Competition for firms in an oligopolistic industry: The impact of economic integration

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ABSTRACT

We set up a model of generalised oligopoly where two countries of different size compete for an exogenous, but variable, number of identical firms. The model combines a desire by national governments to attract internationally mobile firms with the existence of location rents that arise even in a symmetric equilibrium where firms are dispersed. As economic integration proceeds, equilibrium taxes initially decline, but then rise again as trade costs fall even further. A range of trade costs is identified where economic integration raises the welfare of the small country, but lowers welfare in the large country.

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1. Introduction

The rise in foreign direct investment (FDI) and the increasing role played by large, multinational firms have been amongst the most important dimensions of the continuing globalization of the world economy over the past three decades. These developments have had profound effects on the attitude taken by governments towards the location of mobile firms in their jurisdictions. This is reflected in the policies governments have adopted in order to encourage investment by these firms.

One facet of this is the decline in corporate taxes as nations compete to attract investment. Table 1 shows that nominal and effective average rates of corporation tax have fallen significantly over the last two decades and this downward trend has been even more pronounced in small countries. Nevertheless, corporate tax rates remain substantial in large and small countries alike. Moreover, at least for the small countries the downward trend of tax rates seems to have slowed down during the period 1995–2005, as compared to the preceding decade. This offers some first indication that there may be a

'bottoming out' of tax rate competition as economic integration proceeds.[1]

Competition for mobile firms also arises through state aid for the location of new plants or the expansion of existing ones. Such investment subsidies have become commonplace, in particular in sectors that combine the use of modern technologies with the creation of new jobs. This is well documented in the European Union (EU), where state aid given by member states to individual enterprises in their jurisdiction must be approved by the European Commission. Table 2 lists 16 cases for the years 2001–2007 where investment subsidies in excess of Euro 40 million, and typically accounting for 10–30% of the present value of the investment, have been approved.[2] The recent apparent decline in the number of such subsidies may, however, be first

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[1] Revenue from corporate taxation, as a percentage of GDP, has remained stable or even increased in most OECD countries during the last two decades (see OECD, 2007). Corporate tax revenue may not be a good indicator for the forces of tax competition, however, because it includes the effect of firms switching from unincorporated to incorporated businesses in order to take advantage of falling corporate tax rates. Recent empirical evidence shows that this effect may be substantial, raising corporate tax receipts at the expense of personal income tax revenue (see de Mooij and Nicodème, 2008). Nevertheless, the evidence on corporate tax collections underscores the point that profit taxation is not losing its importance. See Hines (2007) for a recent overview of these developments.

[2] Davies (2005, Table 1) collects a similar list of investment subsidies granted by U.S. states.

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Table 1
Corporate taxation in OECD countries.
Sources: Devereux et al. (2002); www.ifs.org.uk/publications.php?publication_id=3210.

	Statutory tax rate[a]			Effective average tax rate[b]		
	1985	1995	2005	1985	1995	2005
Large countries (>20 million)						
Australia	50	36	30	37	31	26
Canada	45	36	36	28	28	28
France	50	37	34	34	27	25
Germany	63	57	38	45	41	32
Italy	46	52	37	31	36	26
Japan	56	50	40	45	40	32
Spain	35	35	35	27	24	26
United Kingdom	40	33	30	28	26	24
United States	50	39	39	32	29	29
∅ Large countries[c]	48.3	41.7	35.4	34.1	31.3	27.6
Small countries (<20 million)						
Austria	61	34	25	37	24	22
Belgium	45	40	34	35	31	26
Finland	60	25	26	45	19	21
Greece	44	40	32	36	33	21
Ireland	10	10	13	5	8	11
Netherlands	43	35	32	34	28	25
Norway	51	28	28	36	24	24
Portugal	55	40	28	48	29	20
Sweden	60	28	28	45	21	21
Switzerland	35	35	35	26	26	25
∅ Small countries[c]	46.4	31.5	28.0	34.7	24.3	21.6
∅ All countries[c]	47.3	36.3	31.5	34.4	27.6	24.4

[a] Including local taxes.
[b] Base case: real discount rate: 10%, inflation rate: 3.5%, depreciation rate: 12.25%, rate of economic rent: 10% (financial return: 20%).
[c] Unweighted average.

evidence of a policy reversal in this area. In Germany, for example, an intensive debate on the justification of subsidies for increasingly mobile investments broke out in 2008, after Nokia had closed a mobile phone plant in Northrhine–Westphalia that had only been erected in the

Table 2
Approved investment subsidies in EU member states (2001–2007).
Source: Official Journal of the European Communities, C and L (http://eur-lex.europa.eu).

Company (sector)	Date of approval	Host country (city/region)	State aid (million €)	Aid intensity (%)[a]
Nissan	01/2001	U.K. (Sunderland)	60[b]	18.6
Volkswagen	07/2001	Germany (Dresden)	75	12.3
Daimler Chrysler	12/2001	Germany (Thuringia)	57	30.9
Infineon (semiconductors)	04/2002	Germany (Saxony)	219	19.8
ST Microelectronics	04/2002	Italy (Sicily)	542	26.3
Iveco (utility vehicles)	10/2002	Italy (Puglia)	109	44.0
BMW	12/2002	Germany (Leipzig)	363	30.1
Solar World (solar cells)	03/2003	Germany (Saxony)	73	35.0
Ford	07/2003	Belgium (Genk)	45	4.2
AMD (microelectronics)	02/2004	Germany (Saxony)	545[c]	22.7[c]
Wacker (silicon wafers)	02/2004	Germany (Saxony)	120	28.0
Infineon (semiconductors)	03/2004	Portugal (Porto)	42	29.0
DHL Airways (logistics)	04/2004	Germany (Leipzig)	70	28.0
De Tomaso (vehicles)	01/2005	Italy (Calabria)	81	60.0
Südzucker (bioethanol)	06/2005	Germany (Saxony-Anh.)	43	23.8
AMD (microelectronics)	07/2007	Germany (Saxony)	262	11.9

[a] Present value of state aid divided by present value of investment.
[b] 1 British Pound is converted to 1.5 €.
[c] Upper limit.

1990s, with the help of state subsidies, and simultaneously opened up a new plant in Romania.

Finally, there are clear signs that increasing economic integration and the mobility of multinational firms have led to conflicting interests between large and small countries. During the last decade large countries, in particular, have found themselves under increasing pressure to cut tax rates, in order to avoid losing investment to their smaller, lower-tax neighbours (see Table 1). In the EU, for example, this has led to the adoption of a Code of Conduct for business taxation that was directed primarily at the special tax breaks being offered to multinational firms. This regulation caused a total number of 40 preferential tax regimes to be phased out, most of which had been applied by small EU countries (see Primarolo Report, 1999).[3] At the same time the OECD (2000) launched a campaign against 'harmful tax policies', which was directed almost exclusively at small tax havens worldwide. Essentially these policy initiatives attempted to counter-act the way in which small countries have taken advantage of an increased organizational flexibility in large, multinational firms.

In this paper we aim to contribute to the understanding of these simultaneous developments. For this purpose we set up a model that incorporates a desire on the part of national governments to attract internationally mobile firms, but also gives governments the ability to tax location rents earned by firms. Countries differ in the size of their respective population. Our focus is on the development of tax rates and the resulting welfare levels in small and large countries as economic integration proceeds.

More specifically, we set up a model of generalised oligopoly in a region where two countries of different size use corporate taxes to compete for an exogenous, but variable, number of identical firms owned by residents of a third country. Our model features location rents for firms that arise even in a symmetric equilibrium. This is because, in the presence of trade costs, firms want to set up in different locations from one another in order to reduce the competitive pressures that they face and increase gross profits. This gives the host governments an opportunity to grab these rents through taxes. On the other hand, we assume that governments want to attract firms to their jurisdiction as consumers prefer locally produced goods to imports. Trade costs again drive this motivation. Local production is cheaper than importing goods and hence consumer prices are lower, and consumer surplus higher, when goods are made in the domestic market.[4] Other things equal, this makes governments willing to subsidise inward foreign direct investment. The overall tax policies in our model thus derive from the combination of these two counter-acting forces.

Our model delivers two main results. First, we find a *U*-shaped relationship between equilibrium tax rates and trade costs. Tax rates in both countries decline in the initial stages of economic integration but rise again when trade costs fall further. This pattern results as the relative strength of the two effects on tax policy described above changes in the course of economic integration. Second, we show that there is a range of trade costs where economic integration raises the welfare of the small country, but lowers welfare in the large country. This indicates that, at some stages of economic integration, there may indeed be conflicting interests between large and small countries with respect to continuing the process of market integration.

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[3] Examples of such preferential tax regimes were a split corporate tax rate regime in Ireland and special tax rules for multinational holding companies in the Benelux countries. Both of these measures were highly successful in attracting foreign direct investment.
[4] Of course, increased consumer surplus is not the only potential benefit that might arise from local production. For example, perhaps the most persuasive argument for government investment subsidies is that multinational firms may offer a wage premium over domestic workers' outside options, an extreme case of which occurs when inward FDI relieves involuntary unemployment. We discuss this case in an extension of our model in Section 5.