Who Gains Most from Trade?

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December 2014

Abstract

Although all nations engaged in international trade should benefit from it, the gains from trade vary through time as changes in the terms of trade and/or in the real exchange rate penalize some countries and benefit others. The purpose of this paper is to determine who gained most from these changes over the past four decades. For this purpose we use an index-number approach that focuses on the difference between real GDP and real GDI. A decomposition of the trading gains between terms-of-trade effects and real-exchange-rate effects is provided. Both relative- and absolute-term estimates are reported. Income-distribution implications are also being addressed. Our results indicate that the cumulated gains or losses can be huge, mounting sometimes to several years worth of GDP.

Keywords: Trading gains, terms of trade, real exchange rate, real GDI, income distribution

JEL classification: O11, O41, C43, F11

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Who Gains Most from Trade?

1. Introduction

Ever since David Ricardo, it has been well understood that under perfect competition free international trade is beneficial to all participating nations. Nonetheless, some countries might benefit more than others. This is all the more so that terms of trade and real exchange rates change over time, benefiting some nations and hurting others.

A bettering of the terms of trade amounts to a windfall gain for the country as a whole and it implies an increase in its real value added and real income.[1] An improvement in the terms of trade essentially means that the country gets more for less. This phenomenon is similar to a technological progress.[2] Contrary to a technological progress, however, a change in the terms of trade is treated by the national accounts as a price phenomenon, rather than as a real effect. Consequently, the beneficial effect of an improvement in the terms of trade is not taken into account by real gross domestic product (GDP)[3]. Real domestic value added growth will thus be underestimated in countries that experience an improvement in their terms of trade.

Similarly, a real appreciation or depreciation of the currency amounts to a change in relative prices that impacts on a country's welfare, unless trade happens to be balanced. A surplus country benefits from a real depreciation of its currency, whereas a deficit country gets hurt by it. Real GDP does not take this effect into account either.

The terms-of-trade effect and the real-exchange-rate effect together form what is known as the trading gains.[4] The trading gains essentially capture the difference between real gross domestic income (GDI) and real GDP. The purpose of this paper is to find out who has experienced the largest trading gains – in relative and in absolute terms – over the past four decades.

The paper proceeds as follows. Section 2 sets out the theoretical framework and it derives a simple index of the trading gains. In Section 3, this index is decomposed into a

[1] An improvement in the terms of trade is generally viewed as being welfare enhancing, although some income redistribution might be needed for welfare to increase in the Pareto sense; see Woodland (1982), for instance.
[2] See Diewert and Morrison (1986), Kohli (1990, 2004a).
[3] In fact, if real GDP is measured by a Laspeyres quantity index, as it is still the case in many countries, an improvement in the terms of trade will actually lead to a *decrease* in real GDP; see Kohli (1991).
[4] See Kohli (2006, 2007).

terms-of-trade effect and a real-exchange-rate effect. Our empirical results are reported in Section 4. Distributional effects are discussed in Section 5 and Section 6 concludes.

2. A Törnqvist index of the trading gains

In this paper we adopt the GDP function approach to the determination of imports and exports.[5] That is, we view traded goods as middle products, with imports as an input to the technology and exports as an output.[6] This view is consistent with the fact that most import and export decisions are made by firms, not by households, and that the bulk of international trade consists of raw materials and intermediate products. Even most so-called finished imports are not ready to meet final demand when they enter the country as they must still transit through the production sector where they undergo a number of changes resulting from activities such as unloading, insuring, financing, transporting, wholesaling, and retailing. In this process they are being combined with domestic labour and capital services so that a substantial proportion of the final price tag generally is accounted for by domestic value added. Exports must go through similar changes in the destination country, so that they are conceptually different from products intended for the home market; these can therefore be viewed as nontraded.

Let $V_{t,t-1}$ be the nominal-GDP (or equivalently nominal-GDI) relative over consecutive periods *t-1* and *t*; thus, $V_{t,t-1}$ is the ratio of nominal GDP (GDI) at time *t* over its value one period earlier, or, equivalently, one plus the nominal GDP (GDI) growth rate. To simplify matters we assume that all domestic GDP components can be consistently aggregated into a nontraded good, with price $P_{N,t,t-1}$. We will compute $P_{N,t,t-1}$ as a Törnqvist index of the prices of consumption, investment, and government purchases.

Let $P_{X,t,t-1}$ and $P_{M,t,t-1}$ be the price relatives of exports and imports, and we define $P_{Y,t,t-1}$ as the GDP price deflator. It is computed as a Törnqvist price index of the prices of nontraded goods, imports, and exports:

$$(1) \qquad P_{Y,t,t-1} \equiv \exp\left[\sum_i s_{i,t,t-1} \ln P_{i,t,t-1}\right],$$

[5] See Kohli (1978, 1991).
[6] The term "middle product" has been coined by Sanyal and Jones (1982).

where $s_{i,t,t-1} \equiv (s_{i,t} + s_{i,t-1})/2$ and $s_{i,t}$ ($s_{i,t-1}$) is the nominal GDP share of good i (i = N, X, M) at time t (t-1). Note that $s_{N,t,t-1} + s_{X,t,t-1} - s_{M,t,t-1} = 1$.

We define $Q_{Y,t,t-1}$ as the implicit Törnqvist index of real GDP:[7]

$$(2) \qquad Q_{Y,t,t-1} \equiv \frac{V_{t,t-1}}{P_{Y,t,t-1}} ,$$

and $Q_{Z,t,t-1}$ as the implicit Törnqvist index of real GDI:[8]

$$(3) \qquad Q_{Z,t,t-1} \equiv \frac{V_{t,t-1}}{P_{N,t,t-1}} .$$

The difference between $Q_{Y,t,t-1}$ and $Q_{Z,t,t-1}$ relates to the price index that is used to deflate nominal GDP: the GDP price index in one case and the domestic expenditures price index in the other. One can show that both quantity indices are superlative indices and they are exact if the true nominal GDP (GDI) function is Translog.[9]

The ratio of real GDI to real GDP defines the trading gains index ($G_{t,t-1}$):

$$(4) \qquad G_{t,t-1} \equiv \frac{Q_{Z,t,t-1}}{Q_{Y,t,t-1}} .$$

$G_{t,t-1}$ is greater than one if the trading gain is positive, and it is less than one if there is a trading loss. It can immediately be seen from (2)–(4) that $G_{t,t-1}$ can also be obtained as:

$$(5) \qquad G_{t,t-1} = \frac{P_{Y,t,t-1}}{P_{N,t,t-1}} .$$

That is, the trading gains factor can be measured by comparing the two price indices used to deflate nominal GDP (GDI). What is key here is that the prices of imports and exports are contained in $P_{Y,t,t-1}$, but not in $P_{N,t,t-1}$.

[7] See Diewert and Morrison (1986), Kohli (2004b).
[8] See Kohli (2006, 2007). The Swiss National Bank uses essentially the same procedure when computing real GDI. Diewert uses the price of consumption as a deflator instead. The Australian Bureau of Statistics measures real GDI by deflating the trade balance by the price of imports; not only is this asymmetric treatment rather arbitrary, but it also has the drawback that the implied GDI price deflator has no simple interpretation.
[9] Kohli (2007).

3. Terms-of-trade and real-exchange-rate effects

We define the price of traded goods ($P_{T,t,t-1}$) as the geometric mean of the prices of exports and imports:[10]

$$P_{T,t,t-1} \equiv P_{X,t,t-1}^{1/2} P_{M,t,t-1}^{1/2} \quad . \tag{6}$$

The price of traded goods in terms of nontraded goods ($E_{t,t-1}$), therefore is:

$$E_{t,t-1} \equiv \frac{P_{T,t,t-1}}{P_{N,t,t-1}} = \frac{P_{X,t,t-1}^{1/2} P_{M,t,t-1}^{1/2}}{P_{N,t,t-1}} \quad . \tag{7}$$

Following the Australian model literature, we will refer to this price ratio as the real exchange rate.[11] As for the terms of trade ($T_{t,t-1}$), they are defined as follows:

$$T_{t,t-1} \equiv \frac{P_{X,t,t-1}}{P_{M,t,t-1}} \quad . \tag{8}$$

Now consider expression (5) for $G_{t,t-1}$. It can be developed in logarithms as follows:

$$\begin{aligned}
\ln G_{t,t-1} &= \ln P_{Y,t,t-1} - \ln P_{N,t,t-1} \\
&= s_{N,t,t-1} \ln P_{N,t,t-1} + s_{X,t,t-1} \ln P_{X,t,t-1} - s_{M,t,t-1} \ln P_{M,t,t-1} - \ln P_{N,t,t-1} \\
&= (1 - s_{X,t,t-1} + s_{M,t,t-1}) \ln P_{N,t,t-1} + s_{X,t,t-1} \ln P_{X,t,t-1} - s_{M,t,t-1} \ln P_{M,t,t-1} - \ln P_{N,t,t-1} \\
&= s_{X,t,t-1} (\ln P_{X,t,t-1} - \ln P_{N,t,t-1}) - s_{M,t,t-1} (\ln P_{M,t,t-1} - \ln P_{N,t,t-1}) \\
&= \frac{1}{2} (s_{X,t,t-1} + s_{M,t,t-1}) (\ln P_{X,t,t-1} - \ln P_{M,t,t-1}) + \\
&\quad (s_{X,t,t-1} - s_{M,t,t-1}) \left(\frac{1}{2} \ln P_{X,t,t-1} + \frac{1}{2} \ln P_{M,t,t-1} - \ln P_{N,t,t-1} \right) \\
&= \ln G_{T,t,t-1} + \ln G_{E,t,t-1}
\end{aligned} \tag{9}$$

where

$$G_{T,t,t-1} \equiv \exp\left[\frac{1}{2} (s_{X,t,t-1} + s_{M,t,t-1}) \ln T_{t,t-1} \right] \tag{10}$$

captures the terms-of-trade effect in the Törnqvist case, and

$$G_{E,t,t-1} \equiv \exp\left[(s_{X,t,t-1} - s_{M,t,t-1}) \ln E_{t,t-1} \right] \tag{11}$$

[10] Others have proposed an arithmetic mean; see United Nations (2002), for instance.

[11] See Salter (1959), Dornbusch (1980), and Edwards (1989), for instance; Corden (1992) also proposes the name "Salter ratio". A value of $E_{t,t-1}$ greater than one means a real depreciation of the home currency.

is the real-exchange rate effect. These two effects measure the impact on real GDI, other things equal, of a change in the terms of trade and in the real exchange rate, respectively. They are exact measures if the underlying nominal GDP function is Translog.[12]

4. Empirical Results

Compound estimates of $G_{t,t-1}$ are reported in Table 1 for a sample of 26 OECD countries for the period 1970-2012. Compound effects for ten-year intervals are also reported. It is apparent that over the entire period, it is Australia that has enjoyed the largest trading gains relative to its GDP. From 1970 to 2012, the trading gains have increased real GDI by about 10.9% relative to its GDP. Norway, Switzerland and Canada follow in that order. At the bottom of the list, we find Japan, Ireland and Korea, who have lost between 12.3% and 17.7% of real GDP. For the United States, the income loss amounts to about 2.9% of real GDP.

One notes that there are substantial differences between sub-periods. These are also illustrated by Figures 1 to 9 that show the path of the trading-gains over the entire period for a selection of countries. For Australia, for instance, the trading gains occurred mostly during the 2000-2012 period. For Norway, severe trading losses during the 1970-1990 interval were followed by huge trading gains, propelling the country to second place in our ranking. In the case of Switzerland and of Spain, the trading gains were mostly achieved during the 1980s. Luxembourg was hit by huge trading losses between 1970 and 2000, only to benefit from a dramatic recovery during the following 12 years. Portugal experienced wide swings in its trading gains over the forty-year period; the same applies to Korea, whereas as the trading gains were predominantly negative for Japan and Ireland.

Table 2 shows the decomposition of the trading gains between the terms-of-trade effect ($G_{T,t,t-1}$) and the real exchange-rate effect ($G_{E,t,t-1}$) over the entire period. The cumulated real-exchange rate effects were generally quite small, less than one per cent of GDP in absolute terms for most countries. Nonetheless, there were large positive effects for Portugal and Greece reflecting real appreciations of their currencies coupled with large trade deficits. The substantial gain enjoyed by Luxembourg, on the other hand, is explained by a real depreciation of the currency in presence of a substantial trade surplus. The real appreciation of the currencies of Switzerland, Japan, Ireland, and Korea, on the contrary,

[12] Kohli (2007).

resulted in fairly large losses for these countries in view of their mostly positive trade balances.

The distance between the trading gains index and the index of the real-exchange-rate effect in Figures 1 to 9 implicitly documents the index of the terms-of trade effect. Actual values for all the countries in our sample can be found in column 1 of Table 2. For most countries, the terms-of-trade effect dominates the trading gains. It is in excess of 5% of real GDP in absolute terms for half the countries. The terms-of-trade effect is as large as 10.2% in the case of Australia, whereas it reaches minus 16.4% for Korea.

The estimates contained in Tables 1 and 2 are expressed relative to real GDP. For international comparison purposes, it is also of interest to express the trading gains or losses in absolute terms. This was done for 2012, by converting the corresponding nominal figures into U.S. dollars. The results are reported in Table 3. By 2012 Australia's trading gains amounted to about USD 171.0 billion and those of Canada reached about USD 116.6 billions. Due to the relatively large size of Spain, its 4.2% trading gains propelled it into third place with a gain of USD 55.8 billions. The relatively large size of the French, the Italian, and, especially the U.S. and Japanese economies explain why these countries end up near the bottom of the table. For the United States the 2012 loss amounted to 476.7 billions and for Japan USD 731.3 billions.

While these figures are indeed huge, they only relate to one year, namely 2012. Given that the gains and losses are recurrent, and take place year after year, it is of interest to add them up over the entire sample period. We have thus cumulated the yearly real trading gains, capitalizing them using a one per cent real rate of interest (using $P_{N,t,t-1}$ as the relevant price index). The resulting figures are reported in USD terms and as percentages of 2012 nominal GDP (or GDI) in columns 1 and 2 of Table 4. The results are impressive, ranging from gains of USD 1.2 trillions for Spain and Canada, to losses of USD 11.3 trillions for the United States and USD 16.7 trillions for Japan. In the case of Switzerland, the USD 1.1 trillion gain amounts to about 168% of 2012 GDP. For ten countries in our sample, the losses exceed 2012 GDP, with Japan experiencing a loss equivalent to 2.8 times its 2012 GDP.

Even though Australia by 2012 achieved the highest trading gains index of all the countries in our sample, its cumulated trading gains in terms of real GDP only placed it in 8th position in our list. This is because Australia enjoyed its largest trading gains late in our time period. Indeed, it accumulated losses during much of the 1970-2000 period. In present value

terms these counted relatively heavily. The same applies to Norway, who actually went from a 2012 trading gains winner to a 1970-2012 cumulated trading gains loser! The opposite applies to Switzerland and, to a lesser extent, Spain who enjoyed early trading gains which were then capitalized over a long time.

5. Trading Gains and Income Distribution

In view of the possibly large trading gains and losses, one may ask who of labour and capital are the ultimate winners or losers. This much depends on the substitution and transformation possibilities allowed for by the technology. Relative price effects are not necessarily neutral. The relevant information can be summarized by the so-called Stolper-Samuelson elasticities.[13]

In what follows we adopt the standard GNP/GDP approach to modeling imports and exports.[14] We again assume that production involves two primary factors – labour and capital – and three variable netputs – nontraded goods, exports and imports. Let w_L and w_K be the user costs of labour and capital, and p_X and p_M the prices of exports and imports. For given factor endowments, a given price of nontraded goods and an unchanged technology, the comparative statics of the model can be represented as follows:

(12) $$d\ln w_L = \eta_{LX} d\ln p_X + \eta_{LM} d\ln p_M$$

(13) $$d\ln w_K = \eta_{KX} d\ln p_X + \eta_{KM} d\ln p_M \ ,$$

where the η_{ij}'s ($i = L, K; j = X, M$) are the Stolper-Samuelson elasticities, also known as price elasticities of inverse factor demands, and they indicate the impact of a change in a netput price on factor rental prices. These two expressions can be rewritten as follows:

(14) $$\begin{aligned} d\ln w_L &= \left(\frac{1}{2}\eta_{LX} - \frac{1}{2}\eta_{LM}\right)\left[d\ln p_X - d\ln p_M\right] + (\eta_{LX} + \eta_{LM})\left[\frac{1}{2} d\ln p_X + \frac{1}{2} d\ln p_M\right] \\ &= \left(\frac{\eta_{LX} - \eta_{LM}}{2}\right) d\ln\tau + (\eta_{LX} + \eta_{LM})\, d\ln\varepsilon \end{aligned}$$

[13] See Kohli (1991), for instance.
[14] See Kohli (1978, 1991).

$$
\begin{aligned}
d\ln w_K &= \left(\frac{1}{2}\eta_{KX} - \frac{1}{2}\eta_{KM}\right)\left[d\ln p_X - d\ln p_M\right] + (\eta_{KX} + \eta_{KM})\left[\frac{1}{2}d\ln p_X + \frac{1}{2}d\ln p_M\right] \\
&= \left(\frac{\eta_{KX} - \eta_{KM}}{2}\right)d\ln\tau + (\eta_{KX} + \eta_{KM})\,d\ln\varepsilon
\end{aligned}
\tag{15}
$$

The first term in square brackets in the first part of (14) and (15) gives the change in the terms of trade (τ), whereas the second square-bracketed term indicates the change in the real exchange rate (ε, for a given price of nontraded goods). The terms in the round brackets thus indicate the impact of changes in the terms of trade and the real exchange rate on the rental prices of labour and capital.

Note that if we multiply (14) by s_L, the share of labour, and (15) by s_K, the share of capital, and then add up, we get:

$$
\begin{aligned}
s_L d\ln w_L + s_K d\ln w_K &= (s_L\eta_{LX} + s_K\eta_{KX})d\ln p_X + (s_L\eta_{LM} + s_K\eta_{KM})d\ln p_M \\
&= s_X d\ln p_X - s_M d\ln p_M \\
&= \left(\frac{1}{2}s_X + \frac{1}{2}s_M\right)\left[d\ln p_X - d\ln p_M\right] + (s_X - s_M)\left[\frac{1}{2}d\ln p_X + \frac{1}{2}d\ln p_M\right] \\
&= \left(\frac{s_X + s_M}{2}\right)d\ln\tau + (s_X - s_M)\,d\ln\varepsilon
\end{aligned}
\tag{16}
$$

where we have used the fact that $\sum_i s_i\eta_{ij} = \pm s_j$, ($i$ = *L, K; j* = *X, M*),[15] the sign being negative for imports and positive for exports. For a given price of nontraded goods, the term on the left-hand side is the relative change in real GDI, i.e. the trading gains. This expression thus again shows how the trading gains can be decomposed into a terms-of-trade effect and a real-exchange-rate effect.

If one had econometric estimates of the η_{ij}'s it would be a simpler matter to identify the winners and/or losers of the trading gains and losses. Unfortunately, such estimates are not widely available, but they can be found nonetheless for a handful of countries. We show in Table 5 values for the United States, Canada, Switzerland, and Australia. Although these are rather old estimates, we use them for illustrative purposes.

We report in Table 6 estimates of the terms-of-trade and real-exchange-rate elasticities implied by (14) and (15). We can see that the distributional effects of terms-of-trade changes appear to vary greatly between the four countries. In Australia, the favourable terms-of-trade

[15] This results directly from the constant-returns-to-scale property of the GDP function and the symmetry of its Hessian (Young's Theorem) ; see Kohli (1991).

effect has benefited almost exclusively capital, whereas in Canada, labour has been the great winner, and capital owners have actually been hurt. In Switzerland, both factors have benefited from the terms-of-trade improvements, although capital was favoured, pocketing about half the gains in absolute terms. In the United States, like in Canada, terms-of-trade improvements tend to favour labour and marginally hurt capital, but, since in the U.S. case the terms-of-trade effect was negative, it is labour that suffered the resulting loss.

We can also see that in Canada, Switzerland and the United States a real depreciation of the currency (an increase in ε) benefits capital, but hurts labour. An appreciation leads to the opposite outcome. This effect is largest for Switzerland, who is also one of the countries in our sample who has experienced the largest real appreciation of its currency. No wonder, therefore, that whenever the Swiss franc appreciates, the loudest complains always come from business circles. Estimates are not available for Australia, for exports were aggregated with domestic output in the underlying model, so that only the terms-of-trade elasticity can be identified.

We do not have any trade elasticity estimates for individual European Union (EU) countries, but Sfreddo (2001) has reported some for the EU-15. Considering that all large EU-15 countries except the United Kingdom have experienced a negative term-of-trade effect,[16] and that all four of them have seen their currency appreciate in real terms, it seems admissible to apply the EU-15 wide elasticity estimates to come to some preliminary conclusions. Thus, it appears from the estimates of Table 6 that, even though terms-of-trade improvements benefit both factors of production (the same as in Switzerland), they strongly favour capital. Given that the terms of trade have mostly worsened over the sample period, EU-15 capital has thus been penalized more than labour. The real appreciation of the currency has benefited labour and hurt capital even further. Given that most of the countries tended to have small trade surpluses, the losses to capital dominated the gains to labour as indicated by the overall negative real-exchange-rate effects.

According to the estimates of Table 6, about 109.9% of Australia's trading gains (which, according to Table 3, reached USD 171 billions in 2012) go to capital. Thus, the gain to capital would have been about USD 188 billions. Given that a large share of Australia's capital is foreign owned, much of that, perhaps half, while belonging to its real gross domestic income (GDI), is not part of its gross *national* income (GNI). This amount, perhaps close to

[16] This is true for Germany, France and Italy; the terms-of-trade effect was positive, but close to zero for the United Kingdom.

USD 100 billions, would be a gain for Australia's creditors. It is beyond the scope of this paper to try to identify the lucky winners.

6. Concluding Comments

The estimates reported in this paper are very tentative, particularly the ones of Section 5. It must also be emphasized that this paper deals with trading gains, rather than with the gains from trade in the absolute. The gains from trade for all participating nations must be huge, but it is next to impossible to estimate them since one would first have to come up with a model of national economies under autarky. Nonetheless, it is important to recognize that the gains from trade vary through time. They probably tend to increase with the size of the world economy. Nonetheless, they might fall at times. The gains from trade are likely to be influenced by changes in factor endowments, in technology, and also by changes in the terms of trade and the real exchange rate. The focus of this paper was on the last two effects, together making up the trading gains.

Our sample of 26 countries is necessarily incomplete. We focused on OECD members, more precisely the ones for whom data are available for the entire 1970-2012 period. It is well possible that there are many other significant winners and losers among emerging-market nations. Indeed, the fact that, according to the estimates in Tables 3 and 4, there appears to be more losers than winners in our sample suggests that there are still some big winners out there. While free trade is definitely not a zero-sum game – it is Pareto improving –, the trading gains are.

Even if incomplete, our results have uncovered huge gains and losses, sometimes multiples of annual GDP. This shows the importance of trading gains, and it demonstrates that the difference between GDP and GDI is not trivial and deserves to be better emphasized.

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Table 1
Trading Gains, 1970-2012

	1970-2012	1970-1980	1980-1990	1990-2000	2000-2012
Australia	**1.1086**	0.9907	1.0021	1.0009	1.1157
Norway	**1.0935**	0.9701	0.9059	1.1063	1.1247
Switzerland	**1.0697**	0.9987	1.0452	1.0123	1.0124
Canada	**1.0640**	1.0254	0.9839	1.0053	1.0491
Portugal	**1.0600**	0.9515	1.0458	1.0523	1.0123
New Zealand	**1.0596**	0.9685	1.0490	1.0020	1.0408
Denmark	**1.0566**	0.9904	1.0282	1.0109	1.0265
Greece	**1.0459**	0.9622	1.0527	1.0330	0.9997
Spain	**1.0422**	0.9783	1.0523	1.0057	1.0066
Mexico	**1.0170**	1.0401	0.9447	1.0118	1.0229
United Kingdom	**1.0015**	0.9893	1.0085	1.0110	0.9928
Germany	**0.9894**	0.9775	1.0233	1.0023	0.9868
Luxembourg	**0.9871**	0.8874	0.9628	0.9949	1.1613
United States	**0.9707**	0.9658	1.0078	1.0059	0.9914
France	**0.9663**	0.9701	1.0118	0.9935	0.9909
Netherlands	**0.9564**	0.9661	0.9924	1.0018	0.9957
Italy	**0.9503**	0.9442	1.0411	0.9841	0.9823
Belgium	**0.9472**	0.9626	1.0215	0.9886	0.9744
Iceland	**0.9399**	1.0189	0.9998	1.0087	0.9147
Turkey	**0.9396**	0.9934	0.9893	0.9857	0.9699
Austria	**0.9303**	0.9769	1.0002	0.9820	0.9695
Finland	**0.8985**	0.9693	1.0224	0.9732	0.9317
Sweden	**0.8961**	0.9583	1.0007	0.9669	0.9665
Japan	**0.8768**	0.9261	1.0081	0.9911	0.9475
Ireland	**0.8369**	0.9318	1.0141	0.9433	0.9389
Korea	**0.8233**	0.9465	1.0613	0.9126	0.8980

Table 2
Trading-Gains Decomposition, 1970-2012

	$G_{T,t,t-1}$	$G_{E,t,t-1}$	$G_{t,t-1}$
Australia	1.1022	1.0058	**1.1086**
Norway	1.0835	1.0092	**1.0935**
Switzerland	1.0865	0.9846	**1.0697**
Canada	1.0729	0.9917	**1.0640**
Portugal	1.0443	1.0151	**1.0600**
New Zealand	1.0689	0.9913	**1.0596**
Denmark	1.0592	0.9975	**1.0566**
Greece	1.0019	1.0440	**1.0459**
Spain	1.0395	1.0026	**1.0422**
Mexico	1.0132	1.0038	**1.0170**
United Kingdom	1.0058	0.9957	**1.0015**
Germany	0.9925	0.9969	**0.9894**
Luxembourg	0.9507	1.0383	**0.9871**
United States	0.9672	1.0035	**0.9707**
France	0.9700	0.9962	**0.9663**
Netherlands	0.9742	0.9817	**0.9564**
Italy	0.9583	0.9916	**0.9503**
Belgium	0.9606	0.9861	**0.9472**
Iceland	0.9472	0.9923	**0.9399**
Turkey	0.9520	0.9869	**0.9396**
Austria	0.9308	0.9995	**0.9303**
Finland	0.9131	0.9840	**0.8985**
Sweden	0.9086	0.9863	**0.8961**
Japan	0.8987	0.9757	**0.8768**
Ireland	0.8614	0.9716	**0.8369**
Korea	0.8363	0.9845	**0.8233**

Table 3
2012 Trading Gains in Absolute and Relative Terms

	USD billions	% GDP
Australia	**171.0**	10.86%
Canada	**116.6**	6.40%
Spain	**55.8**	4.22%
Norway	**46.8**	9.35%
Switzerland	**44.0**	6.97%
Mexico	**20.2**	1.70%
Denmark	**17.8**	5.66%
Portugal	**12.7**	6.00%
Greece	**11.4**	4.59%
New Zealand	**10.2**	5.96%
United Kingdom	**3.6**	0.15%
Luxembourg	**-0.7**	-1.29%
Iceland	**-0.8**	-6.01%
Finland	**-25.1**	-10.15%
Belgium	**-25.5**	-5.28%
Austria	**-27.5**	-6.97%
Netherlands	**-33.6**	-4.36%
Ireland	**-34.4**	-16.31%
Germany	**-36.4**	-1.06%
Turkey	**-47.8**	-6.04%
Sweden	**-54.5**	-10.39%
France	**-88.0**	-3.37%
Italy	**-100.2**	-4.97%
Korea	**-199.7**	-17.67%
United States	**-476.7**	-2.93%
Japan	**-731.3**	-12.32%

Table 4
Cumulated Trading Gains , 1970-2012

	USD billions	**% 2012 GDP**
Switzerland	1'062.2	**168.16%**
Greece	237.5	**95.59%**
Spain	1'196.9	**90.47%**
Portugal	175.7	**82.80%**
Denmark	243.2	**77.12%**
New Zealand	114.8	**67.00%**
Canada	1'187.2	**65.16%**
Australia	969.5	**61.57%**
Iceland	6.8	**50.09%**
Mexico	11.1	**0.94%**
United Kingdom	-99.9	**-4.04%**
Germany	-160.6	**-4.69%**
Turkey	-431.8	**-54.62%**
United States	-11'284.4	**-69.47%**
France	-2'181.1	**-83.50%**
Belgium	-462.6	**-95.75%**
Austria	-421.9	**-106.92%**
Netherlands	-861.0	**-111.77%**
Norway	-566.4	**-113.22%**
Finland	-308.5	**-124.79%**
Italy	-2'702.7	**-134.19%**
Korea	-1'935.6	**-171.26%**
Sweden	-1'059.4	**-202.01%**
Ireland	-535.6	**-254.18%**
Luxembourg	-141.4	**-256.34%**
Japan	-16'692.4	**-281.16%**

Table 5
Stolper-Samuelson Elasticities for Selected Regions

	year	η_{LX}	η_{LM}	η_{KX}	η_{KM}
Australia[a)]	1974/75	-0.049	0.049	0.546	-0.546
Canada[b)]	1972	0.422	-0.505	-0.272	0.499
Switzerland[c)]	1988	0.289	-0.409	0.858	-0.563
United States[d)]	1987	0.152	-0.247	-0.016	0.035
EU (15)[e]	1997	-0.011	-0.098	0.431	-0.241

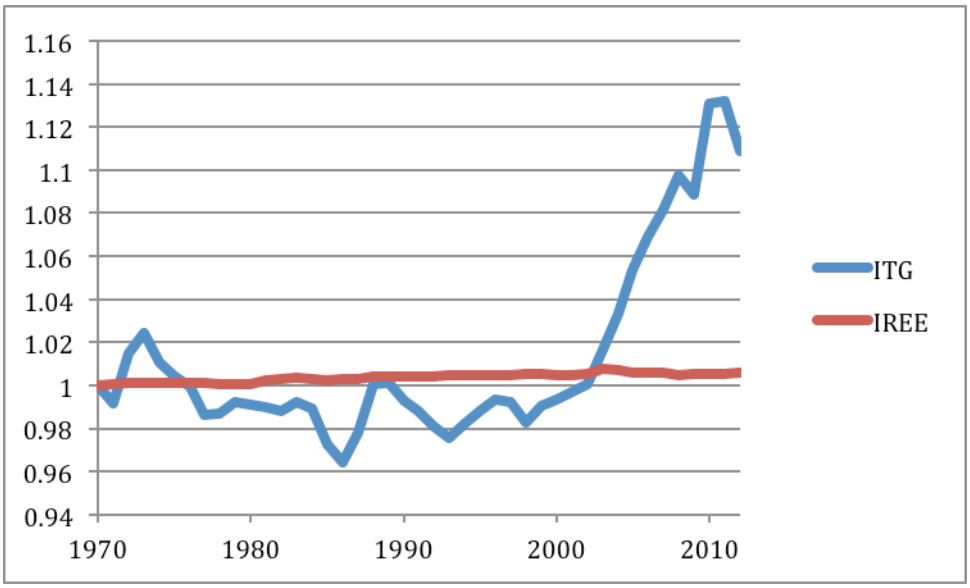
Sources: a) Kohli (1983), Table 5, Model 1(i); b) Kohli (1978), Table 4, Model 2R; c) Kohli (1993) Table 2; d) Kohli (1991), Table 12.2; e) Sfreddo (2001), Table 2.7.

Table 6
Trading Gains and Income Distribution

	$\partial \ln w_L / \partial \ln \tau$	$\partial \ln w_L / \partial \ln \varepsilon$	$\partial \ln w_K / \partial \ln \tau$	$\partial \ln w_K / \partial \ln \varepsilon$
Australia	-0.049	0	0.546	0
Canada	0.464	-0.083	-0.386	0.227
Switzerland	0.349	-0.120	0.711	0.295
United States	0.200	-0.095	-0.026	0.019
EU (15)	0.044	-0.109	0.336	0.190

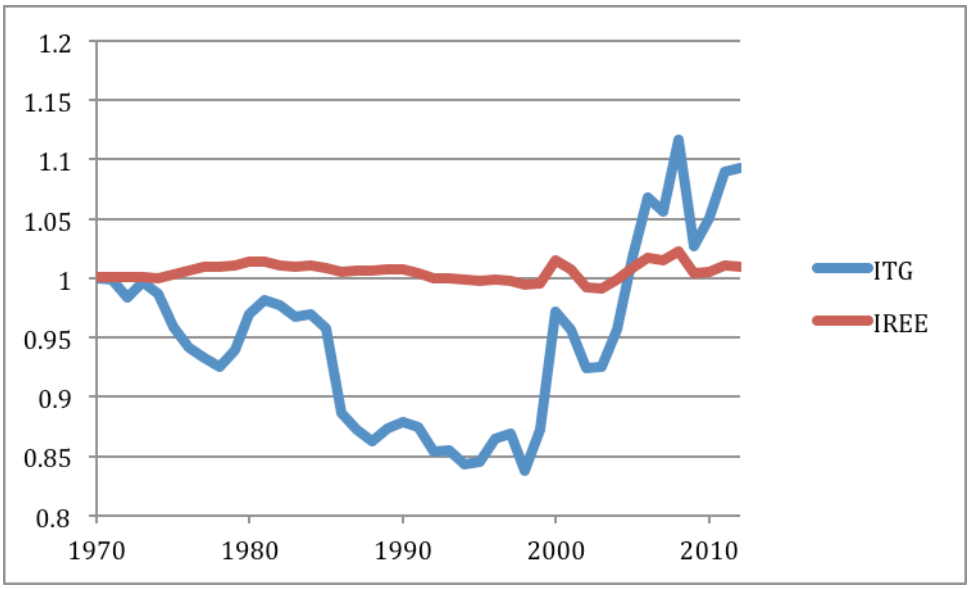
Source: Table 5.

Figure 1
Trading Gains and Real Exchange Rate Effect
Australia, 1970-2012



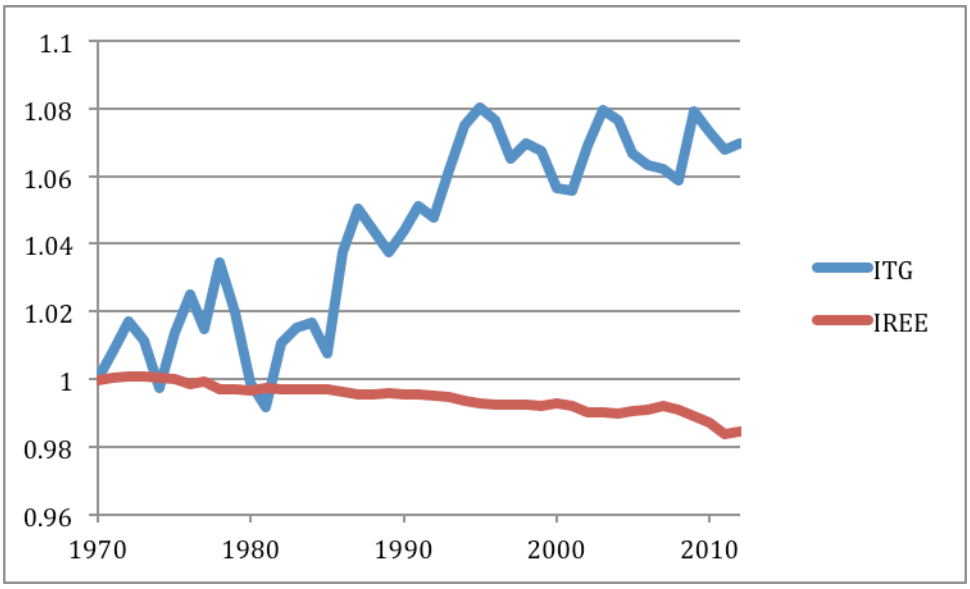
Australia

Figure 2
Trading Gains and Real Exchange Rate Effect
Norway, 1970-2012



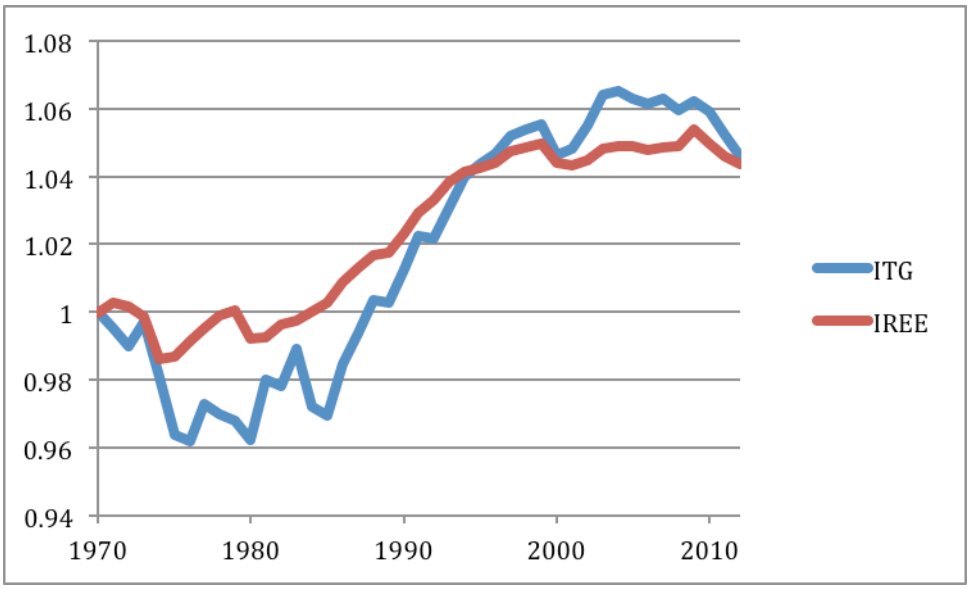
Norway

Figure 3
Trading Gains and Real Exchange Rate Effect
Switzerland, 1970-2012



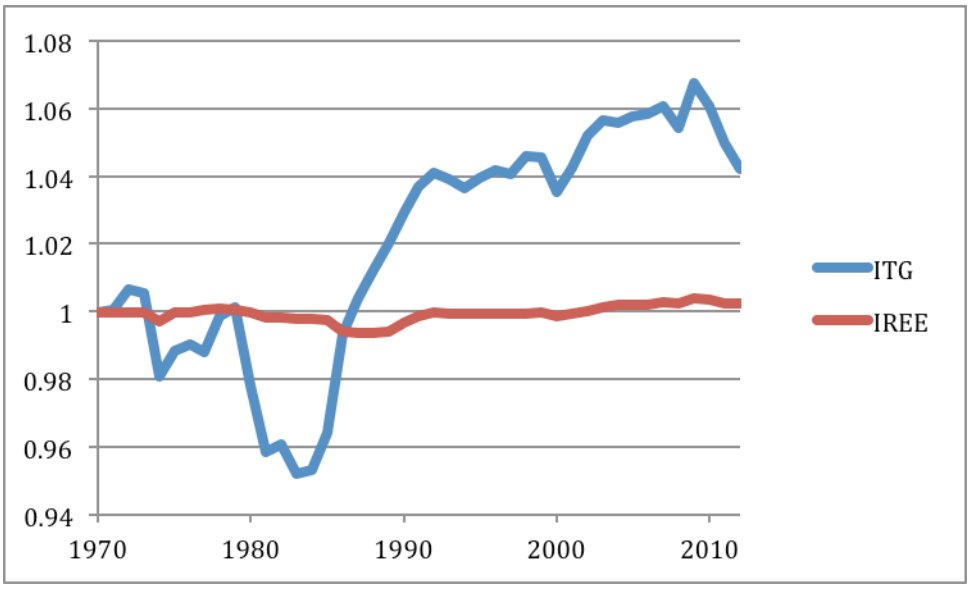
Switzerland

Figure 4
Trading Gains and Real Exchange Rate Effect
Greece, 1970-2012



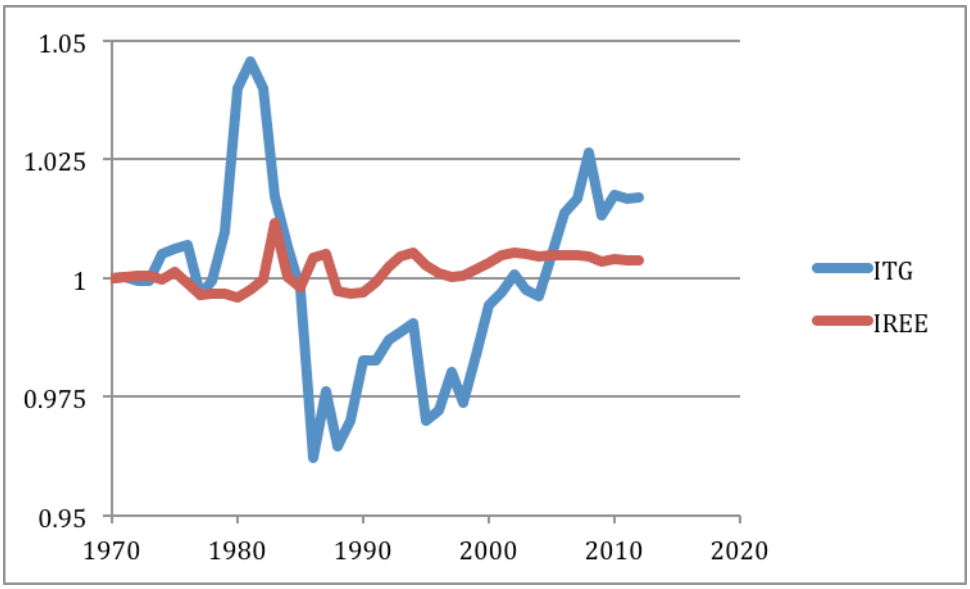
Greece

Figure 5
Trading Gains and Real Exchange Rate Effect
Spain, 1970-2012



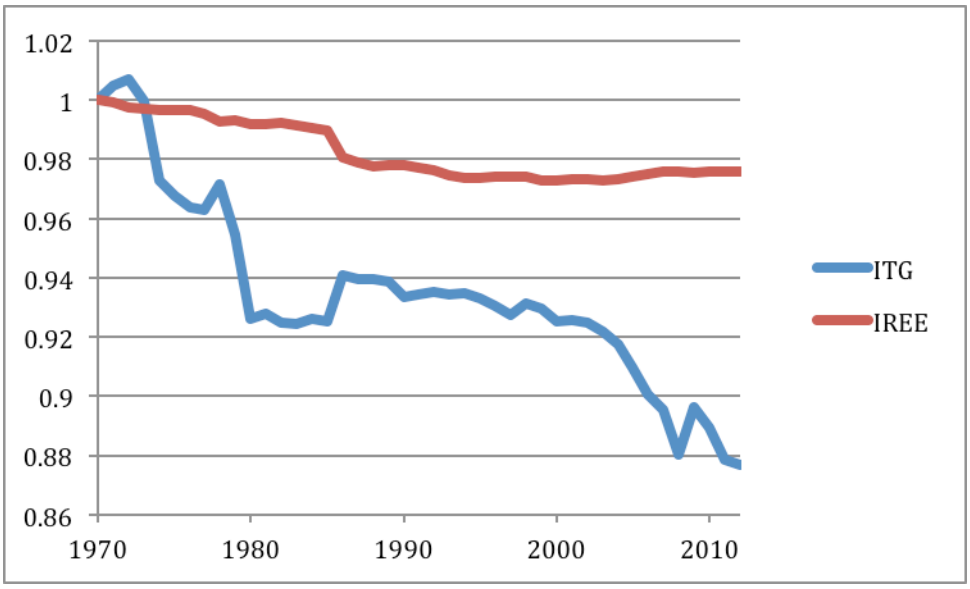
Spain

Figure 6
Trading Gains and Real Exchange Rate Effect
Mexico, 1970-2012



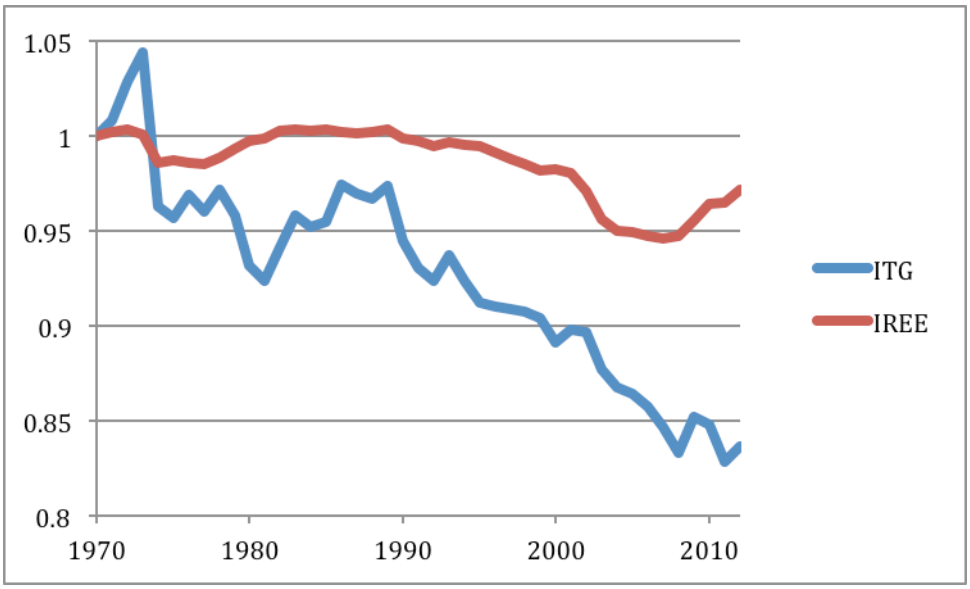
Mexico

Figure 7
Trading Gains and Real Exchange Rate Effect
Japan, 1970-2012



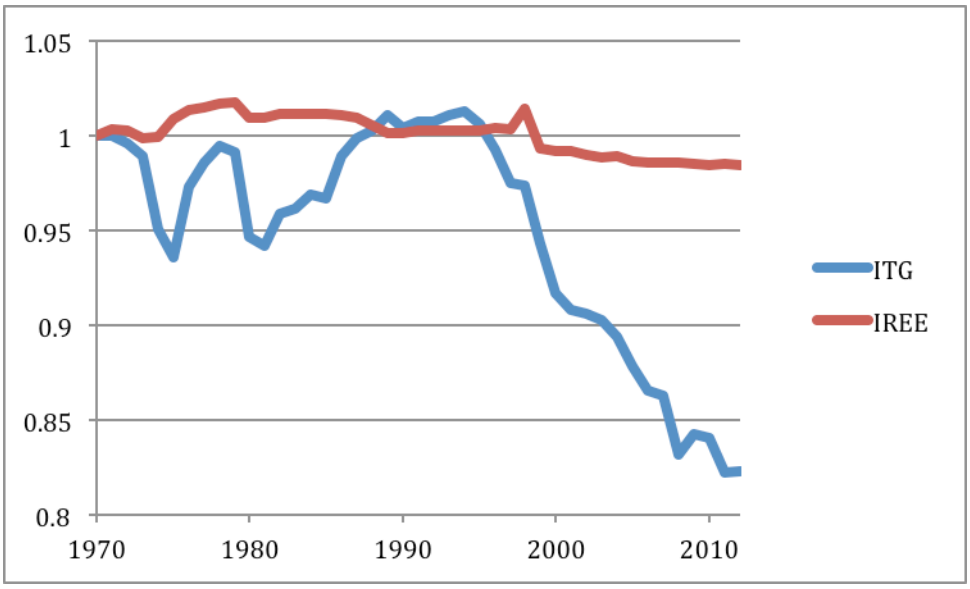
Japan

Figure 8
Trading Gains and Real Exchange Rate Effect
Ireland, 1970-2012



Ireland

Figure 9
Trading Gains and Real Exchange Rate Effect
Korea, 1970-2012



Korea