

Lecture 1:
Intergovernmental Competition
for Capital: Welfare-Improving or
Welfare-Reducing?

By
John D. Wilson

Definition of Tax Competition

Narrow definition:

- Noncooperative tax setting by independent governments.
- Each government's policy choices influence the allocation of a mobile tax base among the “regions” represented by these governments.

- This definition covers different types of **horizontal tax competition**: competition among governments at a single level (e.g., national governments or local governments).
- Governments compete for...
 - capital
 - firms
 - labor (residents or commuters)
 - consumers (cross-border shopping)

Broader definition

- Noncooperative tax setting by independent governments.
- Each government's policy influences the allocation of tax revenue across government treasuries.
- This definition also covers both horizontal tax competition and **vertical tax competition**:
 - **Vertical tax competition**: different levels of government (e.g., central and local) tax the same base.

- **Broadest definition:** Any form of noncooperative tax setting by independent governments.
- This definition also covers yardstick competition:
 - Voters learn about a politician's capabilities by comparing tax rates in their jurisdiction with those in "similar" jurisdictions
 - Result: A given jurisdiction lowers its tax rate in response to a reduction in tax rates in similar jurisdictions.

- **Scope of my lectures**
 - Horizontal tax competition, along with some discussion federal systems with horizontal and vertical tax competition.

 - Competition for capital, along with some discussion of competition for firms.

 - This lecture
 - The standard model and its extensions: Welfare-worsening tax competition
 - Departures from the standard model: Welfare-improving tax competition

 - Next lecture: Recent topics in tax competition
 - Tax Competition and Goods Trade
 - Comparing Tax Competition under Formula Apportionment and Separate Accounting
 - Preferential vs. Non-Preferential Tax Regimes
 - Tax Havens

- Some review articles

- Wilson, “Theories of Tax Competition (NTJ, 1999).
- Wilson and Wildasin, “Capital Tax Competition: Bane or Boon?” (JPubE, 2004).
- Fuest, Huber, and Mintz, “Capital Mobility and Tax Competition” (Foundations and Trends in Macroeconomics, 2005).
- Wilson, “Tax Competition in a Federal Setting” (Handbook on Fiscal Federalism, edited by G. Brosio and E. Ahmad, Edward Elgar, 2006).
- Wildasin, “Fiscal Competition” (Oxford Handbook of Political Economy, edited by B. Weingast and D. Wittman, 2006)
- Brueckner, “Strategic Interaction Among Governments: An Overview of Empirical Studies” (International Regional Science Review, 2003).
- Revelli, “On Spatial Public Finance Empirics” (International Tax and Public Finance, 2005).

The Standard Model (Zodrow-Mieszkowski-Wilson)

- Many small identical jurisdictions or regions (cities, states, provinces, regions or countries).
- Two factors: mobile capital and an immobile factor, "labor."
- Residents possess identical factor endowments and identical utility functions:

$$u(C, G),$$

where C is private consumption and G is the supply of a public good.

- Competitive firms use a constant-returns-to-scale technology to produce a single output from capital and labor.
- Output is either sold as the private good C , or it is purchased by the government and transformed into the public good G , which is then provided to the "representative resident."
- Taxes: A source-based tax on capital (tax on capital or income from capital within the jurisdiction's borders). Examples: property tax; some forms of corporate income taxation.

- Government budget constraint: $tK(r+t) = G$

where $t =$ tax rate;

$r =$ after-tax return on capital
(exogenous for a small jurisdiction);

$K(R) =$ capital demand function,

where $R = r + t$: before-tax return.

- Representative resident's budget constraint:

$$C = w(r+t)L^* + rK^*$$

where

$w(r+t) =$ factor-price frontier;

L^* and $K^* =$ labor and capital endowments.

Local government's problem: Choose t to solve

$$\text{Maximize } u[w(r+t)L^* + rK^*, tK(r+t)]$$

Solution:

The public good is “underprovided”: The marginal rate of substitution between C and G exceeds the marginal cost of G :

$$\text{MRS} = \frac{1}{1+t \frac{dK}{dR} \frac{1}{K}} > 1;$$

Central government's problem:

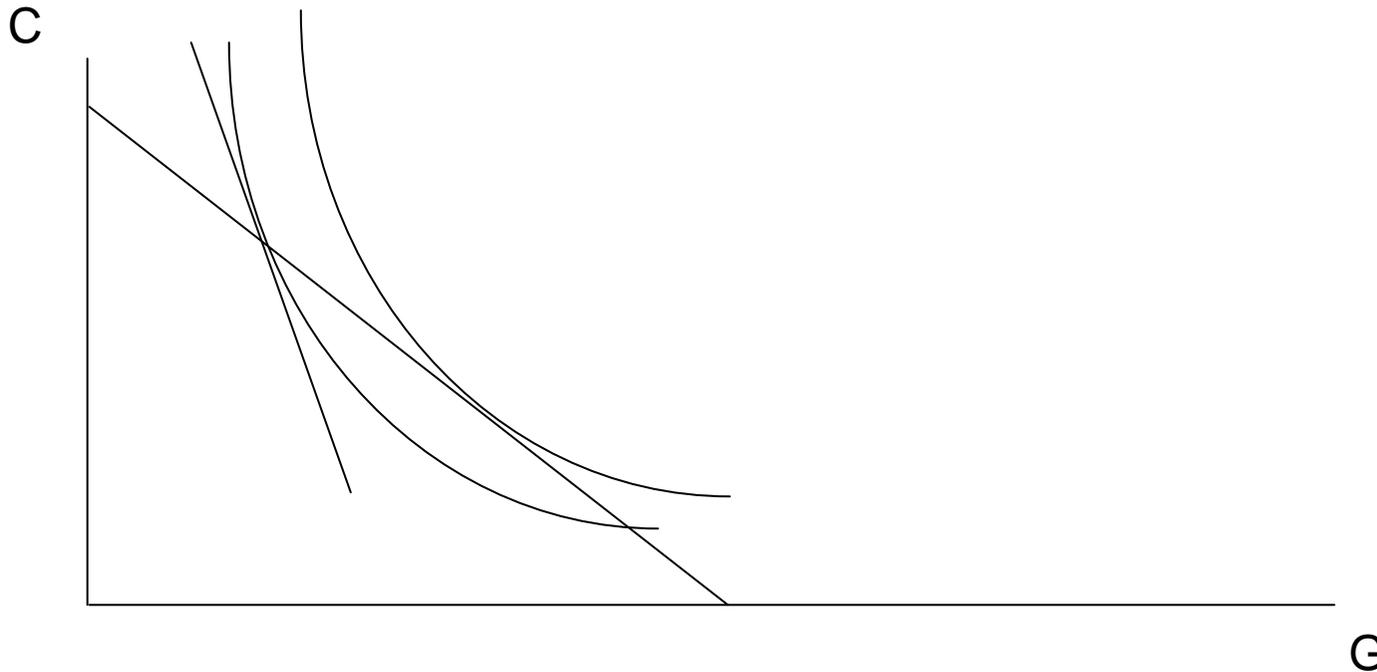
Choose t in each of the identical jurisdiction's to solve

$$\text{Maximize } u[w^* + (R^* - t)K^*, tK^*]$$

where R^* solves $K(R^*) = K$ and $w^* = w(R^*)$.

Solution: Since R^* is fixed, t is capitalized into the after-tax return, representing a lump-sum tax. Thus,

$$\text{MRS} = 1.$$



Explanation for Underprovision: Interjurisdictional externalities

- Straight line w/ slope = -1: PPF when all jurisdictions choose the same t and G ; no capital flows.
- Steeper line: PPF for a single jurisdiction, holding taxes fixed in other jurisdictions.
 - **Fiscal externality**: A rise in one jurisdiction's t causes a capital outflow, which represents a cost for the jurisdiction, but is also a positive externality because other jurisdictions benefit from the additional capital.

Extensions to the basic model

Extension #1. Nash competition between “large” jurisdictions

- Assume a Nash game in tax rates.
- Underprovision is reduced relative to the large-number case:

$$\text{MRS} = \frac{1}{1+t \frac{dK}{dR} \frac{1}{K} \left(1 + \frac{dr}{dt}\right)} < \frac{1}{1+t \frac{dK}{dR} \frac{1}{K}}$$

- A rise in a jurisdiction’s tax rate lowers the world return r .
- The cost of capital, $R=r+t$, rises by less than the increase in t , lowering the tax elasticity of capital (See Hoyt, JUE, 1991.)

Extension #2: Choice of Strategic Variables

- Standard model: taxes are the strategic variable.
- Alternative: Public good levels are the strategic variable, with taxes then adjusting to balance government budgets.
 - Assume 2 jurisdictions, and raise i's tax rate.
 - Capital moves from i to j, increasing j's tax base.
 - Jurisdiction j's budget-balancing tax rate fall, given that expenditures are fixed.
 - Fall j's tax rate causes additional flows of capital from i to j, increasing the "fiscal externality."
 - Conclusion: Fiscal externalities created by capital flows are greater under "expenditure competition" than under "tax competition", so more underprovision under expenditure competition.
 - Wildasin ("Some Rudimentary Duopoly", JPubE, 1991) shows that if there is an initial stage of the game where 2 identical jurisdictions non-cooperatively choose their strategic instruments, then the Nash equilibrium is for both to choose taxes.

- **Extension #3: Spillover Effects**

- Suppose that two identical jurisdictions play Nash in capital tax rates
- Suppose that utility depends on total public good provision, $G_1 + G_2$ (“international public good”)
- When one jurisdiction raises its tax rate, capital flows to the other jurisdiction, but total tax base does not change, so no change in $G_1 + G_2 = t(K_1 + K_2)$.
- Fiscal externalities are eliminated: $MRS = 1$.
- There is still underprovision: with spillover effects, the rule for efficiency is: $2MRS = 1$
- Generalization: utility for i depends on $G_i + \alpha G_j$, $\alpha < 1$: capital outflow now lowers $G_i + \alpha G_j$, implying a fiscal externality from tax competition. But spillovers lower the size of the fiscal externality.

- Extension #3 (cont.)
 - Suppose the strategic variable is expenditures, not taxes.
 - Then the capital outflow from a rise in jurisdiction i 's tax rate has no impact on G_j (instead, t_j declines to balance j 's budget).
 - So fiscal externality is not eliminated—choice of strategic variable matters a lot.

Extension #4. Wasteful tax diversity

- **Size differences between jurisdictions**

(Bucovetsky, JUE, 1991; Wilson, RSUE, 1991)

- Misallocation of capital: Small jurisdictions choose lower taxes than large jurisdictions and benefit from the resulting capital inflows.
- New rules for public good provision include terms-of-trade effects:

$$\text{MRS} = \frac{1 + \left(1 - \frac{K^*}{K}\right) \frac{dr}{dt}}{1 + \frac{t}{K} K' \left(1 + \frac{dr}{dt}\right)}$$

- Capital importer ($K > K^*$) lowers the cost of imports ($dr/dt < 0$) by increasing its tax rate.
- These results assume perfect competition. See Haufler and Wooton, JPubE, 1999, for an imperfect-competition model where large jurisdictions “win” the competition over attracting a firm.

- **Inefficient Goods Trade**

- Competitive markets (Wilson, 1987): Identical jurisdictions produce different goods: High-tax (low-tax) jurisdictions specialize in labor-intensive (capital-intensive) goods. This is inefficient.
- Imperfect competition: Similar inefficiencies in equilibrium tax rates—see “Tax Competition with Heterogeneous Firms with Endogenous Entry,” by Ron Davies and Carsten Eckel (unpublished):

Extension #5: Alternative tax instruments

- Standard model: The tax on capital is a **source-based tax on capital**, which taxes the capital income earned within the jurisdiction's borders.
 - Source-based taxes are dominated by head taxes, which do not distort investment.
 - Source-based taxes are also dominated by distortionary taxes on saving and labor supply.

- **Diamond-Mirrlees theorem on aggregate production efficiency:**
 - If an optimal commodity tax system is available and there are no untaxed profits, then the optimal tax system should leave the economy on the frontier of its aggregate production possibility set.
- Open-economy application: no source-based capital tax, because it distorts the location of capital investment.
- Taxes on wage income and residents' worldwide capital income ("residence-based tax") are preferable, because they do not distort the location of investment (Gordon, AER, 1986).

- Bucovetsky-Wilson (RSUE, 1991)
 - Adds a labor supply decision to the standard model.
 - For a small open economy, a tax on wage income is preferred to a source-based tax, even if no other taxes are available.
 - Intuition: The labor supply has a finite elasticity; capital is infinitely elastic.
 - Bucovetsky-Wilson show that the public good is underprovided when a labor tax is used.

Question: Why tax capital?

- **Some residence-based taxation is available:**
Taxing capital income abroad may be difficult, but it is not impossible, so some taxation of domestic and foreign-source capital income is justified (Fan and Wilson, *Asia-Pacific Journal of Accounting and Economics*, 2008).

- **Large jurisdictions have an incentive to tax capital**

- When the tax rate is increased, capital flows out of the jurisdiction, reducing the equilibrium after-tax return, r , so that the cost of capital rises by less than the tax:

$$\frac{dR}{dt} = 1 + \frac{dr}{dt} < 1$$

- So a portion of the tax falls on capital owners, implying that some capital tax is desirable if the alternative is a distortionary wage tax (Bucovetsky-Wilson)
- Terms-of-trade effects: A capital-importing country has an incentive to tax capital to lower the return r paid for capital imports.
- Even small jurisdictions may possess “market power” on international capital markets, once it is recognized that income earned by capital within their borders possess unique risk characteristics (Gordon and Varian, JIE, 1989)

- **Capital investments impose costs on the host country at the margin** (e.g., infrastructure investments)
 - A small open economy should tax capital at a rate equal to these marginal costs (e.g., infrastructure investment).
 - Related literature: The property tax as an efficient "user fee" for public good provision (Hamilton, Urban Studies, 1975).
 - Zoning is used to eliminate the distorting effect of this tax on housing.

- **Violations of the Diamond-Mirrlees Assumptions**
 - Untaxed economic profits: Taxing capital raises the cost of capital to firms, thereby representing a beneficial “indirect” tax on profits.
 - This indirect tax on profits is desirable, if profits are viewed as rents earned by a fixed factor.

- **Double-Taxation Conventions**

- Countries often provide tax credits for taxes their citizens pay to foreign governments on income earned in the foreign countries.
- Thus, a foreign country's tax is effectively a transfer from the home treasury to the foreign treasury.
- The foreign country has an incentive to increase its tax rate to the level levied by home country, since doing so maximizes this transfer.

- **Partially immobile capital**

- Capital becomes partially immobile once it is located in a jurisdiction.
- The jurisdiction exercises its market power by taxing this capital.
 - Problem with this argument: Firms anticipate future taxes on partially immobile capital, causing countries to compete for new capital by subsidizing new firms. So capital not taxed in a present value sense (J.D. Wilson, "The Tax Treatment of Imperfectly Mobile Firms: Rent-Seeking, Rent-Protection, and Rent-Destruction," 1996).

- **Partially immobile capital in dynamic models**
(Wildasin, “Fiscal Competition in Space and Time”
JPubE, 2003)
 - Infinite-Horizon model of a single jurisdiction.
 - Firms incur a cost of adjusting their capital stocks.
 - Lump-sum taxes are available, and the capital tax is time-invariant.
 - **Proposition 2:** *The optimal steady-state rate of taxation of local capital is directly proportional to the share of foreign ownership of firms and inversely proportional to the elasticity of demand for capital. It is inversely proportional to the speed with which the local capital stock adjusts in response to changes in the local rate of return on capital. In particular, if adjustment is instantaneous, the optimal local tax rate is zero.*

- **Capital taxes are sometimes part of a property tax system, which also taxes land.**
 - Difficult to separate the value of land from the value of capital located on that land (Wilson, JUE, 1995.)
 - Taxing property is desirable, because part of the tax is an efficient land tax.
- **Difficult to distinguish between capital with different mobility characteristics (e.g., domestic vs. foreign-owned capital).**
 - If these characteristics not known, then the tax system must give similar treatment to different types of capital.
 - OECD guidelines against favorable treatment for mobile capital.

- **Tax capital to prevent “income shifting” as a form of tax evasion.**
 - Without capital taxation, taxpayers will attempt to shift their forms of compensation away from wage income and towards capital income.
 - Although the capital tax distorts investment, it limits incentives to shift income (see Gordon and MacKie-Mason, “Why Is There Corporate Taxation in a Small Open Economy? The Role of Transfer Pricing and Income Shifting” in Issues in International Taxation, edited by Feldstein and Hines).

- **Conclusions about multiple tax instruments:**
 - A number of models do generate a tax on capital in an open economy.
 - No single explanation dominates the others.
 - If capital is not taxed, then public goods may still be underprovided
 - Bucovetsky-Wilson: When a single jurisdiction raises its tax on labor, capital flows to other jurisdictions, increasing their revenue for labor taxes—another fiscal externality.
 - Future research: identify the types of inefficiencies that emerge in tax competition models with endogenous use of capital taxation.

Extension #6: Labor mobility

- **Wilson (JUE, 1995)**
 - Extend the standard model by adding land as a separate factor, and assume both labor and capital are mobile.
 - Many identical jurisdictions with land-value-maximizing governments.
 - A public good is financed with a property tax, levied at a uniform rate on land and capital.

- No scale economies in public good provision: the public good is underprovided (same as standard model, where only capital is mobile).
- Samuelson public good: The equilibrium may be fully efficient.
 - The property tax substitutes for an efficient land tax.
 - But the empirically relevant case is closer to no scale economies.
- Other tax competition models with labor mobility: Breckner (JPubE, 2000), and Kessler, Lulfesmann, and Myers (RES, 2002).

Models with monopolistic competition and agglomeration economies

- Krugman Geography Model: One region captures all of the “manufacturing,” which it exports to the other region in return for “agricultural goods.”
- Baldwin-Krugman (EER, 2004)
 - Competition for manufacturing leads to inefficiently low taxes: A “tax floor” would be Pareto-Improving.
 - Lower transports costs lead to higher taxes by increasing agglomerative forces.
 - Increased economic integration (more “trade freeness”) leads to higher taxes.

Overall conclusion about horizontal tax competition:

- Leads to inefficiently low taxes and underprovision of public goods in the standard model and several extensions.
- Other distortions: inefficient diversity in taxes and public good levels.

Vertical Tax Competition

- Vertical tax competition: central and lower-level governments share the same tax base, capital, which is not fully inelastic (savings decisions or internationally mobile capital).

- **Overprovision of public goods by local governments**

- When one jurisdiction raises its tax rate, the aggregate tax base shrinks.
- The lower tax base reduces centrally-provided public goods, harming other jurisdictions.
- This **negative externality** leads to inefficiently high public good provision.

Which form of tax competition dominates, vertical or horizontal?

Keen and Kotsogiannis (AER, 2002):

- (a) The horizontal externality dominates if the supply of savings is independent of the net interest rate (since then the aggregate tax base is fixed).
- (b) The vertical externality dominates if the interest responsiveness of savings is sufficiently high relative to that of the demand for capital (since a low demand for capital implies low capital outflows in response to a tax increase).

Brulhart and Mametti (JPubE, 2006):

Empirical evidence from Swiss canton data suggests that the vertical externality dominates.

- **Horizontal and vertical tax competition in a model of optimal fiscal federalism:** “Decentralization and International Tax Competition” by E. Janeba and J.D. Wilson (JPubE, 2005).

- Basic idea: The relative importance of horizontal and vertical tax competition can be optimally manipulated by choosing how many public goods are provided by the central government, and how many are provided by local governments.

The Model

- 2 countries, home and foreign, each with N identical regions.
- Each region has a representative resident, with endowments of immobile labor and mobile capital
- Labor and Capital produce “private output,” which is consumed and used to produce publicly-provided private goods (no scale economies).
- Utility: $U(x, G)$; x = private consumption; G = aggregate public good consumption
- $G = \int_0^1 g(n)^a dn$; $g(n)$ = supply of a type- n good.

- Regions supply $g(n)$ with $n < n^*$; the central government supplies $g(n)$ with $n > n^*$.
- Central government's tax rate = T ; local government's tax rate = t .
- Regional government's constraint: $n^*g_r = tK(r + t + T)$.
- Central government's constraint:

$$(1 - n^*)g_c = TK(r + t + T).$$
- After-tax return r is determined by the vector of "combined tax rates," $t + T$ for a region with tax t in a country with central tax T .
- Two-stage Nash game: n^* 's chosen in the first stage, t 's and T 's in the second.

- Two externalities

- Horizontal externality: a rise in one region's t increases K in other regions, which is a positive externality.
- Vertical externality: a rise in one region's t lowers K for the nation as a whole, reducing the central government's $g(n)$'s—a negative externality.

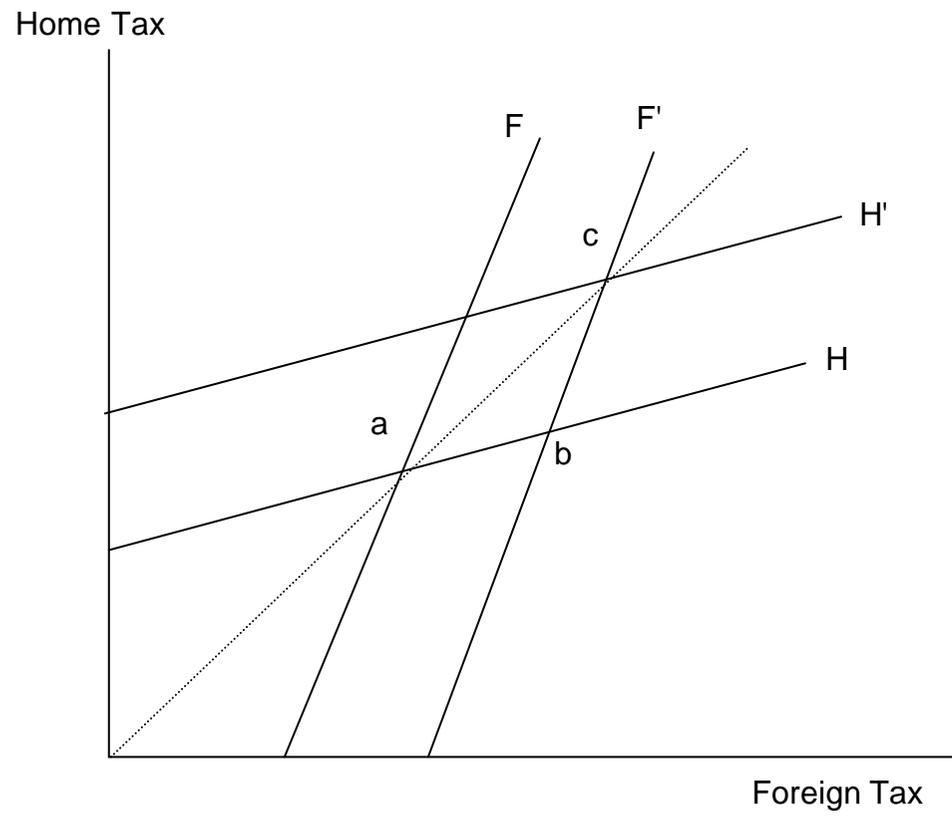
- If n^* is low (not much decentralization), then t is low, so the vertical externality dominates: regions overprovide the public good, $g_r > g_c$

- If n^* is high (not much centralization), then the horizontal externality dominates: regions underprovide the public good: $g_r < g_c$

Proposition 1. In any symmetric equilibrium, both countries choose some level of decentralization ($n^* > 0$).

Basic Argument

- Suppose the reaction curves for the combined taxes, $t + T$, slope up in tax space.
- Then country i benefits from shifting up its reaction curve by using some decentralization where $g_r > g_c$ (vertical externality dominates).
- Shift in reaction curve causes country j to raise its combined tax, which is beneficial for country i (more capital).
- If reaction curves slope down, then a large share of public goods should be decentralized, so that $g_r < g_c$ (horizontal externality dominates). Reaction curve shifts down.



Welfare

- Assume reaction curves slope up.
- Countries have an incentive to both decentralize some public good provision, so that both reaction curves shift up, leading to higher taxes and public good provision ($g_r > g_c$). See diagram.
- Conclusion: Decentralization play a role in alleviating the negative effects of international tax competition on taxes and spending.

Final Remarks on Wilson-Janeba

- Regional governments create horizontal and vertical externalities.
- The central government could control these externalities using the traditional tools, taxes and subsidies.
- Political pressures might interfere with such policies.
- Alternative method of control: Design the federal system in a way that optimally controls the externalities.
- This paper: Choose the division of public good provision between different levels of government to achieve the optimal net impact of the vertical and horizontal externalities (not zero).
- The paper suggests the usefulness of endogenizing the relative importance of vertical and horizontal externalities.

The Slope of Reaction Curves in the Standard Model

- Reaction curves in tax space can slope up or down.
- The underprovision result from the standard model does not depend on whether reaction curves slope up or down.
 - This result says that a central authority could raise welfare by increasing all tax rates and public good levels, not how one region's tax affects another region's tax.

- Empirical work on testing tax competition models nevertheless typically views upward-sloping reaction curves as evidence of tax competition.
- Yes, these reaction curves do indicate a type of “strategic interaction”, but many models have this property (good and bad tax competition), and downward-sloping reaction curves are consistent with tax competition.

Welfare-Improving Tax Competition

1. Tiebout Competition for Firms.

Assume:

- A large number of competitive jurisdictions.
- No restrictions on available tax instruments (marginal-cost pricing).
- No cross-border externalities
- Perfect mobility of households and firms.
- Land-value-maximizing governments.

An efficient Tiebout equilibrium:

- Households sort themselves across jurisdictions and receive public goods that are tailored to their incomes and preferences.
- Public services are efficiently provided to firms, which also efficiently sort themselves across jurisdictions.
- Households and firms pay taxes equal to the marginal costs of providing them with these public goods and services.

- Differences with the standard model
 - Firms are mobile, rather than the capital used by firms, but capital mobility could be added.
 - Availability of efficient “congestion fees” is critical for efficiency

2. Efficient bidding for firms among small numbers of jurisdictions

- Efficient firm location: Hoyt and Black, "Bidding for Firms," AER, 1989.
- Efficient firm location and infrastructure investment: King, McAfee, and Welling, "Industrial Blackmail: Dynamic Tax Competition and Public Investment" CJE, 1993).
- Inefficient bidding by self-interested politicians: Biglaiser and Mazzetti, "Politicians" Decision Making with Re-Election Concerns" (JPubE, 1997)

Empirical Evidence: “Bidding for Industrial Plants: Does Winning a ‘Million Dollar Plant’ Increase Welfare?” by Greenstone and Moretti (unpublished)

- Compare labor earnings and property values between the U.S. county that ‘wins’ the plant and the ‘runner-up’ county in the bidding (these two counties should have similar characteristics).
- Evidence that winning the plant increases earnings and property values.
- The study goes against the view that large subsidies needed to attract large plants reduce resident welfare.

3. Labor Mobility eliminates inefficiencies from competition for capital (Kessler, Lulfesmann, and Myers, RES, 2002).

- Reducing tax rates to attract more capital also results in an inflow of labor, which lowers welfare for the majority of voters.
- Consequently, labor mobility results in increased tax rates on capital.
- In the limiting case of no migration costs, the result is efficient income redistribution.

3. (cont.) Wilson (JUE, 1995) also shows that labor mobility can lead to an efficient equilibrium, but this requires sufficient scale economies in public good provision (see previous lecture)

4. Tax competition as a substitute for other types of inefficient competition.

- Janeba (1998): Tax competition eliminates wasteful subsidy competition in “strategic trade policies”
 - Governments do not want to attract firms if they have to subsidize their output.
 - Government “overcut” each other’s output subsidies, until subsidies are eliminated.

5. Tax competition as a cure for tax exporting.

- Governments have the incentive to tax heavily income earned by foreigners.
- Tax competition can offset these incentives.
- Conclusion: Tax competition can be welfare-improving in economies with lots of foreign ownership.

6. **Tax competition as a solution to commitment problems**

- Governments possess incentives to raise taxes on firms that have already sunk their investments.
- This discourages investment.
- If firms can move their taxable income between regions after investments have been made, then governments may compete taxes down to levels where initial investments become profitable (Janeba, AER, 2001).

7. **Welfare-Improving Tax Competition under Imperfect Competition** (Ottaviano and van Ypersele, JIE, 2005).

- Monopolistic competition without free-entry: each firm requires one unit of mobile capital for production, but total capital is fixed in supply for the two countries.
- Trade costs raise the prices of imported goods above the prices of domestically produced goods.
- Country H is larger than country F in terms of its total number of workers, who produce the “traditional good.”

Equilibrium without taxes

- The larger country has more than a proportionate number of firms, but this number is inefficiently large.

Tax competition

- For some intermediate values of trade costs, tax competition improves welfare because the larger country subsidizes capital at a lower rates, reducing the number of firms that locate there.

Why does the larger country provide a lower subsidy?

- The large country imports capital.
- The subsidy increases imports, raising their unit cost (the after-tax return on capital).
- This terms-of-trade effect is a cost of the subsidy.
- The small country is a capital exporter, so it benefits from the terms-of-trade effect from its subsidy.

8. Tax competition tames “Leviathan” governments.

- Total size of government would be excessive in the absence of tax competition, since government officials benefit from increasing the size of the public sector.
- Tax competition is beneficial because it reduces this excessive size.

Examples of models with Leviathan features

(a) Wilson (JUE, 2005)

- Modify the standard tax competition model.
- Each jurisdiction's tax rate is again chosen by a welfare-maximizing decision-maker.
- Public officials then choose the level of a public input, with the goal of maximizing the excess of revenue over expenditures on the input ("waste"):

- The public input enters the production function as a separate argument, which increases the productivity of capital: $h(g)f(K, L)$.
- Public officials choose the public input g to maximize the excess of tax revenue over public expenditures, where both labor and capital are taxed:

$$\text{Max}_g \quad TWL + tRK - g.$$

- Closed economy: L and K are fixed, but public input increases wage W and return on capital R .
FOC:

$$TL \frac{\partial W}{\partial g} + tK \frac{\partial R}{\partial g} = 1$$

- Open economy: capital is mobile and depends on the before-tax return and public input g : $K(r+t, g)$, where public officials treat $r+t$ as fixed.
- This dependence of K on g makes tax revenue more sensitive to g , giving officials an additional incentive to raise g .

Proposition 2. *Assume a constant substitution elasticity between labor and capital, i.e., a CES production function. Then opening the economy raises the equilibrium level of public input provision*

- Greater public input provision makes the equilibrium more efficient:

Proposition 3. *Each region's after-tax income is higher in the open economy than in the closed economy.*

(b) Janeba and Schjelderup, “The Welfare Effects of Tax Competition Reconsidered: Politicians and Political Institutions” (unpublished).

- A legislative process determines capital taxes and public good levels.
- Legislators seek to maximize “rents,” but they also act partially in the interests of voters because they value re-election
- Two period model:
 - Each legislator represents a district, and voters re-elect the legislator if utility in the first-period is at least as great as a level u^* .
 - Voters select the highest u^* that induces politicians to provide this u^* and get re-elected. (At higher u^* 's, politicians would provide no public goods and instead maximize first-period rents.)
 - In the basic model, second period rents for the politicians are exogenous at R

- Two political regimes
 - **Parliamentary** (Europe): An agenda-setter in the legislator chooses taxes, public goods, and the distribution of rents among legislators, subject to the constraint that 2 of the 3 legislators support the proposal over a default proposal.
 - **Presidential-Congressional** (U.S.): Taxes chosen in the first stage by an agenda setter, and public goods and rents chosen in the second state by a different agenda setter.
 - The “divided government” specification—taxes chosen, and then expenditures chosen by a different decision-maker—is similar to Wilson (2005), but the utility constraint is an important difference.

Presidential-Congressional Regime

- Equilibrium public good levels are independent of whether or not capital is mobile:
 - They are chosen after tax rates and do not affect the supply of capital.
 - Tax revenue chosen in previous stage: tK
 - If no public good provided, legislators receive tK are not re-elected.
 - To induce public good provision, rents r must be high enough to satisfy
$$\gamma r + 2R = tK$$
where $2R$ = second-period rents going to the 2 of three legislators who choose policies, and $\gamma < 1$ = transactions costs involved in collecting rents.
 - Public good level = $tK - r = 2R/\gamma$
 - **Conclusion: Public good level does not depend on whether capital is mobile**

Presidential-Congressional Regime

- Choice of tax revenue:
 - In closed economy, politicians not seeking re-election would tax away all capital income: $t = f'(K) \Rightarrow \max tK = f'K$
 - In open economy, tK is maximized, taking into account capital outflows: $\max tK < f'K$
 - Rents large enough to induce legislators to provide the public good:
 - open economy: $\gamma r + 2R = \max tK$
 - closed economy: $\gamma r + 2R = f'K$
 - So capital mobility leads to lower first-period rents, because not being re-elected is less attractive.
 - Capital mobility lowers the tax rate (since tax revenue = rents plus public good expenditures).

Presidential-Congressional Regime

- Conclusion: Tax competition has no effect on the public good level, but lowers rents, implying higher welfare.

- **Parliamentary Regime** (both taxes and public good levels chosen by the same agenda setter):
 - Welfare effect of tax competition is ambiguous: lower rents but also maybe lower public good levels.
 - To maximize first-period rents, the agenda setter provides voters with their reservation utility in the most efficient manner for the country, which involves recognizing that capital outflows from higher taxes are a cost.

(c) Wilson and Gordon, “Expenditure Competition,” JPET, 2003.

- Political economy model with mobile labor and agency problems in government.
- Property tax (modeled as a tax on housing) finances a public good.
- Taxes chosen first, with the goal of maximizing land values. The self-interested politicians then choose public good expenditures.
- Probability of re-election is increasing in utility.

- Expenditure Competition

- Increase expenditures on public goods and services valued by residents.

- More households move to the jurisdiction.

- Tax base rises.

- More tax revenue for public officials.

Proposition 2. Opening the borders to migration raises the utility of residents.

- Basic idea: Opening the economy lowers waste by increasing the opportunity cost of waste to public officials: transferring resources from public goods provision to perks reduces the willingness to pay for housing, causing property tax payments to fall.

- **Empirical Evidence:** “Does Tax Competition Tame the Leviathan,” by Brulhart and Jametti (unpublished).
 - Use Swiss canton data to study effects of fiscal fragmentation on taxes.
 - Compare direct-democratic jurisdictions (benevolent government) with delegated-government jurisdictions.
 - Fragmentation tends to lower tax rates in delegated-government jurisdictions.

Lessons from this Lecture

- Traditional models of tax competition focus on the inefficiencies associated with decentralized decision-making by local governments.
- But these models “stack the deck” against tax competition by assuming that there are no other inefficiencies in the economy.
- More recent research has described potential efficiency improvements from tax competition.
- An important source of these efficiency improvements is the presence of inefficient government behavior under centralized decision-making.
- Future research: Focus on developing better models of the politics of tax competition.

- Next: Janeba and Wilson, “OPTIMAL FISCAL FEDERALISM IN THE PRESENCE OF TAX COMPETITION” (unpublished)
 - Model inefficiencies in public good provision at the central level, and analyze the optimal level of decentralization, given the inefficiencies associated with tax competition.