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The Making the Eurozone Works: a Risk-Sharing Reform of the European Stability Mechanism

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ESM Reform and a New Risk-Sharing Mechanism for the EMU

- **Shaping a new role for the European Stability Mechanism (ESM) in the Eurozone;**
- **Building a common Insurance Fund managed by the ESM as a Eurozone bond insurance scheme;**
- **Targeting full Eurozone public debt mutualisation in the medium term, with the prospect of a single issuer of Eurozone government debt**

ESM Toolbox Expanded

- **Goal of the Fund: public debt insurance**
- **Insurance Fund scheme functioning as a bond insurer offering a *Conditional Guarantee* for eligible sovereign bonds protecting investors against potential haircuts;**
- **Countries purchasing this guarantee pay a pre-determined fee, indexed to market price, for the (notional) debt insured;**

ESM Toolbox Expanded

- **The new ESM Insurance Fund would support the full transition from national debt to a single Eurozone public debt (Eurobonds), achieving a single (credit) risk-free yield curve for all EMU sovereign bonds (credit spread convergence in the Eurozone to AAA level);**
- **Both core and peripheral EMU countries would benefit from our ESM reform proposal;**

ESM Insurance Fund Benefitting the Whole EMU

- **Riskiest Countries (high credit spread):**

a) **secure a net gain from the ESM conditional debt guarantee, as insurance premia are permanently accumulated as common pool of Fund assets;**

b) **as beneficiary of the bond insurance scheme they would give up the option of redenominating (ESM insured) national debt;**

ESM Insurance Fund Benefitting the Whole EMU

c) Strict covenants would require beneficiaries of the Fund to keeping a balanced (cyclically adjusted) fiscal budget and no further debt accumulation;

d) Resources flowing into the Fund would beef up ESM investable assets …

e) … in part they could be deployed in financially viable public sector infrastructure, targeting the weakest regions of the EMU

ESM Insurance Fund Benefitting the Whole EMU

- **Less Risky Countries (low credit spread) gains:**

a) **drastic systemic risk reduction in the Euro-zone at virtually no cost for them;**

b) **improved bond market integration and liquidity in the Eurozone as a result of a truly single market for public debt being achieved;**

c) **monetary policy transmission made more robust to fiscal and business cycle shocks;**

Conditional Insurance, Covenants and Moral Hazard

- **Insurance Fund sovereign debt guarantee does not imply non-market based fiscal transfers;**
- **Insured debt is subject to (and conditional upon) a list of covenants (and measures):**

1. **Balanced structural budget;**
2. **ESM Insured debt is senior**
3. **Additional debt issuance beyond current level subject to ESM insurance Fund Approval**

Conditional Insurance, Covenants and Moral Hazard

4. Breaching covenants and restrictions – including provisions about default on outstanding debt - would result in severe financial penalties, such as the immediate loss of the supranational guarantee and the exit from the risk-sharing program with drastic consequences in terms of debt sustainability and membership in the monetary union

ESM Insurance Fund Assets & Liabilities

Assets	*Liabilities*
Insurance Premium Proceeds: $\sum_{i=1}^{N} c_i$	*Bond Guarantee Market Value:* $\sum_{i=1}^{N} E^Q(\widetilde{L}_i)$
Invested Equity Capital: EQ_0	*Net Worth (Equity Capital):* EQ_0

$$c_i = E^Q(\widetilde{L}_i),\ \mathrm{i} = 1, \mathrm{N}\,; \sum_{i=1}^{N} c_i = \sum_{i=1}^{N} E^Q(\widetilde{L}_i)$$

ESM Insurance Fund: Assets & Liabilities

- **Working Hypothesis for this model:**

$$CDS_i = E^Q\left(\widetilde{L}_i\right),\ i=1,N$$

- **Sovereign Bond (Risk-Neutral) Expected Loss of country *i-th*, $E^Q\left(\widetilde{L}_i\right)$, equal (observed) Credit-Default-Swap Premium market value, CDS_i , $i=1,N$**

- **Think of CDS_i as an up-front CDS Premium**

ESM Insurance Fund: Assets & Liabilities

- **Hence, we assume:**

$$c_i = CDS_i \ , \ i=1,N$$

paid-in insurance premia to the Fund equal market value CDS premia of country sovereign bond;

- **Equity Capital, EQ_0, takes care of Unexpected Insurance Fund Losses;**

- **Insurance premia proceeds and paid-in Equity Capital are invested in liquid and illiquid assets**

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **We measure only the direct impact on Euro-zone sovereign risk indicator, ΔSSR;**
- **Key assumptions on the Fund operations are:**

a) **ESM Fund Expected Loss (EL) – e.g. Probability of Default (PD) - matches that of German sovereign debt, as implied by its CDS (1-year horizon, 0.44 percent);**

ESM Insurance Fund Impact on Euro-zone Systemic Risk

a) Loss-Given-Default (LGD) for each country are the same across all debts and equal to 45% (Basel II/III credit risk modelling);

b) Capital requirement – e.g. Unexpected Loss (UL) risk measure – set according to Basel II/III credit risk modelling for equity capital regulation using a VaR risk measurement approach;

ESM Insurance Fund Impact on Euro-zone Systemic Risk

c) Confidence level - α = 0.99.9956=1- 0.0044 such that capital requirement for both the ESM and the (uninsured) sovereign bond portfolio exactly matches the amount needed for achieving the same (estimated) Germany's PD;

d) capital requirement replicates the ASFR model under the VaR approach,

ESM Insurance Fund Impact on Euro-zone Systemic Risk

$$K_i^{\alpha} = 1.06\, LGD \left[\Phi\left(\frac{\Phi^{-1}(p_i^*) + \Phi^{-1}(\alpha)\sqrt{R_i}}{\sqrt{1-R_i}} \right) - p_i^* \right] MA_i$$

$$MA_i \equiv \frac{1 + (M_i - 2.5)\, g(p_i^*)}{1 - 1.5\, g(p_i^*)} \,,$$

$$g(p_i^*) \equiv \left(0.11852 - 0.05478\, ln(p_i^*)\right)^2,$$

$$R_i \equiv 0.12 \frac{\left[\left(1 - exp(-50 p_i^*)\right)\right] + 2\left[1 - \left(1 - exp(-50 p_i^*)\right)\right]}{\left(1 - exp(-50)\right)}$$

$$i = 1, N$$

ESM Insurance Fund Impact on Euro-zone Systemic Risk

R_i = default correlation measure;

M_i = years-to-maturity of debt;

MA_i = maturity adjustment factor;

p_i^* = Probability of Default;

for each country debt *i-th;*

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ESM Insurance Fund Impact on Euro-zone Systemic Risk

COUNTRIES	PUBLIC DEBT OUTSTANDING	DEFAULT PROBABILITY	CORRELATION	Capital MM (%)	Capital MM	Outstanding Debt Weights	ADDITIONAL DEBT	Capital MM (PAID TO ESM)	Insurance Premia (EL 1-YEAR HORIZON)	Total Debt	TOTAL LOSS CHANGE CONTRIBUTION	EXPECTED LOSS CHANGE CONTRIBUTION	UNEXPECTED LOSS CHANGE CONTRIBUTION	Rate of return
		1-YEAR HORIZON	SEE FORMULA	SEE FORMULA	BILLION of EURO		BILLION of EURO	BILLION of EURO	BILLION of EURO	BILLION of EURO	BILLION of EURO	BILLION of EURO	BILLION of EURO	
GERMANY	2.102	0,44%	0,22	2,43%	51	21,58%	52	52	0	2.154	1	0	1	-0,20%
FRANCE	2.230	1,12%	0,19	3,84%	86	22,89%	67	55	12	2.297	-37	-7	-30	9,98%
ITALY	2.284	5,08%	0,13	7,29%	167	23,44%	112	58	55	2.396	-156	-47	-109	42,20%
SPAIN	1.136	2,12%	0,16	5,15%	59	11,66%	40	28	11	1.176	-39	-9	-30	21,51%
PORTUGAL	249	3,25%	0,14	6,03%	15	2,56%	10	6	4	259	-12	-3	-9	31,16%
AUSTRIA	294	0,60%	0,21	2,70%	8	3,01%	8	7	1	302	-1	0	-1	2,32%
NETHERLANDS	413	0,57%	0,21	2,65%	11	4,24%	11	10	1	424	-1	0	-1	1,97%
BELGIUM	465	0,88%	0,20	3,54%	16	4,77%	13	12	2	478	-6	-1	-5	6,64%
FINLAND	134	0,60%	0,21	2,95%	4	1,38%	4	3	0	138	-1	0	-1	2,32%
IRELAND	211	0,99%	0,19	3,62%	8	2,16%	6	5	1	217	-3	-1	-2	8,19%
OTHERS	225	1,53%	0,18	4,20%	9	2,31%	7	6	2	232	-5	-1	-4	15,14%
TOTAL	**9.742**	**2,02%**		**4,45%**	**433**	**100,00%**	**331**	**242**	**88**	**10.073**	**-259**	**-69**	**-191**	**20,77%**

SYSTEMIC SOVEREIGN DEBT RISK REDUCTION

EUROZONE DEBT AND ESM INSURANCE FUND	SOVEREIGN BOND EXPOSURE	DEFAULT PROBABILITY	CORRELATION	Capital MM (%)	UL	EL	TOTAL LOSS (EL+UL)
ESM INSURANCE FUND	10.073	0,44%	0,22	2,41%	242	20	262
EUROZONE PUBLIC DEBT WITHOUT INSURANCE FUND				4,45%	433	89	522
LOSS CHANGES (WITHOUT INSURANCE FUND - WITH INSURANCE FUND)					-191	-69	-259

$$\Delta SSR_{\alpha} \equiv (D^{I} - D^{*})\left[p_{ESM}\left(1-\bar{\delta}\right) + K_{ESM}^{\alpha}\right] - D^{*}\sum_{i=1}^{N}\left[\left(p_{i}^{*} - p_{ESM}\right)\left(1-\bar{\delta}\right) + K_{i}^{\alpha} - K_{ESM}^{\alpha}\right]\omega_{i}^{*}$$

ESM Insurance Fund Impact on Euro-zone Systemic Risk

K_i^{α}= capital requirement for country debt *i-th*

K_{ESM}^{α}= capital requirement for ESM;

$\bar{\delta}$ = Loss-Given-Default

p_{ESM}^{*} = Probability of Default for ESM;

$\omega_i^{*} \equiv \frac{D_i^{*}}{D^{*}}$ = share of country i-th public debt over total Eurozone debt

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **first term of ΔSSR_α is positive – thus increasing risk - as a result of additional debt issuance, $(D^I - D^*)$, financing the purchase of Bond Guarantee;**
- **second term is positive – being subtracted reduces systemic risk - mirroring sovereign country PDs converging to the lower ESM level**

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **Without ESM risk of a loss (at 0.9956 confidence level) for the Eurozone total sovereign debt portfolio would be**

$$SSR_{\alpha}^{*} = \underbrace{433}_{UL} + \underbrace{89}_{EL} = 522\ billion\ euro$$

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **Insurance Fund collects insurance premia and equity capital from Eurozone countries;**
- **they issue additional public debt to raise funds for the purchase of debt guarantee;**
- **government bond-holders risk of losses declines in that ESM insurance scheme is in operation and thereby credit spread are shrinking;**

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **Now with debt insured by the Fund the risk of loss (at 0.9956 confidence level) would decline toward ESM level for the whole Eurozone sovereign debt portfolio,**

$$SSR_{\alpha}^{I} = \underbrace{242}_{UL} + \underbrace{20}_{EL} = 262\ billion\ euro$$

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **Therefore, as a result of the ESM insurance policy operation, systemic sovereign risk reduction in the Eurozone turns out to be,**

$$\Delta SSR_\alpha \equiv SSR_\alpha^I - SSR_\alpha^* = -\underbrace{191}_{UL} - \underbrace{69}_{EL} = -259\ billion\ euro$$

- **With additional debt issuance being equal to,**

$$D^I - D^* = \underbrace{242}_{Equity} + \underbrace{88}_{Ins.\,Premia} = 331\ billion\ euro$$

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **Italy, Spain and France are the largest contributors to sovereign risk reduction, 156, 39 and 37 billion euro, respectively, out of a total decline of 259 billion;**
- **Italy's debt equity capital "relief" would be substantial, its requirement dropping from 7.29 to 2.41 percentage points;**

ESM Insurance Fund Impact on Euro-zone Systemic Risk

- **Italy's credit spread reduction would be the largest of the Eurozone, with a decline by more than 200 basis points;**
- **Additional debt issuance is one-off, whereas credit spread reduction – driving down systemic sovereign risk - is meant to be permanent;**
- **omputing the implied rate of return on debt financing the purchase of ESM insurance**

ESM Insurance Fund Impact on Euro-zone Systemic Risk

$$D_i^I - D_i^* = \sum_{\tau=1}^{\infty} \left[p_i^* \left(1 - \bar{\delta}\right) D_i^* - p_{ESM} \left(1 - \bar{\delta}\right) D_i^I \right] (1 + \beta)^{-j}.$$

$$i = 1, N$$

- **where β denotes the Internal Rate of Return (IRR) on investment;**
- **We can solve the above equation for each country yielding for country *i-th***

ESM Insurance Fund Impact on Euro-zone Systemic Risk

$$\beta_i^I = \left[\frac{D_i^*}{D_i^I - D_i^*}\left(p_i^* - p_{ESM}\right) - p_{ESM}\right]\left(1-\bar{\delta}\right),\ i = 1, N$$

… and for the Eurozone as a whole,

- $$\beta^I = \left[\frac{D^*}{\mathrm{D}^I - \mathrm{D}^*}\left(\sum_{i=1}^{N} p_i^* \omega_i^* - p_{ESM}\right) - p_{ESM}\right]\left(1-\bar{\delta}\right)$$

- **Italy's annual IRR would be the largest one, 42% !**
- **Eurozone as a whole IRR, 21%.**