

Government Debt and the Macroeconomy

Political economy of government debt

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Introduction

Reminder: optional tax policy (tax smoothing)

- Predicts that tax rates should not be fluctuating much, unless there are unforeseen large expenditures such as wars
- Business cycle: run deficits in recessions, surpluses in booms

Deviations from optimality

- Beginning in early 90s, literature started discussing widespread deviations from tax smoothing in data:
 - Deficits irrespective of business cycle
 - Upward-sloping trajectory of debt over long periods of time
- For example, Alesina and Perotti (1995) identify several countries (Belgium, Greece, Ireland, Italy, Netherlands, Spain) on trajectories to unsustainable debt levels (Figure 1)
 - But other OECD countries have stable debt levels – why?
- Alternative **positive** theories needed to explain the data: **Political Economy of Fiscal Policy**
 - Should be able to explain differences in debt across countries and time.

Increase in debt levels in selected OECD countries

Debt accumulation in Belgium, Greece, Italy, Ireland, The Netherlands and Spain, 1970–1990.

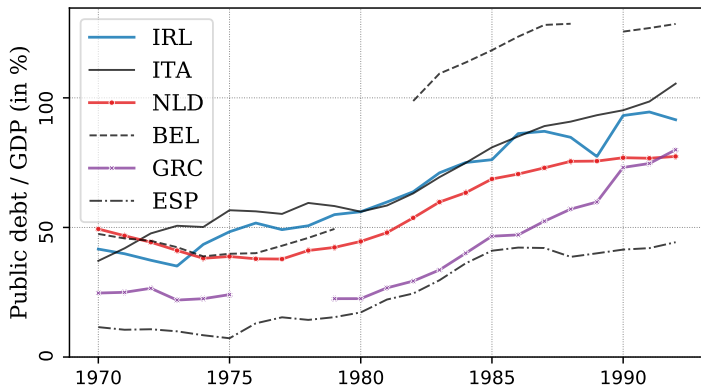


Figure 1: Increases in public debt levels, 1970–1990. Data source: Abbas et al. (2010).

1 This lecture:

- 1 Empirical facts documenting deviations from optimality
- 2 Six theories of political economy of fiscal policy and government debt:
 - 1 Fiscal illusion
 - 2 Intergenerational redistribution
 - 3 Geographically dispersed interests
 - 4 Budgetary institutions
 - 5 Strategic debt accumulation
 - 6 Social conflict and delayed stabilisation

2 Lecture 2: Preference aggregation and social choice

- 1 Arrow's impossibility theorem
- 2 Median-voter theorem

3 Lecture 3: Detailed example of model with *strategic accumulation of debt*

4 Lecture 4: Detailed example of model with *social conflict and delayed stabilisation*

Budget deficits in OECD countries

Empirical facts

Budget deficits in OECD countries are the norm, rather than an exception.

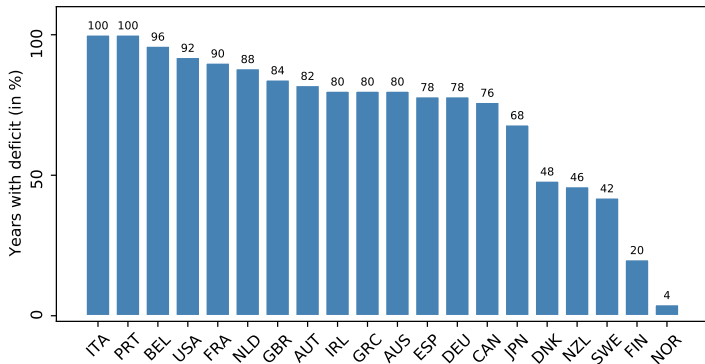


Figure 2: Share of years with government budget deficits, 1960–2011. Source: Wyplosz (2012), mainly based on data from OECD Economic Outlook.

Debt levels in UK and US

Empirical facts

From a long-run perspectives debt is far from historical peaks, but note substantial increase over last two decades!

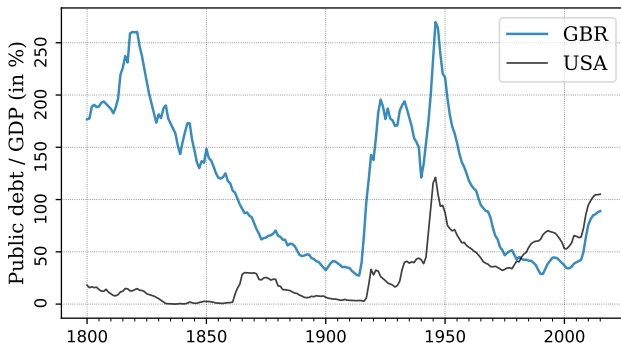


Figure 3: Public debt as a share of GDP for the United Kingdom (GBR) and the United States. Data source: Abbas et al. (2010)

Debt levels in Western Europe

Empirical facts

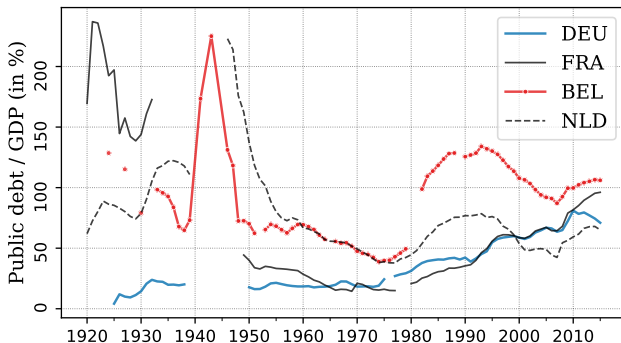


Figure 4: Public debt as a share of GDP for selected Western European countries. Data source: Abbas et al. (2010)

Fiscal policy as redistributive policy

Empirical facts

- Fiscal policies are inherently **redistributional** across regions, generations, socioeconomic groups
- Redistribution often associated with political conflict
- Social welfare programs as share of GDP are increasing
 - E.g. due to demographic change (pensions, health care)
 - Increased role for “political” perspective on fiscal policy and debt

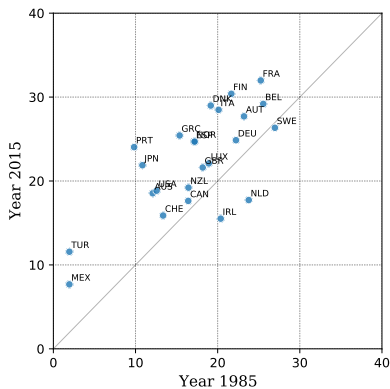


Figure 5: Social expenditures as share of GDP (in percent) in 1985 vs. 2015. Data source: OECD Social Expenditure Database

Why political economy?

Summary of empirical facts

- Widespread deviations from optimal policy / tax smoothing
- Huge differences across countries, even within the OECD
- Huge differences within countries over time
- Increases in (redistributive) welfare spending, thus bigger role for “politics”

Political economy of fiscal policy can potentially explain these observations!

Political economy models of fiscal policy

Most common theories in political economy literature on fiscal policy and government debt:

- 1 Fiscal illusion
- 2 Intergenerational redistribution
- 3 Geographically dispersed interests
- 4 Budgetary institutions
- 5 Strategic debt accumulation
- 6 Social conflict and delayed stabilisation

Common framework

- Analyse fiscal policies as outcomes of majority voting and bargaining between political groups
- Do this using the toolbox of economics: rational, optimising agents (allowing for limited information)

Fiscal illusion

- Early attempt from 1970s to explain budget deficits and growing debt as a result of
 - non-rational voters; or
 - voters with limited knowledge who do not understand intertemporal government budget constraint
- Politicians have incentive to increase spending or reduce taxes to unsustainable levels

Problems

- Government debt too salient for majority of voters to be uninformed
- Unclear why limited knowledge should systematically bias in favour of larger deficits
- Can hardly explain differences in debt levels between otherwise similar countries (e.g. Belgium vs. The Netherlands – see [Figure 4](#))
- Empirical evidence weak, limited to “new democracies” with less experienced voters and short-run departures from optimal policy

Intergenerational redistribution (1)

Reminder: Ricardian equivalence

- Households fully internalize higher government debt today, adjust savings to compensate
 - Infinite horizon (dynasties)
 - Finite horizon with perfectly altruistic parents

What if households receiving benefits today are different from those paying the bill tomorrow?

- Not all households have children or care about descendants' welfare
- Individual savings response is asymmetric: cannot leave behind *negative* wealth

Breaks Ricardian equivalence, allows gov't to use debt as redistributive instrument!

Intergenerational redistribution (2)

Why would gov't / voters support intergenerational redistribution?

- 1 Older generations might accept higher debt levels to increase spending on pensions, health care, etc.
 - Will not be around to pay higher levels of taxes in the future
 - Redistribution from young (or even unborn) to old
- 2 “Bequest-constrained” households (Cukierman and Meltzer 1986):
 - Poor households would ideally want to leave negative wealth to children (intergenerational consumption smoothing)
 - Higher gov't spending / higher debt allows them to work around this constraint

Unclear whether theory can explain deficit bias:

- Parents *do* care about welfare of their (grand)children
- Massive reductions in debt within a generation in some countries (Belgium, Netherlands, UK – see [Figure 3](#))

Demographic change: mechanism more relevant in future?

Geographically dispersed interests (1)

District-based legislatures

- Applies to legislative bodies such as the US Congress or the UK House of Commons in which members represent specific districts
- Representatives have incentive to propose projects which direct funds toward their districts (“pork barrel” spending)
- Projects financed out of **common pool** of tax revenues
 - District representatives overestimate benefit of projects, to not fully internalise costs
 - Too many projects lead to increase in spending
 - Simplest model: with N districts, any district-specific spending of £1 costs tax payers in that district only $\pounds \frac{1}{N}$

Related literature: decentralised government

- Local authorities have asymmetric spending vs. taxing powers
- Incentive to increase local spending, financed by transfers from federal government

Geographically dispersed interests (2)

Empirical relevance

- Primarily a theory about the size of government budgets not so much about its balance (taxes vs. debt financing)
- Pork barrel spending usually is only a small fraction of spending, dwarfed by expenditures on social welfare, which are not district-specific
- Theory therefore not well suited to explain increase in debt levels

Budgetary institutions

Alesina and Passalacqua (2016) identify two types of institutional setups:

1 Hierarchical institutions

- More power to prime minister or Treasury vs. spending ministers
- Legislature has limited possibilities to alter gov't budget proposals

2 Collegial institutions

- Individual ministers have more power to decide spending levels
- Another instance of “common pool” problem

Other characteristics of budgetary institutions:

- Whether legislatures vote on individual items or only on entire budget
- Transparency of budget process:
 - Less transparency opens up possibility for too optimistic GDP growth forecasts, overestimating fiscal benefits of reforms, etc.

Some empirical support for greater fiscal discipline in countries with more “hierarchical” institutions.

Strategic debt accumulation (1)

Debt can be used strategically to “tie the hands” of next government if

- 1 re-election is uncertain; and
- 2 parties running for office disagree about level or type of government spending

Disagreement about level of government spending

(Persson and Svensson 1989)

- Two parties, prefer **low (conservative)** vs. **high (left)** levels of government spending
- Assume **conservatives** are in power:
 - Want to limit spending capacity in case **left** wins next election
 - Take on more debt today (e.g. by reducing taxes) so that next gov't has to repay debt, cannot increase spending
- Opposite prediction if **left** is in power: reduce debt today so next gov't can spend more freely

Strategic debt accumulation (2)

Disagreement about type of government spending

(Alesina and Tabellini 1990; Tabellini and Alesina 1990)

- Two variants of the same model:
 - 1 **Parties** that prefer different types of public good (e.g. military vs. non-military spending)
 - 2 **Voters** who differ in preferences over types of public goods.

We discuss first variant of the model here (second variant discussed in detail in later lecture!)

- Assume **conservative** party is in power, prefer to spend on military
- Chance that **left** party elected next period, prefers non-military goods
- **Conservative** gov't has incentive to accumulate debt today and spend on military
- Next period, if **left** party wins they have to repay debt, cannot spend on non-military goods as much as they'd prefer.
- Sub-optimal debt accumulation results from rational individual behaviour!

Strategic debt accumulation (3)

Empirical evidence

Empirical evidence

- Alesina and Perotti (1995) claim that since 1970s we have seen:
 - 1 More frequent changes in government
 - 2 More polarized politics
- Theory would predict increases in public debt levels, as observed for some countries
- Debt accumulation under Reagan in 1980s often cited as an attempt to constrain (welfare) spending by later Democratic administrations.
- Anecdotal evidence for US (Figure 6) and UK (Figure 7) shows no clear trend in debt despite frequent changes of party in gov't.

Strategic debt accumulation (4)

Empirical evidence for the US

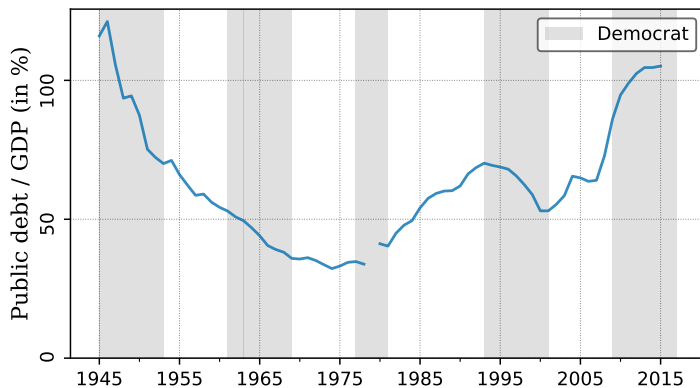


Figure 6: Government debt in the US as fraction of GDP, 1945–2015. Shaded areas show periods with Democratic presidents. Data source: Abbas et al. (2010)

Strategic debt accumulation (5)

Empirical evidence for the UK

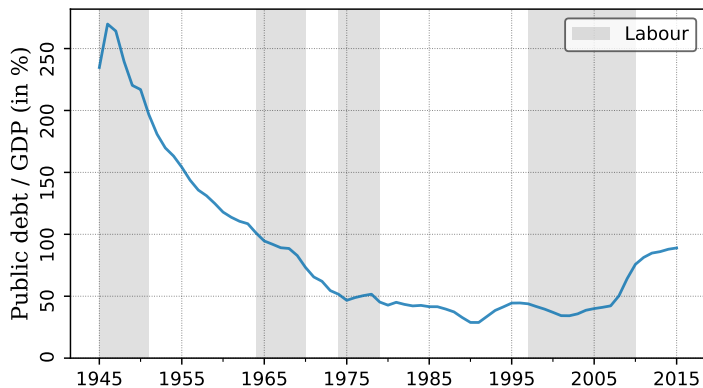


Figure 7: Government debt in the UK as fraction of GDP, 1945–2015. Shaded areas show periods with Labour governments. Data source: Abbas et al. (2010)

Social conflict and delayed stabilisation (1)

- Theory explains why reforms to stabilise gov't debt may be delayed, even if costs of such delays are obvious, e.g.
 - Hyperinflation
 - Sub-optimal, distortionary taxation
 - High interest rate payments, exclusion from financial markets, etc.
- Delays result from social conflict:
 - 1 Who should bear costs of stabilisation? (the rich, the middle class, etc.)
 - 2 Incomplete information introduces uncertainty over how long opposing groups can hold out.
Each group hopes that the other concedes first (“war of attrition”)
 - 3 Delaying reforms can lead to to more favourable offer in future
- Important: uncertainty about each groups relative strength
 - Without uncertainty, loser would concede immediately instead of continuing with costly delays
- Literature finds some empirical support that weaker and more fragmented governments are associated with less fiscal discipline.

Summary

Political economy of fiscal policy and government debt

Empirical findings

- Public debt is on increasing trajectory in many OECD countries
- Widespread deviations from tax smoothing

Political economy theories

- Deviations from optimality are due to conflicting interests between **rational** voters and political parties
- Actors extract advantages for themselves (e.g. directing spending towards their constituencies), but do not fully internalise overall costs.
- Individually rational behaviour leads to sub-optimal size of government budgets and accumulation of debt.

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Government Debt and the Macroeconomy

Preference aggregation and social choice

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Motivation

So far: representative-agent macroeconomics

- Assumes that all households have identical preferences, endowments, etc.
- All households make the same choices \implies aggregation is trivial
 - Number of households irrelevant, can assume **representative** household
 - Aggregate outcomes coincide with choices made by representative households
- Convenient, makes solving models easier!

Political economy of fiscal policy

- Need to spell out how political decisions are taken
- Requires voter heterogeneity in preferences, endowments, etc.
 - Otherwise all decisions are unanimous!
- Need some way to aggregate individual preferences, e.g. policy chosen by majority of voters.

Outline

1 Arrow's impossibility theorem:

Illustrates that aggregation fails in general.

2 Median-voter theorem:

One possible solution to aggregate individual preferences into policies that have majority support.

Arrow's impossibility theorem

- We want to construct a **social welfare function** that can be used to represent “economy-wide” preferences
- Non-technical summary:
 - Assume we have at least **two individuals** who choose among at least **three alternatives**
 - The theorem states that a social welfare function which satisfies certain desirable properties cannot be constructed **in general**
 - Solution: we need to impose additional restrictions on individual preferences
- We will illustrate with an example!

Example

Arrow's impossibility theorem

Environment

- Three voters **1**, **2** and **3**
- Three alternatives A, B, C
- Notation: $A > B$ means A is strictly preferred to B

Individual preferences

- 1** $A > B$ and $B > C$
- 2** $B > C$ and $C > A$
- 3** $C > A$ and $A > B$
- Transitivity: $A > B$ and $B > C$ imply $A > C$

Aggregated preferences

- A vs. B : A preferred by **1** and **3**, so $A >_m B$
- B vs. C : B preferred by **1** and **2**, so $B >_m C$
- A vs. C : C preferred by **2** and **3**, so $C >_m A$

Aggregated preferences **not** transitive: $A >_m B >_m C >_m A$

Median-voter theorem

Additional restriction

- Individual preferences have to be **single peaked**

Illustrative example

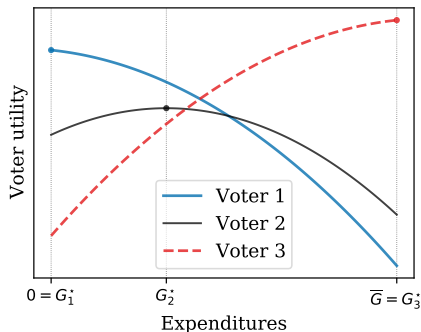
- Three voters **1, 2** and **3**
- Preferences over single continuous policy variable:
 - Expenditures on preserving environment: $G \in [0, \bar{G}]$
- Goal: Find expenditure level G^m which is supported by majority.

Single-peaked preferences

Median-voter theorem

Preferences satisfy:

- Unique maximum G_i^* for each voter i
- For any $G'' > G' \geq G_i^*$, voter i prefers G' over G''
- For any $G'' < G' \leq G_i^*$, voter i prefers G' over G''



Median-voter theorem

Theorem

- Assume that individual preferences are single peaked.
- Then any politician who only cares about holding office will adopt the policy preferred by the median voter.

Intuition

- In our example, preferred policies are $G_1^* < G_2^* < G_3^*$, so voter **2** is the median voter
- From single peakedness we have:
 - 1 G_2^* wins against any proposal $G \geq G_2^*$ (supported by voters **1** and **2**)
 - 2 G_2^* wins against any proposal $G \leq G_2^*$ (supported by voters **2** and **3**)
- Median voter's G_2^* therefore wins a majority in any pair-wise contest
- Politician can do no better than proposing policy G_2^* in elections (but can do worse by proposing any other policy)

Summary

Preference aggregation and social choice

Aggregation failures

- In general, we cannot aggregate individual preferences into a social welfare function that has “desirable” properties (Arrow’s impossibility theorem)
 - Example: aggregating **transitive** individual preferences can result in **non-transitive** social preference ranking

Median-voter theorem

- Imposes additional restriction that individual preferences have to be **single peaked**
- Theorem says that alternative preferred by **median voter** has majority support in pair-wise contest against any other alternative
- Candidates who only care about being elected can do no better than adopt policy preferred by median voter.

Government Debt and the Macroeconomy

Strategic debt accumulation

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Strategic debt accumulation

Motivation

Incumbents can use public debt **strategically** to influence successor gov't policies.

Why would they want to do that?

- There is a chance that current government will lose next election
- Parties disagree over the level of spending
- Parties disagree over the type of spending (e.g. military vs. non-military)

Theory predictions

- Deficit bias: excessive public debt accumulation even in periods without recessions or wars
- Higher debt levels if
 - 1 politics is more polarised; or
 - 2 chance of re-election is low

Simplified two-period model

Illustrates mechanism from Tabellini and Alesina (1990), based on simplified version in Romer (2019), chapter 13.

Outline

- 1 Model assumptions
- 2 Social planner allocation
- 3 Equilibrium with electoral competition
 - 1 Extreme preferences
 - 2 Logarithmic utility

Assumptions

- 1 Two periods, $t = 1, 2$
- 2 Two types of government spending: **military M_t** , **non-military N_t**
- 3 Ignore private consumption, households derive utility only from M_t and N_t
- 4 Aggregate endowment W in each period; additionally, government can use **debt D** to transfer resources between periods
 - D purchased by foreign investors
 - Government cannot default on D
- 5 Elections at beginning of period 2 can lead to **change in government**:
 - Period-2 policy determined by median voter
- 6 Discount factor $\beta = 1$, interest rate $r = 0$.

Preferences

Household i 's expected utility at beginning of period 1:

$$v^i = \mathbf{E} \left[\sum_{t=1}^2 \alpha^i u(M_t) + (1 - \alpha^i) u(N_t) \right]$$
$$u'(\bullet) > 0, u''(\bullet) < 0$$

- α^i : weight put on military spending M_t by household i
- $u(\bullet)$ strictly concave
- Expectations taken over possible policies in period 2

Government budget

Government budget constraints in periods $t = 1, 2$:

$$M_1 + N_1 = W + D \quad (1)$$

$$M_2 + N_2 = W - D \quad (2)$$

Restrictions on debt D

- Debt needs to be repaid with certainty in $t = 2$, so $D \leq W$.
- Non-negative public consumption $M_t \geq 0$ and $N_t \geq 0$, so $D \geq -W$.

Debt level therefore has to satisfy

$$-W \leq D \leq W$$

What would the social planner do?

Social planner allocation

Preferences

- Assume one representative household with $\alpha^i = \alpha$
 - Alternative interpretation: fraction α of households values only M , fraction $(1 - \alpha)$ only N
- Social planner maximizes

$$\max_{M_1, N_1, M_2, N_2} \sum_{t=1}^2 \alpha u(M_t) + (1 - \alpha)u(N_t)$$

Resource constraint

- Consolidated resource constraint: combine (1) and (2) to eliminate debt level

$$M_1 + M_2 + N_1 + N_2 = 2W \quad (3)$$

First-order conditions

Social planner allocation

Lagrangian

$$\begin{aligned}\mathcal{L} &= \sum_{t=1}^2 \alpha u(M_t) + (1 - \alpha)u(N_t) + \lambda \left[2W - M_1 - M_2 - N_1 - N_2 \right] \\ &= \alpha u(M_1) + (1 - \alpha)u(N_1) + \alpha u(M_2) + (1 - \alpha)u(N_2) \\ &\quad + \lambda \left[2W - M_1 - M_2 - N_1 - N_2 \right]\end{aligned}$$

Optimality requires that

$$\frac{\partial \mathcal{L}}{\partial M_1} = 0 \qquad \frac{\partial \mathcal{L}}{\partial M_2} = 0 \qquad \frac{\partial \mathcal{L}}{\partial N_1} = 0 \qquad \frac{\partial \mathcal{L}}{\partial N_2} = 0$$

First-order conditions for M_1 , M_2 , N_1 and N_2 :

$$M_1 : \qquad \alpha u'(M_1) = \lambda \qquad (4)$$

$$M_2 : \qquad \alpha u'(M_2) = \lambda$$

$$N_1 : \qquad (1 - \alpha)u'(N_1) = \lambda \qquad (5)$$

$$N_2 : \qquad (1 - \alpha)u'(N_2) = \lambda$$

Solution

Social planner allocation

Optimal allocation

- Consumption smoothing implies:

$$\begin{aligned}M_1 &= M_2 = M \\ N_1 &= N_2 = N\end{aligned}\tag{6}$$

- Plug (6) into (4) and (5), eliminate λ :

$$\frac{u'(M)}{u'(N)} = \frac{1 - \alpha}{\alpha}$$

- Interpretation: Larger weight α implies $u'(M) \ll u'(N)$, and therefore $M \gg N$

Optimal level of debt

Social planner problem

Implication for debt

- Insert (6) into period constraints (3) and (2):

$$\left. \begin{array}{l} t = 1: \quad M + N = W + D \\ t = 2: \quad M + N = W - D \end{array} \right\} \implies D = 0$$

- Any non-zero debt level is **inefficient!**
- Intuition: no need to transfer resources between periods because of consumption smoothing and assumption that $\beta(1+r) = 1$

Equilibrium with electoral competition

- New assumption: policy makers are **voted into office**, election takes at beginning of period 2
- Preferences of period-2 median voter might differ from period-1 policy
 - **Median-voter theorem**: policy maker adopts preferences of median voter
- Preferences of median voter in period 2 are random
 - “Microfoundation:” randomness in voter turn-out
 - Creates uncertainty about period-2 policy

Problem in period 2

Equilibrium with electoral competition

Solution method: backward induction

- 1 Solve period-2 problem for any given debt level
- 2 Solve period-1 problem, taking into account period-2 solution

Period 2

- Debt level D fixed by policy maker in period 1
- Period-2 budget constraint (2): $N_2 = W - D - M_2$
- M_2 is only remaining choice variable

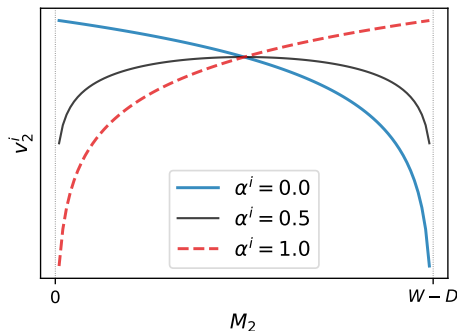
Utility in period 2

Equilibrium with electoral competition

Household i 's utility in period 2:

$$\begin{aligned}v_2^i(M_2) &= \alpha^i u(M_2) + (1 - \alpha^i) u(N_2) \\ &= \alpha^i u(M_2) + (1 - \alpha^i) u(W - D - M_2)\end{aligned}$$

Utility function is **single peaked**



Median voter's household problem

Equilibrium with electoral competition

Period 2

- Single-peaked preferences allow us to apply median-voter theorem
- Need to solve for median voter's preferred policy M_2^m for any debt level D :

$$M_2^m(D) = \arg \max_{M_2} \left\{ \alpha_2^m u(M_2) + (1 - \alpha_2^m) u(W - D - M_2) \right\}$$

α_2^m utility weight of the median voter

- All parties running for office promise to implement M_2^m

Period 1

- Take as given optimal period-2 policy $M_2^m(D)$
- Choose optimal policy (M_1, D) ; N_1 follows from budget constraint
- Tabellini and Alesina (1990) extend median-voter theorem to two-dimensional policy space (M_1, D)
 - Need to find (M_1^m, D^m) preferred by period-1 median voter!

Special case 1: Extreme preferences

- There are only **two types** of voters:
 - **Type 1** values only military spending $\implies \alpha^i = 1$
 - **Type 0** values only non-military spending $\implies \alpha^i = 0$

Period 1

- Median voter can be either type 0 or 1, but type is fixed (no uncertainty)

Period 2

- Uncertainty about median voter:
 - Type 1 with probability π
 - Type 0 with probability $1 - \pi$

Period 2

Extreme preferences

Policy chosen period 2

- Let α_2^m be α^i of period-2 median voter
- Period-2 policy:

$$M_2^m = \begin{cases} W - D & \text{if } \alpha_2^m = 1 \\ 0 & \text{if } \alpha_2^m = 0 \end{cases}$$
$$N_2^m = \begin{cases} 0 & \text{if } \alpha_2^m = 1 \\ W - D & \text{if } \alpha_2^m = 0 \end{cases}$$

- All resources net of debt are spent on either M or N !

Period 1

Extreme preferences

Expected utility in period 1

- Period-1 median voter is fixed, can be either type 1 or 0.
- Expected utility of period-1 median voter:

$$v_1^m(M_1, D) = \alpha_1^m u(M_1) + (1 - \alpha_1^m) u(W + D - M_1) + E [u(M_2^m)] \quad (7)$$

- Expectation in (7) reflects uncertainty about period-2 policy

Example: assume median voter is of type 1

- Therefore $\alpha_1^m = 1$
- Period-1 allocation is $M_1 = W + D$ and $N_1 = 0$
- Need to solve for optimal D

Period 1: type-1 median voter

Extreme preferences

Expected utility in (7) simplifies to

$$\begin{aligned} v_1^m(D) &= 1 \cdot \underbrace{u(W+D)}_{M_1} + 0 \cdot \underbrace{u(0)}_{N_1} + \mathbf{E} \left[u(M_2^m) \right] \\ &= \underbrace{u(W+D)}_{\text{utility in period 1}} + \underbrace{\pi \cdot u(W-D) + (1-\pi)u(0)}_{\text{expected utility in period 2}} \end{aligned} \quad (8)$$

Recall: π is probability that period-2 median voter is of type 1

Expected period-2 utility is composed of two terms:

$$\mathbf{E} \left[u(M_2^m) \right] = \underbrace{\pi \cdot u(W-D)}_{\text{Period-2 median voter is type 1}} + \underbrace{(1-\pi)u(0)}_{\text{Period-2 median voter is type 0}}$$

Period 1: Solution for type-1 median voter

Extreme preferences

- To find median voter's preferred policy, take derivative of (8) w.r.t. D
- First-order condition:

$$u'(W + D) - \pi u'(W - D) = 0$$

- Rearrange:

$$\frac{u'(W + D)}{u'(W - D)} = \pi$$

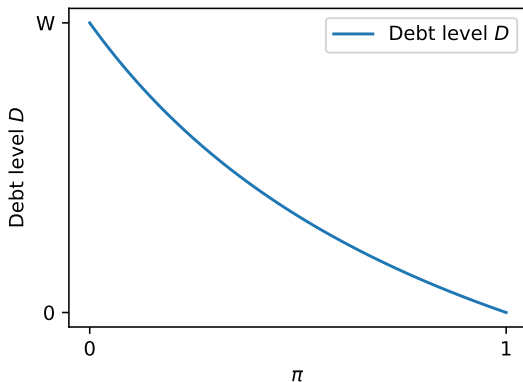
- For $0 < \pi < 1$ we find that

$$u'(W + D) < u'(W - D) \implies W + D > W - D \implies D > 0$$

Period 1: Solution for type-1 median voter

Extreme preferences

Debt policy if period-1 median voter is of type 1



Why would policy maker want to issue debt?

- Positive probability that next-period policy maker has fundamentally different preferences
 - E.g. current policy maker values only M , next period only N
 - From period-1 perspective, resources in next period are “wasted”
- Solution: issue debt now to fund preferred public good today
- Next-period policy maker has to repay debt, has fewer resources to “waste” on other public good.
- Debt used strategically to “tie the hands” of next-period government

Special case 2: Logarithmic utility

Assumptions

- Utility function: $u(c) = \ln(c)$
- Weights α^i satisfy $0 < \alpha^i < 1$

Household problem in period 2

- Median voter solves

$$\max_{M_2} \left\{ \alpha_2^m \ln M_2 + (1 - \alpha_2^m) \ln(W - D - M_2) \right\}$$

- First-order condition for M_2 :

$$\alpha_2^m \frac{1}{M_2} - (1 - \alpha_2^m) \frac{1}{W - D - M_2} = 0$$

- Optional policies M_2^m and N_2^m given by

$$\begin{aligned} M_2^m &= \alpha_2^m (W - D) \\ N_2^m &= (1 - \alpha_2^m) (W - D) \end{aligned} \tag{9}$$

Period 2

Logarithmic utility

- Period-1 median voter takes (9) as given
- Denote period-1 median voter's weight by α_1^m
- Period-1 median voter's period-2 utility:

$$v_2^1(D, \alpha_2^m) = \alpha_1^m \ln M_2^m + (1 - \alpha_1^m) \ln N_2^m$$

- Plug in period-2 policies (9):

$$v_2^1(D, \alpha_2^m) = \alpha_1^m \ln(\alpha_2^m(W - D)) + (1 - \alpha_1^m) \ln((1 - \alpha_2^m)(W - D))$$

- Collect terms:

$$v_2^1(D, \alpha_2^m) = \alpha_1^m \ln \alpha_2^m + (1 - \alpha_1^m) \ln(1 - \alpha_2^m) + \ln(W - D) \quad (10)$$

Only last term depends on D !

Period 1

Logarithmic utility

Short-cut solution

- Period-2 median voter's preferences only shift the utility level in (10), no not interact with D
- Optimal debt level in period 1 must be independent of α_2^m
 - Can just as well assume $\alpha_2^m = \alpha_1^m$
 - But then problem is identical to social planner problem!
- Optional debt level $D = 0$ as in social planner case
- See handout for full derivation without short cut

Intuition

Logarithmic utility

To illustrate intuition, assume that $\alpha_1^m > \alpha_2^m$, i.e. the period-1 median voter puts more weight on military spending.

Higher debt has the following effects:

- 1 As in example with extreme preferences:
 - allows period-1 policy maker to spend more on M
 - prevents period-2 policy maker from spending too much on N

⇒ increases utility of period-1 median voter
- 2 Unlike in example with extreme preferences:
 - Period-2 policy maker spends (some smaller share) on M
 - High debt decreases this share even further
 - Marginal utility of period-1 median voter increases substantially

⇒ decreases utility of period-1 median voter

With logarithmic preferences, these effects exactly cancel!

Strategic debt accumulation

- Rationalizes excessive debt accumulation even outside of recessions and wars
- Mechanism:
 - Debt allows governments to expand preferred type of spending
 - Prevents successor government from “wasting” resources on public goods the current policy maker does not like
- Model predicts higher debt if
 - 1 governments change frequently (probability of “re-election” is low); or
 - 2 preferences are very polarized

References I

Romer, David. 2019. **Advanced macroeconomics**. 5th ed. McGraw Hill.

Tabellini, Guido, and Alberto Alesina. 1990. Voting on the budget deficit. **The American Economic Review** 80 (1): 37–49.

Government Debt and the Macroeconomy

Social conflict and delayed stabilisation

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Social conflict and delayed stabilisation

Motivation

Why delays in fiscal stabilisation?

- Even if costs of delay are obvious and affect all parties, e.g.
 - Hyperinflation
 - Distortionary taxes
 - High interest rates on gov't debt
 - Exclusion from international financial markets
- Early literature relied on non-rational behaviour
 - Not appealing if costs are large and obvious
- Alternative approach: enacting reforms requires agreement between **several groups**, which is complicated:
 - 1 Disagreement over who should bear costs (the rich, the middle class, etc.)
 - 2 Incomplete information:
 - each group wants to downplay its capacity to contribute to stabilisation
 - each group hopes that the others concede first because delays are more costly for them (“war of attrition”)
 - 3 Incentive to delay to get better deal in future.

Simplified one-period model

Based on simplified variant of Hsieh (2000) from Romer (2019), chapter 13.

Model environment

- Objective: raise taxes T to stabilise debt
- Two groups bargain over distribution of tax burden:
 - 1 Workers: make take-it-or-leave-it offer
 - 2 Capitalists: accept or reject offer
- Workers **not perfectly informed** about capitalists' income
 - Uncertainty whether offer will be accepted
- Reform is delayed if capitalists do not accept

Payoffs

Workers make offer x with $0 \leq x \leq T$

- Offer is **accepted**:

	Workers	Capitalists
Endowments	Wages W	Profits R
Taxes	$T - x$	x
Payoffs	$W - (T - x)$	$R - x$

- Offer is **rejected**:
 - Both parties receive zero payoff

Capitalists

Distribution of profits

- Profits R are stochastic, drawn from uniform distribution on the interval $[a, b]$
- Only capitalists observe realisation of R before making a decision
- Workers do not know R , but know its distribution

One trivial solution: a generous offer

- Workers offer $0 \leq x \leq a$
- Capitalists immediately accept since $R \geq a \geq x$ and they are guaranteed a non-negative payoff
- Stabilisation **not** delayed

Next: explore scenarios in which offer is rejected

Probability of accepting

- Assume workers offer some $0 \leq x \leq T$
- Probability of accepting:
 - 1 If $x \leq a$: capitalists accept for sure
 - 2 If $a < x < b$

$$\Pr(\text{accept}) = \Pr(R \geq x)$$

$$\Pr(\text{reject}) = \Pr(R \leq x) = 1 - \Pr(\text{accept})$$

Probability to accept follows from (7):

$$\Pr(\text{accept}) = 1 - \Pr(R \leq x) = 1 - \frac{x - a}{b - a} = \frac{b - x}{b - a} \quad (1)$$

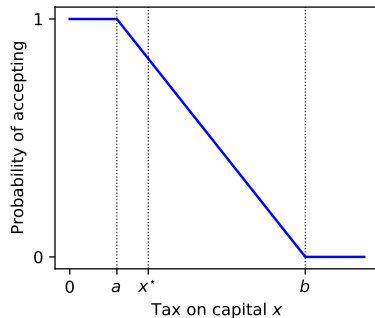
- 3 If $x \geq b$: capitalists reject for sure

Details on uniform distribution

Probability of accepting

Combine all three cases:

$$\Pr(\text{accept}) = \begin{cases} 1 & \text{if } x \leq a \\ \frac{b-x}{b-a} & \text{if } a < x < b \\ 0 & \text{if } x \geq b \end{cases}$$



Workers' expected utility

Workers' expected utility from making offer $a \leq x \leq b$ is sum of **payoffs** times **probabilities**

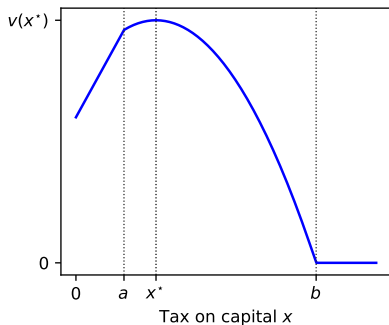
$$\begin{aligned} v(x) &= \underbrace{[W - (T - x)] \times \Pr(R \geq x)}_{\text{accept}} + \underbrace{0 \times \Pr(R \leq x)}_{\text{reject}} \\ &= [W - (T - x)] \frac{b - x}{b - a} \end{aligned} \quad (2)$$

Workers' expected utility for any x :

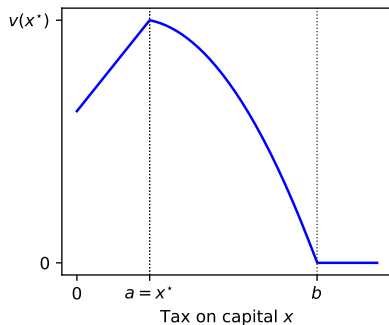
$$v(x) = \begin{cases} W - (T - x) & \text{if } x \leq a \\ [W - (T - x)] \frac{b - x}{b - a} & \text{if } a < x < b \\ 0 & \text{if } x \geq b \end{cases}$$

Workers' expected utility

Workers' expected utility for two different parametrisations of a and b



(a) Increasing derivative $v'(x)$ at a



(b) Decreasing derivative $v'(x)$ at a

Worker's expected utility

Intuition for shape of expected utility

$x \leq a$: Capitalists accept for sure, so probability of accepting stays constant at 1.

Increase in x maps one-to-one into increase of workers' payoff

$a < x < b$: Workers face **trade-off**: less generous offer (larger x) decreases chance of being accepted.

Interaction of these effects creates non-linear shape.

$x \geq b$: Such offers are rejected for sure, so payoff is zero

Optimal proposal x

Take derivative of $v(x)$ in (2) w.r.t. x :

$$v'(x) = \frac{b-x}{b-a} - \frac{1}{b-a} [w - (T-x)] = \frac{b-W+T-2x}{b-a} \quad (3)$$

Workers' optimal x depends on slope of $v(x)$ evaluated at a :

- 1 Slope is **negative**: workers can do no better than proposing $x^* = a$
- 2 Slope is **positive**: workers will make less generous offer $x^* > a$ if

$$v'(a) = \frac{b-W+T-2a}{b-a} > 0 \quad \iff \quad b > W - T + 2a \quad (4)$$

Intuition: if b is large, there is a high chance that capitalists have high R and accept less generous offer.

Optimal proposal x

Boundary solution

Assume that $v'(a)$ is **negative**:

- Workers can do no better than offering $x^* = a$
- Any less generous offer (larger x^*) disproportionately decreases the likelihood of being accepted
- Expected utility therefore maximized at $x^* = a$
- Probability of acceptance:
 $\Pr(\text{accept}) = 1$

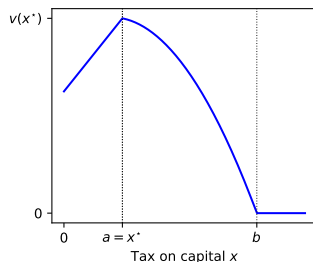


Figure 2: Decreasing derivative $v'(x)$ at a

Optimal proposal x

Interior solution

Assume that $v'(a)$ is **positive**:

Optimal x^* pinned down by setting (3) to 0:

$$0 = \frac{b - W + T - 2x}{b - a}$$
$$\Rightarrow x^* = \frac{b - W + T}{2} \quad (5)$$

Workers extract a higher contribution x^* if

- b is large: capitalists able to bear higher taxes
- W is small: workers unable to bear higher taxes
- T is large: need to raise more tax revenue

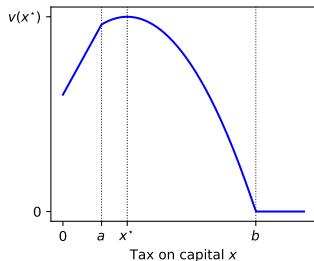


Figure 3: Increasing derivative $v'(x)$ at a

Probability of accepting

Interior solution

Probability of accepting: Plug (5) into (1)

$$\Pr(\text{accept}) = \frac{b - x^*}{b - a} = \frac{1}{b - a} \left[b - \left(\frac{b - W + T}{2} \right) \right] = \frac{b + W - T}{2(b - a)} \quad (6)$$

Main result: probability of accepting < 1

- From (4) we know $W - T < b - 2a$
- Apply inequality to (6):

$$\Pr(\text{accept}) = \frac{b + W - T}{2(b - a)} < \frac{b + b - 2a}{2(b - a)} = 1$$

Positive probability that capitalists reject offer, **delay reform!**

Special case: no uncertainty

Consider case with known and fixed R :

- Assume $R = \bar{R}$
- Workers and capitalists both know \bar{R}
- Bargaining:
 - 1 Workers propose $x = \bar{R}$
 - 2 Capitalists: accepting and rejecting both yield zero payoffs, so capitalists accept
- Reforms **not delayed**
- Result due to simple bargaining protocol: workers make a one-time take-it-or-leave-it offer

Uncertainty is crucial for **delayed** stabilisation!

Summary

Social conflict and delayed stabilisation

- Delays arise from conflict over how costs of reform should be distributed
- Rational agents try to extract large concessions, which decreases probability that proposal is accepted
- Crucial ingredient: uncertainty about other group's willingness/capacity to bear costs

Extensions

- Multiple bargaining periods:
 - Additional incentive to hold out to get more favourable offer in the future
- Foreign aid (e.g. from the IMF, etc.): decreases likelihood of agreement if it lowers costs of continued conflict

Additional slides

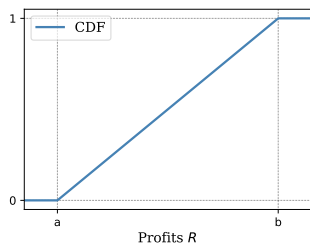
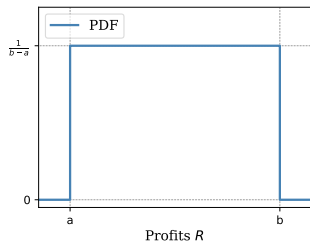
Uniform distribution

- If a random variable R is uniformly distributed on the interval $[a, b]$, any realization $a \leq R \leq b$ is equally likely
- The probability density function (PDF) is given by

$$f(x) = \begin{cases} 0 & \text{if } x \leq a \\ \frac{1}{b-a} & \text{if } a < x < b \\ 0 & \text{if } x \geq b \end{cases}$$

- The cumulative distribution function (CDF), $F(x) = \Pr(R \leq x)$, is

$$F(x) = \begin{cases} 0 & \text{if } x \leq a \\ \frac{x-a}{b-a} & \text{if } a < x < b \\ 1 & \text{if } x \geq b \end{cases} \quad (7)$$



References I

Hsieh, Chang-Tai. 2000. Bargaining over reform. **European Economic Review** 44 (9): 1659–1676.

Romer, David. 2019. **Advanced macroeconomics**. 5th ed. McGraw Hill.

Government Debt and the Macroeconomy

Policy implications: Fiscal rules

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Previous topic: Political economy of fiscal policy

- Empirical evidence: increase in debt levels since 1970s
- Theory: Political economy explanations of “deficit bias”

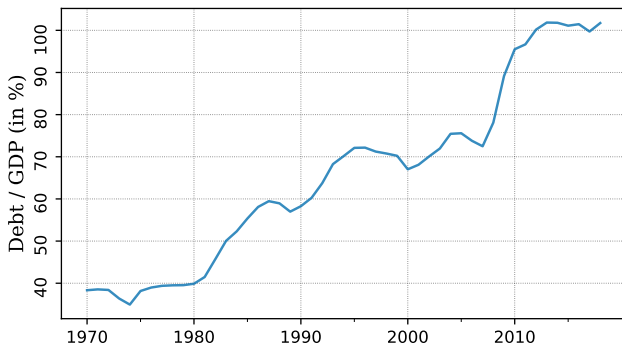


Figure 1: General government debt as share of GDP in OECD countries. Data sources: IMF Global Debt Database and OECD

This topic: policy implications

Implications for **design of fiscal institutions** to address deficit bias:

1 Optimal fiscal policy (this lecture)

2 Fiscal rules (this lecture)

- Motivation and trade-offs
- Empirical evidence – do they work?
- Case studies:
 - 1** Fiscal rules under Labour government, 1997–2010
 - 2** EU's Stability and Growth Pact

3 Independent fiscal councils (next lecture)

- Fiscal councils as complements to fiscal rules
- Empirical evidence
- Case study: Office for Budget Responsibility (OBR)

Recap: optimal fiscal policy

Implications of tax smoothing

Tax smoothing

Recap of topic III: debt trajectory depends on **benevolent** govt's discount factor β and interest rate r :

- 1 $\beta(1+r) < 1$: myopic government, potentially exploding debt levels
- 2 $\beta(1+r) > 1$: in the long run, govt accumulates net wealth to finance spending, eliminates (distortionary) taxes.
- 3 $\beta(1+r) = 1$: **random-walk result**
 - shocks are fully accommodated, debt operates as “shock absorber”
 - Intuition: govt can either
 - 1 increase distortionary taxes on impact to fully neutralise (adverse) shock
 - 2 allow debt to rise, increase taxes slightly forever to finance higher interest payments.

Policy 2 maximises welfare as “pain” of servicing debt is spread over many years (and discounted!)

Qualifications to random-walk result

Random-walk result rests on many assumptions:

- Full commitment (policy maker can credibly commit to policy ex ante)
- No sovereign default, no increase in risk premium
 - Applies to small shocks and/or low levels of debt
 - Otherwise risk of debt-interest spiral
- Symmetric shocks
 - With asymmetric shocks (collapse of financial system, pandemics) debt should be decreasing in normal times
- Monetary policy works
 - If large shocks move economy to zero lower bound (ZLB), fiscal policy needs to step in
 - Central bank instruments are asymmetric (there is no upper bound on interest rates!)
 - Debt level should be decreasing in normal times

Conclusion: if $\beta(1+r) \approx 1$, debt level should be adjusted **gradually**, and if anything **decrease** at slow pace!

Fiscal rules

Definitions

Definition

- Fiscal rules are **numerical**
 - **targets** (e.g. balanced budget)
 - **ceilings** (e.g. upper bound on debt-to-GDP ratio)
- Legal basis: constitutional/supra-national, regular laws, coalition agreements
- “Permanent” constraint on fiscal policy: more difficult to change than government budgets

Types of fiscal rules

- 1 Debt rules: limit on debt relative to GDP (e.g. 60% limit in EU’s SGP)
- 2 Budget balance rules: limit on budget deficit, for example:
 - On year-by-year basis
 - Over medium run (e.g. 5 years)
 - Can be cyclically adjusted
- 3 Expenditure rules: ceiling on govt spending
- 4 Revenue rules: floors or ceilings to boost revenue collection or to prevent excessive taxation.

Distribution across regions

Fiscal rules

- Fiscal rules emerged in 1980s to constrain excessive debt
- IMF maintains database on national and supra-national rules
- Most of these rules are from Europe

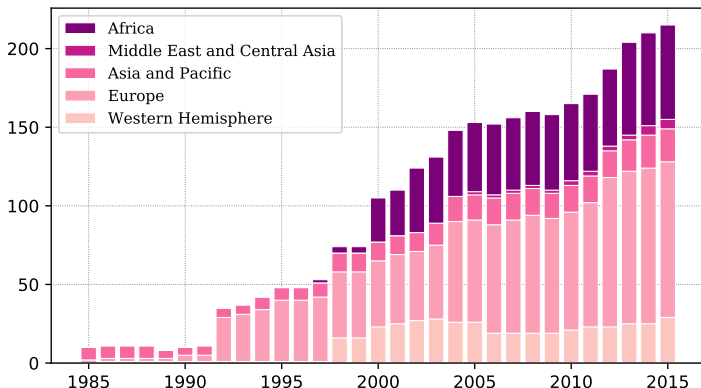


Figure 2: Number of fiscal rules by year and region. Data source: International Monetary Fund (2017)

Distribution by type

Fiscal rules

Fiscal rules in IMF database, disaggregated by type.

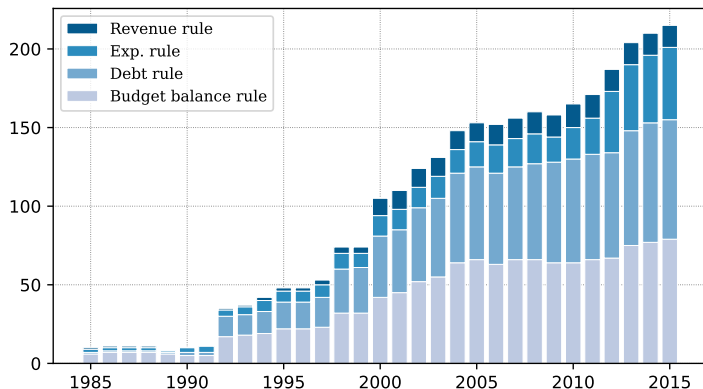


Figure 3: Type of fiscal rules by year. Data source: International Monetary Fund (2017)

Deficit bias/sub-optimality trade-off

Fiscal rules

Recall: optimality prescribes gradual adjustments to debt, and downward sloping debt-to-GDP ratio if shocks are asymmetric.

Implications

- 1 Year-by-year balanced budget rules are sub-optimal:
 - Shocks should be accommodated by increasing deficit
 - Also *pro-cyclical*: need to raise taxes, cut spending to satisfy budget balance, which deepens recession!
- 2 Unconditional debt ceilings are sub-optimal:
 - If debt is close to limit, debt cannot operate as “shock absorber”

Deficit bias/sub-optimality trade-off

Fiscal rules

We therefore have the following trade-off:

- **Contingent, complex rules** allow debt to function as shock absorber, but can be exploited by policy makers.

Example: cyclically-adjusted budget balance rules

- Difficult to monitor
 - Susceptible to manipulating dating of business cycles, over-optimistic forecasts
- **Non-contingent, simple rules** are sub-optimal, but constrain non-benevolent policy maker to avoid deficit bias.

Examples: unconditional balanced-budget rules, constant debt limits

- Easy to monitor
- Time inconsistent: govt has no incentives to impose draconian measures, rarely punished in elections

Empirical evidence

Fiscal rules

Some evidence that fiscal rules improve budget performance

Econometric challenges

- Cross-country regressions usually have no “causal” interpretation (only correlations)
- Fiscal rules very heterogeneous, difficult to compare across countries
- Reverse causality:
 - Countries with preference for fiscal discipline more likely to introduce fiscal rules
 - Disciplined gov't's use fiscal rules to signal determination

Empirical evidence

Fiscal rules

Debrun et al. (2008):

- Panel of *national* fiscal rules in Europe, 1990–2005
- Fiscal rules are assigned scores based on characteristics, aggregated into country- and time-specific Fiscal Rule Index (FRI)
 - Interpretation: higher FRI implies higher “intensity” of fiscal rules
- Findings:
 - One std. dev. higher FRI associated with 0.4 percentage points larger cyclically-adjusted primary balance (as % of GDP)
 - No statistically significant effect on actual debt – evidence for “creative accounting”?
 - Other results: higher primary balance correlated with
 - 1 more stable governments
 - 2 less ideologically fragmented government coalitions
 - 3 years without elections (electoral budget cycles)

Empirical evidence

Main results in Debrun et al. (2008)

Dependent variable:	Cyclically adjusted primary balance				Overall balance	Change in debt
	LSDV (1)	OLS (2)	LSDVC ^a (3)	IV ^b (4)	LSDVC ^a (5)	LSDV (6)
Lagged dependent variable	0.49*** (8.73)	0.61*** (14.55)	0.67*** (10.67)	0.61*** (14.59)	0.59*** (9.31)	-0.02 (-0.20)
Lagged government debt	0.04*** (4.36)	0.02*** (5.67)	0.03 (1.59)	0.02*** (5.71)	0.00 (0.22)	-0.04 (-1.22)
Lagged output gap	-0.03 (-0.49)	-0.02 (-0.50)	-0.01 (-0.18)	-0.02 (-0.52)	-0.06 (-0.85)	-0.10 (-0.71)
Fiscal Rule Index	0.40*** (2.88)	0.43*** (4.15)	0.40** (1.96)	0.42*** (3.51)	0.52*** (2.04)	-0.45 (-0.92)
Government stability	-	0.16*** (3.48)	0.15** (2.01)	0.16*** (3.60)	0.39*** (4.41)	-0.65*** (-3.15)
Government fragmentation	-	0.60 (1.35)	0.52 (0.51)	0.63 (1.40)	0.64 (0.52)	-2.10 (-0.85)
District magnitude	-	-0.00 (-1.05)	0.04 (0.33)	-0.00 (-1.06)	0.16 (1.15)	0.03 (0.19)
Ideology	-	0.05* (1.81)	0.07 (1.24)	0.05* (1.86)	0.03 (0.49)	0.19* (1.63)
Ideological range	-	-0.18** (-2.43)	-0.19 (-1.38)	-0.18** (-2.51)	-0.05 (-0.31)	-0.11 (-0.44)
Parliamentary election (dummy)	-	-0.57*** (-3.11)	-0.59** (-2.52)	-0.57*** (-3.22)	-0.65*** (-2.23)	0.74 (1.34)
Fiscal governance: delegation (dummy)	-	-0.81*** (-2.97)	-1.21** (-2.24)	-0.81*** (-3.06)	-0.27 (-0.40)	-0.12 (-0.09)
Run-up to EMU (dummy)	-	0.46** (2.05)	0.52 (1.34)	0.45** (2.08)	-0.02 (-0.05)	1.08 (0.97)
SGP (dummy)	-	-0.30 (-1.18)	-0.18 (-0.43)	-0.31 (-1.22)	0.38 (0.72)	0.52 (0.58)
Enlargement (dummy)	-	0.38 (1.05)	0.58 (0.80)	0.38 (1.09)	1.71* (1.90)	2.12* (1.65)
Country size (population)	-	-0.58** (-2.51)	-0.91 (-0.04)	-0.57** (-2.51)	-9.91 (-0.40)	-37.63 (-0.85)
Number of observations	297	243	243	243	243	232
R ² ('within' for fixed-effects estimators)	0.40	0.80	0.56	0.80	0.70	0.30
Fixed effects (<i>F</i> -test)	2.47***	0.86	-	-	1.87**	2.27**
Hansen \bar{J} -test (β -value)	-	-	-	0.67	-	-
Exogeneity test (for rule index, β -value)	-	-	-	0.79	-	-
Random effects (Hausman test)	-	13.85	-	-	-	-

Empirical evidence

Fiscal rules

Reuter (2019)

- On average, policy makers comply with national rules only half of the time

Summary of empirical evidence

- Some (limited) evidence that fiscal rules work, if govt's choose to follow them.

Fiscal rules under Labour, 1997–2010

Two main numerical rules

- 1 Golden rule: over the business cycle, borrowing only permitted to finance investment (not consumption)

Motivation:

- Investment (also) benefits future generations, should therefore not be fully funded by current taxes
- Reasoning based on intergenerational equity

- 2 Public *net* debt should be stabilised at 40% of GDP

Motivation:

- Prevent unsustainable borrowing to finance investment spending spree

Additional measures

- 50-year-ahead forecasts for the public finances – these were created by Treasury as opposed to independent institution

Primary budget balance

Fiscal rules under Labour, 1997–2010

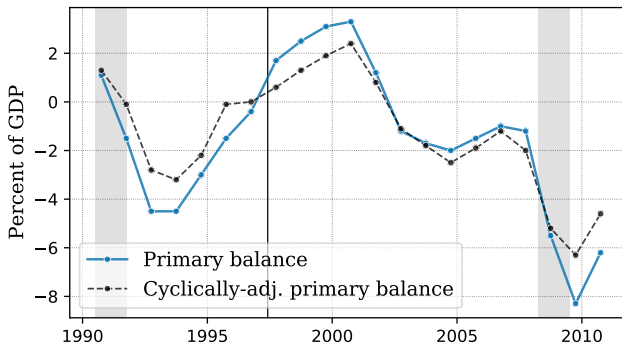


Figure 4: Primary balance and cyclically-adjusted primary balance for the UK, 1990–2010.
Data source: OBR

Public net debt

Fiscal rules under Labour, 1997–2010

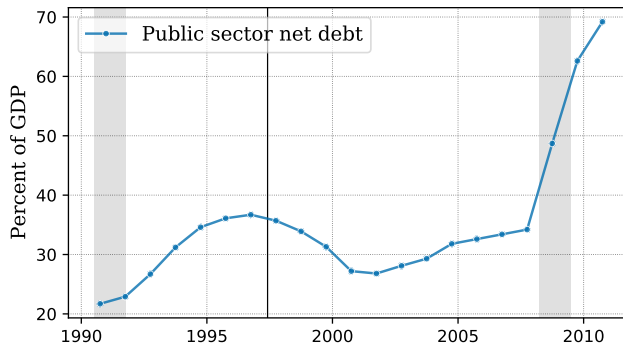


Figure 5: Public net debt for the UK, 1990–2010. Data source: OBR

Overall assessment

Fiscal rules under Labour, 1997–2010

Rules worked well initially, but had some weaknesses and were abandoned as the Great Recession hit

Overall assessment according to Wren-Lewis (2013)

- 1 Measures were innovative and a substantial improvement on previous practice
- 2 Weaknesses:
 - 1 Rules over the cycle: early surpluses were used to justify later deficits
 - 2 Government forecasts in later years were too optimistic, in particular for tax revenues – this encouraged deficits.
 - 3 Constant rather than declining debt-to-GDP target prevented further consolidation.

Weaknesses should not be overstated, most were not obvious ex ante!

Stability and Growth Pact (SGP)

Established in Maastricht Treaty in 1992 as **supra-national** fiscal rules:

- Two central numerical rules of original SGP:
 - 1 Budget deficit not exceeding 3% of GDP
 - 2 Consolidated gross debt ceiling of 60% of GDP;
Countries with higher debt expected to approach ceiling at “satisfactory pace”
- Within EMU, neither EU institutions nor national governments were allowed to bail out other countries.

Motivation

In monetary union with fragmented fiscal policies:

- Debt-financed stimulus in some countries increases inflation, prompts ECB to raise interest rates for all
- Unsustainable debt in some countries increases risk premia for all

Breaches of SGP rules

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Austria	x		x			x				x	x	x
Belgium										x	x	x
Bulgaria												x
Cyprus							x				x	x
Czech Republic								x			x	x
Denmark												x
Estonia												
Finland												x
France				x	x	x	x		x	x	x	x
Germany	x			x	x	x	x			x	x	x
Greece		x	x	x	x	x	x	x	x	x	x	x
Hungary							x	x	x	x	x	x
Ireland										x	x	x
Italy			x		x	x	x	x		x	x	x
Latvia										x	x	x
Lithuania										x	x	x
Luxemburg												
Malta							x			x	x	x
Netherlands					x						x	x
Poland							x	x	x	x	x	x
Portugal			x			x	x	x		x	x	x
Romania										x	x	x
Slovakia									x		x	x
Slovenia											x	x
Spain										x	x	x
Sweden												
UK					x	x	x			x	x	x

Note: The crosses show that a country has a government deficit exceeding 3% of GDP, or a gross government debt exceeding 60% of GDP that is not falling (or both). A grey field indicates that the country, at the time, was not an EU Member State.

Figure 6: Breaches of the SGP. Source: Calmfors and Wren-Lewis (2011)

Overall assessment

Stability and Growth Pact

Original SGP was mostly unsuccessful:

- 1 Rules were frequently violated, but no country was ever fined.
- 2 Fines were harsh (0.5% of GDP), so policy makers were reluctant to impose them
- 3 France and Germany among first offenders – no incentive to punish most powerful countries in the EU
- 4 Sanction as a repeated game: incentive to be lenient
- 5 Imposing sanctions required qualified majority in Ecofin council
- 6 Rules ignored macroeconomic imbalances such as in Ireland and Spain, and resulting nationalisation of private debt
- 7 Several sovereign bailouts during financial crisis (Greece, Ireland, Portugal, Spain, etc.)

Reforms

Stability and Growth Pact

- First reform in 2005, several more after financial crisis
- More flexible medium-term objectives
- European Stability Mechanism (ESM) as EU-level bailout fund

Summary and conclusions

Optimal fiscal policy

- Debt as a “shock absorber”, shocks should be mostly accommodated
- Asymmetry in shocks or policy options implies downward-sloping debt
- Adjustments to debt should be gradual

Fiscal rules

- Designed to reduce deficit bias
- Trade-off between optimality and ability to constraint *non-benevolent* policy maker
- Some limited evidence that rules improve fiscal performance
- UK: introduced by Labour in 1997, abandoned in Great Recession
- Stability and Growth Pact (SGP): failed to prevent build-up of debt and sovereign defaults

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Government Debt and the Macroeconomy

Policy implications: Fiscal councils

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Fiscal institutions to address deficit bias:

- 1 Optimal fiscal policy (previous lecture)
- 2 Fiscal rules (previous lecture)
 - Motivation and trade-offs
 - Empirical evidence – do they work?
 - Case studies:
 - 1 Fiscal rules under Labour government, 1997–2010
 - 2 EU's Stability and Growth Pact
- 3 **Independent fiscal councils (this lecture)**
 - Fiscal councils as complements to fiscal rules
 - Empirical evidence
 - Case study: Office for Budget Responsibility (OBR)

Why fiscal councils?

Fiscal rules mostly unsuccessful in eliminating excessive debt.

Fiscal councils as **complements to fiscal rules**:

- 1 Monitoring of compliance with fiscal rules by independent, non-partisan institution
- 2 Assessment of complex rules requires judgment
 - Cyclical adjustments
 - Dating of business cycles
- 3 Less affected by time inconsistency since not all contingencies need to be specified

Types of fiscal councils

Two main types of independent fiscal councils

- 1 Direct control over some fiscal policy instruments
- 2 Purely advisory and monitoring role, **no control** over fiscal policy

Comparable to independent central banks?

- Characteristics of CB favour delegation:
 - 1 Clear mandate: broad consensus on desirable inflation rate
 - 2 Limited number of instruments with limited redistributive effects
- Fiscal policy:
 - 1 No agreement on goals (budget deficits, debt levels)
 - 2 Substantial redistributive effects (progressive taxes, intergenerational redistribution)

Requires value judgments, cannot be delegated from elected politicians!

Can fiscal councils fix deficit bias?

Whether fiscal councils are effective depends on source of deficit bias:

Source	What can a fiscal council do?
Over-optimistic forecasts	Create independent forecasts, audit govt forecasts
Lack of understanding of intertemporal govt BC	Assess sustainability using long-run projections
Uninformed voters	Actively participate in media discussions, provide public information
Time inconsistency, myopic govt	Impose reputational / political costs for violating fiscal rules
Electoral budget cycles	Unelected experts with long appointments to address short-termism
Common-pool problem	Help coordination to internalise costs; accurate costing of policy measures

Can fiscal councils fix deficit bias?

- Conversely, if deficit bias arises because of deliberate intergenerational redistribution by well-informed govt, FC will not change much.
- Fiscal councils only have impact if they impose costs on govt that violates rules.
- Ideal institutional setup:
 - Independent, non-partisan
 - High degree of budgetary independence
 - Staffed by experts in the field, not (former) politicians
 - Long appointment periods
 - Engagement with media, participate in public discussions
 - Provide information to public, e.g. via reports
 - Should be allowed to make recommendations, evaluate alternative policies

History of fiscal councils

- IMF maintains a data base on fiscal councils
- CPB in Netherlands (1945), CBO in USA (1974), OBR in UK (2010)
- Number exploded after the financial crisis
- Most fiscal councils are in Europe

Number of fiscal councils over time

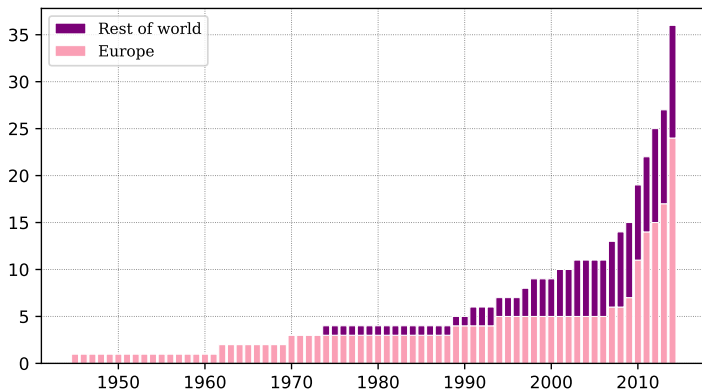


Figure 1: Number of fiscal councils in Europe and the rest of the world. Data source: Debrun, Kinda et al. (2013) and International Monetary Fund (2016)

Remit of fiscal councils

Global averages

- Large heterogeneity in remit (see [Table 1](#))
- Not all councils allowed to make alternative recommendations!

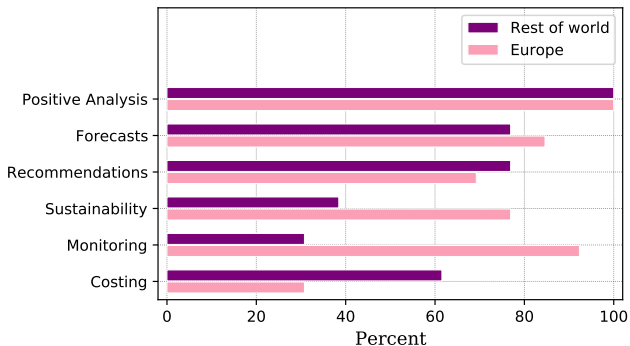


Figure 2: Remit of fiscal councils in Europe and the rest of the world. Data source: Debrun, Kinda et al. (2013) and International Monetary Fund (2016)

Remit and characteristics of fiscal councils

Europe and US

Country	Name	Year	Forecasts	Forecasts used in budget	Recommendations	Long-term sust.	Costing	Monitoring of FR
Austria	FISK	1970	x		x	x		x
Belgium	HRF/CSF	1989			x	x		x
Belgium	FPB	1994	x	x		x		
Cyprus		2014	x		x			x
Denmark		1962	x		x	x		x
Estonia		2014	x		x			x
Finland	NAO	2013	x		x	x		x
France	HPCF	2013	x					x
Germany		2010				x		x
Greece	HPBO	2010	x		x	x	x	x
Hungary	FC	2009	x		x			x
Ireland	IFAC	2011	x		x		x	x
Italy		2014	x			x	x	x
Latvia	FDC	2014	x		x	x		x
Lithuania	NAOL	2015	x		x	x		x
Luxembourg	CNFP	2014	x		x			x
Malta	MFAC	2015	x		x	x		x
Netherlands	CPB	1945	x	x		x	x	
Netherlands		2014			x	x		x
Portugal	CFP	2012	x			x		x
Romania		2010	x		x	x	x	x
Serbia		2011	x		x	x	x	x
Slovakia	CBR	2011				x	x	x
Spain	AIReF	2014	x		x	x		x
Sweden	FPC	2007	x		x	x		x
UK	OBR	2010	x	x		x	x	x
US	CBO	1974	x			x	x	

Table 1: Remit and characteristics of fiscal councils in Europe and the US. Data source: Debrun, Kinda et al. (2013) and International Monetary Fund (2016)

Effects of fiscal councils

Empirical evidence

Does presence of fiscal council improve fiscal performance?

- Evidence even less conclusive than for fiscal rules (fiscal councils are more recent phenomenon!)

Debrun and Kinda (2014)

- Use country-year panel of fiscal councils from IMF data base (up to 2013)
- Examine how presence and characteristics of fiscal councils affect primary budget balance
- Control for fiscal rules using Fiscal Rule Index (FRI)
- Findings:
 - 1 Tighter fiscal rules associated with more positive primary budget balance (same as in previous lecture!)
 - 2 Pure presence of fiscal councils has **no significant effect**
 - 3 Some characteristics have positive association: more independence, monitoring functions, more technical contributions (costing, forecasts), high media impact are all associated with **higher** primary budget balance

Effects on primary budget balance

Debrun and Kinda (2014)

Dependent Variable: Primary Balance in percent of GDP								
Primary Balance (t-1)	0,823 (27.07)***	0,824 (26.84)***	0,821 (26.53)***	0,821 (24.03)***	0,826 (26.96)***	0,826 (27.49)***	0,826 (28.07)***	0,824 (27.13)***
Debt (t-1)	0,015 (2.92)***	0,017 (3.37)***	0,016 (3.24)***	0,023 (3.69)***	0,016 (3.24)***	0,016 (3.14)***	0,016 (3.31)***	0,017 (3.40)***
Output Gap (t-1)	-0,095 (3.05)***	-0,094 (3.03)***	-0,096 (3.09)***	-0,091 (2.40)**	-0,098 (3.17)***	-0,095 (3.06)***	-0,092 (2.98)***	-0,093 (2.99)***
Fiscal Rules Index (FRI)	0,277 (2.62)***	0,275 (2.59)***	0,283 (2.66)***	0,249 (2.26)**	0,232 (2.27)**	0,289 (2.73)***	0,295 (2.79)***	0,280 (2.65)***
Fiscal Council	0,543 (1.42)							
Legal indep.		0,930 (2.38)**						
Safeg. on budget			0,386 (0.71)					
Staff number (High level)				0,296 (2.34)**				
Fiscal rule monitoring					1,524 (2.80)***			
Costing of measures						1,355 (2.57)**		
Forecast Assessment							1,293 (2.78)***	
High media Impact								0,904 (2.32)**
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	901	901	901	890	901	901	901	901
Countries	58	58	58	58	58	58	58	58

Absolute bootstrapped t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 2: Fiscal councils and fiscal performance. Source: Debrun and Kinda (2014)

Effects of fiscal councils

Empirical evidence

Debrun and Kinda (2014) (continued)

- Additional results: FC are associated with less biased forecasts of budget balance and lower forecast errors
- Caveats:
 - Usual problems of cross-country regressions and potentially very different institutional setups
 - Characteristics of councils are highly correlated: makes identifying impact of individual traits difficult

Beetsma et al. (2019)

- Use newer vintage of IMF fiscal council data base
- Find mostly statistically **insignificant** effects of FC on forecasts of real GDP and primary balance

Significant findings:

- Lower forecast errors for primary balance
- Higher compliance with budget and expenditure rules if FC is present

Office for Budget Responsibility (OBR)

- Established in 2010 after being proposed by Conservatives as part of their election platform

Main motivation:

- Eliminate over-optimistic forecasts as way to circumvent fiscal targets
- Legal basis: Budget Responsibility and National Audit Act 2011, The Charter for Budget Responsibility
- Several memoranda of understanding to guide cooperation with Treasury, HM Revenue and Customs (HMRC), Department of Works and Pensions (DWP)
- **Independence?** – OBR is part of Treasury's budget, relies on Treasury information, but has full discretion over
 - methodology and judgments underlying its forecasts
 - contents of its reports, subject to minimum requirements

Main duty

- Examine and report on sustainability of public finances in broad sense
- Includes assessing policies using forecasts, long-term projections (50 years)

Specific tasks

- *Economic and Fiscal Outlook*: medium-term forecast of economic and fiscal aggregates;
 - commissions by Treasury twice a year, used in its budget process
 - includes assessment of whether govt is likely to achieve its fiscal targets
- *Fiscal Sustainability Report*: 50-year-ahead projections of UK debt, every second year
- Additional reports: *Welfare Trends Report*, *Forecast Evaluation Report* (every 2 years), *Fiscal Risk Report* (every 2 years)
- Forecasts of taxes and welfare spending devolved to Scotland

International comparison

Office for Budget Responsibility

Compared to international peers:

- OBR's forecasts used in govt's budget process (Treasury can disagree with forecasts)
- OBR explicitly barred from examining alternative policies, cannot make normative comments on merits of policies or their effectiveness
- Independence: OBR ranked highest among 26 institutions examined by OECD
- Solid international reputation, quality of output on par or exceeding other independent fiscal councils (recent external review by OECD)

Impact of Covid-19

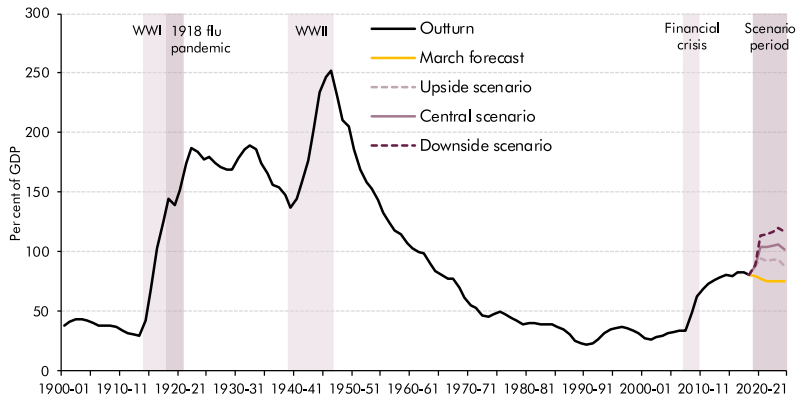
Fiscal sustainability report, July 2020

We examine impact of Covid-19 using OBR's most recent publication

- FSR published every two years, contains 50-year-ahead projections
- Usually forecast is based on most recent *Economic and Fiscal Outlook*, which was obsoleted by Covid-19 outbreak
- Three **scenarios**:
 - 1 *upside* scenario: rebound in first quarter of 2021
 - 2 *central* scenario: back to pre-pandemic level ob end of 2022
 - 3 *downside* scenario: sluggish recovery, pre-pandemic level only by 2024

Public sector debt

OBR's Financial sustainability report, July 2020

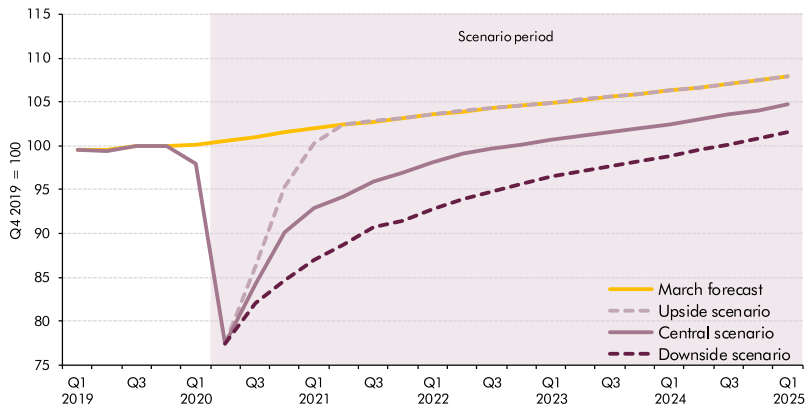


Source: Bank of England, ONS, OBR

Figure 3: Public sector net debt: Covid-19 scenarios versus OBR's March forecast. Source: OBR (2020)

Real GDP forecast

OBR's Financial sustainability report, July 2020



Source: ONS, OBR

Figure 4: Real GDP: Covid-19 scenarios versus OBR's March forecast. Source: OBR (2020)

Sources of higher borrowing due to Covid-19

OBR's Financial sustainability report, July 2020

Higher borrowing due to collapsing tax revenue and increase in spending:

- Due to changes in economic activity:
 - Lower income taxes, corporation taxes, VAT revenue
 - Increase in welfare spending
- Due to additional policy measures:
 - Coronavirus Job Retention Scheme (“furlough scheme”)
 - Self-Employment Income Support Scheme
 - Business support measures such as grants and loan guarantees
 - Additional spending on public services, e.g. contact tracing, health services
 - Welfare measures such as increase of universal credit

Sources of higher borrowing due to Covid-19

OBR's Financial sustainability report, July 2020

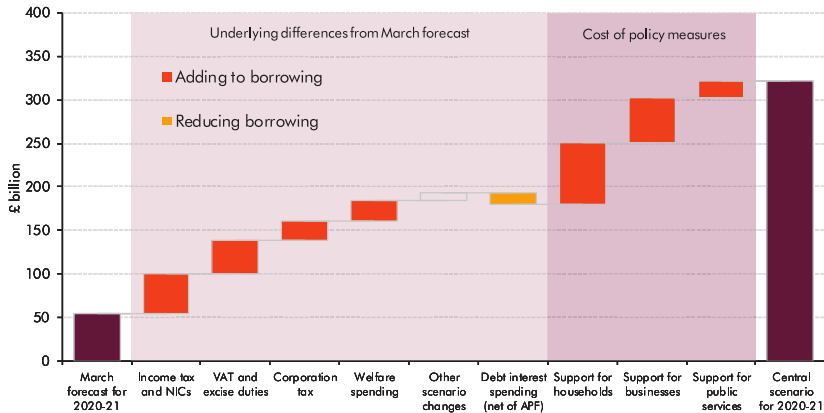
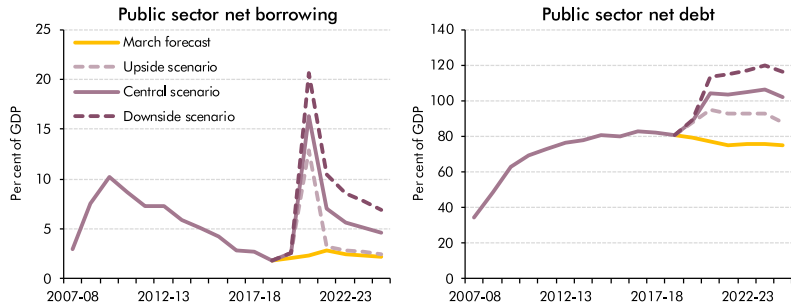


Figure 5: Sources of higher borrowing in 2020–21 in OBR's central scenario. Source: OBR (2020)

Higher borrowing due to Covid-19

OBR's Financial sustainability report, July 2020

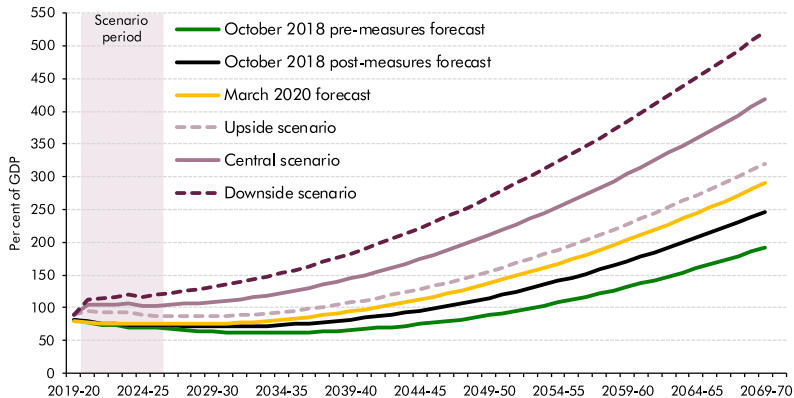


Source: ONS, OBR

Figure 6: Public sector net borrowing and net debt. Source: OBR (2020)

Debt projections after Covid-19

OBR's Financial sustainability report, July 2020



Note: The October 2018 forecasts' 2024-25 jumping-off points are assumed to equal their 2023-24 medium-term horizon values.

Source: ONS, OBR

Figure 7: Public sector net debt: long-term projections. Source: OBR (2020)

Summary and conclusions

Fiscal councils

- Complement to fiscal rules
- Monitoring and advisory role, no direct control over fiscal policy instruments
- Effectiveness rests on imposing reputational / political costs on governments
- Institutional requirements to do that:
 - Independent, non-partisan, transparent, credible
 - Technically competent expert staff
 - Provide information to media, voters and politicians
 - Engagement in media and public discussions

Office for Budget Responsibility (OBR)

- UK's independent fiscal council since 2010
- Plays central role in forecasting, assessing sustainability of public debt
- Positive analysis of existing government policy
- No normative statements, recommendations or alternative policy evaluation

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