Sovereign Default: Thinking the Unthinkable

by
Robert Lucas
Department of Economics
U of S

Overview

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2. Defining Default
3. Chronology of a Sovereign Crisis
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I Government Budget Constraints

I.1 Annual Budget Constraint

(1) $B^g_{t+1} - B^g_t = $ Gov't Expenditures$_t$ $-$ **Tax Revenue$_t$ = Deficit$_t$**

(2) $B^g_{t+1} - B^g_t = (G_t + i{\cdot}B^g_t + OTP_t) - T_t = D_t$

(3) $B^g_{t+1} - B^g_t = G_t - (T_t - OTP_t) + i{\cdot}B^g_t = (G_t - T_{Nt}) + i{\cdot}B^g_t = D_t$

Define a lower case letter as the ratio of the variable to nominal GDP.

(4) $b^g_{t+1} - b^g_t = \Delta b^g_t = (g_t - t_{Nt}) + (r\text{-}n){\cdot}b^g_t$,   where r = real rate of interest and n = growth rate of real GDP.

I.2 Intertemporal Budget Constraint

Rewrite equation (3) as

(5) $(1+i) B^g_t + G_t = T_{Nt} + B^g_{t+1}$

Update equation (5) by one period

(6) $(1+i) B^g_{t+1} + G_{t+1} = T_{Nt+1} + B^g_{t+2}$

Solve (6) for B^g_{t+1} and substitute into (5)

(7) $(1+i) B^g_t + \{G_t + G_{t+1}(1+i)^{-1}\} = \{T_{Nt} + T_{Nt+1}(1+i)^{-1}\} + B^g_{t+2}(1+i)^{-1}$

Repeat this process for the foreseeable future to obtain an intertemporal budget constraint.

(8) $(1+i) B^g_t +$ {Present value of G} = {Present value of net taxes}

Definition of Bankruptcy

Bankruptcy occurs when the holders of government debt conclude that the intertemporal budget constraint is violated. That is, the projected path of spending and tax revenue net of other transfers is such that:

(9) $(1+i)B^g_t + \{\text{Present value of G}\} > \{\text{Present value of } T_N\}$

- **Since present value calculations involve expectations of future variables, this state can come about very quickly.**
- Market participants utilize both b and Δb in forming **expectations of the likelihood of bankruptcy.**
- **As the probability of bankruptcy increases, so also do the nominal and real interest rates that holders of government debt demand in order to continue holding government debt.**

Chronology of Sovereign Crisis

- A high debt to GDP ratio (b^g) is not by itself a trigger for a sovereign debt crisis, but it does increase a country's vulnerability to one.

- The typical initiating event is a financial crisis that produces a prolonged recession with large declines in income and employment.

- The recession generates a sharp decline in T, a rise in OTP (unemployment insurance, social welfare, bailouts) and an increase in G (stimulus spending).

- The combined effects of these changes leads to an explosion of government debt and a large increase in the debt/GDP ratio.

- As the debt/GDP ratio rises, so does the probability of default and, as a consequence, the interest rate on new and maturing government debt increases, reinforcing the explosion in the debt to GDP ratio.

1. Government Debt Held By Domestic Nationals

- The default impairs the domestic banking system as banks have to write down the value of their assets. This writedown may lead to an additional systemic crisis with a collapse in financial intermediation.

- All public and private pension plans and private savings experience sharp declines in value.

- The collapse in financial intermediation and wealth leads to a large decline in spending, resulting in further contractions in income and employment.

- Because of the severe consequences for the real economy, governments rarely default explicitly on domestic debt.

1.1 Fiscal Structural Reform

- Lower G (cut public sector employment) and OTP (public pension reform), and raise T (increase tax rates).

- A severe decrease in G and sharp increase in T can bring the intertemporal budget back to balance, particularly if the new policies are maintained for a period of time.

- The immediate impact of these policies is to exacerbate the recession as the growth rate of real GDP becomes more negative.

- Recall, $\Delta b^g_t = (g_t - t_{Nt}) + (r-n) b^g_t$. As n declines, its direct impact on Δb^g_t is reinforced by the indirect impact on t_{Nt} and the probability of default rises, along with r. Thus a debt spiral begins which may eventually result in default, notwithstanding the policy attempts to bring the crisis under control.

1.2 Sell New and Maturing Debt to the Central Bank

- This policy generates new revenue to augment net tax revenue.

- The rapid expansion of the money supply generates surprise inflation.

- Rather than defaulting by writing down the nominal value of the outstanding debt, surprise inflation reduces the purchasing power of this debt, so the net result for b is the same as an explicit default. This policy was the principal means of avoiding explicit default prior to the 20th century.

- A danger of this policy is hyperinflation, as the sale of debt to the central bank accelerates. The classic example is that of Germany in 1921-23. In two years the price level rose by a factor of 2.22×10^{10}, causing massive redistributions of wealth.

2.   Government Debt Held By Foreign Nationals

- **If the debt is held by foreign nationals, the domestic economy is spared some of the consequences of a sovereign default.**

- **The default implies that the country will not be able to access the international credit market for the foreseeable future.**

- **This loss of access is manageable if the structural deficit is zero. Recall: (3) $B^g_{t+1} - B^g_t = (G_t - T_{Nt}) + i B^g_t$**

- **Therefore, once the structural deficit is close to zero, default on external debt is much more likely and a settlement with creditors is negotiated (structured default).**

- **This negotiation involves:
(i) a partial write down in the nominal value of existing debt (haircuts);**

(ii) a restructuring that involves a swap of debt about to mature for debt of longer maturity and lower interest rates;

(iii) credible commitments for fiscal structural reform involving lower future G and OTP, and higher future T;

(iv) short-term lending to finance the current deficit until the structural reforms takes effect.

- If properly executed, a negotiated default can avoid the debt spiral that results if the reform focuses solely on eliminating the current deficit.

- Thus, a successful settlement will bring the intertemporal budget back into balance by changing all four components of the budget while simultaneously financing the current deficit.

$$(1+i)B^g_t + \{\text{Present value of } G\} = \{\text{Present value of } T_N\}$$

Countries in External Default or Restructuring 1800-2008

Spain 13; France 8; Germany 8; Austria 7; Hungary 7; Portugal 6; Greece 5

Source: Reinhart and Rogoff, This Time is Different, 2009

European Sovereign Debt Crisis

- The sovereign debt crisis of the euro monetary union combines the features of both domestic and external debt crises.

- In a monetary union, domestic control over the currency is transferred to a central body, the European Central Bank(ECB).

- In the deliberations that established the ECB, Germany insisted that the primary method of domestic default (the sale of debt to the central bank) be eliminated. Thus the charter of the ECB does not allow it to purchase the sovereign debt of individual countries that run into difficulty.

- The original treaty also required that countries could not join the monetary union until the deficit/GDP ratio was 3% or less and the debt/GDP was 60% or less. However, there was no provision for enforcing the compliance of member states once in the union.

European Sovereign Debt Crisis

- The sovereign debt of individual countries (Ireland and Greece) was purchased by banks and pension plans throughout the Euro zone, so from the perspective of the Euro creditors (Germany and France), a default in the sovereign debt of Ireland and Greece generates consequences similar to a domestic default.

- From the perspective of Euro debtors a default can either be viewed as an external default (Ireland and Greece) or a domestic default if the sovereign debt is held primarily by domestic agents (Italy and Spain).

- This difference of perspective is important for understanding the dynamics of negotiations among the euro countries over the appropriate resolution of the default crises of individual counties.

1 Origin of the Crisis

- Of all current sovereign debt crises, Ireland's is most directly tied to the housing bubble that preceded the world financial crisis of 2007-08.

- Between 1996 and 2006, the national index of house prices rose 270 percent.

- In 2006, more than 17 percent of the total non-farm workforce was in construction, a figure that rises to 20 percent if one includes jobs in the service sector related to construction.

- From 2000, the bank lending that fueled this bubble relied increasingly on short-term (3-month) debt sold externally in the interbank market rather than on deposits. The net external debt of Irish banks rose from 20 percent of GDP in 2003 to 70 percent in 2008.

Irish Housing Prices
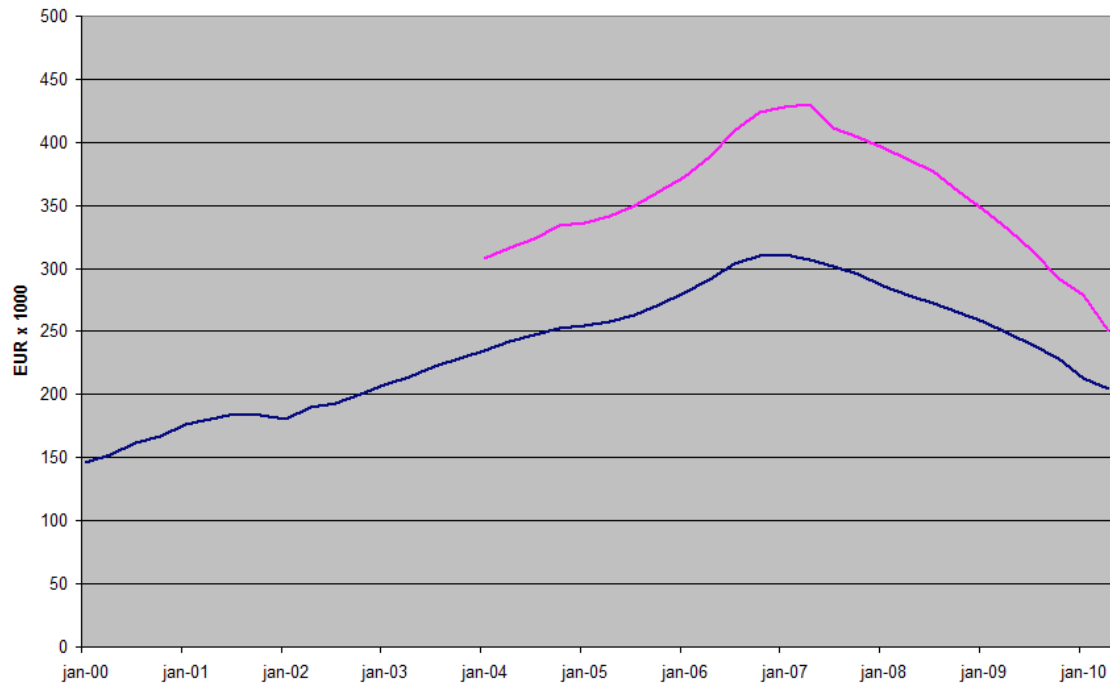
Source: Wikimedia Commons

2   Crisis Chronology

- When the bubble burst in 2007 and prices began declining, borrowing in the overnight market became difficult and Irish banks were forced to cover their shortfall with loans from the Irish Central Bank and the ECB.

- By 2008, banks were experiencing large scale redemptions and on September, 29th, 2008, the Finance Minister, Brian Lenihan, guaranteed the debt of the six main Irish banks. In effect, this decision converted private debt to public debt, due to a confusion between illiquidity and insolvency of the banking system.

- Over the next two years, additional government attempts to recapitalize some banks and nationalize others contributed to a government deficit equal to 32 percent of GDP in 2010.

Ireland

- The recession that began in 2008 peaked in 2009 with a decline of 10 percent in real GDP, the largest decline in the Euro zone.

- Negative growth in real GDP together with the efforts to refinance the banking system generated an increase in the debt to GDP ratio from 25 percent in 2007 to 95 percent in 2010.

- As the debt to GDP ratio grew, so also did the interest rate on government debt, as markets began to consider the possibility of default. By October 2010, interest rates on 10 year bonds had reached 7 percent, a level that is considered unsustainable.

- This perfect storm of a large structural deficit, high interest rates and negative GDP growth led to a Euro bailout in 2010.

3 Irish Bailout

- €85 billion loan from the EFSF, 53 percent contributed by European governments, 26 percent from the IMF and the remaining from the ICB cash reserves and national pension fund. The interest rate on the loan is 5.8 percent.

- This loan represents about $25,000 per man, woman and child.

- The loan is dependent on austerity measures including large cuts in welfare payments (OTP), a rise in the VAT (T) and thousands of layoffs in the public service (G).

- The loan is to finance the current deficit until structural reforms can be implemented to bring the intertemporal budget into balance.

- Note the absence of haircuts or restructuring. Private holders of Irish debt receive full repayment of maturing debt.
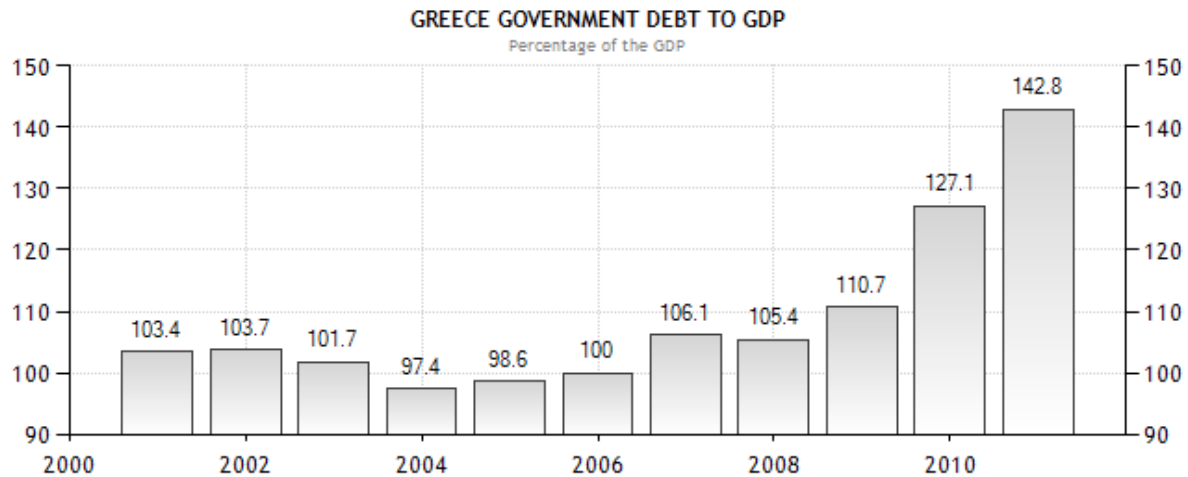
Ireland

- The bailout occurred because of the fear of contagion in the Euro zone if Ireland defaulted.
- The tepid recovery of real GDP in 2011 has increased the probability of another bailout package.
- Austerity measures are forecast to remain in effect until at least 2014.
- In February of 2011 the government suffered the worst defeat of a sitting government since the formation of the Irish state in 1921.
- "The banks sank the economy and the government"

1 Origin of the Crisis

- In contrast to the Irish crisis, the Greek debt crisis began long before the financial crisis of 2007-08.

- To achieve the debt to GDP (60 percent) and deficit to GDP (3 percent) targets to qualify for entry to the EMU in 2001, Greece understated the magnitude of its annual deficit.

- Over 2001-2008, the Greek deficit averaged about 3.5 percent of GDP (although there is a question about the quality of this data).

- A former budget minister suggests the official figure of 1.5 percent in 2004 was actually 8.3 percent.

- This issue was masked by strong real GDP growth of close to 4 percent. As a result, the official debt/GDP ratio was relatively stable, but exceeded 100 percent of GDP over 2001-2008.

Greece Debt/GDP Ratio

GREECE GOVERNMENT DEBT TO GDP
Percentage of the GDP

Year	Value
2001	103.4
2002	103.7
2003	101.7
2004	97.4
2005	98.6
2006	100
2007	106.1
2008	105.4
2009	110.7
2010	127.1
2011	142.8

SOURCE: WWW.TRADINGECONOMICS.COM | EUROSTAT

Recall: $\Delta b^g_t = (g_t - t_{Nt}) + (r-n) b^g_t$

Greece

2 Crisis Chronology

- **With an economy heavily reliant on shipping and tourism, Greece GDP declined rapidly in 2009 (-3.5%) with the onset of the global recession.**

- **In October 2009, the newly elected government admitted that the** previous government had been manipulating the nation's **economic data on debt and deficits. The deficit was revised upward from 3.6 percent to 12.8 percent of GDP (since revised to 15.4 percent).**

- **By May of 2010 Greece was unable to access world credit markets. It was given a loan of €110B from the EFSF staggered over two years, with successive payments tied to structural reform of the government budget.**
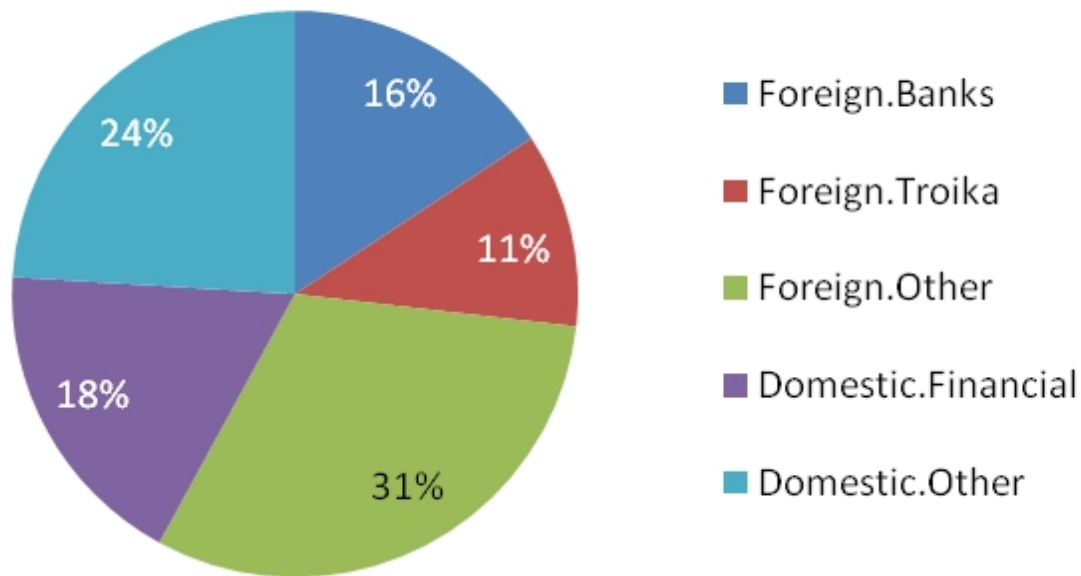
- The cutbacks in G and OTR contributed to a decline in real GDP in 2010 of 4.5 percent (and a corresponding collapse in taxation revenue) which reinforced a debt spiral as the debt/GDP ratio rose to 127 percent.

- In 2011 real GPD declined by 6 percent, the debt/GDP ratio rose to 143 percent, and it was forecast to reach 160 percent by 2012.

- It became apparent that Greece could no longer repay the principal and interest payments on its debt and the only question was whether its default would be disorderly or structured.

- Since about 60 percent of Greek debt is held externally, some argued that Greece should simply default on its external debt.

- Disorderly default is not feasible because the 2011 structural deficit is about 9 percent of GDP. Greece needed to borrow to finance its operations.

Greece External Debt

**Holders of Greek Public Debt Q3 2010 (€ 337 bn)
Estimates by Greek Default Watch**

- Foreign.Banks — 16%
- Foreign.Troika — 11%
- Foreign.Other — 31%
- Domestic.Financial — 18%
- Domestic.Other — 24%

- In October, 2011 on the verge of an unstructured Greek default, Merkel and Sarkozy engineered a structural default:

(a) another €130B bailout;

(b) a haircut of 50 percent on private holders of Greek debt;

(c) a restructuring of remaining debt, extending the maturity to 30 years with an interest rate of 3.5-4 percent (an effective haircut of 70 percent);

(d) Additional reforms to deal with tax evasion (40/40/20), generous entitlements and a pubic sector that is 40 percent of GDP.

- The attempt by PM Papendreou to hold a referendum resulted in his replacement with a technocratic government led by Papademos, a former central banker.

- With reforms, the hope is that b will fall to 120 percent by 2020.

Italy

1   Origin of the Crisis

- Zero GDP growth over the past decade generated a debt/ratio of 116 percent even though the structural deficit has been close to zero.

- The recession in 2008-09 reduced real GDP by 7 percent which generated a structural deficit. Forecasts of low (and even negative) real GDP growth into 2013 and beyond compounded the problem.

- Throughout 2010 and early 2011, the coalition government of Berlusconi failed to pass legislation to address the fiscal situation.

- Since Italian GDP is 16 percent of the Euro zone income (7th largest economy in the world) compared to 1.8 percent for Greece, concern developed that the EFSF would not have sufficient funds to bail out Italy should it need assistance.

2 Crisis Chronology

- **The crisis peaked in November of 2011 when Italy was forced to pay 7.3 percent interest on new ten-year bonds, a level that is not considered sustainable, as it threatened to initiate a debt spiral.**

- **In mid November, 2011, the Italian government failed a confidence motion and was replaced by a technocratic government lead by Mario Monti, a professor of economics and former EU commissioner.**

- **The Monti government began to implement structural reforms to reduce government spending, reform the public pension plan and to reduce tax evasion.**

Italy

3   Why Italy will not Default

- The majority of Italian public debt is held internally (58%), so the political and economic cost of default is prohibitive.

- The average maturity of Italian debt is about 7 years. Thus it is less likely to face significantly higher interest rates on most of its debt in the short term.

- Therefore it has about 7 years to bring its structural deficit into balance and to reduce the debt/GDP ratio to more sustainable levels through structural reforms before a debt spiral develops.

- The recent decline in borrowing costs indicates that markets believe the new government of Italy has introduced credible structural reforms to deal with its fiscal situation.

Maastricht Treaty

- 1991 treaty that established rules for joining the EMU.

(a)   Max inflation of 1.5 percent;

(b)   Max b of 60 percent;

(c)   Max d of 3 percent.

- No enforcement mechanism once countries joined the EMU.

- In 2002-03 both France and Germany violated the guidelines on the deficit.

- Other countries, notably Greece, routinely violated the guidelines over the past ten years with no consequences.

Fiscal Compact December 2011

- A treaty between governments of the EU.

Reforms

(a)   Cap of 0.5 percent structural deficit;

(b)   Automatic penalties for countries whose d exceeds 3 percent;

(c)   Rules to be enshrined in countries' constitutions;

(d)   A new ESM operational in July 2012.

- UK and Czech Republic opted out.

- The ECB welcomed this reform and announced a series of three-year loans to commercial banks and by December 21, banks had borrowed €489 billion. Another €530 billion was borrowed in late February, 2012.

- Some of these funds were used to purchase sovereign euro debt.

- The fear of another liquidity crisis in Europe has diminished over the past three months along with interest rates on most euro sovereign debt.

1　The Debt Ceiling Crisis of August 2011

- Not a default crisis as defined as a violation of the intertemporal budget constraint.

- The maximum level of debt is established by an Act of Congress.

- Recall the annual budget constraint:

(3)　$B^g_{t+1} - B^g_t = (G_t - T_{Nt}) + i B^g_t = D_t$

- A failure to raise the debt ceiling results in the following yearly budget constraint:

(3a)　$0 = (G_t - T_{Nt}) + i B^g_t = D_t$

- Since net taxes and interest on the debt are given, the only way to satisfy (3a) is to reduce government spending by shutting down some government operations. This happened in December, 1995.

2   Crisis Chronology

- **Political stalemate developed in the Congress as Republicans under the influence of the Tea Party refused attempts of the Democrats to raise additional tax revenue to address the large annual deficit of 9 percent.**

- **On July 31, 2011 a deal was struck to raise the debt ceiling and to cut spending by 2.4 trillion dollars in the next two years.**

- **A bipartisan committee was struck to find additional savings by the end of the year or have automatic cuts start in 2013.**

- **S&P downgraded the U. S. debt in August since the deadlock in addressing the growth in the federal debt appears to be in place until the 2012 election.**

USA The Artificial Crisis

- Markets around the world experienced heavy losses, DJ dropped 5.6 percent in one day.

- The bipartisan committee reported a failure to reach consensus in November, 2011.

- The Congressional deadlock will continue at least until the 2012 election as each party hopes to achieve a majority in both houses to enact its preferred solution.

- If the election does not resolve the impasse, then the parties will have to negotiate a path of spending and taxation revenue that will be sustainable in the longer term.

![USA The Real Problem]

U. S. Debt/GDP Ratio under Alternative Scenarios
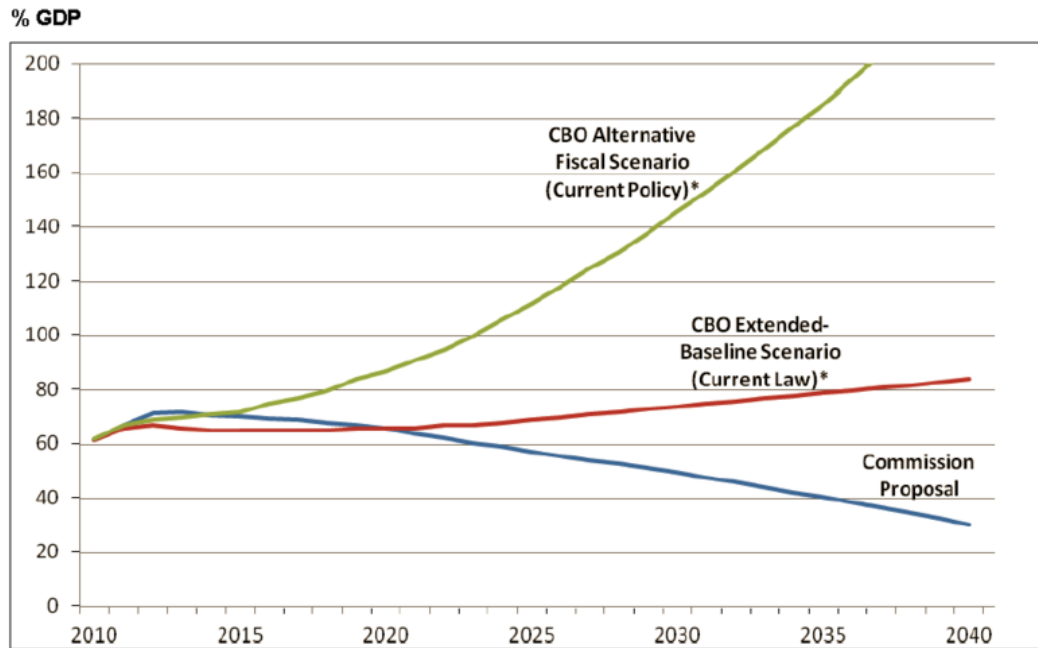
Source: *Report of the National Commission on Fiscal Responsibility and Reform* - December 2010
*Note: Explanations of the Alternative and Baseline scenarios are included on graph's article page.

References

Alessi, Christopher, "The Eurozone in Crisis," Council of Foreign Relations, Feb. 14, 2012, available at www.cfr.org/eu/eurozone-crisis/pp220-55.

Barro, R and R. Lucas, <u>Macroeconomics: First Canadian Edition.</u> (Boston, Irwin, 1994).

Bowles, E. and A. Simpson, "The Moment of Truth: Report of the National Commission on Fiscal Responsibility and Reform," December 2010.

Hope, Karen, "Greek Tax Collectors Accused over Bribes, Financial Times Report, December 14, 2011.

Lewis, Michael, <u>Boomerang: Travels in the New Third World</u> (New York: W. W. Norton, 2011).

Little, Allen, "How 'Magic' Made Greek Debt Disappear Before it Joined the Euro," BBC News, 2 February, 2012.

Reinhart, C and K. Rogoff, <u>This Time is Different.</u> (Princeton: Princeton University Press, 2009).

The Economist, various issues.

The Irish Times, various issues.

Questions/Discussion