

ECON 206 MACROECONOMIC ANALYSIS

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Chapter # 13b

What imposes limits to spending and debt?

- ✓ Although it can save or borrow in any one period, the government must adhere to a *budget constraint over time*, just like the rest of us
- Lenders know that high debt may prompt governments to *print money* and collect seignorage, which would cause inflation and erode the real value of their debt, so lenders may stop lending to high-debt countries
- Continued borrowing may place very high tax burdens on future generations, our children and grandchildren
- ✓ Borrowing may *crowd out investment*, lowering GDP

Government

Chapter 13 (2 of 2)

What is the government's **budget constraint**?

- In any one time period, the government can spend more than it takes in tax revenue by borrowing money from lenders, but it must eventually pay it back

$$G_t + Tr_t + iB_t = T_t + \Delta B_t + \Delta M_t$$

Spending on goods & services	Interest (<i>i</i>) on outstanding debt (<i>B</i>)	Borrowing new debt	Seignorage : just printing money
Transfers like Social Security	Taxes		

Let's simplify by assuming that transfers and seignorage are zero.

Our objectives today

- More on government spending, taxes, deficits, and debt
- The limits to borrowing:
 - The government's intertemporal budget constraint
 - When borrowing *crowds out investment*
- The Fiscal Problem of the 21st Century: extremely rapid growth in all health spending and in government programs: Medicare and Medicaid

The budget constraint becomes

$$G_t + iB_t = T_t + \Delta B_t$$

Since $\Delta B_t = B_{t+1} - B_t$ we can rewrite this as

$$B_{t+1} = (1 + i)B_t + \underbrace{G_t - T_t}_{\text{The "primary" deficit}}$$

Debt next period	Debt last period grown at the rate of interest	The "primary" deficit (without interest payments)
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For the second period,

$$B_2 = (1 + i)B_1 + G_1 - T_1$$

Let's consider only 2 periods, so that by period 3, the government has to pay down all its debt to zero

$$B_3 = (1+i)B_2 + G_2 - T_2 = 0$$

Now rearrange for B_2

$$(1+i)B_2 = T_2 - G_2$$

$$B_2 = \frac{T_2}{1+i} - \frac{G_2}{1+i}$$

And substitute for B_2 in $B_1 = (1+i)B_1 + G_1 - T_1$

$$\frac{T_2}{1+i} - \frac{G_2}{1+i} = (1+i)B_1 + G_1 - T_1$$

Another limit: Excessive borrowing may crowd out investment and hurt GDP

- Intuitively, here's what happens:
- How does the government borrow money? It offers Treasury bills, notes, and bonds to us, the **public**
- By buying a bond, we are "saving" in that we aren't spending that money
- But we can't also save that money and **invest** it by purchasing capital
- It's an either/or kind of thing, either your saving is investment that increases the capital stock, or your saving finances the government's deficit, unless you *save more*
- And there's also the issue of **foreign saving** too ...

$$\frac{T_2}{1+i} - \frac{G_2}{1+i} = (1+i)B_1 + G_1 - T_1$$

Now rearrange again, putting the G's and the B on the left, and the T's on the right

$$\underbrace{G_1 + \frac{G_2}{1+i}}_{\text{Present discounted value of total spending}} + \underbrace{(1+i)B_1}_{\text{Initial debt grown at the interest rate}} = \underbrace{T_1 + \frac{T_2}{1+i}}_{\text{Present discounted value of total taxes}}$$

Present discounted value of total spending Initial debt grown at the interest rate Present discounted value of total taxes

This says: Although taxes do not have to be equal in any one period, the *present discounted value* of taxes must equal the present discounted value of spending plus initial debt

How do we see this? Start with income accounting:

$$Y = C + I + G + EX - IM$$

Now rearrange, putting investment, I , on one side:

$$I = Y - C - G - EX + IM$$

Taxes, T , are subtractions from your income. So let's add and subtract T from the right hand side, and flip EX and IM:

$$I = \underbrace{Y - C - T}_{\text{Income minus consumption minus taxes is what you have left for private saving}} + \underbrace{T - G}_{\text{Taxes minus spending equals public saving}} + \underbrace{IM - EX}_{\text{Imports minus exports is foreign saving (think: imported investment goods)}}$$

Income minus consumption minus taxes is what you have left for **private saving** Taxes minus spending equals **public saving** Imports minus exports is **foreign saving** (think: imported investment goods)

$$G_1 + \frac{G_2}{1+i} + (1+i)B_1 = T_1 + \frac{T_2}{1+i}$$

- Let's work an example of what the **intertemporal** budget constraint means in practice

- Pretend there is no initial debt: $B_1 = 0$, and rearrange:

$$G_1 + \frac{G_2}{1+i} = T_1 + \frac{T_2}{1+i} \quad G_1 - T_1 = \frac{T_2 - G_2}{1+i}$$

- Suppose $G_1 = 1000$ and $T_1 = 750$, and $i = 0.03$

- Then $250 = \frac{T_2 - G_2}{1.03}$ and $T_2 - G_2 = 258$

- Taxes must exceed spending by *more than 250* in the future! This is our children paying more than they get.

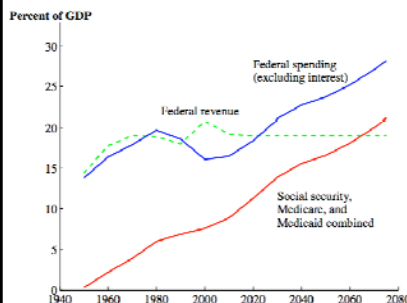
Crowding out investment is bad, but doesn't the government invest?

- Yes, some government activities qualify as investment in productive resources that will be useful for many years. Examples include:
 - **Roadways:** In 1956, Eisenhower signed the National Interstate and Defense Highways Act, which envisioned \$41 billion (about \$300 billion in today's dollars) for over 40,000 miles of new interstate
 - **Defense:** Although there is the potential for misuse, training and equipment for national defense pays clear dividends later
 - **Education:** We have seen how investment in human capital is important, and states and localities spend about \$700 billion annually on education
 - **Health?** Human capital can depreciate either through skill obsolescence or through sickness and death! But does government health spending intervene early enough to matter?
- But a very large role for government is **social insurance** through transfer payments with less clear long-term payoffs

Composition of federal spending and taxes

	Billions of dollars	Dollars per person	Percent of GDP
Total Expenditures	\$2,433	\$8,330	19.8%
Health (+Medicare)	541	1,850	4.4
Social Security	516	1,760	4.2
National Defense	492	1,670	4.0
Income Security	344	1,170	2.8
Net Interest	184	620	1.5
Other	369	1,260	3.0
Total Revenues	\$2,126	\$7,260	17.3%
Income taxes	909	3,130	7.4
Payroll taxes	787	2,680	6.4
Corporate taxes	270	940	2.2
Other	147	520	1.2
Deficit (-)	-\$320	-\$1,070	-2.6%

What is the outlook for all this spending on the elderly?

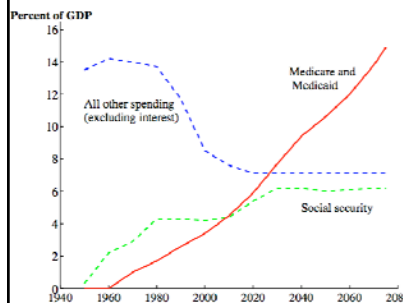


- Not too good!
- While federal revenue, which is mostly the income tax, will remain fairly flat as a share of GDP,
- Federal noninterest or "primary" spending will grow rapidly, from about 15% of GDP today to near 30% by the year 2080
- Growth in primary spending is solely due to growth in entitlements

What do we expect will happen to these different taxes and spending programs over time?

- **Taxes** are the easy part. Unless Congress were to enact a significant change, **tax rates** will remain steady at around 20% of income
- What does that mean about the level of taxes as a share of GDP in the future?
- Taxes will be pretty constant at around 20% of GDP
- But what about **spending**? What drives it?
 - Wars and external threats drive defense spending
 - Need drives spending on welfare and public assistance
 - Entitlement drives much spending on Social Security, Medicare, and Medicaid — by law, people are due to receive these

Contrary to popular belief, Medicare is a bigger problem than Social Security



- Social Security spending will indeed rise after 2010 when the "Baby Boom" generation retires
- But the real gorilla in the room is Medicare and Medicaid
- This forecast actually predates the massive prescription drug expansion passed and signed into law in 2003, which might increase Medicare spending near 1% of GDP

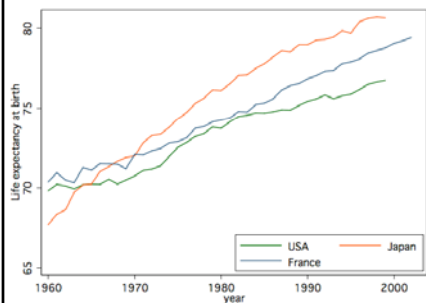
What are the major entitlement programs, and how do they work?

- **Social Security**
 - Pays monthly pensions to retirees over the age of 62 who contributed their payroll taxes to the system back when working
 - Receives your (and my) payroll taxes today in return for promises
- **Medicare**
 - Pays hospitals and subsidizes supplemental medical insurance and prescription drugs for Americans over 65
 - Receives payroll taxes and some general revenues (income taxes)
- **Medicaid**
 - Covers medical care for the poor and medically needy, including elderly nursing home (long-term care) patients
 - Funded from general revenues

Why is health spending rising so rapidly?

- Is there **waste** and **fraud** in Medicare and in the health system more generally?
- Yes, but nowhere near enough to justify this huge increase
- Are people using too much medical care, since Medicare and Medicaid pay for it?
- Maybe, but this is far from clear. Even on Medicare, many people fear out-of-pocket health expenditures
- Are we in the U.S. subsidizing the development of prescription drugs, which then benefit the entire world? Remember the pharmaceutical company, R&D, and the fixed cost of \$800 million?
- This is a good point, and nobody knows the true effect of this. But **all** countries around the world find their health spending is rising as a share of their GDP — nobody's getting a free lunch
- What's left? Maybe people **want** to spend more and more of their incomes on health spending and new health technologies, so they live longer!

Average life spans — *life expectancy* — has been increasing rapidly here and abroad



- Just like GDP per capita, life span (per capita) has also risen dramatically over time and seems to have no limit in sight
- Having more life is probably more desirable than having more consumption in any year of life, so it's not surprising that people are pursuing it!

What can we do about rising health costs and pressure on government budgets?

- We could "muddle through" by probably paying a lot more taxes! Whom does it benefit? Us, by keeping our parents alive, and ultimately us alive longer
- The problem with taxes is that they cause deadweight losses — distortions and disincentives
- The problem with free markets in health is that sometimes people don't participate, or they may help drive costs higher and care poorer by *selecting* plans strategically, which insurance companies recognize and spend a lot of time trying to exploit by limiting care
- The other possibility is to restrict spending. Given how not much of that has been done lately, is it realistic to assume this will happen?
- Every industrialized country faces this same problem, but that doesn't lessen its weight for future generations (that's **you**). Health spending is The Fiscal Problem of the 21st Century

Next time

- FOREIGN TRADE
- Why do we trade? Who gains from trade?
- What is a trade deficit?
- How is the trade deficit related to the government's budget deficit?