Economic Effects of Investment Subsidies

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Explicit Investment Subsidies in the U.S.

- 1954 Accelerated Depreciation
- 1962 Investment Credit (first permanent, then countercyclical, then permanent)
- 1982 Abandonment of explicit subsidies, investment credit repealed, tax rates reduced, present value of depreciation set close to economic
- Currently, equipment favored because of fall in inflation rate

Investment Subsidies Around the World

- Pechman (1987): all countries studied (Sweden, the Netherlands, France, Italy, Germany, the UK, Canada, Japan) had experimented with subsidies
- Noted a growing disenchantment with subsidies due to inequities and distortions
- Subsidies tend to favor equipment

Tax Rates 1982

Country	Statutory	Equipment	Buildings
Australia	50	32	52
Canada	44	9	42
France	50	26	46
UK	52	0	9
Germany	62	47	60
Italy	39	18	22
Japan	55	52	54
US	50	22	37

Tax Rates 2005

Country	Statutory	Equipment	Structures
Australia	30	24	29
Canada	36	25	36
France	34	20	30
UK	30	20	29
Germany	38	29	39
Italy	37	19	33
Japan	40	28	43
US	39	24	41

Investment Subsidies vs. Rate Cuts and Cash Flow taxes

- Revenue more focused at margin than rate cuts, less than cash flow
- Can be non-neutral with respect to assets
- Can produce negative tax rates
- Require less offsetting replacement revenue than rate cuts, more than cash flow.

Two Basic Issues

- How much might a country gain in standard of living?
- What are benefits and costs of choosing investment subsidies and how might they be designed to be most effective?

Simple One-Good Model

- Cobb Douglas (Factor substitution elasticity of one)
- All Equity, Perfectly Elastic Capital Supply
- Tax Rate of 30% with economic depreciation; typical values of K/Q
- Reduce Cost of Capital by 10% (a 57.7% reduction in effective tax rate to 12.7%)
- Closed and small open capital importing

Steady State Changes

Variable	Percentage Change
Capital Stock	16.2
Gross Output	4.6
Net Output	2.2
Consumption: Closed	1.5
Consumption: Open	0.6

Results are Too Optimistic

- Debt finance: reduces the open economy gain by 0.2 percentage points, or to 0.4%.
- Factor substitution elasticity is probably too high.
- Capital supply not perfectly elastic.
- Does not account for imperfect product substitution, investment from countries with worldwide systems, and effects of other sources of revenue.

Factor Substitution Elasticity

- Early studies found no effect
- Panel data studies 0.18 to 0.6
- Capital stock, most 0.3 to 0.6
- Most recent studies, most 0 to 0.6
- We consider 0.5.

Sensitivity to factor substitution

Variable	Cobb Douglas	0.5 Elasticity
Capital Stock	16.2	7.7
Gross Output	4.6	2.2
Net Output	2.2	1.2
Consumption: Closed	1.5	0.7
Consumption: Open	0.6	0.3
Open with Debt	0.4	0.2

Capital Supply: Closed Economy

- Simple evidence suggests little savings response, consistent with rule of thumb
- Infinite horizon model that produces infinite elasticity unrealistic, produces corner solutions
- Life cycle model also unrealistic, and results depends on revenue replacement

Open Economy

- International capital not likely perfectly mobile, strong evidence of home bias
- Gravelle and Smetters choose 3, which they consider high
- De Mooji et al. survey implies 1.7

Percentage Change

Variable	S=1 E=∞	S=0.5 E= ∞	S= 1 E= 3	S= 0.5 E= 3	E= 0
Capital Stock	16.2	7.7	12.3	6.9	0.0
Gross Output	4.6	2.2	2.7	2.0	0.0
Net Output	2.2	1.2	2.1	1.1	0.0
Consumption: Closed	1.5	0.7	1.2	0.6	0.0
Consumption: Open	0.6	0.3	-0.1	0.0	-3.1

Sensitivity to Initial Conditions

- Reduce K/Q by 15% by raising after tax return: with Cobb Douglas , infinite elasticity, 1.5% consumption rises to 2.1% in closed; 0.6% rises to 0.8% in open
- Reduce K/Q by 15% by reducing capital income share: with Cobb Douglas, infinite elasticity, reduce 1.5% to 1.1% in closed, reduce 0.6% to 0.5% in open

Comparison with Rate Reduction

- (not considering cash flow alternative, major transition issues)
- Role of corporate tax in system; cutting corporate tax rate too much can create a tax shelter from the individual tax; investment subsidies apply to both corporate and noncorporate
- Bang for buck greater
- Rate cut is neutral and does not produce negative tax rates, investment subsidies can

Bang for the Buck

- Investment subsidy actually not that much superior to rate reduction
- Ratio is (g+d)/(r+d) for small change beginning with economic depreciation
- In our example, 83%
- If applied, as typical, to equipment, 90%

Neutrality

- Investment tax credit a nice form because it has an even revenue loss pattern
- But is typically applied to equipment and distorting
- Even if applied broadly, is distorting because it favors short lived assets
- Still favors short lived (although reduced) with a basis adjustment

Neutral Forms of Investment Subsidies

- Partial expensing (but bad revenue pattern)
- Properly designed accelerated depreciation (also bad revenue pattern)
- Investment credit for investment in excess of depreciation (neutral because of anticipation of future reductions)
- Investment credit that rises with asset durability

Should Equipment be Favored?

- Most subsidies have favored equipment
- Most arguments (obsolescence, more debt for structures) invalid
- Spillovers (learning by doing): evidence from Summers and DeLong debunked by Auerbach et al.
- Judd (1997): Monopoly power or producers, not true of all assets, difficult to determine

Negative Tax Rates: Equity

- Our example: 12.7% with 7% depreciation
- Equipment (15% depreciation) -4.5%
- Short lived equipment (33% depreciation), -87.8%
- With accelerated depreciation, easier; in U.S. major class of equipment, any credit greater than 4.5% creates negative tax rates.

Negative Tax Rates: Debt

- Debt taxed at zero, so any subsidy creates negative
- Our example, -24%
- Debt financed equipment -49%
- With 2% inflation, no subsidy -12%
- Our Example -40%
- Equipment -60%

Conclusion

- Little is gained in standard of living from investment subsidies or lower tax rates, especially for small open capital importing economies, which are likely to lose
- There are many difficulties in designing investment subsidies, they can (and typically do) produce distortions and negative tax rates