

European Sovereign Debt Risk Management: the Role of an European Debt Agency

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Executive Summary

This paper proposes the establishment of a European Debt Agency (EDA) as a tool for the efficient management of Eurozone, to address two primary risks: roll-over and sustainability risk.

- EDA collects liquid funds on the market by issuing bonds with finite maturity.
- EDA provides credit to MSs in form of perpetual loans, priced using a using a transparent formula that would anchor the price to fundamental economic factors.
- This approach would encourage fiscal discipline among Member States and avoid inefficient costs resulting from market price deviations from fundamentals, without resorting to debt mutualization.
- The simulation of a scenario in which flexible fiscal rules are adopted alongside the EDA show smoother path towards debt stabilization due to the mitigation of the macroeconomic effects of excessive fluctuations in risk premia.
- debt management with EDA could offer a comprehensive strategy for managing sovereign debt in the Eurozone that would promote fiscal responsibility and stability.

Public Debt as a Risk Factor in the European Macro Scenario

- The current macroeconomic conditions in Europe, characterized by high government debts, low growth, uncertain inflation, and rising interest rates, make effective and efficient risk management for government debt more important than ever before.
- There are two main sources of risk: roll-over and sustainability risk.
 - Sovereign debt roll-over risk refers to the risk that a government may not be able to refinance its existing debt obligations as they come due or roll them over into new debt, causing a default. This risk materializes very rapidly with a collapse in the price of sovereign bonds. Roll-over risk can serve as a tool to deter excessive debt when bond prices are firmly linked to underlying fundamentals. However, its efficiency as a discipline device is hampered when bond prices diverge from these fundamentals.
 - Sustainability risk refers to the risk that the government debt to GDP ratio gets on an explosive path. This risk materializes when the primary surplus to GDP ratio is permanently lower than the debt-stabilizing primary surplus. Sustainability risk builds more slowly than roll-over risk as it takes time for fluctuations in bond prices to be reflected in the average cost of financing the debt.

De-risking with Fiscal Stabilization

- There is an ongoing broad debate on the changes to be implemented to the Stability and Growth Pact (SGP) in order to prevent these phenomena.
- The fragility of European growth, combined with the containment of inflation, does not allow for sudden fiscal consolidation. Such high debts can only increase the risk of downgrading of the sovereigns of some eurozone countries, a prospect that will be further reinforced as soon as the ECB returns to applying the capital key rule. The debt normalization path could exacerbate the problems related to the scarcity of safe assets in the European financial system and to the doom loop.
- In order to manage such a delicate situation, several proposals have been put forward to introduce schemes of collaboration and coordination between Member States and European institutions and a debate has emerged on the reform of the current framework for fiscal rules.
- This paper describes the effect of the joint implementation of growth-friendly fiscal rules for debt sustainability and the establishment of EDA as an efficient debt management institution.

EDA as a De-Risking Tool

- The Agency operates under the given fiscal framework and it raises liquid funds from the market by issuing bonds with finite maturity and continuously rolling them over to pay principal and capitalized interests.
- It offers credit to MSs through perpetual loans, which are priced based on their creditworthiness. As the cash flows from these loans are higher than the interest payments on EDA bonds, the Agency accumulates reserves. EDA bonds are traded, while perpetual loans are not, and they are priced using a transparent algorithm that considers them as risky perpetual loans.
- EDA amortizes its loans by recording a liability on its balance sheet under the Expected Loss Provision. The Expected Loss Provision is higher for countries with lower creditworthiness.
- The Agency's long-run equilibrium is maintained by matching its assets and liabilities. The Agency has seed capital, and because loans to MSs are priced differently based on their creditworthiness, there is no mutualization of debt.
- However, the pricing of loans generates a pooling effect that feeds the Solvency Capital of EDA on top of the Endowment. The size of this Solvency Capital justifies the low-risk status of EDA.
- The presence of EDA loans reduce roll-over risk and help MSs hedge their financing from market sentiment vagaries.

Three main points that have emerged in the debate.

- First, during the early stages of eurozone operation, there were several instances of excessive volatility of sovereign debt spreads. These episodes were characterized by prices diverging from their underlying fundamentals and sudden bursts of roll-over risk.
 - Faini 2006, Afonso and Strauch 2007 and Manganelli and Wolswijk 2009, Bernoth et al. 2004, Pagano and Von Thadden 2004, Beber et al. 2009, Corsetti and Dedola 2011, Lane 2012, De Santis 2019, Kremens 2020, Afonso et al. 2019, Ceci and Pericoli 2022
- Second, the creation of a European safe asset is considered crucial for the smooth daily operations of financial market participants and for solving the “doom loop” problem that currently hampers debt sustainability for European banks. Various proposals have been made for creating such a safe asset, the most recent ones being associated with the establishment of a European Debt Agency.
 - Caballero et al. 2017, Golec and Perotti 2017, Greenwood and Vissing-Jorgensen 2018, Krishnamurthy and Vissing-Jorgensen 2012, Alogoskoufis et al. 2020, Bolton and Jeanne (2011), Gennaioli et al. (2014), Gros and Micossi, 2009; Bonneval, 2010; Delpla and von Weizsacker, 2010; Juncker and Tremonti, 2010; Leandro and Monti, 2010; Beck et al, 2011; Hellwig and Philippon, 2011; Brunnermeier et al., 2011, 2017; Dosi et al., 2018; Leandro and Zettelmeyer, 2018; Giudice et al., 2019; Amato et al 2021; Micossi et al. 2021; D'amico et al., 2022, Ubide 2015, Zettelmeyer 2017
- Third, there is currently a debate surrounding the fiscal rule framework, which aims to reduce the risk of debt sustainability while avoiding an excess of restrictive fiscal policies.
 - Blanchard 2021, Giavazzi et al., 2022

EDA's Balance Sheet

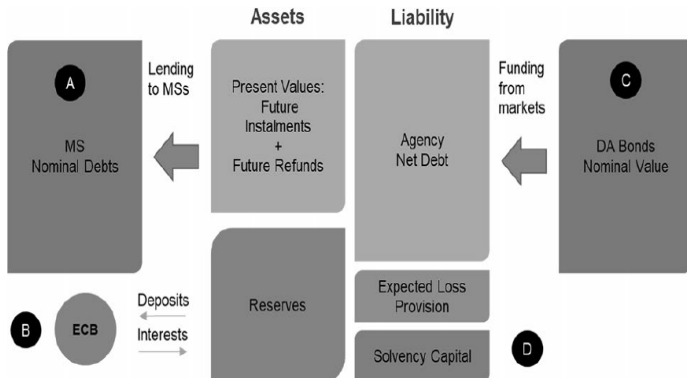


Figure: EDA's Balance Sheet

The working of EDA

- i) The Agency collects liquid funds on the market by issuing bonds with finite maturity and by continuously rolling them over to pay principal and capitalized interests.
- ii) The Agency provides credit to MSs to finance the repayment of their maturing bonds (principal plus interests) as well as their primary budget deficit. This credit facility takes the form of perpetual loans, the Agency is committed to renew the loans perpetually unless a MS partially refunds them through primary budget surpluses.
- iii) The perpetual loans are priced using a risk-adjusted unit cost differentiated according to the MS's creditworthiness. The perpetuity is computed following a perpetual-amortization scheme, EDA amortize its loans by recording a liability on its balance sheet (equal to the Expected Loss) .
- iv) The deferred perpetuities charged to MSs are collected annually and accumulated under an 'accrued interest reserve' item, intended to cover the Agency's future liabilities. The reserve takes the form of a 'Central Bank interest-bearing liability';
- v) The Agency is endowed with solvency capital to withstand the event of a mass entry in state of forbearance on the part of the MSs. We propose to measure this capital in terms of the number of forbearance years of a "stressed" annuity payment that it allows to each MS.

Pricing of Loans

- EDA finance itself by issuing bonds with yield r_t^B to finance Member States with loans that comes in the form of an irredeemable mortgage scheme.
- The irredeemable mortgage scheme is priced by EDA by computing the present value of an infinite stream of payments using the yield r_t^B as a discount rate.
- Future payments are not deterministic, they occur only if states are not in "default".
- The MSs probability of default in each future period is computed by :
 - assigning each MS to a specific credit risk class j , based on its creditworthiness, from the safest (conventionally labelled AAA) to the default class (labelled D)
 - assuming that a country defaults only when it reaches state D, and modelling the transition between states via a transition matrix that depends on the state of the economic cycle,
 - due to stationarity of the business cycle, the predicted point-in-time transition matrix at each period in the future converges rapidly to a constant through-the-cycle transition matrix.
 - The present value of a unitary perpetual annuity for a country i initially in credit risk class j can be then computed as $\tilde{a}_{ij,t}$ and the interest on the perpetual annuity is then set to $\frac{1}{\tilde{a}_{ij,t}}$

The Transition Matrix

The *through-the-cycle transition matrix* *TTC* was estimated averaging publicly available data of rating grades assigned to sovereign debts by Credit Rating Agencies in the period 1993-2015

	AAA	AA	A	BBB	BB	B	CCC	D
AAA	0.9599	0.0401	0	0	0	0	0	0
AA	0.0179	0.9107	0.0643	0.0071	0	0	0	0
A	0	0.0281	0.8989	0.0730	0	0	0	0
BBB	0	0	0.0528	0.8746	0.0561	0.0132	0.0033	0
BB	0	0	0	0.0490	0.8529	0.0784	0.0131	0.0065
B	0	0	0	0	0.0706	0.8853	0.0294	0.0147
CCC	0	0	0	0	0	0.3846	0.4231	0.1923
D	0	0	0	0	0	0	0	1

Table: Estimated TTC transition matrix

Pricing of Loans: An Illustration

$$E\mathbf{cdp}(t, t + \tau) = TTC^\tau \mathbf{v} \quad (1)$$

$$\mathbf{sp}(t, t + \tau) = E[\mathbf{1} - \mathbf{cdp}(t + \tau)] \quad \text{for } \tau > 1 \quad (2)$$

The expected present value of a vector of unitary annuity maturing at time $t + \tau$ can be written as:

$$\mathbf{a}(t, t + \tau) = \sum_{j=1, \dots, \tau} \frac{1}{(1 + r_t^B)^j} \mathbf{sp}(t, t + j) \quad (3)$$

By letting $\alpha = \frac{1}{(1 + r_t^B)}$ and $B = \frac{TTC}{(1 + r)}$, the expected present value of a vector of unitary perpetual annuity can now be written as:

$$\begin{aligned} \mathbf{a}(t) = \lim_{\tau \rightarrow \infty} \mathbf{a}(t, t + \tau) &= \frac{\alpha}{1 - \alpha} \mathbf{1} - B' \mathbf{v} \\ B' &= B(I - B)^{-1} \end{aligned} \quad (4)$$

Idiomatic Pricing

- Each Member State debt is priced independently.
- Given the unitary perpetual annuity value the annual instalment cost for each country, labelled as “idiomatic fundamental price”, is computed in order to preserve the financial equilibrium of EDA. To this end each country should pay an annual instalment, $c_{ij,t}$ that ensures the match between the present value of the perpetuity's payment and the difference between the value of bonds issued by EDA to finance the country, $B_{i,t}^{EDA}$, and reserves accumulated by the country with EDA, $R_{i,t}^{EDA}$:

$$c_{ij,t} = \frac{B_{i,t-1}^{EDA} - R_{i,t-1}^{EDA}}{\tilde{a}_{ij,t}}.$$

Idiomatic Pricing and Average Pricing

- Think of a simple two countries example, where country 1 is low risk and country 2 is high risk
- Idiomatic Pricing

$$\begin{aligned}c_{11,t} &= \frac{B_{1,t-1}^{EDA} - R_{1,t-1}^{EDA}}{\tilde{a}_{11,t}} \\c_{26,t} &= \frac{B_{2,t-1}^{EDA} - R_{2,t-1}^{EDA}}{\tilde{a}_{26,t}} \\p_t^{EDA,IP} &= c_{11,t} + c_{26,t}\end{aligned}$$

- Average Pricing

$$\begin{aligned}\tilde{a}_{av,t} &= \tilde{a}_{26,t} \frac{B_{2,t-1}^{EDA} - R_{2,t-1}^{EDA}}{B_{t-1}^{EDA} - R_{t-1}^{EDA}} + \tilde{a}_{11,t} \frac{B_{1,t-1}^{EDA} - R_{1,t-1}^{EDA}}{B_{t-1}^{EDA} - R_{t-1}^{EDA}} \\p_t^{EDA,AP} &= \frac{B_{1,t-1}^{EDA} + B_{2,t-1}^{EDA} - R_{1,t-1}^{EDA} - R_{2,t-1}^{EDA}}{\tilde{a}_{av,t}}\end{aligned}$$

$$p_t^{EDA,IP} > p_t^{EDA,AP}$$

The Properties of Idiomatic Pricing

“Idiomatic pricing” has several important features.

- Each Member State pays for the risk inherent to the specific credit risk class j to which it is assigned, without involving any form of solidarity or mutuality among Member States of different credit risk classes.
- The annual instalment cost is repriced in each period so that EDA's assets are shielded from interest rate risk and upgrades and downgrades in the merit credit of Member States are timely fully priced.
- Each Member State debt is priced independently and idiomatic fundamental pricing scheme generates a total payment that is structurally higher than the one implied by average pricing.
- Under idiomatic pricing EDA will accumulate reserves that can be precisely attributed to each country. The sum of reserves and loans will exceed the value of bonds and will form the expected losses component of the balance sheet.
 - Under the pricing scheme adopted, all countries are expected to default on a given debt proportion at a (differently distant) finite time in the future, however, EDA has always positive equity. In fact, at the time in which a country is expected to default, reserves will match bonds issued and expected losses will match outstanding loans.
- In the context of a perpetual long scheme where fiscal rules prevent the risk of exploding debts and deficits, capital can be used by MS to suspend the payments of the perpetual loans for a number of “forbearance” years.

EDA and roll-over risk

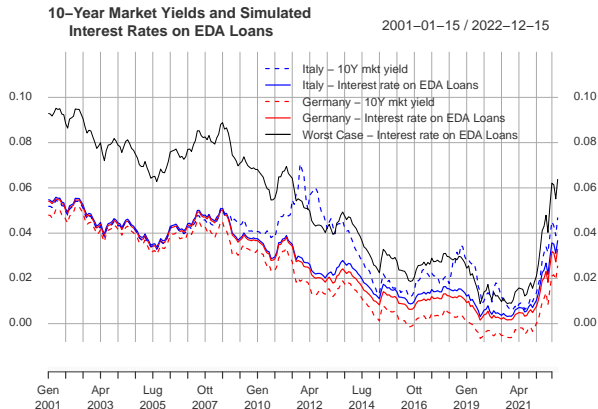


Figure: Yields on 10-year government bonds and simulated interest rate on perpetual EDA loans

Inefficient Pricing

Ceci and Pericoli(2022) provide an estimate of the fair value of the Italian ten-year sovereign spread, defined as the value consistent with the country's macroeconomic fundamentals. They estimate first a panel model with fixed effect for Italy, Spain and France over the period 2007-2022.

$$s_{i,t} = \alpha + \delta_i + \beta_0 Z_{i,t} + \beta_1 X_{i,t} + \beta_2 F_t + \epsilon_{i,t}. \quad (5)$$

where $s_{i,t}$ is the end-of-period spread observed for country i at time t measured as the difference between the 10-year government bond yield of country i and the corresponding 10-year German bond yield; δ_i represents country fixed effects. $Z_{i,t}$ includes country specific macroeconomic variables; $X_{i,t}$ and F_t represent variables related to the risk attitude of investors which are, respectively, country specific (a market-based indicator of redenomination risk, the so-called ISDA basis) and common to all countries (the search volume of “euro break-up” or similar words using the Google search engine). After successful estimation of the model, they determine the fair value of the spread as

$$s_{i,t} = \hat{\alpha} + \hat{\delta}_i + \hat{\beta}_0 Z_{i,t}. \quad (6)$$

Measures of Inefficient Pricing

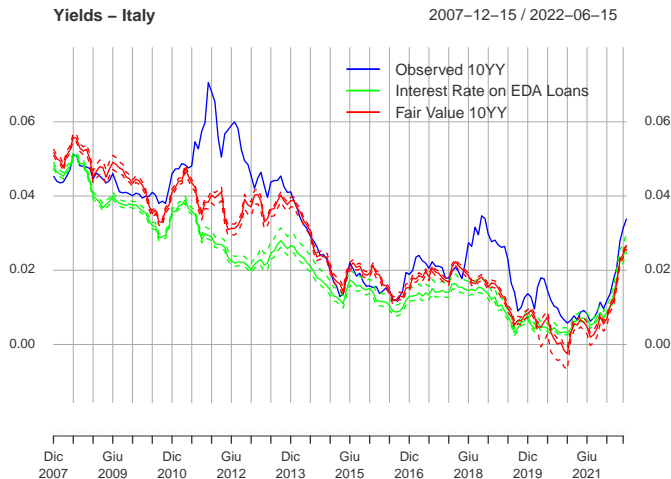


Figure: Italy: Observed 10 Year Yield, fair yield and interest on perpetual EDA loans

Giavazzi et al. 2021 consider a golden rule paired with the separation of the debt into two components: slow speed of adjustment and fast speed of adjustment.

- The proposed rule has a medium-term target for the debt-to-GDP ratio set as follows:

$$\hat{b}_{i,t} = b_{i,t} - 10 * \beta * (b_{i,F,t} - b_{i,F,t}^*) - 10 * \gamma * (b_{i,S,t} - b_{i,S,t}^*)$$

where $\beta = 0.05$ and $\gamma = 0.02$. $b_{i,t}$, $b_{i,S,t}$, and $b_{i,F,t}$ are respectively the ratio to GDP of total debt, slow speed of adjustment debt, and fast speed of adjustment debt for country i at time t .

- Net spending is then set by the fiscal reaction function that stabilizes the debt-to-GDP ratio towards the long-term targets. The reaction function is then specified as follows:

$$(g_{i,t} - t_{i,t}) = -\frac{r_{i,t} - \Delta y_{i,t}}{1 + \Delta y_{i,t}} b_{i,t-1} - \frac{1}{10} * (b_{i,t-1} - \hat{b}_{i,t-1})$$

Equation (18) can be equivalently written as:

$$(g_{i,t} - t_{i,t}) = -\frac{r_{i,t} - \Delta y_{i,t}}{1 + \Delta y_{i,t}} b_{i,t-1} - \beta (b_{i,F,t-1} - b_{i,F,t-1}^*) - \gamma (b_{i,S,t-1} - b_{i,S,t-1}^*)$$

Debt Sustainability and EDA

The potential role of EDA in the implementation of flexible fiscal rules is assessed by simulating over the period 2023-2040 two scenarios for debt stabilization: a benchmark without EDA and an alternate scenario in which EDA is introduced.

- Fiscal rules are first simulated in a baseline scenario without EDA to assess the pattern of debt stabilization and of primary surpluses necessary to achieve it.
- Then an alternative scenario is built in which EDA acquires progressively the slow debt and it takes 5 years to complete this operation.
- In our simulations EDA begins operating in 2022, by issuing bonds to make loans to MS's to acquire progressively their entire current and past slow debt. An initial capital, equal to a share of the ESM capital determined by the ratio of the total "slow" debt to total debt of MS's when EDA becomes operational is conferred to EDA via the ESM and it can be attributed within EDA to member countries according to the ESM weights (<https://www.esm.europa.eu/esm-governance>).
- From the inception of EDA the fiscal rule is modified to take in account that the government debt is made of a mixture of Bonds and Loans with EDA and loans with EDA are treated as slow-debt.
- From 2023 onwards MSs start to pay deferred instalments to EDA. The EDA bonds increase because of interest rate payments and because of new lending.

The Baseline Scenario

In the baseline scenario debt and deficit dynamics are simulated from 2022 onwards in absence of EDA

- the stochastic processes for the 1-year and 10-year euro area swap rates, which are the driver of the ten-year yields and of the average cost of debt for the different MS's, together with the GDP growth rate of the different MS's are estimated over the sample 2000-2021.
- The model is then closed by adding the deterministic reaction functions for the primary deficits and the stock-flow relationship determining the debt dynamics.
- Total debt is reclassified in fast and slow adjusting.
- The model is then simulated stochastically over the period 2023-2043.

The Baseline Scenario

$$\begin{aligned}
 \Delta y_{i,t} &= a_{0,i} + a_1 r_{t-1}^{1,swap} + a_{2,i} (r_{i,t-1}^{10} - r_{DE,t-1}^{10}) + a_{3,i} (t_{i,t-1} - g_{i,t-1}) + u_{1,i,t} \\
 \Delta \bar{y}_t &= \sum_{j=1}^n w_{i,t-1} \Delta y_{i,t}, \quad w_{i,t} = \frac{y_{i,t}}{\sum_{i=1}^n y_{i,t}} \\
 r_t^{1,swap} &= b_0 + b_1 \Delta \bar{y}_t + b_2 r_{t-1}^{1,swap} + u_{2,i,t} \\
 r_t^{10,swap} &= c_0 + c_1 r_{t-1}^{10,swap} + c_2 r_t^{1,swap} + u_{3,t} \\
 r_{i,t} &= d_{1,i} r_{i,t-1} + d_{2,i} r_{i,t}^{10} + d_{3,i} r_t^{1,swap} + u_{4,i,t} \\
 r_{DE,t}^{10} &= h_{0,i} + h_1 r_{DE,t-1}^{10} + h_2 r_t^{1,swap} + u_{6,i,t} \\
 r_{i,t}^{10} &= r_{DE,t}^{10} + k_{0,i} + k_1 * b_{i,t-1} + u_{5,i,t} \\
 (g_{i,t} - t_{i,t}) &= -\frac{r_{i,t} - \Delta y_{i,t}}{1 + \Delta y_{i,t}} b_{i,t-1} - \beta (b_{i,F,t-1} - b_{i,F,t-1}^*) - \gamma (b_{i,S,t-1} - b_{i,S,t-1}^*) \\
 b_{i,t} &= b_{i,t-1} + \frac{r_{i,t} - \Delta y_{i,t}}{1 + \Delta y_{i,t}} b_{i,t-1} + (g_{i,t} - t_{i,t}) \\
 b_{i,S,t} &= \frac{1 + r_{i,t}}{1 + \Delta y_{i,t}} * b_{i,S,t-1} + \phi_{i,t} * (g_{i,t} - t_{i,t}) \\
 b_{i,F,t} &= b_{i,t} - b_{i,S,t} \\
 b_{i,F,t}^* &= 0.6 * \frac{b_{i,F,t}}{b_{i,F,t} + b_{i,S,t}}, \quad b_{i,S,t}^* = 0.6 * \frac{b_{i,S,t}}{b_{i,F,t} + b_{i,S,t}}
 \end{aligned}$$

where $\phi_{i,t}$ is the share of total primary deficit that contributes to slow debt for country i in period t .

The Alternative scenario with EDA

The following model is then considered for the stochastic variables to be simulated by keeping the parameters and the residuals at their estimated values in the baseline scenario:

$$\begin{aligned}\Delta y_{i,t} &= a_{0,i} + a_1 r_{t-1}^{1,swap} + a_{2,i} (r_{i,t-1}^{10} - r_{DE,t-1}^{10}) + a_{3,i} (t_{i,t-1} - g_{i,t-1}) + u_{1,i,t} \\ \Delta \tilde{y}_{i,t} &= \sum_{j=1}^n w_{j,t-1} \Delta y_{j,t}, \quad r_{i,t}^{EDA} w_{i,t} = \frac{y_{i,t}}{\sum_{i=1}^n y_{i,t}} \\ r_t^{1,swap} &= b_0 + b_1 \Delta \tilde{y}_{i,t} + b_2 r_{t-1}^{1,swap} + u_{2,i,t} \\ r_t^{10,swap} &= c_0 + c_1 r_{t-1}^{10,swap} + c_2 r_t^{1,swap} + u_{3,t} \\ r_{i,t}^{EDA} &= f(TTC_i, r_t^{10,swap}) \\ r_{i,t} &= d_{1,i} r_{i,t-1} + d_{2,i} r_{i,t}^{10} + d_{3,i} r_t^{1,swap} + u_{4,i,t} \\ r_{DE,t}^{10} &= h_{0,i} + h_1 r_{DE,t-1}^{10} + h_2 r_{t-1}^{1,swap} + u_{6,i,t} \\ r_{i,t}^{10} &= r_{DE,t}^{10} + k_{0,i} + k_1 b_{i,t-1} + \phi u_{5,i,t}\end{aligned}$$

In this alternative scenario the volatility of the country risk premium declines as a consequence of the presence of EDA (ϕ is set to zero in the reported simulations).

Debt Dynamics under EDA

$$\begin{aligned}
 p_{i,t}^{EDA} &= \frac{b_{i,t-1}^{EDA} - ry_{i,t-1}^{EDA}}{\tilde{a}_{ij,t}(1 + \Delta y_{i,t})} \\
 nl_{i,t}^{EDA} &= \phi_{i,t} (g_{i,t} - t_{i,t}) + p_{i,t}^{EDA} \\
 l_{i,t}^{EDA} &= \frac{1}{1 + \Delta y_{i,t}} l_{i,t-1}^{EDA} + nl_{i,t}^{EDA} \\
 b_{i,t}^{EDA} &= \frac{1 + r_t^{EDA}}{1 + \Delta y_{i,t}} b_{i,t-1}^{EDA} + nl_{i,t}^{EDA} \\
 ry_{i,t}^{EDA} &= \frac{1 + r_t^{ECB}}{1 + \Delta y_{i,t}} ry_{i,t-1}^{EDA} + p_{i,t}^{EDA} \\
 el_{i,t}^{EDA} &= l_{i,t}^{EDA} + ry_{i,t}^{EDA} - b_{i,t}^{EDA} \\
 en_{i,t}^{EDA} &= en_{i,t-1}^{EDA} \\
 SC_{i,t}^{EDA} &= l_{i,t}^{EDA} + ry_{i,t}^{EDA} + en_{i,t}^{EDA} - b_{i,t}^{EDA} - el_{i,t}^{EDA} \\
 (g_{i,t} - t_{i,t}) &= -p_{i,t}^{EDA} - \frac{r_{i,t} - \Delta y_{i,t}}{1 + \Delta y_{i,t}} b_{i,t-1} + \frac{\Delta y_{i,t}}{1 + \Delta y_{i,t}} l_{i,t-1}^{EDA} - \frac{1}{10} * (d_{i,t-1} - \hat{d}_{i,t-1}) \\
 b_{i,t} &= b_{i,t-1} + \frac{r_{i,t} - \Delta y_{i,t}}{1 + \Delta y_{i,t}} b_{i,t-1} + (1 - \phi_{i,t}) (g_{i,t} - t_{i,t}) \\
 d_{i,t} &= b_{i,t} + l_{i,t}^{EDA} \\
 b_{i,t}^* &= 0.6 * \frac{b_{i,t}}{d_{i,t}}, \quad l_{i,t}^{EDA,*} = 0.6 * \frac{l_{i,t}^{EDA}}{d_{i,t}} \\
 \hat{d}_{i,t} &= d_{i,t} - 10 * \beta (b_{i,t} - b_{i,t}^*) - 10 * \gamma (l_{i,t}^{EDA} - l_{i,t}^{EDA,*})
 \end{aligned}$$

Debt Stabilization with Fiscal Rules

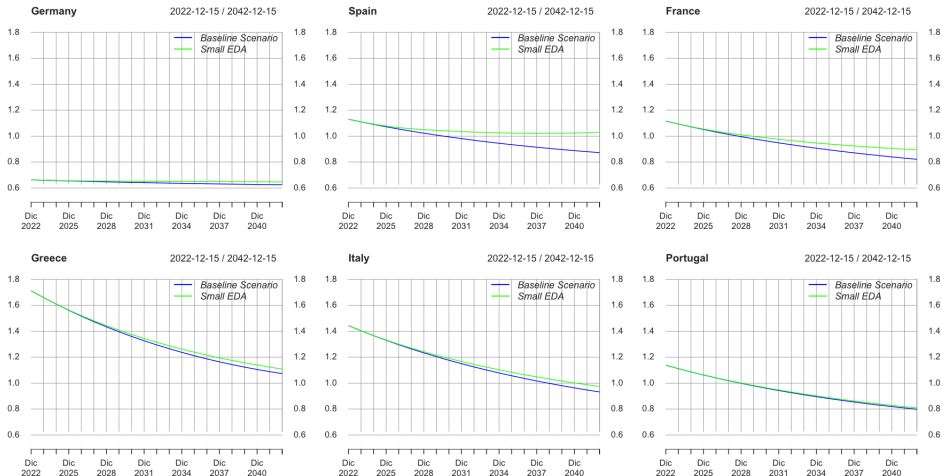


Figure: Simulated Total Debt to GDP ratio

Pareto Efficient Stabilizing Primary Surpluses under EDA.

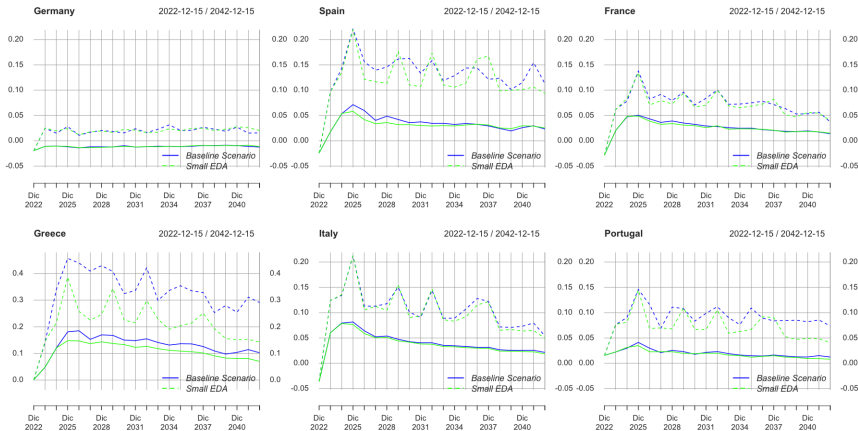


Figure: Simulated Stabilizing Primary Surplus. Solid lines denote the mean simulated values and dotted lines denote the upper bound of the 95 per cent confidence intervals.

The current economic situation in Europe has made it so that countries could be at high risk of two types of government debt risks: roll-over risk and sustainability risk. To help manage these risks, we suggest the establishment of an EDA (European Debt Management Agency).

- Our proposal addresses roll-over risk by pricing EDA loans with a transparent formula that anchors price to fundamentals. This discipline mechanism, avoids the inefficient costs generated by deviation of market prices from fundamentals while giving Member States incentives for fiscal virtues as it does not imply debt mutualization.
- Out-of-sample simulation analysis show that adopting flexible fiscal rules in the presence of EDA allows a smoother path towards debt stabilization by reducing the macroeconomic consequences of excessive fluctuations in risk premia.
- Overall our results show that EDA is efficient in two different ways.
 - With EDA loans roll-over risk is addressed by issuing loans whose pricing is always efficient in the sense that it never deviates from fundamentals.
 - Sustainability risk is addressed by the joint implementation of growth-friendly fiscal rules for debt sustainability and the establishment of EDA as an efficient debt management institution. The important concept of efficiency in this context is Pareto efficiency. Our out-of-sample simulations demonstrate that introducing EDA brings benefits to certain Member States without imposing any significant costs on the others.