MARKET ACCESS AND COMPETITION
IN THE SERVICE SECTOR

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1. INTRODUCTION AND MOTIVATION

This paper is concerned with the relationship between the traditional concept of market access in goods sectors and the degree of competition in the service sector. In particular, we examine the interaction between trade in goods and the degree of competition in the "margin" services that facilitate the interaction between the exporter and the final consumers. This includes domestic shipping and logistic services, of course, as well as the wholesale and retail sectors and other links in the distribution chain that carries imported goods to the consumer.

We focus on the following questions. Does national competition policy in the distribution sectors matter for the level of trade in goods? (That is, does "non-tradables" competition policy have trade effects?) Are the gains from trade affected by the degree of service-sector competition? What are the implications of service-sector competition for the interpretation of tariff concessions (that is, market-access concessions) made during trade negotiations? How might market-access concessions under the GATS in the margin sectors (assumed to involve a mix of profit shifting and increased competition) interact with market access in goods trade? Finally, is there a relationship between the traditional optimal-tariff arguments and the optimal degree of domestic competition?

Recent events and circumstance related to this issue include the Fuji-Kodak dispute about domestic distribution cartels, involving the U.S. and Japanese governments and the ongoing debate about antitrust exemptions within the EU Single Market(s) for autos. They also lurk behind the retail distribution system and its impact on trade in both Switzerland and Japan, and behind the German experience with retailing cartels (and the threat of Wal-Mart-type entry).

We explore these issues both theoretically and empirically. Our results point to potentially important linkages between service sector competition, and the degree of effective

market access affecting goods trade. This, in turn, suggests linkages between GATS-based liberalization and goods trade that go well beyond current policy analyses and discussion.

2. THE BASIC MODEL:

We consider the market for imports of an homogeneous good. The domestic government taxes these imports which we assume to be supplied by competitive firms. We focus on the retail and distribution network within the importing country. This we assume to be less-than-perfectly competitive. Thus we shall be interested in the interactions between three sets of agents: the government, consumers, and the distributors.

2.1 Supply

The home country imports a good that is supplied by competitive, overseas producers. The export supply schedule is assumed to be linear and upward sloping (that is, imperfectly elastic). Consequently, the importing country has some degree of monopoly power in trade and decides to subject trade in these goods to an import tax at rate τ. This creates a wedge between the *cif* price p and the *landed* (that is, after duties are paid) price, p^L. Let the total quantity imported be q. Then the inverse supply function is:

$$p = a + bq \tag{1}$$

while the relationship between the pre- and post-tariff prices is:

$$p^L = tp \tag{2}$$

where the tariff wedge is $t \equiv 1 + \tau$. We shall frequently refer to t as "the tariff".

2.2 Demand

Consumer demand for the imported good is assumed to be linear and inversely related to price. Let p^R be the retail price where the inverse demand curve is:

$$p^R = x - yq \tag{3}$$

2.3   Intermediation Services

Interaction between the exporter and the final consumer is assumed to require the services of a domestic service sector that facilitates both the movement of the good inland, and also the wholesale and retail distribution, marketing, and any ancillary services required to sell the good. These services are supplied by a domestic service cartel (Cournot oligopoly) at constant marginal cost.

The total revenue of a representative firm i in the service sector is, from (3),

$$TR_i = (x - yq)q_i \tag{4}$$

where q_i is the quantity sold by the firm. We assume that there are n identical firms in the market, each having a share $s = 1/n$. It is useful to think of s as an index of market competitiveness that ranges from a value of zero, under perfect competition ($n = \infty$), to a value of one, when a single firm monopolizes distribution ($n = 1$) or, alternatively, an oligopolistic service sector acts as a monopolist through perfect collusion in a cartel.

Firms face a constant marginal cost, c, of getting goods to market. The total variable cost TVC_i for an individual oligopolist is the sum of the landed price they pay for the good and the marginal cost. Using (1) and (2), we have:

$$TVC_i = \left[t(a + bq) + c \right] q_i \tag{5}$$

The profits of an individual firm π_i are determined by subtracting equation (5) from equation (4):

$$\pi_i = \left[(x - c - ta) - (y + tb)q \right] q_i$$

We can see that the services firms have market power on both sides of the market. On the cost side, the price they pay for the imported good depends upon the total quantity q. Similarly, on the supply side, the price at which they sell to consumers is a function of total quantity brought to market. By restricting their trading, the firms are able to both drive down costs and drive up prices, widening the price-cost margin and raising profits.

The perceived marginal revenue for domestic service firm i is (using the Cournot assumption):

$$MR_i = x - (1+s)yq \tag{6}$$

If we again assume Cournot, we can also derive the perceived marginal cost for the individual firm:

$$MC_i = c + t\left[a + (1+s)bq\right] \tag{7}$$

Setting $MR_i = MC_i$, or (6) = (7), and solving for equilibrium imports (that is, retail supply) yields:

$$q = \frac{x - c - ta}{(1+s)(y+tb)} \tag{8}$$

From (8), we see that increases in either s or t will reduce the volume of trade and level of consumption. An increase in the tariff thus reduces trade *even when* the equilibrium response of the service sector is taken into account. When the service industry becomes more concentrated, s rises, and the firms exercise their increased market power, lowering the trade volume.

2.4   Equilibrium prices

Given equilibrium quantity, we can turn back to equations (1), (2), and (3) for prices:

$$p = a + \frac{b(x-c-ta)}{(1+s)(y+tb)} \tag{9}$$

$$p^L = t\left[a + \frac{b(x-c-ta)}{(1+s)(y+tb)}\right] \tag{10}$$

$$p^R = x - \frac{y(x-c-ta)}{(1+s)(y+tb)} \tag{11}$$

From equations (10) and (11), we can also derive the value of the service margin, m, as a function of tariffs and the degree of market power in the service sector:

$$m = \frac{c + s(x - ta)}{1 + s} \tag{12}$$

From equations (8), (9), and (12), we can see that the equilibrium trade volume, exporter price, and service margin all depend on both the level of trade protection and the degree of market power. In the absence of market power (that is, when the service industry is competitive and $s = 0$), the margin reflects purely the cost of intermediation, $m = c$.

There is a linear, negative relationship between the margin m and the tariff. The government's exercise of its own market power clearly limits the firms' ability to extract rents. t^C is the tariff that strips the distributors of their market power by forcing them to marginal-cost price, where:

$$t^C = \frac{x - c}{a} \tag{13}$$

But the problem with this can be seen from (8). t^C is, in fact, a prohibitive tariff at which the equilibrium trade volume is zero. Thus, attempts to use the tariff as competition policy would eliminate the very gains from trade that the government is trying to wrest from the intermediaries. Differentiating (12) with respect to s yields:

$$\frac{\partial m}{\partial s} = \frac{x - c - ta}{(1 + s)^2} \tag{14}$$

which is positive whenever t is less than prohibitive. Thus, as might be expected, the stronger the perceived market power of firms in the service industry, the greater their margins.

3. GOVERNMENT POLICY OPTIONS

We now investigate the optimal policy options for the domestic government. We consider two instruments. The first of these is the tariff. In a standard trade model, without intermediation services, the tariff permits the importing country to exploit its monopsony power with respect to foreign exporters and improve the national terms of trade. An

additional aspect of the setting under consideration in this paper is that, with an imperfectly competitive service industry, the tariff may also serve to capture rents from these firms. Consequently, an important issue will be the nationality of ownership of the firms in the service industry. The incentive to grab rents will be greater if they were otherwise going to foreigners.

The second instrument is policy competition in intermediation services. As we discussed above, *s* is an indicator of the degree of market competitiveness. Instead of *s* being directly related to the number of firms in the industry, we can treat it as an instrument to control the behaviour of the firms. Thus, irrespective of *n*, if *s* = 0 firms are forced to behave competitively and if *s* = 1 firms can act as a cartel. Whether the government chooses to force these firms to behave competitively may, again, depend on their nationality.

In the next two sections we shall show the relationship of *s* and *t* to the gains from trade, such that we can find the optimal combination of competition and trade policy for a nation. We can measure the impact on welfare of both imposing a tariff and making changes in *s* through competition policy. We decompose the welfare effects into three: the change in tariff revenue, *TR*; the change in consumer surplus, *CS*; and the change in rents accruing to the service industry, *SR*. The last of these will be zero if the service industry is competitive and, in any event, should only be counted if the service firms belong to nationals of the home country.

3.1 Tariff revenue

In the free-trade equilibrium, tariff revenues are zero and therefore the change in government earnings from a tariff will be the product of the quantity and the tariff per unit sold:

$$TR = (t-1) pq \tag{15}$$

Substituting the equilibrium values (8) and (9) into (15) yields:

$$TR = \frac{(x-ta-c)(t-1)\{[sta+x-c]b+(1+s)ay\}}{(1+s)^2 (tb+y)^2} \tag{16}$$

3.2 Consumer surplus

The introduction of a tariff will, *ceteris paribus*, raise the retail price of the good and lower consumer welfare. Consumer surplus is simply the area under the demand curve which, in the linear setting that we have assumed, has the simple form:

$$CS = \frac{1}{2}\left(x - p^R\right)q \tag{17}$$

Substituting the values of the tariff-ridden equilibria (8) and (11), yields:

$$CS = -\frac{1}{2}\frac{\left(x - ta - c\right)^2 y}{\left(1+s\right)^2 \left(tb+y\right)^2} \tag{18}$$

3.3 Service-industry margin

We have already established that an imperfectly competitive service sector will be exercising its market power and making profits. The change in the rents accruing to the service industry, as a result of the government's tax policy, are:

$$SR = \left(m - c\right)q \tag{19}$$

This can be evaluated by substituting (8) and (12) into (19)

$$SR = \frac{s\left(x - ta - c\right)^2}{\left(1+s\right)^2 \left(y + tb\right)} \tag{20}$$

When the service sector is competitive, $s = 0$, and makes no profits $SR = 0$. The derivative of (20) with respect to t is negative. Consequently, increases in the tariff will capture some of the rents previously being collected by an imperfectly competitive service sector.

3.4 Aggregate welfare impact of government policies

Whether the impact of government policy on the profits of the service sector is taken into account largely depends upon the ownership of the firms. We define two welfare measures as a result. The first captures the impact of government policy on all agents active in the domestic marketplace: consumers, distributors, and the government itself. Thus, let Z be the composite welfare gain for the *domestic* economy, where:

$$Z = TR + CS + SR \qquad (21)$$

If the service sector is predominantly foreign-owned, we shall assume that the government ignores the profits of these firms, focussing upon the welfare of its nationals. Accordingly, the appropriate measure of *national* welfare, W, would only take account of consumer surplus and tariff revenue:[1]

$$W = TR + CS \qquad (22)$$

4. TARIFF POLICY

The impact of a tariff on the various components of welfare and on aggregate welfare is illustrated in Figure 1, where the service industry is assumed to be a duopoly ($s = 0 \cdot 5$). As would be expected, consumer surplus declines monotonically with an increasing tariff, while tariff revenue increases to a maximum and then falls. Consequently, for national welfare, there is an interior solution for the optimal tariff, indicated by t^Z. When the service rents are taken into account, the optimal tariff is less, though still positive in this case, and is indicated by t^W. The government, in exercising its monopoly power in trade, limits the ability of the service sector to extract rents. When these rents accrue to domestic agents, the government will wish to moderate its use of the tariff.

It is straightforward to find the tariff that maximizes aggregate welfare when the service industry is competitive, as this is the conventional optimal tariff that fully exploits the country's trade power with respect to the exporting nation:

$$t^* = 1 + \frac{b(x - a - c)}{b(a + x - c) + ay} \qquad (23)$$

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[1] It may be the case that there is a foreign presence in the service sector, but that these firms only constitute a share γ of the total industry. In such an intermediate case, we could consider a welfare term $Y = TR + CS + (1 - \gamma)SR$. From our analysis of the effects of policy on W and Z, the implications for Y will be clear.

As the service sector is making no profits, W and Z coincide. The only distortion in the market, from the home country's point of view, is its unexploited monopoly power in trade. This is corrected by the imposition of $t*$.[2]

It is when there is an additional distortion in the market, in the form of an imperfectly competitive distribution sector, that the government's trade policy becomes more complicated. Consider initially, the situation where the retail sector is wholly domestically owned. The appropriate measure for welfare is then Z, capturing the impact on consumers, distributors, and the government. This is illustrated in Figure 2, which shows the relationship between t, s, and Z. The contours show the various levels of welfare that can be achieved through the choice of tariff for any level of service-sector concentration, from competition to monopoly.

In perfect competition, $t*$ maximizes welfare. It is evident that the optimal tariff declines with increasing concentration in services. Differentiating (21), substituting (16), (18), and (20) yields the optimal tariff:

$$t^{Z} = \frac{(2b - sy)(x - c) + (1 + s)ay}{a[y + b(1 - s)] + (1 + s)b(x - c)} \tag{24}$$

Indeed, the optimal tariff when the service sector is a monopoly is a subsidy.[3] The more concentrated the service sector, the greater its exercise of its market power and, consequently, the lower the trade volume. A tariff further reduces the volume of trade, whereas a subsidy increases the levels of import and consumption. Such a subsidy benefits the service sector but, as their profits are part of national welfare, the government is prepared to offer it.[4] In the setting under consideration, the trade volume, consumer surplus and aggregate domestic welfare are the same irrespective of whether the government or the service industry is

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[2] In our numerical simulations, $t* = 1{\cdot}265$.

[3] The value of the subsidy under monopoly is $0{\cdot}8953$.

[4] The government can use other domestic instruments to redistribute income away from the service firms.

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optimally exploiting the country's monopoly power in trade. The only difference that arises is in the distribution of income between the government and the service sector.

We are unable to give a simple expression for the optimal tariff that maximises W. However, Figure 3 illustrates the effects of tariff policy when the distributive sector is owned by foreign nationals. The result is the reverse of that for a domestically owned service sector. Starting from t^*, for a competitive service sector, the greater the market power exercised by that sector, the *larger* the tariff that the government should impose.[5] The more market power that can be exercised by the intermediaries, the greater the justification for the government to compete for these monopoly rents with a tariff. When the service sector acts as a monopolist, the optimum tariff t^W greater than t^*. However, the government's ability to grab these rents from the service industry is limited and the country is unable to achieve the welfare levels under monopoly that could be reached when the intermediaries are competitive. Consequently the welfare contours decline from a maximum attained at t^* under competition.

5. COMPETITION POLICY

We now consider the potential for the domestic government to limit the market power of the service sector by forcing it to behave more competitively. The wisdom of such a policy will depend on whether the service sector is working in the interests of the home country, or if its rents are not part of domestic welfare.

When the service industry is domestically owned, the level of concentration does not affect the attainable aggregate welfare level. The government, through its choice of optimum tariff, can achieve the same level of Z, regardless of s. The difference will be in the composition of Z. When $s = 0$ and the service sector is fully competitive, the benefits of trade are captured by the consumers and the government (through its tariff revenues). The more concentrated the industry, the larger the share of Z that is profits for the intermediaries. As

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[5] In the numerical exercise, the value of the optimal tariff under monopoly is 1·325.

the optimal tariff for a heavily concentrated service sector is negative, the government makes transfers to the intermediaries through a subsidy on trade.[6]

The only grounds upon which a government might choose to implement competition policy, as opposed to using the optimal tariff, would be distributional. In order to ensure efficiency, the government is required to subsidise trade when the service sector is heavily monopolised. In a sense, the government is abetting the service sector's exercise of monopoly power. Welfare is maximised, but the same level of welfare could be achieved using competition policy and the appropriate tariff, such that more of the gains from trade are captured by the government, rather than the intermediaries.

When intermediaries are foreign owned, there is an efficiency argument for the use of competition policy. The service sector raises its profits by driving down the volume of trade (both raising the price paid by consumers and lowering the price that the intermediaries have to pay the foreign suppliers). In the absence of competition policy, the exercise of the tariff will further reduce the volume of trade, lowering the surplus from trade but increasing the share accruing to domestic residents.

6. SOME EMPIRICS

We start with a simple examination of correlations between trade patterns and distribution sector competition. Our data are drawn from the following sources: First, from recent OECD studies on competition in the service sectors we have a cross-country set of indexes of on competition within the retail sector 26 countries.[7] For these same countries, we have combined the retail competition estimates with 1997 import-GDP ratios (taken from World

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[6] The interests of the service sector and the nation coincide when the import is perfectly elastically demanded in the country. In this situation, the only market power enjoyed by the intermediaries is the nation's monopoly power in trade. When the service sector is able to fully exploit this, in the case of a monopoly, then there is no need of further intervention on the part of the government (that is, the optimal tariff is zero).

[7] The countries are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Mexico, The Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, and United Kingdom.

Bank data), import tariffs (again from OECD data, with adjustments from GTAP data to allow for intra-EU duty-free trade), GDP, GDP per capita, and population. We then estimate a simple gravity model, linking import shares to country characteristics G (estimated in logs). The basic OLS results are reported in Table 1.

Following from the results in Table 1, Figure 4 offers a mapping of residual import shares (the deviations unexplained by the basic gravity model) to our index of retail sector competition. As the index is defined, in the figure a high competition index implies less competition. To quantify the strength of the relationship, Table 2 reports OLS regression results, with the residual import share of the dependant variable, and the competition index as the right hand side variable. Roughly 14 percent of the total variation in import shares is "explained" by the degree of competition in the export sector. Obviously, this type of analysis is crude. It does, however, point to a strong relationship between variations in market access (as proxied by import levels) and variations in domestic distribution sector competition.
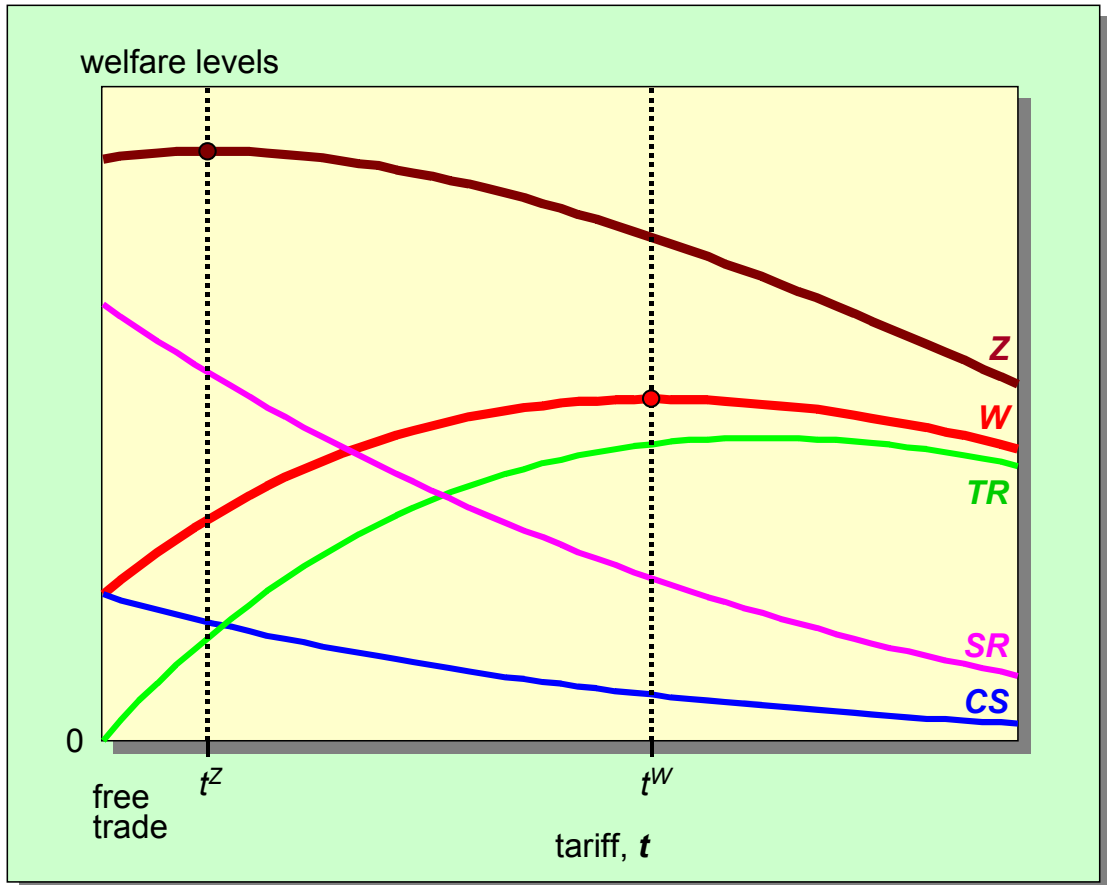
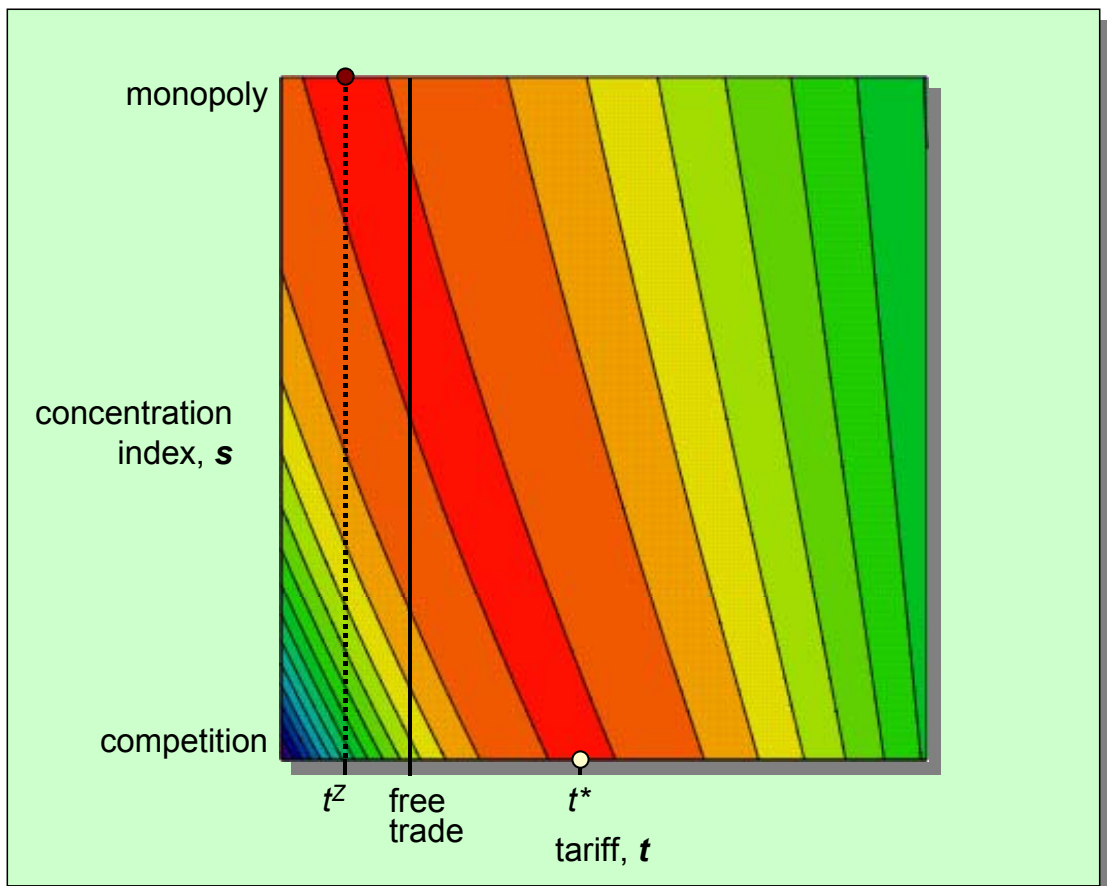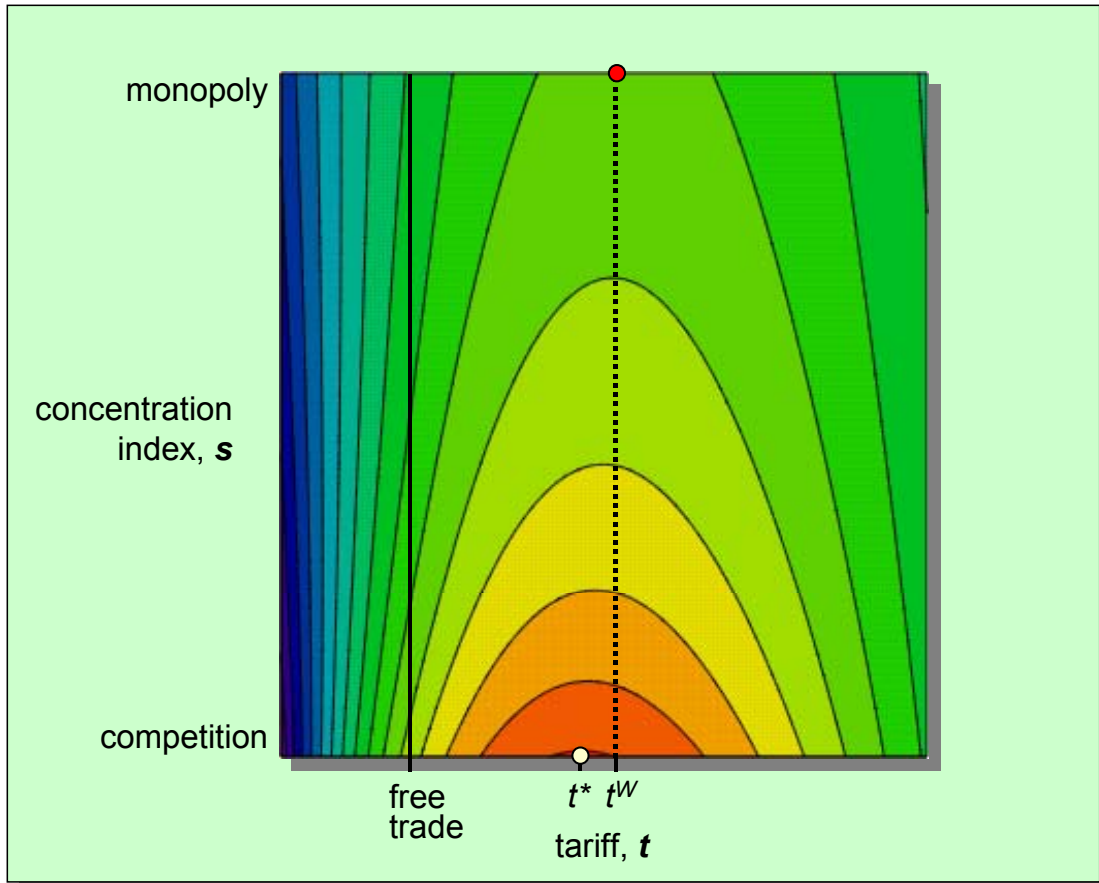Figure 1 The impact of the tariff on welfare under a duopoly in the service sector ($s = 0.5$)
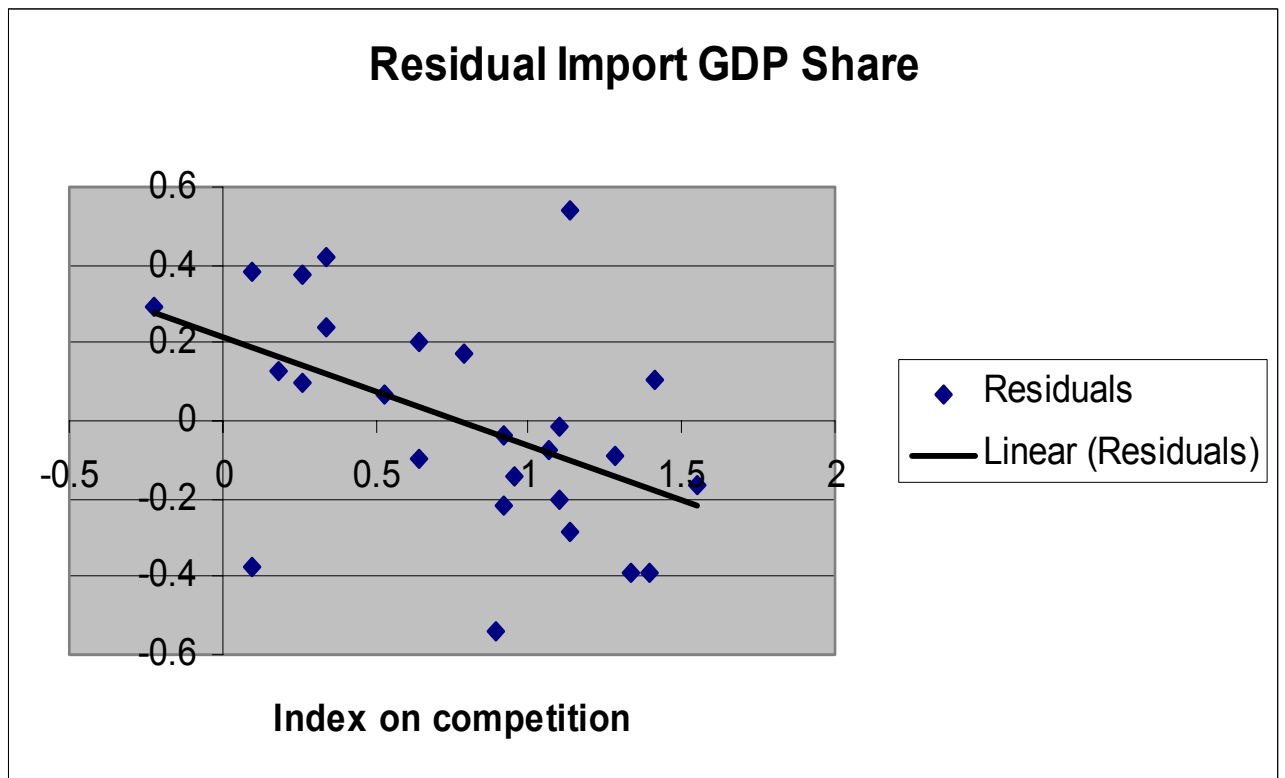

Figure 2 Welfare levels, competition, and the tariff with a domestically owned service sector

Figure 3 Welfare levels, competition, and the tariff with a foreign-owned service sector

Figure 4

Table 1

Complete model

Regression Statistics	
Multiple R	0.824633
R Square	0.68002
Adjusted R Square	0.578974
Standard Error	0.270958
Observations	26

ANOVA

	df	SS	MS	F
Regression	6	2.964536	0.494089	6.729787
Residual	19	1.394947	0.073418	
Total	25	4.359484		

	Coefficients	Standard Error	t Stat	P-value
Intercept	4.866802	2.931696	1.660063	0.113316
Import duties (% of imports)	0.054055	0.109634	0.49305	0.627627
GDP per capita, PPP (current international $)	0.816829	0.589154	1.386444	0.181666
GDP at market prices (constant 1995 US$)	-0.640581	0.317762	-2.015914	0.058173
Retail competition (mid-point)	-0.366422	0.128685	-2.847433	0.0103
Population, total	0.451562	0.312589	1.44459	0.164863
EU	0.366206	0.145091	2.523975	0.020667

Without Retail Competition

Regression Statistics	
Multiple R	0.737208
R Square	0.543475
Adjusted R Square	0.429344
Standard Error	0.315453
Observations	26

ANOVA

	df	SS	MS	F
Regression	5	2.36927	0.473854	4.761841
Residual	20	1.990213	0.099511	
Total	25	4.359484		

	Coefficients	Standard Error	t Stat	P-value
Intercept	1.968406	3.200789	0.614975	0.545505
Import duties (% of imports)	0.05245	0.127636	0.410939	0.685487
GDP per capita, PPP (current international $)	1.431882	0.638139	2.243838	0.036321
GDP at market prices (constant 1995 US$)	-0.9514	0.34743	-2.738389	0.012666
Population, total	0.747266	0.343249	2.177035	0.041628
EU	0.235367	0.160222	1.469007	0.157385

Table 2

Regression Statistics	
Multiple R	0.475228
R Square	0.225842
Adjusted R Square	0.193585
Standard Error	0.253372
Observations	26

ANOVA

	df	SS	MS	F
Regression	1	0.449473	0.449473	7.001414
Residual	24	1.54074	0.064198	
Total	25	1.990213		

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.214238	0.094998	2.255179	0.033517
Retail competition (mid-point)	-0.276678	0.104564	-2.646019	0.014148