



## A Proper Yield Curve for Greece to Kick-Start Financial Intermediation

Christian Kopf and Miranda Xafa

*At present, the market is severely mispricing Greece's sovereign risk relative to the country's fundamentals. As a result of the mispricing, financial intermediation in Greece has become dysfunctional and the privatisation of state-owned assets has stalled. This mispricing is partially due to an illiquid and fragmented government yield curve. A well-designed public liability management exercise can lead to a more efficient pricing of Greece's government bonds and thereby help restore stable and affordable financing for the country's private sector, which is imperative in order to overcome Greece's deep recession. We propose three measures to enhance the functioning of the Greek government debt market: i) Greece should issue a new five-year bond, ii) it should consolidate the 20 individual series of government bonds into four liquid securities and iii) it should offer investors a swap of these newly created bonds into dollar-denominated securities. Each of these measures would be beneficial to the Hellenic Republic, since the government would be able to reduce the face value and the net present value of its debt stock. Furthermore, this exercise would facilitate the resumption of market access, which is a necessary condition for continuous multilateral disbursements to Greece.*

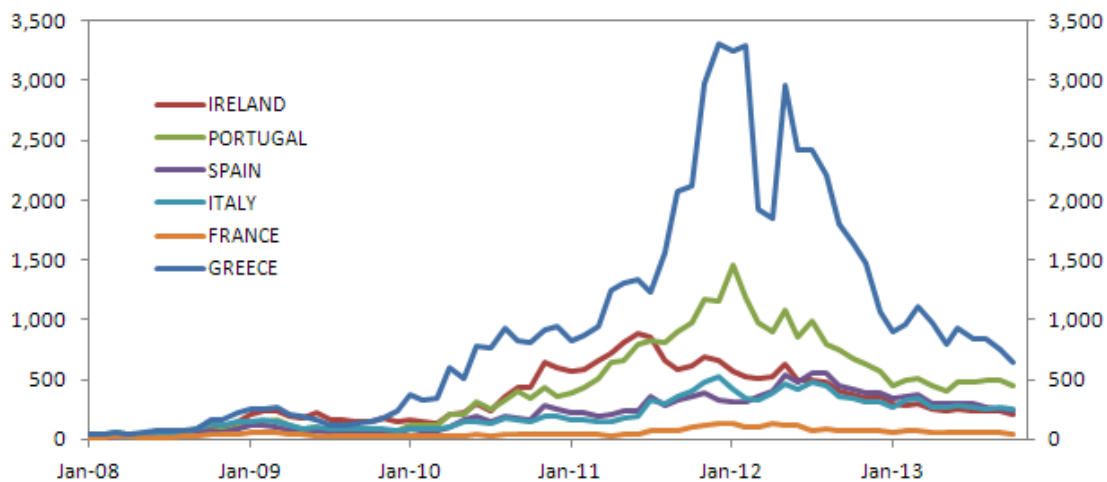
**1. Three and a half years into the debt crisis, and notwithstanding a large-scale debt exchange and buyback in 2012, Greek government bonds continue to trade at the widest credit spreads within the euro area.** While the yield spreads of other peripheral euro area credits have tightened significantly after the ECB's pledge to "do whatever it takes" to save the euro in July 2012, and the subsequent OMT (Outright Monetary Transaction) announcement, Greece remains an outlier in the sovereign credit market. As Figure 1 shows, the 10-year yield on Greek Government Bonds (GGBs), although far below the peak reached in late 2011, is still very high at 8.5% and remains above the yield of emerging market bonds that trade at distressed levels.

**2. High spreads on Greece's public and private debt persist in spite of the country's rapid progress in fiscal consolidation, its debt restructuring, competitiveness gains and bank recapitalisation.**

The Greek government has undertaken a cumulative adjustment of the public sector's primary balance of more than 8% of GDP (and of more than 14% of GDP in cyclically adjusted terms) since 2009 (IMF, 2013a). The country also has already received considerable debt relief from private and official creditors. In March 2012, Greece concluded a debt restructuring that eliminated €106 billion of its sovereign debt due to private bondholders, while borrowing €30 billion from the EFSF (European Financial Stability Facility) to provide credit enhancement. The deal cleared the way for a €130 billion second EU/IMF rescue package for Greece, which includes the €30 billion official contribution to the bond exchange. Some €50 billion out of the new rescue package was set aside to recapitalise Greek banks, which saw a dramatic impairment of the value of their holdings of GGBs, adding to the strains imposed by deposit withdrawals and non-performing loan losses as the recession deepened (Xafa, 2013).

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**Figure 1. Ten-year government bond yield spread over German Bunds, in basis points**

Sources: Bloomberg, authors' calculations.

In the spring of 2012, euro area creditors also agreed to reduce the spread over Euribor on the bilateral loans that funded the first rescue package (the Greek Loan Facility or GLF) from 300 basis points to 150 basis points retroactively to March 2011, and to extend the average maturity of these loans from 10 to 15 years. In late November 2012, the Eurogroup decided to provide further debt relief to Greece by postponing interest payments due to the EFSF, reducing further the interest margin on GLF loans from 150 basis points to 50 basis points, deferring interest on EFSF loans, cancelling the EFSF guarantee commitment, extending the maturities of EFSF and GLF loans, and passing on to Greece the income on the ECB's Securities Market Programme portfolio (including capital gains) as of 2013. This debt relief will be provided in a phased manner, conditional on full implementation of the agreed adjustment measures (European Commission, 2012).

Taken together, these measures will contribute €8.2 billion in additional financing over the period 2013-16 and reduce the debt stock by 7.2% of GDP by 2020 (European Commission, 2012). Moreover, Greece conducted a debt buyback of the newly-issued GGBs in December 2012, which eliminated a further €32 billion of debt at a cost of €11 billion, reducing the debt ratio by 10.8% of GDP in net terms. At the same time, the Eurogroup committed to providing further official debt relief, conditional on full programme implementation, if needed to “bring Greece's public debt on a sustainable path [...] and facilitate a gradual return to market financing”, when Greece reaches a primary surplus. The current programme envisages a decline in the debt ratio to 124% of GDP in 2020 and to “substantially below” 110% of GDP in 2022 from 176% of GDP at end-2013. Also, Greece faces near-zero rollover risk over the next decade, when less than 10% of the debt stock matures.

**3. At present, Greek sovereign risk is severely mispriced relative to the country's fundamentals.** In the run-up to the European sovereign debt crisis, the IMF had shown that a small number of macroeconomic determinants did a good job in explaining the market-implied probability of default of sovereign debt that is traded in the form of sovereign default swaps (IMF, 2010). At the time, more than three-quarters of Greece's sovereign spread could be explained by the government's required fiscal adjustment to restore solvency and by the flow and stock of its external liabilities. Today, however, it is difficult to explain the risk premium attached to Greek government debt via these solvency metrics, and Greek risk appears to be mispriced.

A new CDS (credit default swap) market for Greek sovereign debt has only appeared very recently, and the sovereign currently trades at a CDS spread of around 800 basis points for the standard five-year tenure, while new Greek government bonds trade at a spread of around 650 basis points over the euro swaps curve. In Table 1, we compare Greece's sovereign risk premium to a peer group of other sovereign debtors that share the country's rating and/or its fiscal challenges and external vulnerabilities. Specifically, we look at four solvency metrics:

- i) The fiscal adjustment between 2013 and 2020 that is required in order to achieve a public debt target of 60% of GDP for advanced economies and to bring the debt down to 40% of GDP for emerging market economies. This ‘sustainability gap’ has been calculated by the IMF in its latest Fiscal Monitor (IMF, 2013b). It has the advantage of combining into one number the key elements of public debt sustainability analysis: namely the current primary balance, the stock of debt, the average interest rate on the debt, the real trend growth rate of the economy and trend inflation.

- Thereby, this concept avoids the pitfalls of focusing exclusively on the level of the debt stock, which may be misleading if the debt has a low interest rate and a long maturity.
- ii) Foreign bank claims on the public sector, as a proxy for the relevant portion of the net international investment position.
  - iii) The current account balance as a proxy for the country's competitiveness.
  - iv) The sovereign ratings, as set by Moody's and Standard and Poor's.

**Table 1. Public debt solvency indicators (percent of GDP)**

Country	Rating (Moody's/S&P)	BIS bank claims on public sector	Current account balance	Required fiscal adjustment	5-year sovereign CDS spread
Ukraine	Caa1/B-	1.4	-7.3	3.4	1,100
Pakistan	Caa1/B-	0.8	-1.0	5.5	890
<b>Greece</b>	<b>Caa3/B-</b>	<b>8.5</b>	<b>-1.0</b>	<b>2.1</b>	<b>800</b>
Egypt	Caa1/CCC+	0.6	-2.6	12.0	630
Portugal	Ba3/BB	9.3	0.9	4.9	335
Morocco	Ba1/BBB-	2.4	-7.2	6.1	225
Italy	Baa2/BBB	11.2	0.0	2.1	177
Spain	Baa3/BBB-	5.6	1.4	6.1	155
Ireland	Ba1/BBB+	4.4	2.3	6.3	120

Sources: IMF, BIS, authors' calculations. Market levels are as of 3 December 2013.

The ensemble of these metrics can only provide a rough indication of a sovereign's solvency and each one of them is subject to many shortcomings. Still, we can see that within its rating category, Greece is the country with the lowest current account deficit and with the lowest fiscal adjustment needs by far, a fact that is not fully reflected in its sovereign spread. Compared to other fiscally challenged countries in Europe and North Africa, we can again observe that Greece's necessary consolidation has almost been completed, while Ireland, Spain, Morocco and Portugal all need to undertake fiscal adjustments of more than twice the size. Again, this is not reflected in Greece's sovereign spreads.

It is impossible to derive fair value estimates for Greek sovereign CDS with a simple regression analysis, since coefficients are unstable over time (and actually even change signs). Still, one has to wonder whether Greece should really trade at a wider credit spread than Egypt, a country that still has to undertake a sizable adjustment effort in order to restore fiscal sustainability. At present, we believe that even considering all of Greece's balance sheet vulnerabilities, the country's sovereign debt appears to be trading around 100 to 200 basis points too wide. This may in part be related to the stigma of Greece's 2012 sovereign debt restructuring. However, we will show that the mispricing is likely also due to the structure of Greece's privately held public debt.

**4. As a result of the mispricing of sovereign risk, financial intermediation in Greece has become dysfunctional.** With sovereign credit spreads serving as a benchmark for commercial borrowing, Greek corporates and SMEs borrow at very high rates compared to their northern European counterparts. Large Greek corporates (OTE telecoms, Titan cement, Hellenic Petroleum, S&B Minerals, and Intralot) have tapped the bond market with five-year issues with coupons between 8% and 9¾%. Others, however, have decided to move their corporate headquarters to western Europe in order to access credit at lower rates. Since mid-2012, the independent Greek Coca Cola bottler, S&B Minerals, and recently Viohalco, a metals processing firm, have been delisted from the Athens Stock Exchange and have either been listed on exchanges in Brussels or Geneva, or are privately held. By contrast, SMEs, which account for 70% of value added and 85% of employment, have been hard-hit by their heavy dependence on bank lending which has become both scarce and expensive.

**5. The mispricing of sovereign risk is one of the reasons why privatisation of state-owned assets has stalled.** Faced with falling private savings and high interest rates, Greece urgently needs to attract foreign direct investment (FDI) to help its economy grow and create jobs. The obvious vehicle for such investment is the privatisation programme which has underperformed so far, raising total revenues of only €2 billion since 2011. We believe that the privatisation programme will continue to underperform if Greece

does not deal with the deep valuation discount on its GGBs. Any private-sector agent considering an investment in a Greek company (whether in the form of loans, bonds, listed equity or private equity) faces the opportunity cost of not investing in Greek government bonds, which currently pay a yield of around 8.5%. It is difficult to envision a situation in which Greek companies will continue to thrive in the face of another sovereign default. Therefore, private sector agents will typically discount any investments in Greek companies with the GGB yield (to account for systemic risk) and apply an additional risk premium which reflects the company's idiosyncratic risk. This implies that private-sector agents will typically discount investments in Greek companies at a double-digit yield, which will seldom result in a positive net present value (NPV). Therefore, the privatisation of state-owned assets, foreign direct investments or any other form of investment in the Greek economy will not occur in meaningful size as long as government bonds offer such outstanding return potential. Only a substantial decline in government-bond yields will stop crowding out lending to and investing in the private sector in Greece.

**6. In order to overcome the country's deep recession, it is imperative that stable and affordable financing for the private sector is restored.** The Greek economy currently has a very high level of idle resources, as evidenced by high unemployment and low capacity utilisation in manufacturing. Fixed capital formation has dropped by more than 60% in real terms since the peak reached in the fourth quarter of 2007. Directed bank lending at below-market rates can help to avoid a worsening of the situation, but would hurt bank profitability given high funding costs. Ultimately, the market interest rates that the private sector faces need to be brought down – otherwise, Greece's macroeconomic adjustment programme will fail to induce a recovery of economic activity. In this respect, the most important prerequisite for a reactivation of private sector economic activity and investment is a reduction in the excessive risk premium on Greek government bonds.

**7. A well-designed liability management exercise can contribute to a more effective pricing of Greece's government bonds and thereby improve market functioning.** There are a number of binding constraints on any such exercise, namely i) money should not be raised to close any financing gaps in Greece's macroeconomic adjustment programme and ii) any operation should provide the government with debt relief in NPV terms. For the purpose of the second criterion, we will discount all of Greece's liabilities from the issuers' perspective using discount rates of 3.5% and 5%, which represent two "different guesses for the rates at which Greece might be able to transfer revenues over time, based on borrowing from either the market after it reopens or from the EFSF" (Zettelmeyer et al., 2013).

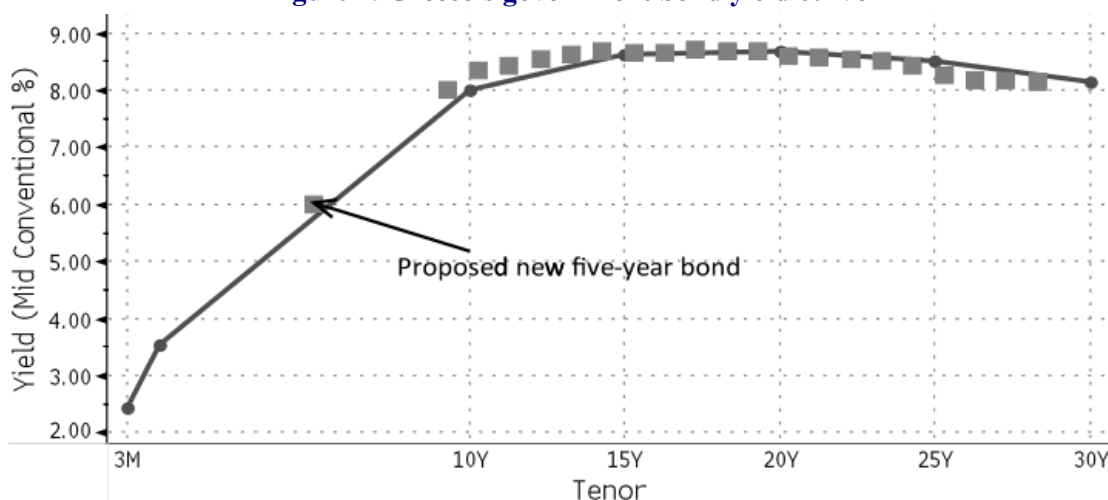
**8. At present, the Greek government bond market is fragmented and offers scarce liquidity.** After the February 2012 debt restructuring and the December 2012 buyback, there is a total stock of €29.6 billion of new Greek government bonds left in the market, consisting of 20 series of around €1.4 billion each, with annual maturities between 2023 and 2042 (Xafa, 2013).

These new bonds currently trade at a yield of around 8.5%, with almost all trading conducted in the 'GGB strip', in which market participants agree to buy or sell a total face amount of bonds that is then split into 20 equal notionals. In other words, market participants typically buy or sell the entire yield curve in one go because this is the only liquid way to trade Greek bonds. There is also a stock of €16.1 billion in Treasury bills with maturities of up to six months that trade at yields of 2.5% to 3.5% and are almost exclusively held by Greek banks.

The settlement of transactions in new GGBs is somewhat complicated, not only because every trade typically requires 20 tickets, but also because these instruments carry a step-up coupon that increases from 2% to 4.2% over the life of the bonds. What is missing on the yield curve is a liquid five-year plain vanilla bond that can be used as a benchmark for private-sector financial intermediation. Figure 2 on the following page shows the current Greek government bond yield curve with the existing 20 GGBs, the T-bills and the proposed new five-year bond.

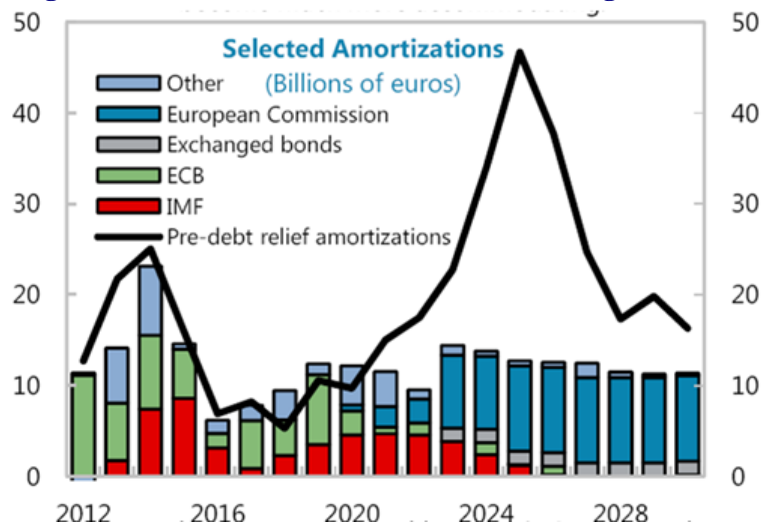


Figure 2. Greece’s government bond yield curve



Source: Bloomberg, market levels as of 3 December 2013.

Figure 3. Amortisation schedule for the Greek government



Source: IMF (2013a).

Apart from new government bonds and Treasury bills, the Greek government is facing amortisations of old government bonds which the Eurosystem bought for the Security Market Programme (SMP) and for the ANFA accounts of national central banks prior to the 2012 debt restructuring (ECB holdings). These instruments have not been restructured, in violation of the principles of preference avoidance and comparability of treatment (Kopf, 2013). Furthermore, there are scheduled repayments to the IMF and to Greece’s European partners. Figure 3 provides a summary of these scheduled debt repayments in the coming years and demonstrates that amortisation payments on new GGBs only amount to a minuscule part of Greece’s overall public service.

**9. We propose three liability management measures to enhance the functioning of the government debt market in Greece.** Specifically, we believe that Greece should i) issue a new five-year bond, ii)

consolidate the 20 individual series of the ‘GGB strip’ into four liquid bonds and iii) swap euro-denominated bonds into dollar-denominated bonds.

**10. Greece should issue a new five-year bond.** In order to achieve lower government bond yields and to provide a reference point for private-sector financing, the Greek government bond-yield curve needs to be anchored at the front end. At present, the yield curve is segmented in two parts: there are short-term T-bills with yields of around 3% and tenures of three to six months, and there are long-term bonds with yields of around 8.5% and tenures of 10 to 30 years. What is missing is a five-year point on the government bond yield curve that could serve as a reference for the pricing of new credit to the private sector and for the discounting of new private-sector investments, such as FDI and privatisations. Furthermore, a new five-year bond would open the Greek bond market to a new investor base, since many European mutual funds and

insurance companies are reluctant to commit themselves to ten-year instruments, while they would consider a shorter bond as a viable strategy to re-gain exposure to Greece.

**11. Greece should offer investors a swap of their existing holdings of the 20 series of new GGBs into four liquid bonds with maturities in 2025, 2030, 2035 and 2040.** Specifically, holders of new Greek government bonds maturing between 2023 and 2027 should be invited to swap their holdings into a new 2025 bond; holders of existing bonds with maturities between 2028 and 2032 should be invited to swap their bonds into a new 2030 bond, etc. As a result, a significant portion of new Greek government bonds would migrate into four relatively liquid instruments, which would allow investors to trade individual Greek bonds with acceptable liquidity and articulate duration views on the yield curve.

**12. Greece should offer investors a swap of the newly created 2018, 2025, 2030, 2035 and 2040 bonds into dollar-denominated securities.** At present, the investor base for European sovereign debt that is subject to elevated credit risk consists almost exclusively of dollar-based investors (mainly former and current Emerging Markets bond fund managers). Many of these institutional investors shy away from purchases of euro-denominated bonds due to difficulties related to the hedging of their currency exposure. Furthermore, the main fund benchmarks such as JP Morgan's Emerging Markets Bond Index consist of dollar-denominated plain vanilla bonds (with no step-up coupons, etc.) and issuance of bonds that can be included in these indices gives access to large pools of captive demand. This is the main reason why Croatia, Lithuania, Romania, Slovenia and other European sovereigns have shifted a significant portion of their issuance into the dollar market. They have been rewarded for this strategy with much lower borrowing costs, and most of these sovereigns regularly swap the proceeds of the bond and the debt servicing cash flows back into euros at issuance. We believe that Greece would be able to issue dollar-denominated bonds at an asset swap spread that is significantly lower than current secondary market levels for its euro-denominated GGBs.

**13. These liability management exercises would be beneficial to the Hellenic Republic.** We have laid out in point 9 above that any such exercise must i) not be used to issue more debt, but to retire debt instead and ii) must provide the government with debt relief in NPV terms.

The Greek government could today issue €4 billion notional of a new plain-vanilla bond with maturity on 24 February 2018, a coupon rate of 6% and an issue price of 100% of face value. It could then use the €4 billion in proceeds to retire €6 billion notional of the

existing Greek government bond with maturity on 24 February 2023 at a market price of 65.4% of face value and a yield of 8.65%. This simultaneous issue and repurchase transaction could be conducted in the form of a ratio swap with existing holders. The results are summarised in Table 2. The stock of public debt would decline by €2 billion, which would provide Greece with debt relief. If the Greek government discounts both the old and the new obligation at a rate of 3.5%, it would achieve a NPV gain of €1.56 billion (by retiring debt worth €5.95 billion and issuing debt worth € 4.39 billion). At a discount rate of 5%, the NPV gain would amount to €1.12 billion. If the ratio swap is carried out for existing bonds with longer maturities, the gains would be substantially higher, since these bonds trade at lower cash prices.

**Table 2. Illustrative results of liability management exercise from the issuer's perspective**

	3.5% Discount rate	5% Discount rate
<b>Issuance of new 2018 bond</b>		
– Increase in face value	€4.00 bn	€4.00 bn
– Increase in debt NPV	€4.39 bn	€4.15 bn
<b>Repurchase of existing 2023 bonds</b>		
– Reduction in face value	€6.00 bn	€6.00 bn
– Reduction in debt NPV	€5.95 bn	€5.27 bn
<b>Net debt relief</b>		
– Reduction in face value	€2.00 bn	€2.00 bn
– Reduction in debt NPV	€1.56 bn	€1.12 bn

*Sources:* Authors' own calculations.

In order to ensure that the Greek government achieves such debt stock reductions and NPV gains at current market prices, the Greek government could auction warrants that allow holders of existing bonds to swap their holdings into new 2018 bonds. (Mexico has carried out similar auctions in its liability management operations in the past.) The proceeds from the sale of exchange warrants would generate an additional source of revenue for the Greek government and it would lock in the desired swap ratio before the transaction takes place.

Some will argue that existing bondholders would not voluntarily participate in such an exchange if the parameters are set in a way that provides NPV gains to the issuer. However, experience with voluntary liability management exercises carried out by many Emerging Markets sovereign issuers such as Mexico and Brazil as well as by Ireland and Portugal has proven otherwise. The key issue here are the dynamic effects on the pricing of sovereign risk that this liability management exercise sets into motion; in this

sense, such bond exchanges can have a catalytic character. By bringing in potential investors that are constrained to dollar-denominated and/or plain vanilla instruments, a successful exchange would broaden the investor base for Greek government bonds. The result would be capital gains not only on the new bonds, but also on existing GGBs. By swapping a portion of their holdings of the ‘GGB strip’ into a new five-year bond, existing investors would benefit from a more efficient pricing of Greek risk at the price of giving up some of the convexity of holding deeply discounted bonds.

The swap of the ‘GGB strip’ into four more liquid instruments would likely be NPV neutral at inception, but the Greek government would gain from this exercise since it will benefit from a less fragmented and more liquid market over time.

**14. This liability management exercise will facilitate the resumption of market access, which is a necessary condition for continuous multilateral disbursements to Greece.** Greece is currently receiving IMF financing under exceptional access criteria. One of the prerequisites for this type of IMF funding is that Greece “has prospects for gaining or regaining access to private capital markets within the timeframe when Fund resources are outstanding”. Restoring market access is thus a stated objective of the current multilateral assistance programme for Greece (see IMF, 2013a, p. 38). Facilitating a gradual return to market financing is also a stated objective of Greece’s European partners (European Commission, 2012). The ability of the Greek sovereign to refinance itself at acceptable interest rates reduces the risk that further multilateral assistance has to be granted to the country. By placing a new 2018 bond on the yield curve via a debt swap, Greece may potentially be able to tap this instrument at a later stage, which would reduce the need for increased multilateral disbursements.

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