Limits to Competition: Strategies for Promoting Jurisdictional Cooperation

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NBER Interjurisdictional Tax Competition Meeting

Important Questions in Public Economics

- What are the patterns and diversity of tax rates in increasingly globalized and "border-free" jurisdictions when there is no central coordination of tax systems?
- What forms of coordination could benefit all jurisdictions? ...some jurisdictions?
- If allowed to cooperate in setting fiscal policies, with whom will jurisdictions form coalitions and how do they influence the patterns of tax rates set across space?
- Does coordination raise/lower tax rates and revenues? ...influence the location of firms, factors, people, and economic activity?
- Should we have more or less decentralization?

Fiscal Competition as Motivation for Cooperation

- Setting policies in an open economy setting can lead to mobility of people, factors, firms, and information, or spillovers.
- Mobility leads to policy interdependence and strategic interactions among governments that may generate inefficiencies.
- Inefficiencies from competition may result in central governments seeking to limit competition, but cooperation and coordination remains understudied.
  - Increasing technological change, economic integration and globalization is putting increasing pressure on decentralized fiscal systems, spurring calls for coordination.
- In this talk, I review the existing theoretical and empirical evidence on these limits, derive new results for interjurisdictional cooperation, and reflect on the future research agenda.
  - I do not focus on economy of scale argument for cooperation.

Policy Responses to Limit Competition

- **Coordination**: Policies available within a federal structure.
  - Harmonization; Minimum tax/spending rates; Maximum tax/spending rates; TELs.
- **Cooperation**: Voluntary or forced.
  - Intermunicipal cooperation on a single purpose or multiple purposes.
  - Mutual consultation versus joint operation with intermunicipal agencies.
  - Forced statutory obligation under law vs. municipality established cooperative bodies
- **Level of Government**: Assignment problem.
  - Centralization; Granting taxing rights to higher level governments; Contracting services to a larger public/private company.
  - Amalgamations.
- **Rules**: Tax treaties or constitutional/legislative restrictions.
  - Sourcing rules; reciprocity agreements; restrictions on available instruments to governments; restrictions on bidding.

A Simple Fiscal Competition Model to Compare Various Limits to Competition

A Framework to Study Cooperation: Model of Shifting with Competition

- Start with a simple model of competition (Kanbur and Keen 1993; Nielsen 2001).
  - Model originally developed to study cross-border shopping, but has been extended in Keen and Konrad (2013) and Agrawal and Wildasin (2020) to characterize fiscal competition with many types of base shifting – profit shifting, real relocation/migration, commuting.
- Basics of model: two jurisdictions with some market power. Jurisdictions maximize tax revenue by setting tax rates (T, t), for simplicity.
- If borders are closed, the tax bases are (H, h). But open borders allows for some shifting of economic activity and thus, the tax base.
- Cost of shifting is convex in the amount of shifting. [Alternative framing: individuals are heterogeneous in cost of shifting.]
- If borders are open, the arbitrage condition that says shifting will occur unit MB of shifting $(T - t)$ = MC of shifting. In the case of quadratic costs, this implies the amount shifted is $\frac{T-t}{d}$, where d is a cost parameter.

Simple Model of Shifting with Competition

- In equilibrium, the tax rate in each jurisdiction is the weighted average of the jurisdiction's sizes, with more weight given to one's own size.
- If $H > h$ then $T^N > t^N$. Big jurisdictions perceive smaller elasticites and set higher rates.
- Tax differentials imply some shifting from high-tax (big) jurisdictions to low-tax (small) jurisdictions.

- Model is motivated in the Leviathan tradition. No public services. Allows focus on rates/revenues, but misses economies of scale and unlike many welfare models, tax rates are too high. Results I will talk about are likely robust to welfare governments, but efficiency implications likely not (and thus not discussed).
- Jurisdictions have market power – closed system – and thus are strategic. May not be realistic for capital taxation, where base is mobile everywhere, but Agrawal, Hoyt and Wilson (2021) argue commuting provides such a link to market power.

Harmonization / Centralization

Harmonization (or Centralization)

- Start with the model of competition: In the presence of mobility, jurisdictions set Nash tax rates of (T^N, t^N). Because of asymmetries, taxes differ in equilibrium: $T^N > t^N$.
- Then following Kanbur and Keen (1993), the jurisdictions harmonize to a common rate, τ.
- In practice, harmonization proposals focus on a common tax rates that is a weighted average of the decentralized equilibrium rates: $\tau = \omega T^N + (1-\omega)t^N$ with $\omega \in [0,1]$.
- Note: in the symmetric case, harmonization is not a policy intervention, but a minimum tax rate would be. Thus, impacts of policies and the appropriateness of policies depends on differences in size and, as a result, differences in Nash tax rates.

The Effect on Tax Revenues Might Appear to Be Ambiguous

- Small (low-tax) jurisdiction:
  - Higher tax rate on its "loyal" part of the base.
  - But now has a smaller tax base because it cannot capture the other jurisdiction's base undercutting.
- Large (high-tax) jurisdiction:
  - Lower tax rate on its "loyal" part of the base,
  - But now has a larger tax base because part of its base no longer shifts to the low-tax jurisdiction.
- Tax revenues increase in τ because harmonization means the tax base is fixed: harmonization closes borders (and simple model assumes no other behavioral responses).

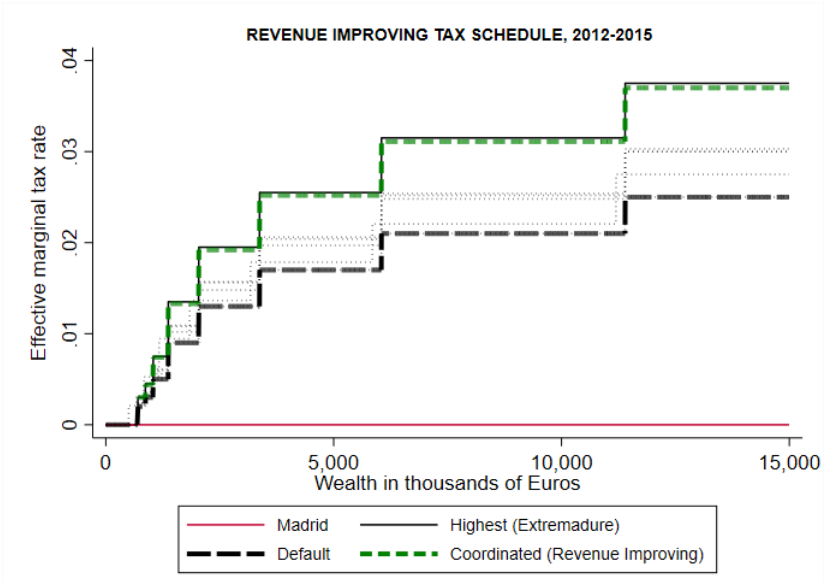
Harmonization: Some Not So Obvious Results

- Harmonization can never raise tax revenue in the small jurisdiction.
  - Proof: Under harmonization, the tax revenue of the small jurisdiction attains its maximum value at $\tau = T^N$. But by revealed preference, this was not the best response to the large jurisdiction picking T^N in the non-cooperative equilibrium.
- Harmonization will increase tax revenue in the large jurisdiction if τ is high enough.
  - Proof: Harmonization to the higher of the non-cooperative tax rates would clearly be beneficial: it would gain revenue from the base that was shifted without losing any from those who were loyal previously. By an argument similar to above, harmonization to the lower of the Nash taxes, in contrast, would reduce revenue.
- Political economy: Both jurisdictions fear harmonization. When the point of convergence is calculated as a weighted average of the non-cooperative tax rates, the small jurisdiction will lose; if enough weight is attached to the lower of the Nash taxes, so too will the large jurisdiction. But, if the harmonized rate is sufficiently high, total tax revenues increase.

How High Does The Harmonized Rate Need to Be?

- Empirical literature provides little guidance on what value to harmonize to.
- Agrawal, Foremny, and Martínez-Toledano (2021) consider the decentralization of the wealth tax in Spain. Using regional variation, they estimate the shifting response in the mobility of the tax base to haven regions and non-haven (but lower tax) regions.
  - In this setting, the elasticity of the base with respect to the haven is large, but the response to low-tax non-havens is negligible.
- Use these estimated elasticities to conduct counterfactual exercises from harmonization, which eliminates base mobility.
- Simulate tax revenue for each tax schedule in between the lowest tax and highest tax non-cooperative equilibrium.
  - Look for a revenue improvement in terms of tax revenue for all non-havens (e.g., large jurisdictions in above theory).

How High Does The Harmonized Rate Need to Be? Very High!



Minimum Tax Rates

Minimum Tax Rates

- Following Kanbur and Keen (1993), suppose instead that a lower bound on tax rates μ is selected such that: $T^N > \mu > t^N$.
- Competition still occurs, and in the new Nash equilibrium, the small jurisdiction sets the minimum tax rate, but still undercuts the large jurisdiction.
- The large jurisdiction will set its tax rate to the best response function evaluated at the minimum rate, which is greater than the prior non-cooperative value (because taxes are strategic complements in this model).
- Note: even if the small jurisdiction will gain revenue from this, it would not have raised the tax on its own because doing so would induce the large jurisdiction to respond.

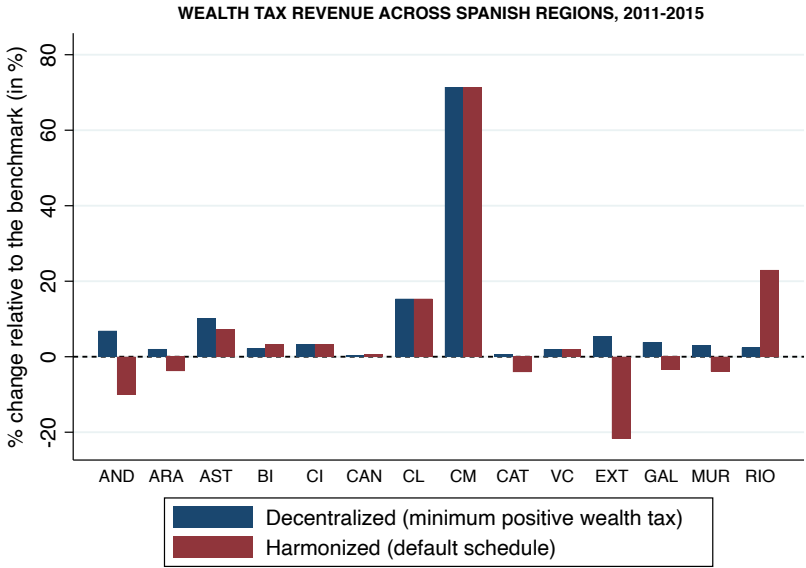
The Effect on Tax Rates and Revenues

- In contrast to harmonization: Revenue is higher in both jurisdictions!
  - Both now set higher tax rates, but the increase is greater in the small jurisdiction (effect in large is dampened by the slope of best response function).
  - Because the minimum tax rate reduces tax differentials, revenue will therefore certainly increase in the large jurisdiction.
  - But similar to harmonization, the effect on the small jurisdiction is initially unclear: revenue is gained from the loyal based but lost through diminished tax avoidance into the jurisdiction. The former effect can be shown to dominate because the minimum tax rate mitigates tax competition.
- This is a remarkably strong result! It establishes a clear dominance of the minimum-tax strategy over that of harmonization.
  - Harmonizing to any tax rate between the unconstrained Nash equilibrium is certain to harm the small jurisdiction and may also harm the large jurisdiction, *but* imposing that same rate as a minimum will be to the benefit of both.

Although Revenues Increase Everywhere, Is the Choice of the Minimum Clear?

- A caveat on the revenues of the small jurisdiction:
- Higher minimum-tax rates do not necessarily revenue-dominate lower ones.
  - Revenue in the large jurisdiction always increases in μ.
  - Revenue in small jurisdiction is increasing in μ if it is sufficiently small. But revenue in small jurisdiction decreases if μ is sufficiently high.
    - At sufficiently high minimum tax rates, the loss of tax avoidance opportunities outweighs the added revenue from the loyal base.
- Political economy: While revenue in the small jurisdiction cannot fall below its level under unconstrained tax competition, there may nevertheless be a conflict of interest between the two jurisdictions in the choice of the minimum.

Comparison of Minimum Tax Rates Harmonization: Case of Spain



Cooperation

Intermunicipal Cooperatives Around the World

- Examples:
  - Town twinning – towns may cooperate across international borders; aimed at benefiting cross-border businesses
  - France: "Establishment for inter-municipal cooperation" (EIMC). The EIMC, commonly provides some public services across all member municipalities, with some taxing powers surrendered to EIMC.
  - France "syndicates" were weaker forms of cooperation, with public service provision, but not tax authority.
  - Germany: Informal cooperation: regional conferences; Single or multi-purpose cooperatives exist; Amalgamations of small municipalities.
  - Belgium: Most extensive form of cooperation: the service association and the mandated association.
  - USA: special districts proving services with possible taxing authority; interstate compacts.
  - Many others in Italy, Switzerland, Finland, Spain, the Netherlands.

Cooperation Among a Subset of Jurisdictions

- Now suppose that jurisdictions can cooperate with each other. Doing so requires harmonization of tax rates.
  - To study this, add a third jurisdiction. Without cooperation, small, medium, and large jurisdictions set tax rates (t_S^N, t_M^N, t_L^N)
  - At most two jurisdictions cooperate setting a common tax rate τ.
- For purposes here, no public services component.
- Unlike full harmonization, there are still competitor jurisdictions outside the cooperative.
- Cooperation can easily be incorporated into the standard model in various forms:
  - "Forced" cooperation where the decision of who to cooperate with is determined by a central government.
  - Endogenously determined cooperation, where another stage to the game is added where jurisdictions form coalitions. [Model extendable, but will not present those results here today.]

Tax Rates Rise Due to Cooperation

- Central government could "force" two asymmetric regions to cooperate. Possible region pairs based on size: small-medium; small-large; medium-large.
- Effect on tax rates:
  - Cooperative government now is larger in size, perceiving a smaller elasticity, allowing it to raise tax rates. Non-cooperative government responds adjusting its tax rates upward.
  - Tax differences at the cooperative's borders widen as relative size difference between jurisdictions increase.
  - The number of competing jurisdictions declines and tax competition is reduced (Hoyt 1991).
  - No offsetting effect of economies of scale in this simple model.
- Thus, it can be shown that tax rates increase in both the cooperative unit and the non-cooperative jurisdiction relative to the tax rates set in the Nash equilibrium.
  - This result holds regardless of which pair of regions cooperate.

Revenues Increase If Revenue Allocated Proportional to Size

- If in the cooperative, revenue is allocated proportional to size, then:
  - Revenue in all jurisdictions increase.
  - Non-cooperating jurisdiction:
    - Sets a higher tax rate on its loyal base.
    - Sees more shifting of the base into its jurisdiction as tax differentials widen.
  - Cooperating jurisdiction:
    - Higher tax rate on loyal base.
    - Shifting between the cooperating jurisdictions is entirely eliminated.
    - But more shifting into the non-cooperating jurisdiction.
    - Positive effects dominate.

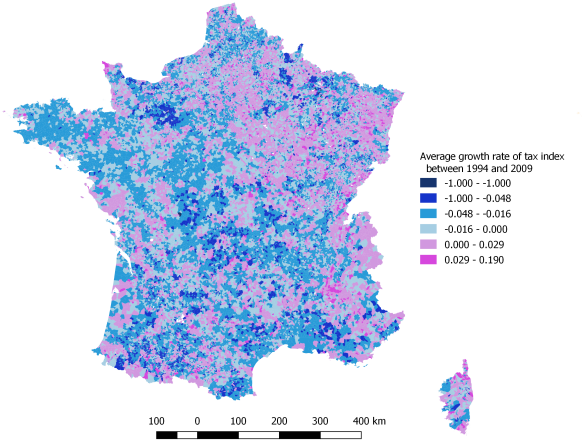
Total Revenues and the Optimal Coalitions

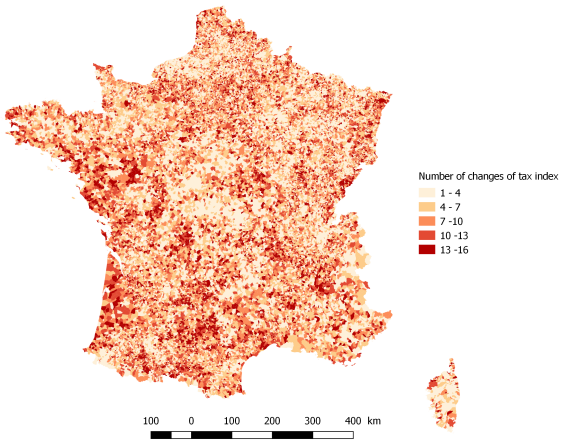
- What about total revenue?
  - Central planner strictly prefers joining the two largest jurisdictions to joining the smallest jurisdictions.
  - Joining the two largest jurisdictions gives them a larger size advantage and allows for a higher tax rate on a larger share of the worldwide tax base than joining the smaller jurisdictions.
  - But comparison to joining the smallest and largest are more nuanced.
  - Market power is important, and although many settings the tax base may be globally mobile, there are many other economic links (for example, commuting) that even make small governments have market power.
- Political economy: Central planner's preferred cooperation may differ with endogenously chosen cooperation among the municipalities, possibly creating a conflict of interest between the central government and decentralized governments. Revenue sharing in the cooperative is key: proportional to size? equally split?

Empirical Applications: The Case of France

- France has a long history of intermunicipal cooperation.
- This dates back to syndicates which were formally codified in 22nd March 1890 Law, providing necessary public services among municipalities (clean water, sewage treatment, waste collection, etc.), but without taxing authority.
- More formal cooperation leading to EIMCs arose in laws of 1966,1970,1992,1999. EIMCs are an example of (voluntary) cooperation among municipalities of one's choosing and delegation of particular revenue and expenditure instruments to the EIMC. But many fiscal instruments remain under municipal control.
  - In 2010, EIMC membership became compulsory for the remaining holdout municipalities.
- Despite rich data, difficult to study empirically: prior to 2010, municipalities select into EIMCs and they select with whom to cooperate. Fiscal policies are then determined in an open economy setting, with fiscal competition persisting at the municipal level and also co-determined with the EIMC.

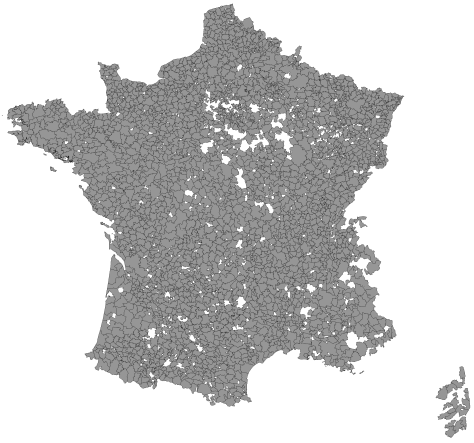
Tax Rates Across Space





EIMCs Over Time: 1994 vs. 2009





Tax Competition with EIMCs

$$\mathbf{T} = \rho^{EIMC}\mathbf{W^{EIMC}T} + \rho^{OUT}\mathbf{W^{OUT}T} + \mathbf{X}\beta + \varepsilon$$

- Standard tax reaction functions assume jurisdictions respond to the average competitor.
- But, EIMC formation may change the nature of competition among municipalities within the EIMC versus outside of the EIMC.
- Agrawal, Breuillé, and Le Gallo (2021), partition the reaction function to estimate heterogeneous effects.
- Problem: in addition to standard endogeneity of competitor taxes, the weight matrix determining who to cooperate with is also endogenous.
  - Resolved (to the best of our ability) using a novel IV procedure that exploit historical cooperative agreements in syndicates.

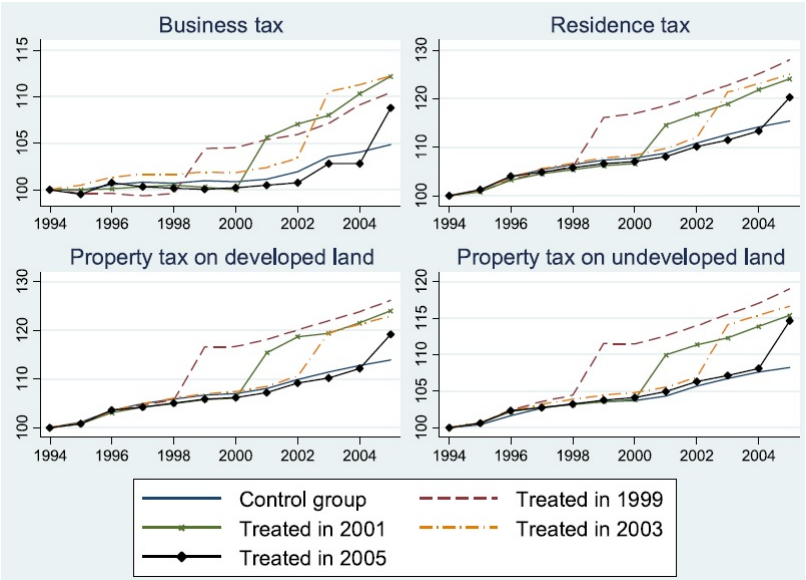
Tax Competition with EIMCs

- Key finding: $\rho^{EIMC} < \rho^{OUT}$. Jurisdictions react more intensely to non-cooperating jurisdictions.
  - The decision to cooperate with other nearby municipalities presumably signals a common interest along at least some policy dimensions.
  - Mobility of the tax base outside of the cooperative unit also imposes "double harm" (on the municipality and on the cooperative unit) and so pressure to respond to external jurisdictions may be higher.
- Result does not say anything about efficiency of the tax competition equilibrium.

What About the Level of Tax Rates?

- Breuillé, Duran-Vigneron, and Samson (2018) exploit a dif-in-dif design to identify the effect of cooperation on the total (EIMC + municipal) tax rate in local jurisdictions.
  - Treatment group: municipalities that form an EIMC. Comparison group: municipalities that do not form a EIMC in their sample.
- Allows the authors to test if the economies to scale of cooperation allow jurisdictions to reduce costs and cut taxes or if the effects on tax competition discussed above may arise.

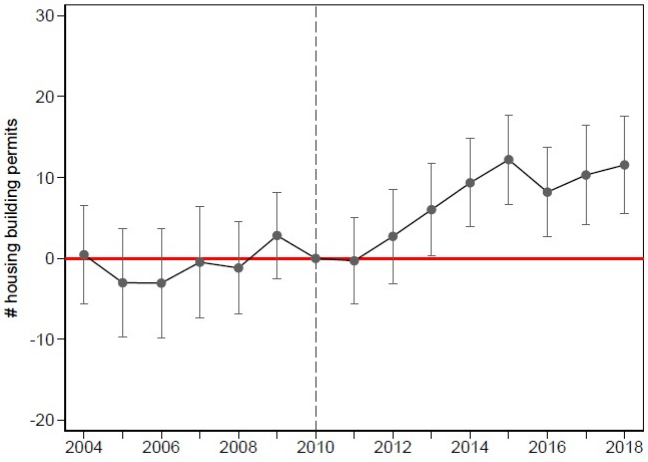
The Results Are Consistent with Reduced Tax Competition



What About the Costs to Municipalities?

- Cooperating can be costly for municipalities, as they lose autonomy over local policies, reducing their ability to tailor policies to local preferences and protect local interests.
- Tricaud (2021) provides this evidence by exploiting the 2010 reform in France that required holdout municipalities to join an EIMC: municipalities forced to join (treatment) vs. municipalities that joined previously (comparison).
- Focus on two costs to municipalities:
  - EIMCs increasingly decides where and how much to build in each member municipality. This can be costly for high-demand municipalities that have been using local housing regulations to prevent outsiders from coming in. (NIMBYism)
  - Decisions over the location of public service can be costly for some municipalities. EIMCs may concentrate resources for new facilities in high-density areas. As a result, low-density municipalities might end up with fewer facilities, increasing the distance to public services for their residents.

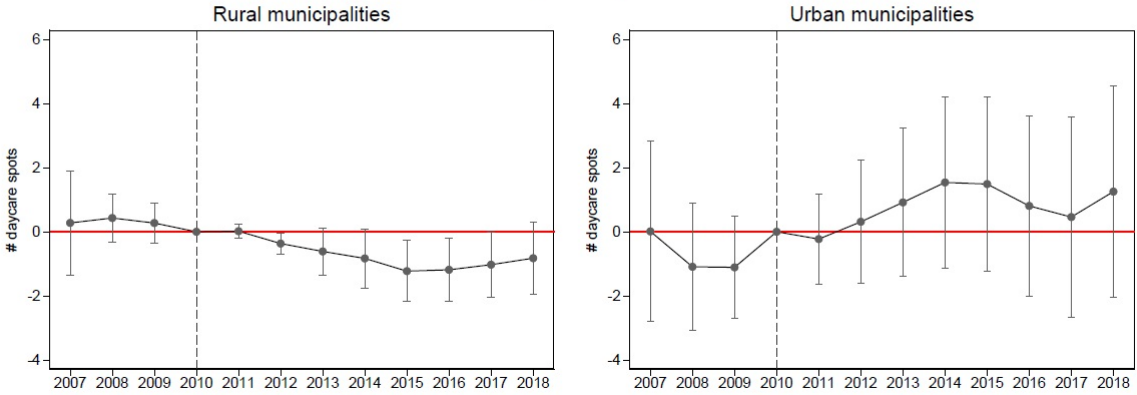
Figure 3: Impact on housing building permits



Location of Services

Figure 7: Impact on daycare and public libraries

A. Daycare spots



Tax Treaties and Sourcing Rules

Tax Treaties, Reciprocity Agreements, Sourcing Rules

- Governments often enter into tax treaties or interstate agreements.
- For example, one common example of bilateral tax treaties concerns reciprocity agreements (Agrawal and Hoyt 2018).
  - The typical state (personal) income tax imposes a tax on all income earned within the state, a source-based tax. To avoid double taxation, tax credits are provided.
  - However, some U.S. states have entered into reciprocity agreements, which turn their income tax systems into residence-based taxes, with no taxation of nonresident incomes and taxation of income earned by residents outside of the state.
- Some have argued reciprocity can reduce tax competition by shifting mobility from more elastic employment locations, to less elastic residential decisions.
  - Rork and Wagner (2012): "states may have less incentive to engage in income tax competition with neighboring states, as nonresident workers no longer contribute to the tax base."
  - Critically, sourcing rules change the mobility of the tax base.

Sourcing Rules in the Simple Model

- Reciprocity is just one example. Other examples: place of consumption vs. place of sale; real activity vs. declared profits. Model accommodates these.
- Recall in the simple model that the size of each jurisdiction's economic activity, and thus tax base in the case of a closed border, is (H, h).
- But some of this activity is shifted abroad due to tax differentials. Prior variant of the model sourced taxes where the economic activity is declared versus where it really occurs (or origin vs. destination).
- In the extreme case: if residential locations are completely immobile, but the employment location can easily be shifted across borders, then switching to tax the residential location versus employment location entirely eliminates tax competition.
  - In practice, this is too extreme, but it can easily be shown that the equilibrium tax rates will be higher under the sourcing rule taxes are levied on the relatively more inelastic base.

Reflections

Research Agenda for the Future

- More work needed to compare across various forms of cooperation, such as minimum tax rates vs. harmonization vs. voluntary cooperation vs. amalgamation.
  - Effect on taxes/spending levels; effect on costs to municipalities; effect on business/factor/individual locations; incidence.
  - Theory could be helpful by nesting different forms of cooperation in a single model, providing information on parameters needed to estimate to conduct counterfactual exercises.
- The literature on federal or state interventions is much more well-developed than the literature with respect to voluntary forms of cooperation.
  - A main issue here is that cooperation is endogenous given it is selected by the municipality.
  - Data challenges are numerous, especially in countries where local data are not tracked nationally, and where special districts often have a vague fiscal authorities.
- More emphasis on the effect of cooperation on fiscal externalities – critical for understanding whether taxes are too high or too low.
  - Difficult to measure fiscal externalities, especially when governments are small: effect on world may be large, but on any one other jurisdiction it may be small.

Research Agenda for the Future

- Limitations on fiscal instruments by state authorities is also a forced form of cooperation.
  - Do outcomes differ when localities cannot levy sales taxes but can levy income taxes, etc.
  - Restrictions on progressivity may also influence whether governments cannot compete.
- Sourcing rules are important. This is well known in the capital tax and corporate tax literature, but tax treaties such as reciprocity agreements are understudied.
  - Taxing rights of income are becoming increasingly controversial, especially with teleworkers.
- My models were highly stylized: single instrument.
  - But governments have access to multiple taxes. There is a budget constraint, and governments offer a package deal of local services.
  - When given the choice to cooperate over some of these, what do governments chose not to cooperate over? Do they chose the instruments with most intense competition?
  - How does cooperation affect competition and economic outcomes in such a complex world?
- Political economy:
  - What challenges do cooperation face? Understanding obstacles to cooperation are critical to increasing its usage.

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