WHEN IS REPAYING PUBLIC DEBT NOT OF THE ESSENCE?

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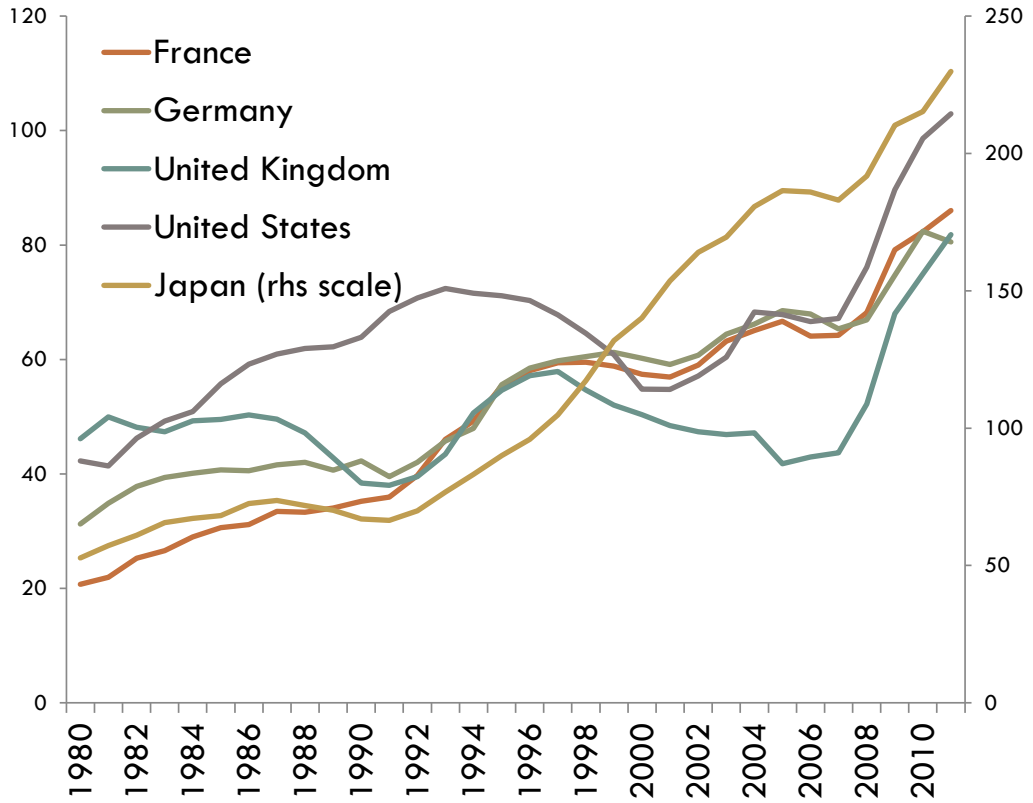
Public debt has been rising in advanced economies …

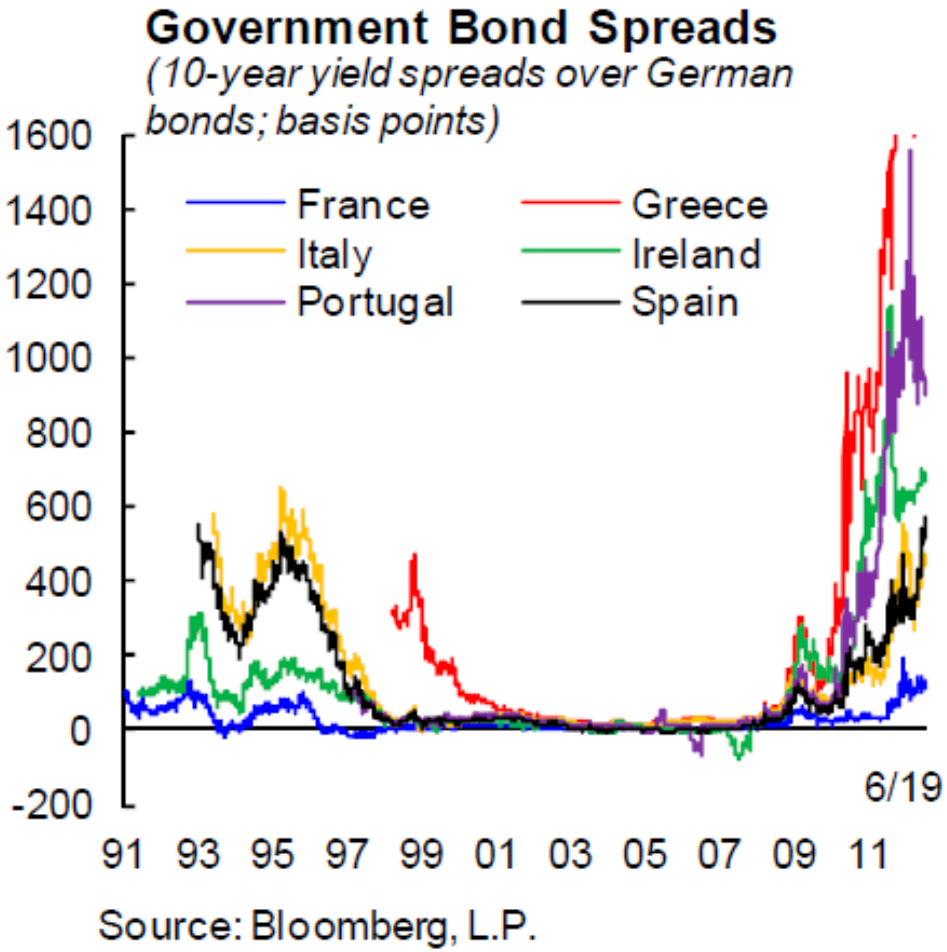


Source: IMF

This has been driven by

- Financial sector bailouts
- Support measures to the economy
- Low growth
- And in some cases high sovereign yields

For countries with funding difficulties, the need to consolidate is unquestioned



But for those other countries with fiscal space, what should be our advice?

Recent debates:

- Maastricht? (60 percent of GDP)
- Reinhart and Rogoff? (90 percent of GDP)
- At which *pace* should be pay down this debt? (IMF, 2013)

But few questions asked about *whether* the debt needs to be paid down in the first place.

The literature has been inconclusive

- Theory predicts everything:
  - Ever increasing debt (Lucas and Stokey; 1983)
  - Negative debt (Aiyagari et al., 2002)
  - Zero debt (Debortoli and Nunes, 2013)
- And that is even abstracting from:
  - External debt issues
  - Distributional issues: who owns the debt (older generations), and who pays taxes (younger generations)
- We need to simplify:
  - Only focus on efficiency issues
  - In a closed economy
  - Without risk of default (we'll cover this later)
  - In a model with commitment

A standard Ramsey problem

The benevolent government maximizes the representative household's utility under the resource constraint

$$Max_{\tau_t, g_t, b_t, k_t^g} \sum_{t=0}^{\infty} \beta^t u(c_t, l_t, g_t)$$

$$s.t. \quad c_t + g_t + k_t^p - (1-\delta)k_{t-1}^p + k_t^g - (1-\delta)k_{t-1}^g = F(k_{t-1}^g, k_{t-1}^p, l_t)$$

and under a feasibility constraint:

$$\sum_{t=0}^{\infty} \beta^t (u_{c,t} c_t + u_{l,t} l_t) = u_{c,0}(Y_0 b_{-1} + R_0 k_{-1}^p)$$

with production as a function of labor supply l_t, private capital (k^g_{t-1}) and public capital (k^p_{t-1})

$$F(k_{t-1}^g, k_{t-1}^p, l_t) = k_{t-1}^{g(\theta)} k_{t-1}^{p(\alpha)} l_t^{(1-\alpha)}$$

Optimal fiscal policy incorporates the private sector's optimization

- The household has a budget constraint

$$c_t + k_t^p + b_t = (1-\tau_t^L)w_t l_t + R_t k_{t-1}^p + Y_t b_{t-1} \qquad \text{(a)}$$

- And the labor supply decision is affected by distortionary taxation.

$$-\frac{u_{l,t}}{u_{c,t}} = (1-\tau_t)w_t \qquad \text{(b)}$$

- The yield on debt is:

$$R_t = Y_t = \frac{u_{c,t-1}}{\beta u_{c,t}} \qquad \text{(c)}$$

- Substituting for prices in (a) by using (b) and (c) and using marginal utility as a discount factor yields the feasibility constraint

$$\sum_{t=0}^{\infty} \beta^t (u_{c,t}c_t + u_{l,t}l_t) = u_{c,0}(Y_0 b_{-1} + R_0 k_{-1}^p)$$

The Ramsey solution has three Euler equations

$$(1) \qquad -(u_{l,t} + \lambda(u_{ll,t} l_t + u_{l,t})) = (u_{c,t} + \lambda(u_{cc,t} c_t + u_{c,t}))F_{l,t}, \quad \forall t \geq 1$$

i.e. taxes such that the marginal disutility of work is equal to the marginal social value of producing more output

$$(2) \qquad F_{k_t^g} = F_{k_t^p}$$

i.e. public capital is accumulated until its marginal product is equal to the marginal product of private capital

$$(3) \qquad \frac{u_{c,t} + \lambda(u_{cc,t} c_t + u_{c,t})}{\beta(u_{c,t+1} + \lambda(u_{cc,t+1} c_{t+1} + u_{c,t+1}))} = F_{k_t^g} + 1 - \delta$$

i.e. intertemporal social MRS is equal to the net return on capital

$$\text{if CES utility}: u_{cc,t} c_t = -\sigma u_{c,t} \Rightarrow \frac{u_{c,t} + \lambda(u_{cc,t} c_t + u_{c,t})}{\beta(u_{c,t+1} + \lambda(u_{cc,t+1} c_{t+1} + u_{c,t+1}))} = \frac{u_{c,t}}{\beta u_{c,t+1}} = Y_{t+1}$$

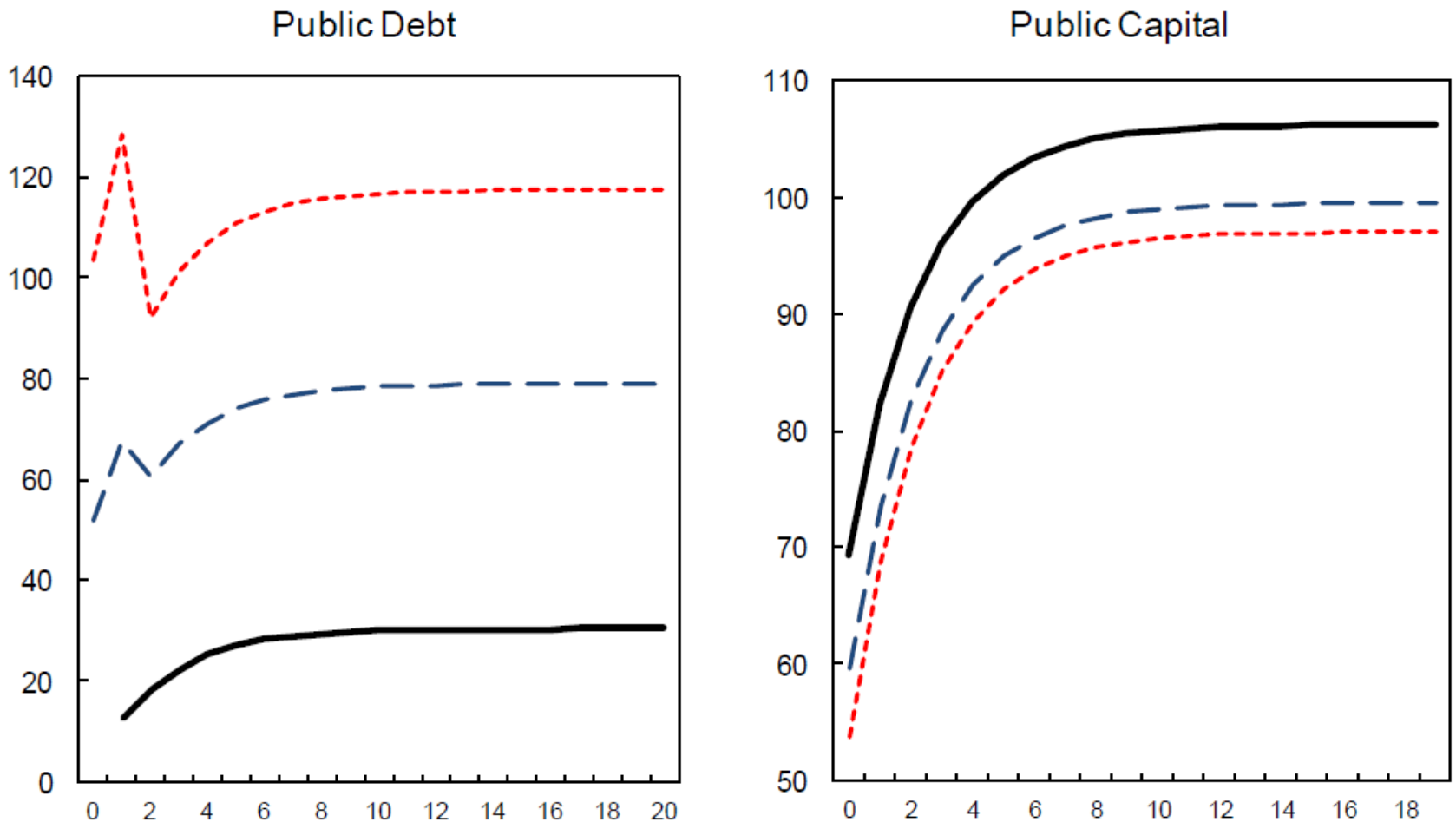
With CES utility, yield always equals intertemporal social MRS
This also holds in the long-run for any utility function (Chamley)

To pay down or not to pay down the debt?

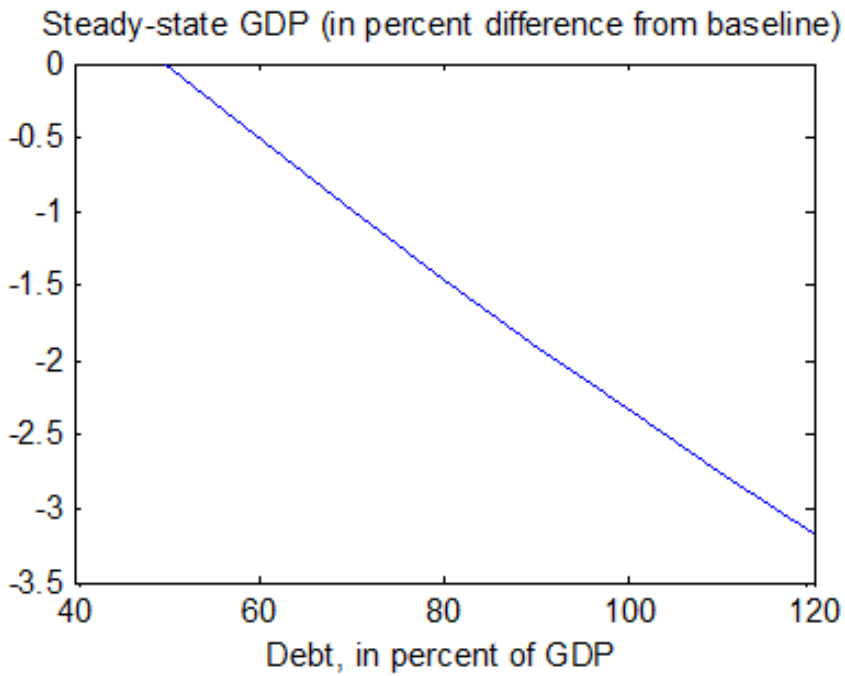
- Is there a trade-off?
  - Paying down the debt involves taxation and distortions
  - But never paying debt down means servicing it forever, incurring the distortionary costs of taxation in perpetuity.
- Suppose the government is considering paying down $1 of public debt, either today or tomorrow
  - If it pays today, it incurs the distortionary costs of raising another dollar of revenue.
  - If it defers to tomorrow, debt grows by the market interest rate, (1+r), and the cost will be the distortion associated with raising an additional $(1+r).
  - But the government discounts the future at precisely 1/(1+r), so it gains nothing by paying down a dollar of debt today.

Optimal policy is not to repay debt!

Figure 2. Dynamics Under Low, Medium, and High Initial Debt
(in percent of GDP)



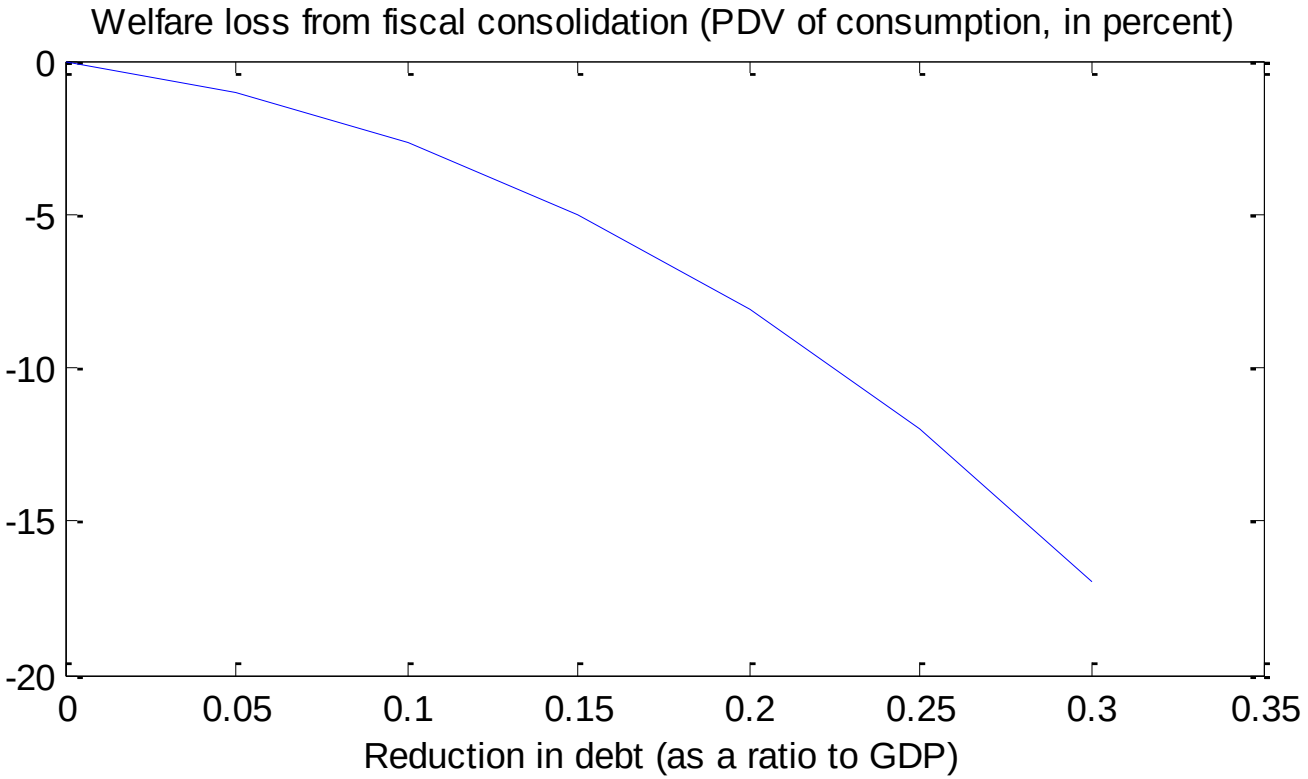
The cost of inherited debt indeed is high



For an initial increase in public debt from 50 to 100 percent of GDP:

- GDP is about 2.5 percentage points lower permanently.
- The present value welfare cost of inheriting 50 percent of GDP higher debt is around 30 percent of the initial period consumption.

but paying down the debt is even more costly: debt is a sunk cost



- Repaying 10 percent of GDP of debt reduces welfare by 2.7 percent of equivalent consumption (1.7 percent if spread over 10 years)
- The costs are convex in the speed and extent of consolidation

Higher public debt dampens public investment

- Higher debt implies:
  - Higher taxes
  - Lower labor supply
  - And thus lower stocks of capital in the steady-state
- Public investment plans should be scaled down. For an increase in public debt from 50 to 100 percent of GDP:
  - Over the first 5 years, public investment is 0.7 percent of baseline GDP lower on average (-5.9 percent)
  - Over the first 10 years, public investment is 0.4 percent of baseline GDP lower on average (-4.2 percent)

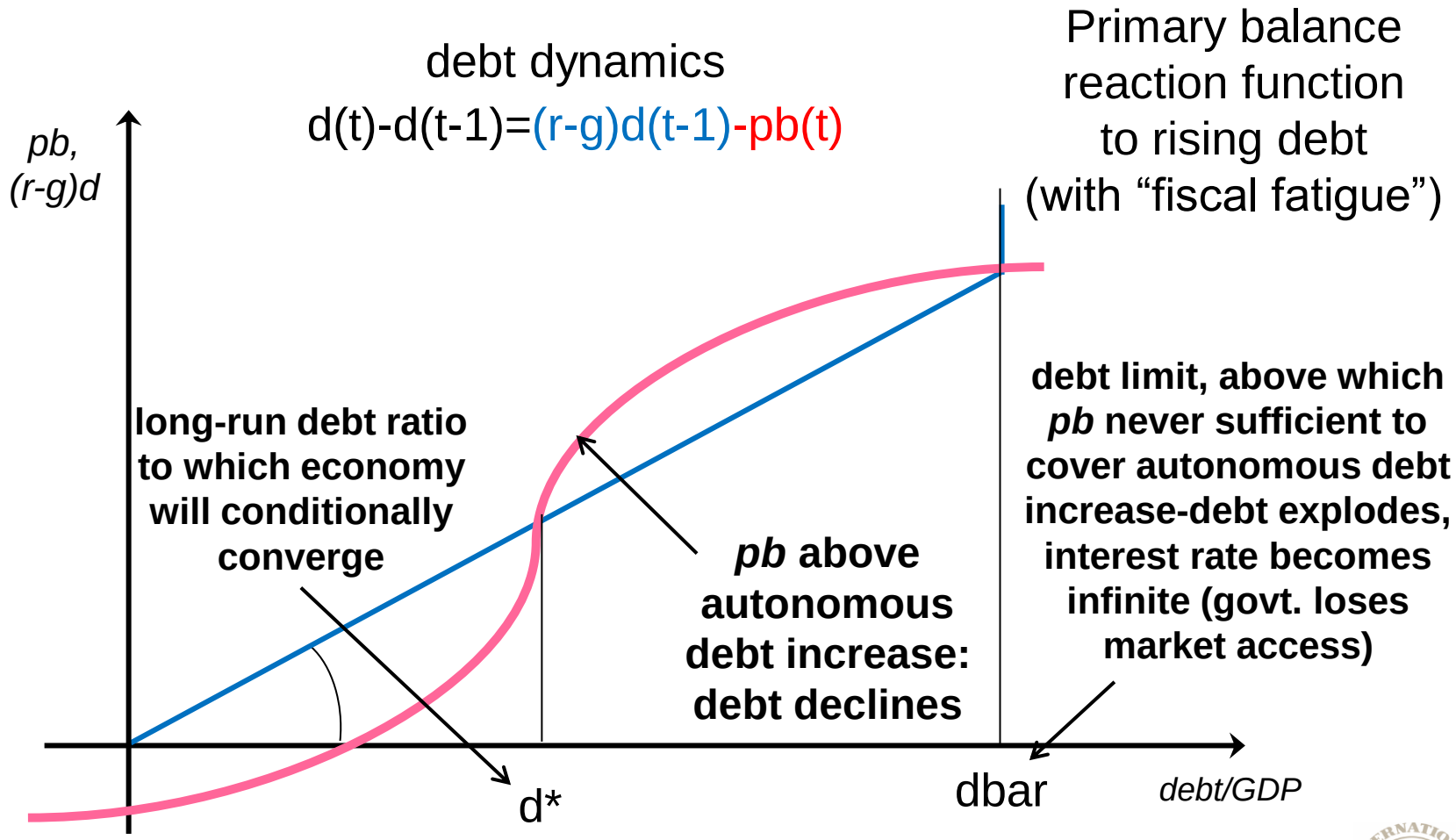
Three counter-arguments

- You are neglecting default risk!
- You are forgetting the need to build precautionary savings!
- Did you forget that debt is bad for growth?!

Yes, this model is not about Greece

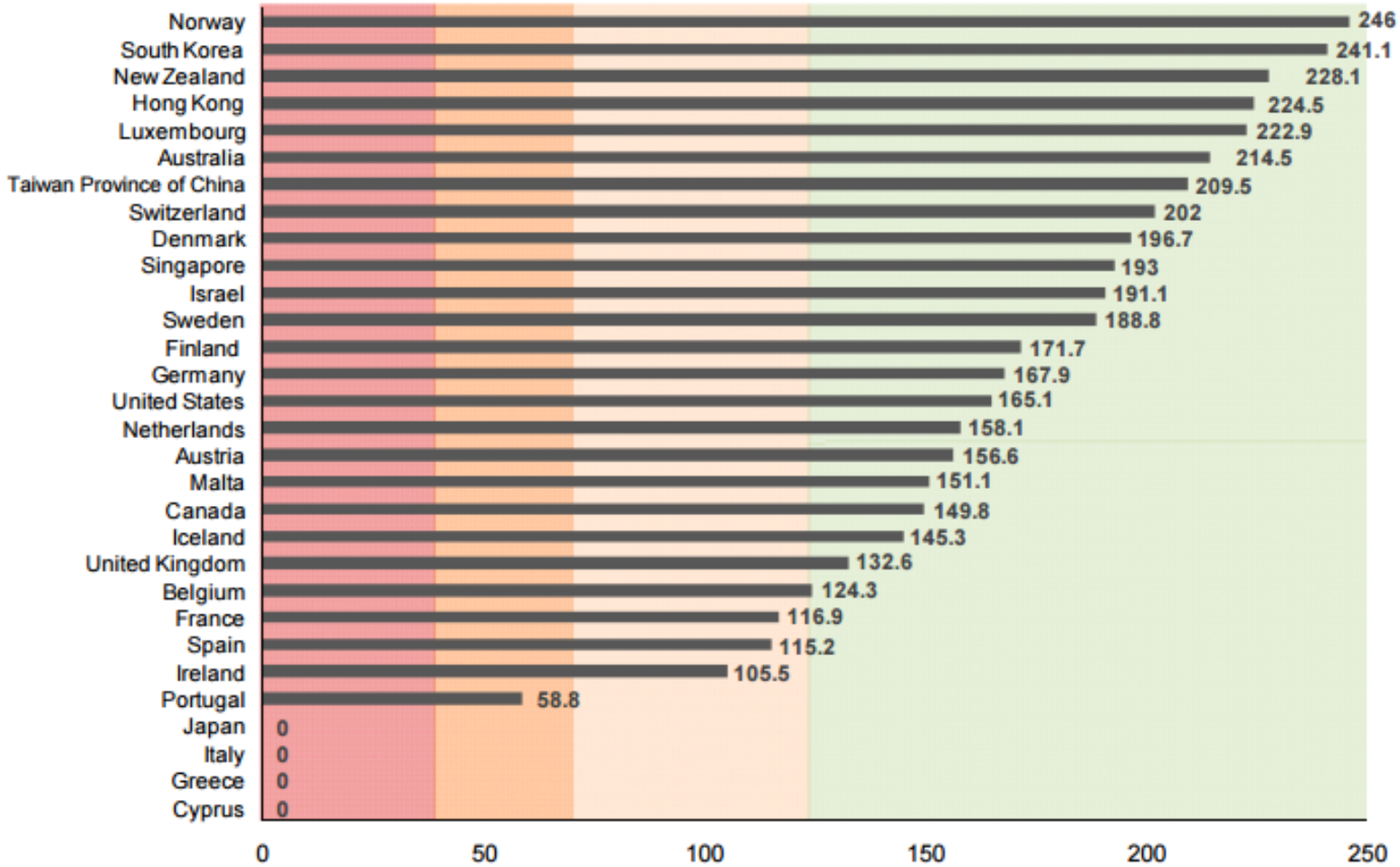
- In Ostry et al. (2010), we looked at default risk
  - Endogeneity of interest rate to default risk, and vice-versa
  - The capacity of governments to generate surpluses is limited by fiscal fatigue
  - This leads to the existence of a debt limit

A Deterministic Example



Empirical Implementation requires cubic estimation of primary fiscal balance as a function of debt

Method applied by Moody's: 3 colors for different situations



Crisis-insurance benefits of lower public debt are small

Correct but to evaluate this one needs a cost-benefit analysis.

- For debt =120 percent of GDP, the likelihood of a debt crisis is around 2.6 percent per year (Baldacci et al, 2011).
  - It is around 2.4 percent if debt is 100 percent of GDP
- Over a 20 year horizon, the expected number of crises is 0.52
- The cost of a fiscal crisis is around 15 percent of GDP
- Expected cost of fiscal crisis $\approx 0.52*15 \approx 7.8$ percent of GDP
- If debt goes down from 120 to 100 percent of GDP

  Benefits = Δ Expected cost $\approx 7.8 - 7.2 \approx 0.6$ percent of GDP
- Compare this to the distortionary costs of bringing debt down

  Cost $\approx$ 5 percent of GDP
- In any case, more than one way to get debt/gdp down in good times. Better the denominator does the work, rather than target overall surplus.

Higher taxes associated with higher debt dampen growth

- We agree debt is bad for growth, specifically the taxes needed to service it. (note that endogeneity bias would strengthen the argument)

VARIABLES	(1) FE excl. Inv	(2) FE incl. debt	(3) A-Bond 2-step collapsed	(4) IV instruments: VAT and SSC rates	(5) A-Bond 2-step collapsed
Gvt revenues (in percent of GDP)	-0.0424**	-0.0399*	-0.0866**	-0.423**	
	[-2.349]	[-1.756]	[-2.207]	[-2.306]	
Debt (in percent of GDP) (t-1)		-0.00463	-0.00559	0.0164	0.0175
		[-0.718]	[-0.341]	[0.984]	[1.463]
VAT rate					-0.00657***
					[-4.289]
Observations	240	227	222	70	107
R-squared	0.669	0.651		0.596	0.736
Hansen test p-value			0.235		
A-B AR(1) test p-value			0.000840		
A-B AR(2) test p-value			0.829		

Robust t-statistics in brackets

*** p<0.01, ** p<0.05, * p<0.1

Coefficients for country dummies and control variables (terms of trade growth and vol., inflation, population growth and initial GDP not shown)

Note: Growth regression, 5-year non-overlapping average, OECD countries, 1960-2008

But the cure of paying down the debt is worse than the disease

- We agree debt is bad for growth, specifically the taxes needed to service it.
- But that does not mean we should pay down the debt
- Debt is now a sunk cost, unavoidable unless the country defaults
- This sunk cost does not justify raising taxes (and harming the economy further) in order to lower taxes later

Conclusion

- Inherited public debt represents a deadweight burden on the economy, reducing both its investment potential and its growth prospects.
- When fiscal space is ample, there is a case for *simply living with the debt*, paying it down only "opportunistically" when non-distortionary sources of revenue are available and letting the debt ratio decline through growth
- Debt should be used to smooth the taxes necessary to finance lumpy government expenditures.