

Levy Economics Institute of Bard College

Public Policy Brief

No. 140, 2015

THE ECB, THE SINGLE FINANCIAL MARKET, AND A REVISION OF THE EURO AREA FISCAL RULES

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Editor: Michael Stephens
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For information about the Levy Institute, call 845-758-7700 or 202-887-8464 (in Washington, D.C.), e-mail info@levy.org, or visit www.levyinstitute.org.

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ISSN 1063-5297
ISBN 978-1-936192-48-9

Preface

The outbreak of the eurozone crisis, marked by a divergence in interest rates on member-state sovereign debt, revealed the underlying fragmentation along national lines of the euro area's financial system. In a policy brief from September of last year (*The ECB and the Single European Financial Market*), Mario Tonveronachi suggested that this fragmentation helped demonstrate the truth of the proposition that while a currency union is necessary for the creation of a single financial market, it is not sufficient. Financial market integration, as opposed to mere temporary "convergence," requires that market participants face a single benchmark yield curve. However, there is no authority issuing the set of common risk-free assets that would serve as the basis for such a benchmark—a key structural flaw in the euro setup.

In his last policy brief, Tonveronachi noted that the European Central Bank (ECB) is already authorized to issue "debt certificates" (DCs). If issued across the maturity spectrum, DCs could provide the missing structural element necessary for a single financial market. Under Tonveronachi's proposal, the ECB would balance its issuance of DCs with the purchase of member-state sovereign debt on the secondary market. Such purchases would be made according to the capital key of each country, and the seigniorage the ECB would earn on the higher-yielding sovereign debt in its portfolio would be remitted to national governments on the same basis.

In this new policy brief, Tonveronachi investigates the implications of his proposed reform of ECB operations for member-state fiscal rules. Far from creating fiscal moral hazard, the DC proposal, as compared to the status quo, would better enable national adherence to the Maastricht Treaty's definition of debt discipline. However, the crucial difference is that the proposal would do so while simultaneously mitigating the overly tight, self-defeating fiscal stance required by the current rules.

As Tonveronachi observes, given a certain initial level of ECB bond purchases, implementation of the DC proposal would immediately put some countries below the 60 percent of NGDP threshold with respect to their market-held sovereign debt. For more indebted countries, he demonstrates that the rate of adjustment toward this threshold would be very sensitive to both the initial acquisition of sovereign debt and to NGDP growth rates: the higher the initial level of ECB bond purchases and the greater

the economic growth rates, the faster the ratio of market-held debt would dip below the Maastricht limit. In that light, the growth-throttling fiscal stance required by the current budget rules is quite salient.

Tonveronachi frames the Maastricht Treaty's fiscal rules as means, and thus subordinate, to ensuring debt sustainability (understood as a debt-to-GDP ratio below 60 percent). His proposal would continue guaranteeing the latter, all while relaxing the counterproductive limits of the former. Member-states with debt ratios above the 60 percent Maastricht limit would not be required to run fiscal surpluses—balanced budgets would still enable their debt ratios to move toward compliance with the debt-ratio limit—and the rest could run fiscal deficits. Moreover, the DC proposal would help create fiscal space by decreasing the amount of sovereign debt held by the market, improving the rating and lowering the cost of the remaining debt, and through ECB remittance of newly earned seigniorage to national treasuries. Countries with debt ratios below 60 percent would be free to follow individual deficit strategies compatible with the debt constraint. As an alternative, two rules could be introduced in accordance with the tendency to reach a safer debt ceiling. Countries with debt ratios below 60 percent but, for example, above 30 percent would run fiscal deficits consistent with sustained declines in their debt ratios, and countries with debt ratios below 30 percent would run fiscal deficits of a magnitude consistent with keeping their debt ratios constant.

Allowing fiscal policy in the eurozone to take on a reflationary stance, with many countries immediately empowered to run fiscal deficits, would itself feed back into these dynamics and hasten the rate at which many highly indebted countries would achieve the prevailing treaty-defined standard of debt sustainability. In place of the current deflationary trap, this proposal would help establish a virtuous cycle of debt adjustment. This is a badly needed reform for an economic and monetary union that has been designed to fail.

As always, I welcome your comments.

Dimitri B. Papadimitriou, *President*
November 2015

Introduction

In a previous policy brief (Tonveronachi 2014), I proposed an approach to establishing the structural conditions necessary for creating a single financial market in the euro area (EA). This approach to denationalizing financial markets centered on reforming European Central Bank (ECB) operations to create the set of common risk-free assets required by a single financial market, filling a void left by the absence of an EA-wide fiscal authority. The financial instrument at the center of the proposal—“debt certificates” (DCs)—can already be issued by the ECB, and there are no statutory limits to doing so in the amounts and with the range of maturities necessary to produce a single risk-free yield curve, glaringly absent from the EA financial landscape. In a corresponding move, the ECB would buy sovereign debt in the secondary market in an amount equal to its issuance of DCs, with acquisitions made according to the paid-up capital (capital key) for each EA country. In its operations with banks, the ECB would thereafter accept DCs, not sovereign bonds, as collateral. Since DCs, in contrast with higher-yielding national sovereign bonds, would be perfectly risk free, the ECB would earn a new form of seigniorage that would be paid back to the EA countries according to their capital key.

In Tonveronachi (2014) I explained why the goal of creating a single financial market and managing its liquidity would legally overcome the objections that could be raised against the fiscal effects of such operational arrangements. However, objections raised on the grounds of national fiscal moral hazard could hamper the adoption of the proposal.

In this policy brief I propose to look at the dynamic effects of the DC proposal on sovereign debt and, in that context, to revisit the existing EA fiscal rules. Under this proposal, national debt discipline as defined by the Maastricht Treaty would be maintained—even enabled—yet without the deflationary effects of the current budgetary rules.

Debt Dynamics under Reformed ECB Operations

Let us consider the entire EA and let D be its sovereign debt, while the subscript T stands for total debt, M for the amount held by the market, and B the amount held by the central bank. Once the above ECB operations have started, we have:

$$(1) \quad D_T = D_M + D_B$$

Since the emission of the DCs, and hence the value of D_B , would be largely responsive to the demand coming from the financial sector for liquidity purposes, we may link the issuance of DCs to the growth of nominal GDP (g). We may then write:

$$(2) \quad \frac{(D_{B(0)} - D_{B(-1)})}{D_{B(-1)}} = \dot{D}_B = a \cdot g$$

Because the DCs would become a further ECB policy instrument for affecting market liquidity, the coefficient a could vary around that trend.

Making the increase of D_T equal to the public deficit (F), with some substitution, from equations (1) and (2) we obtain:

$$(3) \quad -\dot{D}_M = a \cdot g \cdot \frac{D_{B(-1)}}{D_{M(-1)}} - \frac{F}{D_{M(-1)}}$$

Apart from a , which by its nature refers to the entire EA financial market, the above debt dynamic should be applied utilizing national parameters. We may then derive from equation (3) the debt dynamics for a single country i , where K_i is the country's ECB capital key adjusted for paid-up capital:

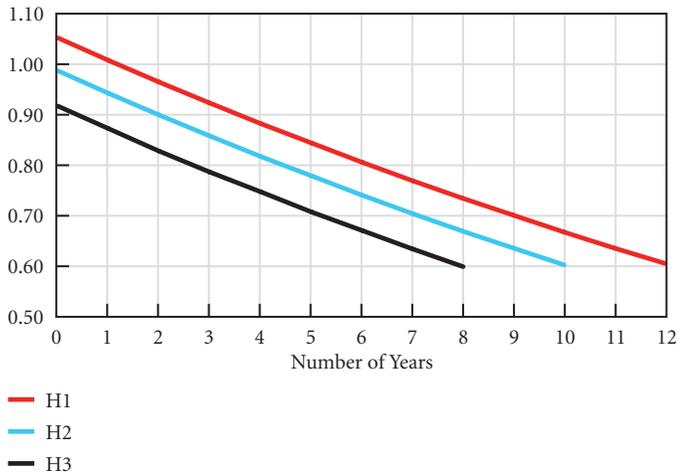
$$(4) \quad -\dot{D}_{Mi} = a \cdot g_i \frac{K_i \cdot D_{B(-1)}}{K_i \cdot D_{M(-1)}} - \frac{F_i}{K_i \cdot D_{M(-1)}}$$

Putting aside F , which will be discussed in more detail below, the issuance of DCs linked to liquidity requirements would decrease the amount of debt held by the market, with beneficial effects on its rating and cost. Critically, the relevance of our exercise depends on the speed of the adjustment process of D_M . We have two nonnational parameters (a , D_B/D_M) and three national ones (g , K , and F).

Taking a neutral ECB policy stance as a working hypothesis for our calculations, we may suppose that the demand for DCs increases more or less in proportion to nominal GDP (Y); hence we can assume that the value of a is near to 1.

Although with the passage of time and given certain conditions on the fiscal deficit (see below) the ratio of ECB-held to market-held debt (D_B/D_M) will increase, thus helping to sustain a decrease of D_M/Y , the speed of adjustment is very sensitive to the initial value of D_B/D_M (the initial level of the ECB's acquisition of sovereign debt). Figure 1 illustrates this point by taking 2014 data for Italy and showing the debt adjustment—the number of years it would take for market-held debt as a share of NGDP (D_M/Y) to drop below 60 percent—under three scenarios for ECB bond buying: one-third of total public securities

Figure 1 Decrease of D_M/Y for Alternative Initial Values of D_B for Italy ($a = 1, g = 3.5\%, F = 0$)



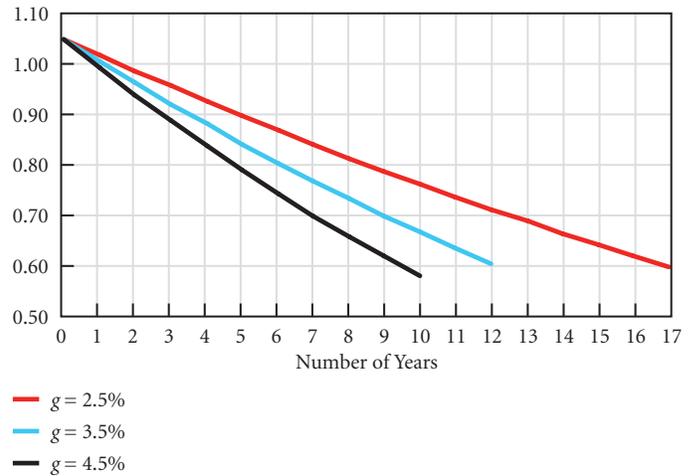
Sources: Eurostat; ECB

(H1), one-third of total debt (H2), and one-half of total securities (H3).¹

The market demand for DCs could be made larger by intervening with regulatory measures, such as including a high share of DCs in Basel's liquidity requirements for banks and money market operators, or by allowing DCs to be bought for investment purposes (relaxing a constraint proposed in Tonveronachi [2014]). It is worth noting that the issuance of DCs would be an alternative to the current policy of monetary easing plus quantitative easing (QE). This means that the one trillion euros of monetary base currently in excess of its "normal" (2007) percentage of GDP and the almost one trillion euros coming from the QE program would be transformed into DCs. Given the special nature of the EA and the special responsibilities the ECB should consequently bear, there is no reason why the latter's budget should not be greater than that of other central banks.

As for national parameters, the higher the capital key is with respect to total debt and the growth of nominal GDP, the higher the rate of market-held-debt reduction. Figure 2 shows the sensitivity of debt reduction to alternative values of the growth rate of nominal GDP, once again for Italy. This demonstrates the extent to which altering the deflationary stance of the current EA fiscal rules would facilitate debt adjustment.

Figure 2 Decrease of D_M/Y for Alternative NGDP Growth Rates for Italy ($a = 1, D_{B(0)}$ according to H1)



Sources: Eurostat; ECB

Fiscal Rules Revisited

The acquisition of sovereign debt by the ECB would lower a country's total cost of debt service in two ways: by paying back the new seigniorage, even if in the initial period a share of it could be put in a reserve against risk; and by improving sovereign ratings.

Let us consider how to maintain fiscal discipline in this new policy environment. The fiscal constraints attached to the Maastricht Treaty should be understood as intended to guarantee debt sustainability. In other words, the rules limiting fiscal deficits are ancillary to debt sustainability, which is officially defined as a debt ratio lower than 60 percent of NGDP. Conforming to the Treaty, the present proposal maintains the 60 percent ceiling and the obligation to remain under it.

In the conditions created by the ECB's sovereign bond acquisition, the deficit rule for a country with a debt ratio higher than 60 percent should be $F = 0$ (i.e., total debt should remain constant).² Equation (4) becomes:

$$(5) \quad -\dot{D}_{Mi} = a \cdot g_i \cdot \frac{K_i \cdot D_{B(-1)}}{K_i \cdot D_{M(-1)}}$$

D_M/Y would decrease, due to changes in both the numerator and the denominator, and at an accelerating rate due to the increase of D_B/D_M . With D_T constant, D_T/Y would also decrease. In contrast with the existing rules, debt reduction would thus be obtained without imposing a fiscal surplus. As noted, fiscal space

Table 1 Simulation of Debt Dynamics for Italy (absolute values in trillions of euros)

Years	D_T	Y	D_T/Y	a	g (%)	D_B	D_M	D_B/D_M	$\Delta D_M/D_M$ (%)	D_M/Y	D_B/Y
0	2.135	1.616	1.32	1	3.5	0.437	1.698	0.257		1.05	0.27
1	2.135	1.673	1.28	1	3.5	0.452	1.683	0.269	-0.90	1.01	0.27
2	2.135	1.731	1.23	1	3.5	0.468	1.667	0.281	-0.94	0.96	0.27
3	2.135	1.792	1.19	1	3.5	0.485	1.650	0.294	-0.98	0.92	0.27
4	2.135	1.854	1.15	1	3.5	0.501	1.634	0.307	-1.03	0.88	0.27
5	2.135	1.919	1.11	1	3.5	0.519	1.616	0.321	-1.07	0.84	0.27
6	2.135	1.986	1.07	1	3.5	0.537	1.598	0.336	-1.12	0.80	0.27
7	2.135	2.056	1.04	1	3.5	0.556	1.579	0.352	-1.18	0.77	0.27
8	2.135	2.128	1.00	1	3.5	0.575	1.560	0.369	-1.23	0.73	0.27
9	2.135	2.202	0.97	1	3.5	0.596	1.539	0.387	-1.29	0.70	0.27
10	2.135	2.280	0.94	1	3.5	0.616	1.519	0.406	-1.35	0.67	0.27
11	2.135	2.359	0.90	1	3.5	0.638	1.497	0.426	-1.42	0.63	0.27
12	2.135	2.442	0.87	1	3.5	0.660	1.475	0.448	-1.49	0.60	0.27

Sources: Eurostat; ECB

would also be created as a result of the ECB paying back its newly earned seigniorage, as well as from lower interest rates on national debt.

In order to have a clearer idea of the dynamic process, Table 1 shows the case for Italy, starting from 2014 values and assuming the lower initial level of ECB debt acquisition represented by scenario H1 (one-third of total public securities).

Table 2 shows the capital key of the EA countries³ and the initial acquisition of their debt by the ECB according to H1 and H3 (one-half of total securities).

Let us assume that $a = 1$ and that the new reflationary stance will produce the following nominal GDP growth for the countries needing adjustment: Italy, 3.5 percent; France, 4 percent; Spain, 4 percent; Belgium, 4 percent; Ireland, 4.5 percent; Austria, 3.5 percent; Portugal, 3.5 percent; Cyprus, 3.5 percent; and Greece, 3 percent.

Taking the initial values from 2014 data, Table 3 shows the number of years necessary to reach $D_M/Y = 60$ percent following the $F = 0$ condition, with two different scenarios for the initial amount of the ECB's acquisition.

In both cases, the acquisition of sovereign debt by the ECB according to national capital keys puts many countries below the 60 percent threshold at time 0.⁴ Table 3 confirms the high sensitivity of the debt dynamics to the value of the initial debt acquisition by the ECB.

Below the 60 percent barrier, no rigid deficit rule would be necessary. As an example of the dynamics of deficits and debt,

Table 2 Capital Keys and the ECB's Initial Debt Acquisition

	K (%)	H1*	H3*
Austria	2.79	0.070	0.105
Belgium	3.52	0.088	0.132
Cyprus	0.21	0.005	0.008
Estonia	0.27	0.007	0.010
Finland	1.78	0.045	0.067
France	20.14	0.504	0.755
Germany	25.57	0.639	0.959
Greece	2.89	0.072	0.108
Ireland	1.65	0.041	0.062
Italy	17.49	0.437	0.656
Latvia	0.40	0.010	0.015
Lithuania	0.59	0.015	0.022
Luxembourg	0.29	0.007	0.011
Malta	0.09	0.002	0.003
Netherlands	5.69	0.142	0.213
Portugal	2.48	0.062	0.093
Slovakia	1.10	0.027	0.041
Slovenia	0.49	0.012	0.018
Spain	12.56	0.314	0.471
Total	100.00	2.500	3.750

* Trillions of euros

Sources: Eurostat; ECB

Table 3 Number of Years to Comply with the Debt Ceiling

	H1	H3
Austria	1	0
Belgium	7	4
Cyprus	6	1
Estonia	0	0
Finland	0	0
France	4	0
Germany	0	0
Greece ⁵	20	14
Ireland	7	4
Italy	12	8
Latvia	0	0
Lithuania	0	0
Luxembourg	0	0
Malta	0	0
Netherlands	0	0
Portugal	9	4
Slovakia	0	0
Slovenia	0	0
Spain	3	0

Sources: Eurostat; ECB

let us consider two possible strategies the EA countries could choose. The first one would maintain D_M constant, so that D_M/Y would decrease with the increase of NGDP. Equation (4) becomes:

$$(6) \quad 0 = a \cdot g_i \cdot \frac{K_i \cdot D_{B(-1)}}{K_i \cdot D_{M(-1)}} - \frac{F_i}{K_i \cdot D_{M(-1)}}$$

Given that $\dot{D}_B = a \cdot g$ and D_M is constant, D_B/D_M increases and D_T/Y decreases. Keeping D_M constant permits a fiscal deficit as follows:

$$(7) \quad F_i = a \cdot g_i \cdot K_i \cdot D_{B(-1)}$$

For a given level of NGDP, countries with a higher growth rate and capital key may sustain higher levels of F/Y . Because the annual increase of D_T is equal to the value of F , from equation (7) we have:

$$(8) \quad \frac{\dot{D}_{T_i}}{g_i} = a \cdot \frac{D_{B(-1)_i}}{D_{T(-1)_i}}$$

With a near unity, the growth of total debt is lower than the growth of nominal income.

The second possible strategy could target a constant ratio of market debt to NGDP (D_M/Y). Since $\dot{D}_M = g$, equation (4) becomes:

$$(9) \quad -g_i = a \cdot g_i \cdot \frac{K_i \cdot D_{B(-1)}}{K_i \cdot D_{M(-1)}} - \frac{F_i}{K_i \cdot D_{M(-1)}}$$

from which

$$(10) \quad F_i = a \cdot g_i \cdot K_i \cdot D_{B(-1)} + g_i \cdot K_i \cdot D_{M(-1)}$$

and

$$(11) \quad \frac{\dot{D}_{T_i}}{g_i} = a \cdot \frac{D_{B(-1)_i}}{D_{T(-1)_i}} + \frac{D_{M(-1)_i}}{D_{T(-1)_i}}$$

The fiscal deficit and the rate of growth of total debt are higher than for the previous strategy.

An alternative way to think of the above strategies would be to transform them into rigid deficit rules. For example, the first strategy (now rule) would apply with a debt-to-NGDP ratio below 60 percent but, for example, above 30 percent, and the second rule would apply for countries with a debt-to-NGDP ratio below 30 percent. To have an idea of the dynamics when applying such rules, Table 4 shows the case for Germany. The simulation shows that both strategies keep total indebtedness under control.

Implications for Aggregate Demand and Growth of the Euro Area

Under the current rules, structural deficits may not be higher than 0.5 percent of NGDP and the debt-to-NGDP ratio must be lower than 60 percent. Countries with higher indebtedness must run a fiscal surplus in order to reach the required ratio in 20 years. These rules do not take into account the large differences that exist between EA countries. While Italy has a gross debt-to-GDP ratio higher than 130 percent, Estonia's is around 10 percent. If the aim of the fiscal rule is to create a cushion to make it possible to increase deficits and debt in case of a shock, why impose the same structural deficit rule on Estonia and Italy? With the 0.5 percent deficit ceiling, Estonia could bring its indebtedness near to zero in a few years. Our proposal would allow Estonia to run a deficit without necessarily increasing its market indebtedness. Alternatively, if permitted to run even larger deficits for a protracted period, such that its market

Table 4 Simulation of Debt Rules for Germany

Years	D_T	Y	D_T/Y	a	g (%)	D_B	D_M	D_B/D_M	$\Delta D_M/D_M$ (%)	D_M/Y	D_B/Y	F	F/Y (%)
0	2.17	2.915	0.74	1	4.5	0.64	1.53	0.417		0.53	0.22		
1	2.20	3.046	0.72	1	4.5	0.67	1.53	0.436	0	0.50	0.22	0.029	0.94
2	2.23	3.183	0.70	1	4.5	0.70	1.53	0.456	0	0.48	0.22	0.030	0.94
3	2.26	3.326	0.68	1	4.5	0.73	1.53	0.476	0	0.46	0.22	0.031	0.94
4	2.29	3.476	0.66	1	4.5	0.76	1.53	0.498	0	0.44	0.22	0.033	0.94
5	2.33	3.633	0.64	1	4.5	0.80	1.53	0.520	0	0.42	0.22	0.034	0.94
6	2.36	3.796	0.62	1	4.5	0.83	1.53	0.544	0	0.40	0.22	0.036	0.94
7	2.40	3.967	0.61	1	4.5	0.87	1.53	0.568	0	0.39	0.22	0.037	0.94
8	2.44	4.145	0.59	1	4.5	0.91	1.53	0.594	0	0.37	0.22	0.039	0.94
9	2.48	4.332	0.57	1	4.5	0.95	1.53	0.620	0	0.35	0.22	0.041	0.94
10	2.52	4.527	0.56	1	4.5	0.99	1.53	0.648	0	0.34	0.22	0.043	0.94
11	2.57	4.731	0.54	1	4.5	1.04	1.53	0.677	0	0.32	0.22	0.045	0.94
12	2.61	4.943	0.53	1	4.5	1.08	1.53	0.708	0	0.31	0.22	0.047	0.94
13	2.66	5.166	0.52	1	4.5	1.13	1.53	0.740	0	0.30	0.22	0.049	0.94
14	2.78	5.398	0.52	1	4.5	1.18	1.60	0.740	4.5	0.30	0.22	0.120	2.22
15	2.91	5.641	0.52	1	4.5	1.24	1.67	0.740	4.5	0.30	0.22	0.125	2.22
16	3.04	5.895	0.52	1	4.5	1.29	1.75	0.740	4.5	0.30	0.22	0.131	2.22

Note: Using starting values for Germany from the end of 2014. H1 is assumed for the initial bond purchase by the ECB.

Sources: Eurostat; ECB

indebtedness increases, Estonia would still remain constrained by the 60 percent barrier.

Furthermore, if a cushion of safety must be maintained, it is more sensible to set it with reference to debt rather than the deficit. Let us suppose that the safe ratio of indebtedness is not considered to be 60 percent but, for example, 30 percent. Transforming the exemplified strategies into rules, as shown by the example for Germany, a fiscal deficit could be permitted that would still allow D_M/Y to decrease.

Beyond creating a single EA financial market, the proposed reform of ECB operational policy and fiscal rules would discriminate among different degrees of indebtedness and maintain debt discipline while converting the overall deflationary stance of the existing rules into a reflationary one, not least due to the lower average unit cost of the debt service. No fiscal surplus would be required for highly indebted countries, and the rest of the area could run fiscal deficits. As the above simulations show, several countries would be immediately positioned in the reflationary zone, which would raise the overall rate of growth of the area and facilitate adjustment for the highly indebted ones.⁶ We have seen that the results are highly sensitive to assumptions about the volume of the initial debt acquisition by the ECB and

the growth of NGDP. The values of both parameters depend considerably on the political cohesion with which the EA countries might embrace the above reforms.

While not an instant panacea, the proposal would nevertheless entail a significant fiscal easing with respect to the existing rules. In addition to satisfying the 60 percent debt limit, the EA countries would gain the flexibility to respond both to special or unforeseen needs and to asynchronous cycles across the area. For countries that are in dire need of expanding and improving their infrastructure, the preferred solution might be to require that the fiscal space acquired when debt is below the 60 percent ceiling be used to finance public investments. This would help the EA establish a positive and credible design for its future and attract countries from the European Union that are currently resisting joining the euro.

Keeping the seigniorage from the creation of public debt within the public sector is part of both an old debate (Kregel 2014) and the Modern Money Theory policy toolbox. The moral hazard problem coming from a mechanical link between sovereign debt issuance and its acquisition by the central bank would in general require some special institutional or constitutional setup. In the case of the EA, the finalization of sovereign debt

acquisition to create the single financial market and serve its liquidity needs, plus the existence of the debt ceiling (eventually necessitating debt adjustment), would be sufficient defense against such problems.

Notes

1. At the end of 2014, with a nominal GDP of €10.1 trillion, the EA's public debt totaled €9.3 trillion, with securities amounting to €7.5 trillion.
2. As an alternative, the current rule allowing a structural deficit equal to 0.5 percent could be adopted. This obviously would lengthen the adjustment period.
3. Capital keys have been recalculated considering only countries with paid-up capital.
4. Part of the different adjustment paths of countries starting with similar parameters, like France and Spain, comes from their different ratios of capital key to 2014 NGDP.
5. For Greece, total debt includes the net addition coming from the recent agreement. Without a debt haircut, the assumptions for NGDP growth (3 percent) and the deficit ($F = 0$) are more than heroic for Greece.
6. In order to avoid litigation and facilitate their future adhesion to the euro, all non-EA European Union countries should be permitted to adopt the proposed reform for their central bank operations and consequent fiscal rules.

References

- Kregel, J. 2014. *Wright Patman's Proposal to Fund Government Debt at Zero Interest Rates: Lessons for the Current Debate on the US Debt Limit*. Policy Note 2014/2. Annandale-on-Hudson, N.Y.: Levy Economics Institute of Bard College. February.
- Tonveronachi, M. 2014. *The ECB and the Single European Financial Market: A Proposal to Repair Half of a Flawed Design*. Public Policy Brief No. 137. Annandale-on-Hudson, N.Y.: Levy Economics Institute of Bard College. September.

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