From Trade Wars to Tax Wars

A Trade Policy Perspective on Tax Competition

Ralph Ossa

University of Zurich and CEPR

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Overview

- Introduce the modern literature on trade wars and explore its implications for our understanding of tax competition
- Trade wars and trade talks: Big picture, mechanisms, institutional design, applications
- Tax wars and tax talks: Big picture, a simple model

Trade wars and trade talks: Big picture

- Why do countries engage in trade wars and trade talks?
- At the most basic level, the literature argues that countries can benefit at the expense of their trading partners by unilaterally imposing import tariffs
- As a result, tariffs are inefficiently high in the non-cooperative equilibrium (**trade war**) and a cooperative approach is needed to get to the efficiency frontier (**trade talks**)

Trade wars and trade talks: Mechanisms

- Why can countries gain at the expense of their trading partners by unilaterally imposing import tariffs?
- In a perfectly competitive setting, countries have an incentive to use tariffs to manipulate their **terms-of-trade** (e.g. Bagwell and Staiger, AER 1999)
- In an imperfectly competitive setting, countries also have an incentive to use tariffs to **relocate foreign firms** (e.g. Ossa, JPE 2011) or **shift profits** away from foreign countries (e.g. Ossa, AER P&P 2012)
- In a **political economy** setting, countries have an incentive to use tariffs in order to cater to lobbies in import-competing industries (e.g. Maggi and Ossa, 2020)

Trade wars and trade talks: Institutional design

- Why has the GATT worked so well but the WTO is struggling?
- The literature has explained the benefits of various key features of the **GATT** such as reciprocity and non-discrimination (Bagwell and Staiger, AER 1999)
- It has also highlighted the difficulties associated with various add-ons introduced under the **WTO** such as the TRIPS agreement (Grossman and Lai, AER 2004), the SCM agreement (Bagwell and Staiger, AER 2006), and the GATS agreement (Staiger and Sykes, JPE forthcoming)

Trade wars and trade talks: Applications

- How costly are trade wars? How beneficial are trade talks?
- While the trade policy literature has long been dominated by theoretical contributions, it is now beginning to integrate modern **quantitative approaches** (e.g. Ossa, AER 2014, Lashkaripour, JIE forthcoming)
- Key findings: (i) A fully-escalated trade war wipes out 1/4 of the gains from trade; (ii) 85% of all possible efficiency gains have been reaped in past GATT/WTO negotiations
- This work leverages the **exact hat algebra** popularized by Dekle et al (AER P&P, 2007)

Tax wars and tax talks: Big picture

- What can we learn from the trade policy literature?
- The literature on trade wars and trade talks assumes that factors are internationally immobile. As a result, it **cannot be applied directly** to international tax competition, which involves internationally mobile tax bases
- However, it is only a small step from "new trade" models to "**new economic geography**" models so that it is relatively easy to apply the trade wars and trade talks logic in models with international factor mobility (e.g. Ossa, 2019)
- This should allow us to take a **broader view of tax competition** that goes beyond the standard narrative of tax base competition and highlights governments' incentives to "create jobs" or "support manufacturing"

Tax wars and tax talks: A simple model - Overview

- As a proof of concept, I will now give a brief overview of my work in Ossa (2019). While this model is designed to analyze subsidy competition among US states, I will highlight how it could also be applied to study corporate tax competition among countries

- Subsidies are modeled as deviations from a benefit tax benchmark and could therefore also be reinterpreted as tax breaks. Needless to say, this would have to be refined substantially to adequately capture the key features of the corporate tax system

- Key mechanism: Countries have an incentive to attract firms from other countries to exploit local agglomeration externalities. Consumers want to be close to firms and firms want to be close to firms to have better access to final and intermediate goods

Tax wars and tax talks: A simple model - Preferences

- Preferences are common over goods and heterogeneous over amenities:

$$
\begin{aligned}
U_{jv} &= U_j u_{jv} \\
U_j &= \frac{A_j C_j^F}{L_j} \\
C_j^F &= \left(\sum_i \int_0^{M_i} c_{ij}^F (\omega_i)^{\frac{\varepsilon-1}{\varepsilon}} d\omega_i \right)^{\frac{\varepsilon}{\varepsilon-1}} \\
u_{jv} &\sim Frechet(1, \sigma)
\end{aligned}
$$

NB: Heterogeneity is necessary to allow for a meaningful sense in which regions can benefit at the expense of one another

Tax wars and tax talks: A simple model - Technology

- Firms produce differentiated products using labor, capital, and intermediates:

$$
\begin{aligned}
q_j &= \varphi_j \left(z_j - f_j \right) \\
z_j &= \frac{1}{M_j} \left(\frac{1}{\eta} \left(\frac{L_j}{\theta^L} \right)^{\theta^L} \left(\frac{K_j}{\theta^K} \right)^{\theta^K} \right)^{\eta} \left(\frac{C_j^I}{1-\eta} \right)^{1-\eta} \\
C_j^I &= \left(\sum_i \int_0^{M_i} c_{ij}^I \left(\omega_i \right)^{\frac{\varepsilon-1}{\varepsilon}} d\omega_i \right)^{\frac{\varepsilon}{\varepsilon-1}} \\
1 &= \theta^L + \theta^K
\end{aligned}
$$

NB: Tax-financed cost subsidies would not work if there was only labor because then workers would essentially subsidize themselves

Tax wars and tax talks: A simple model - Government

- Government objective
  - In the non-cooperative regime, governments maximize regional expected utility, $E\left(U_{jv} | \text{living in } j\right)$, which amounts to maximizing U_j
  - In the cooperative regime, governments maximize aggregate expected utility, $E\left(\max_j \left\{U_{jv}\right\}\right)$, which amounts to maximizing $\left(\sum_{i=1}^{R} U_i^{\sigma}\right)^{\frac{1}{\sigma}}$
- Policy instruments
  - Governments provide cost subsidies to local firms which they finance with lump-sum taxes on local residents
  - These subsidies could also be thought of as capturing deviations of corporate taxes from a benefit tax benchmark

Tax wars and tax talks: A simple model - Properties

- The solution to the model can be expressed as a system of $3N$ equilibrium conditions in the $3N$ unknowns $\hat{\lambda}_i^L$, $\hat{\lambda}_i^K$, and $\hat{P}_i$
- It can be calibrated with minimal data requirements using the "exact hat algebra" approach of Dekle et al (2008)
- Following Allen and Arkolakis (2014), the model is isomorphic to an Armington model with external IRS technology if $\phi = \frac{1}{\varepsilon - 1}$ and the technology is:

$$Q_i = \varphi_i (Z_i)^{1+\phi}$$

$$Z_i = \left(\frac{1}{\eta} \left(\frac{L_i}{\theta^L} \right)^{\theta^L} \left(\frac{K_i}{\theta^K} \right)^{\theta^K} \right)^{\eta} \left(\frac{C_i^I}{1-\eta} \right)^{1-\eta}$$

Tax wars and tax talks: A simple model - Mechanism

- The welfare effects resulting from small subsidy changes can be decomposed into:

$$\frac{dU_j}{U_j} = \underbrace{\frac{1}{\eta}\sum_i \frac{X_{ij}}{E_j}\frac{1}{\varepsilon-1}\frac{dM_i}{M_i}}_{\text{home market effect}} + \underbrace{\frac{1}{\eta}\sum_i \frac{X_{ij}}{E_j}\left(\frac{dp_j}{p_j}-\frac{dp_i}{p_i}\right)}_{\text{terms-of-trade effect}}$$

- The terms-of-trade effect can be further decomposed into:

$$\underbrace{\theta^L \sum_i \frac{X_{ij}}{E_j}\left(\frac{dw_j}{w_j}-\frac{dw_i}{w_i}\right)}_{\text{relative wage effect}} + \underbrace{\frac{1}{\eta}\sum_i \frac{X_{ij}}{E_j}\left(\frac{d\rho_j}{\rho_j}-\frac{d\rho_i}{\rho_i}\right)}_{\text{direct subsidy effect}} + \underbrace{\frac{1\text{-}\eta}{\eta}\sum_i \frac{X_{ij}}{E_j}\left(\frac{dP_j}{P_j}-\frac{dP_i}{P_i}\right)}_{\text{intermediate cost effect}}$$

Tax wars and tax talks: A simple model - Original application

- In my original application, I show that US states have strong incentives to subsidize firm relocations in order to gain at the expense of other states. In particular, states can gain $14.9 billion on average by unilaterally imposing **optimal subsidies**

- I also show that observed subsidies are closer to cooperative than non-cooperative subsidies but the potential losses from an escalation of subsidy competition are large. A fully escalated **subsidy war** would cost the country $30.9 billion overall

- An important feature of economic geography models is that the spatial allocation of economic activity is in general inefficient (e.g. Fajgelbaum and Gaubert, QJE 2020) so that laissez-faire is not the optimal policy

Conclusion

- Introduced the modern literature on trade wars and explored its implications for our understanding of tax competition
- Many of the tools from the trade policy literature can be applied to tax policy questions so there are lots of arbitrage opportunities
- The key challenge will be to model tax policy in a way that strikes the right balance between transparency and realism
- Further reading: Ossa (Handbook of Commercial Policy, 2016), Caliendo and Parro (Handbook of International Economics, forthcoming), Wang (JIE, 2020).