case of higher risk and negative in case of lower risk.

HOW SOVEREIGN ARE EURO GOVERNMENT BONDS

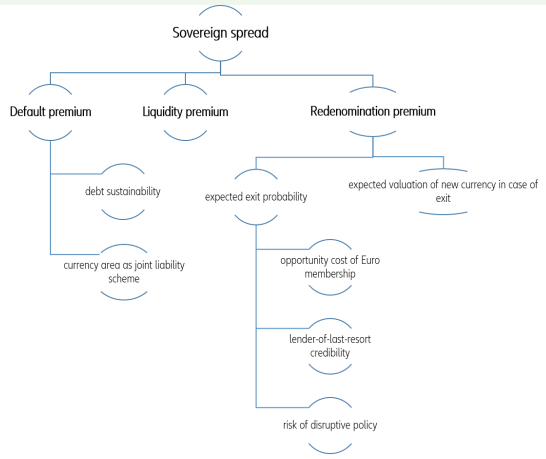
Generally, sovereign spreads in the Eurozone put one price on three different risks: liquidity risk (which is not covered in this paper), default risk and redenomination risk (see illustration 1).

The premium for default risk is based on the perception of debt sustainability according to the country-specific fundamentals. But in addition, it also reflects the perceived credibility of the Eurozone as a system of risk-sharing between member states. This risk component is usually known from sub-sovereign issuers like regional governments joint in a federal scheme of mutual liability.

The premium for redenomination risk is derived from the expected appreciation or depreciation of a new national currency, weighted by the expected exit probability. Generally, the exit probability rises with the perceived opportunity costs for Eurozone membership in terms of interest rate, loss of competitiveness, expected liabilities for other member countries etc. But the exit probability also depends on the perceived willingness or credibility of the central bank to act as lender-of-last-resort. It could have a political component if markets perceive a higher risk of potentially disruptive policies being implemented in one or more member states.

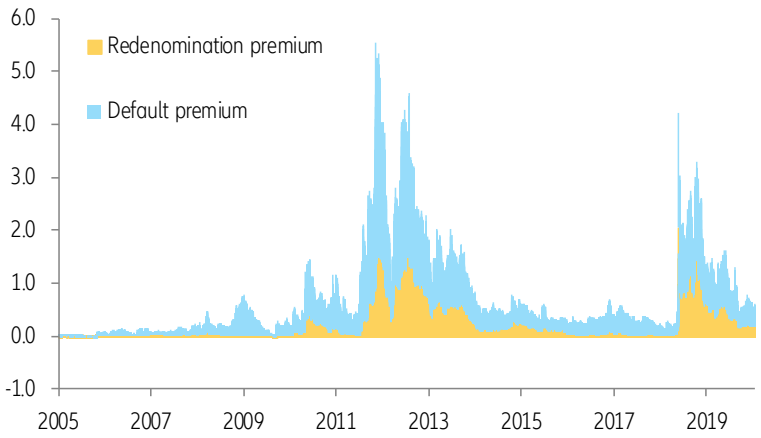
By applying a variance decomposition technique from Ammann et al., we can disentangle the default from the redenomination risk premium (see Figure 2)

Illustration 1: The decomposition of Euro sovereign spreads



Source: Allianz Research

Figure 2: Spread composition for Italy (10y vs Eurozone, in pp)



Sources: Refinitiv, Allianz Research

[3] Ammann, M. and Tobler, J. (2000), Measurement and Decomposition of Tracking Error Variance. Working Paper, University of St. Gallen. The underlying hypothesis in our approach is that in a perfect currency union (exit probability = 0), the government bonds of all member states should be perfect substitutes to each other. That means if yield differences appear, they should be purely attributable to purely idiosyncratic deviations from the currency area's benchmark and not explained by a systematic decoupling. This would be the case if for example bond yields mostly rise when benchmark yield fall. In this setting, when explaining the variance of Euro government bonds yields with respect to the benchmark (German bunds or Euro area yield), there should be no systematic term arising. If it does, the perfect substitute the hypothesis has to be rejected and the systematic part of the variance can thus be interpreted as the redenomination risk. If we compare our decomposition method with other estimation techniques (based on CDS, or FX denominated bonds) we get similar results for the large Euro countries like Italy. However, our approach has the advantage to be hardly exposed to distortions due to liquidity risk and to be applicable to almost all Euro area countries and maturities.

By looking of the evolution of the default and redenomination premia of all Eurozone countries since 2000, we find five major insights:

- Redenomination risk is mainly a corollary of default risk. It generally appears suddenly as a response to expectation shocks when market participants start to fear that sovereign solvability can only be secured by reintroducing a national currency combined with an unconditional back-up guarantee from a national central bank. This is a legacy from the euro crisis. Before, sovereign spreads in the Eurozone were explained by default risk premia only.

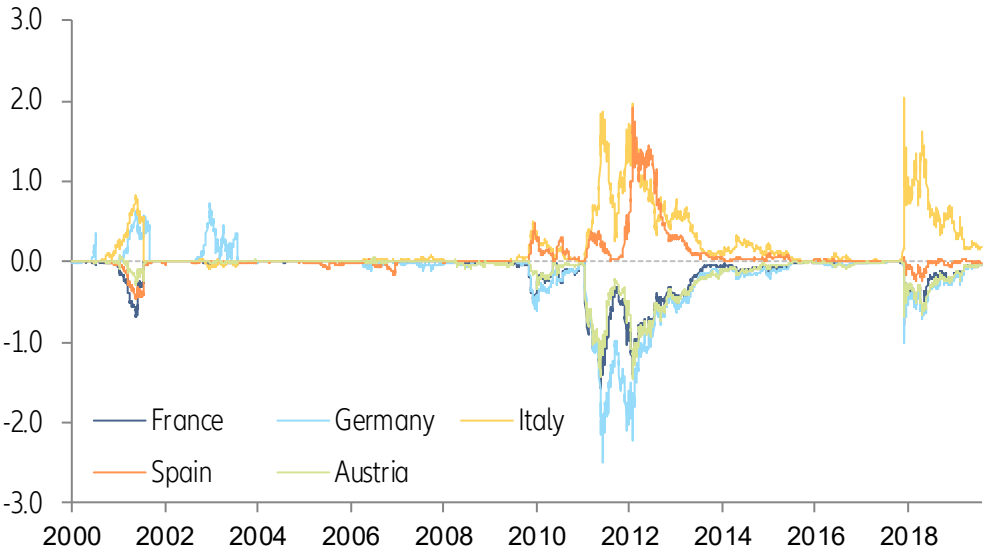
- The ECB put a cap on redenomination risk with Draghi's "whatever-it-takes" speech and the OMT program, at least for now. The possibility of a self-reinforcing loop between default and redenomination risks has been significantly reduced. With OMT, euro sovereigns benefit from a bail-out guarantee backed by (potentially) unlimited central bank reserves. Before, the bail-out guarantee was provided by the European rescue funds backed by the limited fiscal capacities of the member states. OMT, however, remains a conditional bail-out guarantee, subject to participation in an European Stability Mechanism program. Therefore, redenomination risk is currently capped, but it still exists.

- A new type of redenomination stress appeared in mid-2018 related to the government involvement of Eurosceptic parties in Italy (M5S and Lega). But at this time, the rise in redenomination risk did not cause a contagion. It was an episode of insulated repricing of political uncertainty.

- However, one should not confound redenomination risk and political uncertainty (as measured for instance by the EPU Index). Redenomination risk only captures the systemic tail risk of a Eurozone break-up, while the EPU Index is a much broader risk measure. For political uncertainty to be reflected in redenomination risk there must be a combination of a significant expected exit probability and an expected change in the valuation of the new national currency. Especially for smaller, export-oriented countries, the opportunity costs of leaving the Eurozone might be perceived as prohibitory. This could be the reason why redenomination premia hardly appear in countries with relatively strong Eurosceptic parties, like the Netherlands, even when political uncertainty was high (see Figure 5).

- Finally, short term investors generally seem to be more sensitive to redenomination risk. The impact of redenomination risk on the yield level tends to be stronger for the 2y than for the 10y maturity (see Figures 3 and 4). These results have been confirmed by other studies (i.e. Bayer et al., 2018)[4]. This term structure of redenomination risk provides interesting insights when assessing sovereign yield curve movements. For example, in July 2018, the Italian 2y yield was almost entirely explained by the redenomination premium while it accounted only for 20% of the 10y yield. Here, half of the yield level was still explained by the level of the Eurozone benchmark (see Figure 6). In January 2020, Italian yields were 60 bp lower on the 2y maturity and 130 bp lower on the 10y maturity. But the 2y yield mainly dropped due to a strong reduction of the redenomination premium, while for the 10y maturity the major part of the yield drop was attributable to the level shift in the benchmark yield.

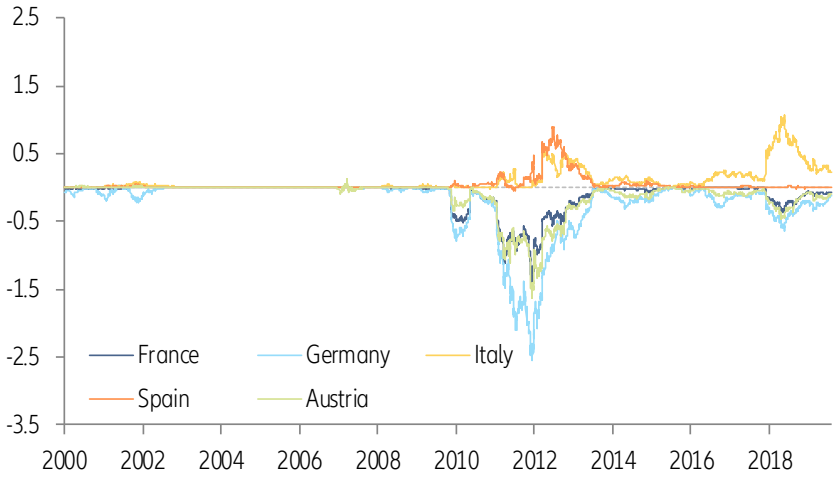
Figure 3: Evolution of redenomination risk premia (2y vs Eurozone, in pp)



Sources: Refinitiv, Allianz Research

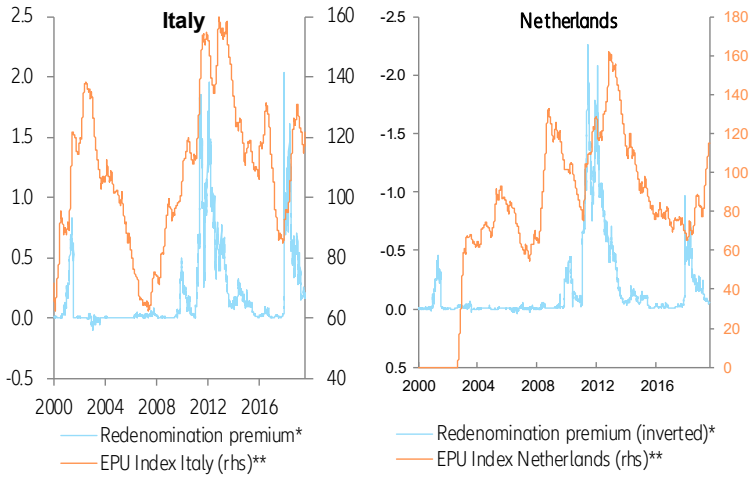
[4] Bayer, C., Kim, C.H. and Kriwoluzky A. (2018) The term structure of redenomination risk, DIW Research Paper 1740.

Figure 4: Evolution of redenomination risk premia (10y vs Eurozone, in pp)



Source: Refinitiv, Allianz Research

Figure 5: Political uncertainty and redenomination risk

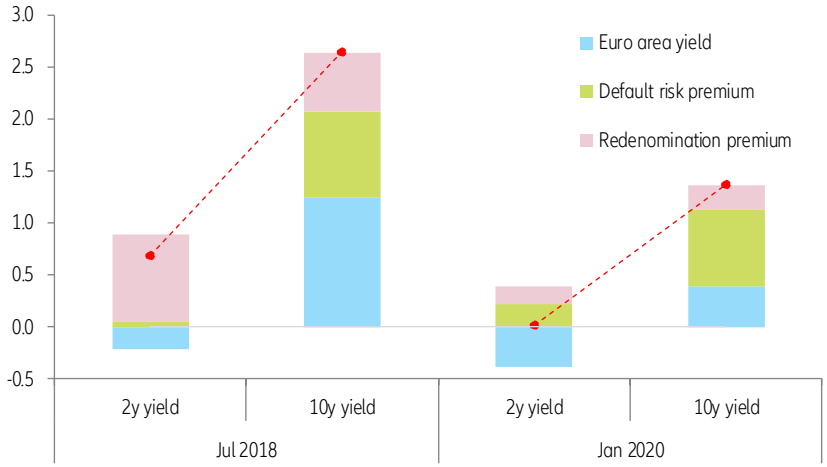


**derived from 2y spread vs Euro area, in pp*

***Economic Policy Uncertainty Index, filtered*

Source: Refinitiv, Allianz Research

Figure 6: Italy - Yield decomposition (in pp)

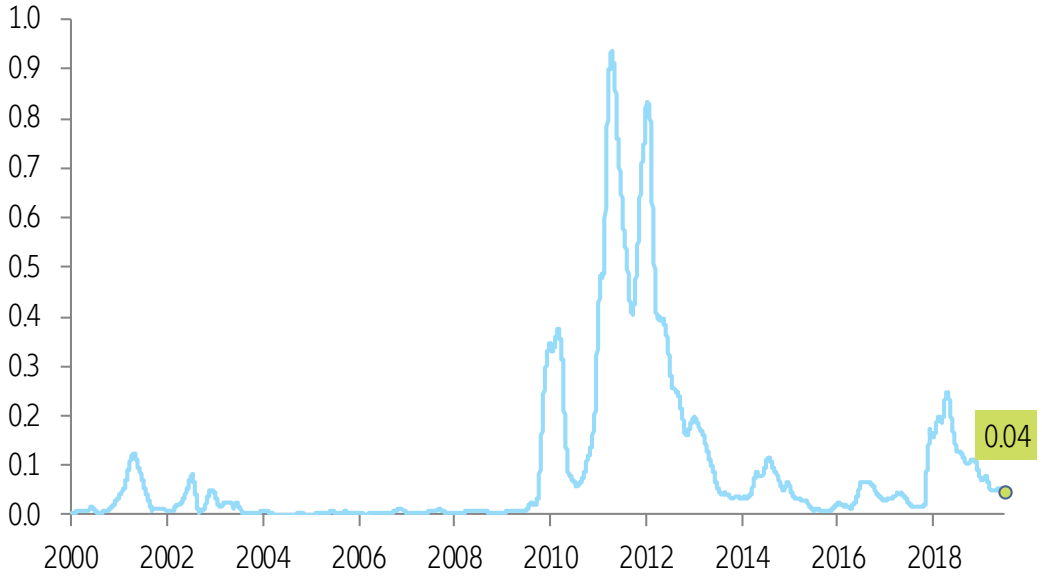


Source: Refinitiv, Allianz Research

THE ALLIANZ EURO FRAGILITY INDEX

In our view, redenomination premia are an indicator of the perceived fragility of the Eurozone. We consider that the stronger their divergence, the higher the perceived fragility of the Eurozone, the higher the likelihood of the systemic tail risk of a Eurozone break-up to be realized. We therefore construct an index based on the redenomination premia of 11 Eurozone countries using cross-sectional volatility as a measure of dispersion. This "Euro Fragility Index" currently stands at 0.04, which signals a situation of low fragility (see Figure 8). However, the mid-2018 episode has shown how quickly these situations can revert.

Figure 7: Allianz Euro Fragility Index*



*based on cross-sectional volatility of 2y and 10y redenomination premia, normalized (DE, FR, AT, NL, BE, IT, ES, PT, GR, IE, FI)

Sources: Allianz Research

REDENOMINATION PREMIUM AND EXIT PROBABILITY

Redenomination premia can also provide an estimation of the expected exit probability implicitly priced into euro sovereign spreads. As a reminder, the redenomination premium consists of two parts: the expected "currency valuation given exit" (from now on referred to as CVGE) and the expected exit probability. The latter can therefore be estimated by relating the redenomination premium to the CVGE. By remaining in a scenario of a partial Eurozone break-up, the CVGE can be estimated by, for instance, comparing the evolution of prices (GDP deflators) in one country to the evolution in the euro are,a excluding this country since the Euro introduction. However, this estimation method is based on the following assumptions:

1. The adjustment to a new equilibrium exchange rate happens very quickly after the exit (no overshooting). As this is a strong assumption, these estimates should be seen as upper limits.
2. Following the exit, the nominal exchange rate compensates entirely for all real exchange rate movements since the euro introduction.
3. The exchange rate was in a state of equilibrium when the country entered joined the Eurozone.

We observe an appreciation potential for France and Germany against a residual euro. On the other hand, Portugal, Spain and Italy exhibit significant potential for depreciation. The potential appreciation potential for Greece, however, seems strongly distorted by the growth shock following the euro crisis. Generally, one can observe that price differences in the Eurozone have declined since the peak in 2009.

Combing the redenomination premium and CVGE provides us with estimates for the implied exit probabilities (see Table 1) of Eurozone countries.

Table 1: Implied exit probabilities (partial Eurozone break-up)*

	Spread vs EA (10y, in bp)	Redenominati on premium (10y, in bp)	Currency Valuation Given Exit (CVGE)	Implied exit probability (10y, p.a.)	Spread vs EA (2y, in bp)	Redenomination premium (2y, in bp)	Implied exit probability (2y, p.a.)
Germany	**-64.4**	**-12.7**	**6.0**	2.1%	-20.9	-4.0	0.7%
Austria	-47.2	-10.1	-4.2	2.4%	-16.6	-4.1	1.0%
Greece	98.8	19.9	3.4	5.8%	n.a.	n.a.	n.a.
Portugal	1.6	0.1	-7.5	0.0%	2.4	0.4	0.1%
Spain	2.3	0.1	-4.9	0.0%	-4.5	-2.0	0.4%
Italy	**97.2**	**23.6**	**-3.6**	6.6%	39.1	17.5	4.9%
Ireland	-37.9	-7.3	-1.6	4.6%	-7.2	-7.2	4.6%
France	-39.0	-6.4	5.1	1.3%	-17.7	-4.5	0.9%
Netherlands	-55.6	-12.7	-2.6	4.9%	-20.0	-5.0	2.0%
Belgium	-40.7	-6.5	-2.5	2.6%	-16.7	-6.4	2.6%
Finland	-45.0	-11.8	-1.6	7.5%	-19.1	-4.3	2.7%
Slovenia	-18.1	-6.8	-20.0	0.3%	17.2	1.1	0.1%
Slovakia	-36.9	-7.4	-7.2	1.0%	13.4	13.4	1.9%

*as of end of January 2020

Sources: Refinitiv, Allianz Research

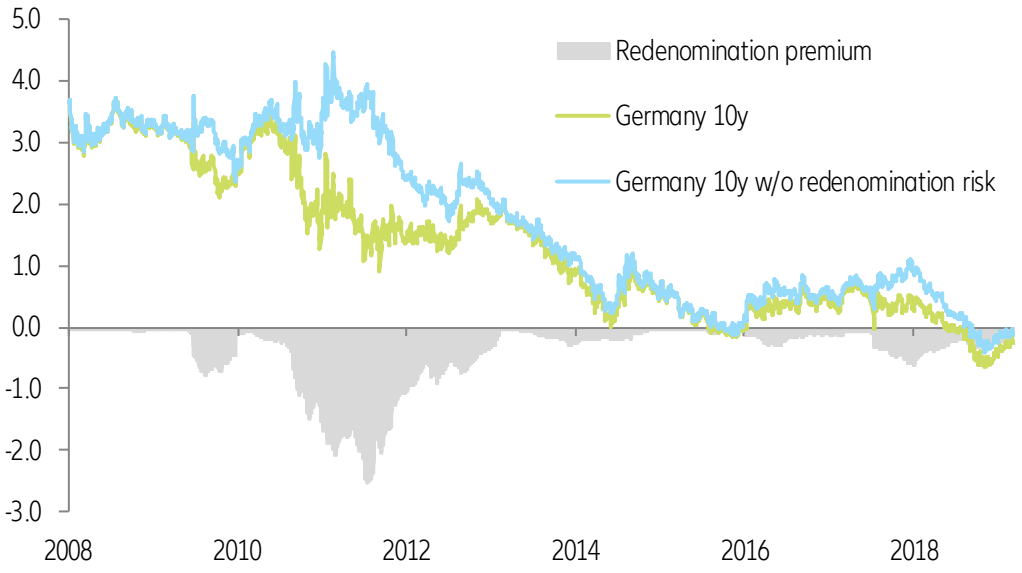
For Italy, it is currently between 6.6% and 4.9% p.a. depending on whether one uses the 10y or 2y maturity for the estimation of the redenomination premium. For Spain and Portugal, despite a potential depreciation, there is almost no exit probability priced in. Core countries like Germany and the Netherlands exhibit exit probabilities of 2% to 5% p.a. However, in these cases, one can also interpret these as implied probabilities for a systemic shock, against which their government bonds provide a systemic hedge.

This means that when an investors buys a 10y Italian government bond, he gets a premium of 23.6 bp but bears a loss of 3.6% if the exit occurs (see Table 1 in bold). Inversely, when buying a 10y German bund, an investor implicitly pays a premium of 12.7 bp but realizes a gain of 6.0% if the exit occurs (see Table 1 in bold). This illustrates the fact that the low level of core euro area yields isn't only attributable to structural and monetary factors but also due to their hedging properties against the systemic shock of an Eurozone break-up. This means the 10y German yield could currently be 13 bp higher if the Eurozone architecture was perceived as sufficiently solid to eliminate any expected probability of a Eurozone exit.

Redenomination premia are the opportunity cost of the imperfect status quo of the currency area

Our analysis shows that the overall risk for a Eurozone break-up is currently low. However, it is very likely that we will again experience phases of increased redenomination risk as its underlying causes persist. The Euro architecture is still too weak to prevent expectations building up over possible Eurozone exit (e.g. OMT remains a conditional lender-of-last-resort commitment). And price developments are still sufficiently large to allow valuation expectations of new national currencies. More price convergence could be achieved by strongly coordinating economic policies and transfers. However, this incurs other economic and political costs. It seems that for decision–makers, these costs still outweigh the advantage of eliminating redenomination risk. For the foreseeable future, redenomination premia will therefore persist as the opportunity cost for the imperfect status quo of the currency area. But this is a risky strategy. Redenomination premia have polarizing redistributive effects among member states. They represent additional financing costs for the weaker members while acting as discount for the safe haven members. This can foster Eurosceptic sentiments, which may lead to higher expected exit probabilities and thus even higher redenomination premia. Such a politically induced redenomination risk spiral could be harder to contain by the ECB.

Figure 8: Impact of redenomination risk on German yield level (10y, in pp)



Sources: Refinitiv, Allianz Research

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