

Who Gains Most from Trade?

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Who gains most from trade?

- 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, and the benefits might change over time
- This is all the more so that the terms of trade and real exchange rates vary over time, benefiting some nations and hurting others

Terms-of-trade changes

- 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
- This phenomenon is similar to a technological progress
- 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)

Real-exchange-rate changes

- 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

Trading gains

- The terms-of-trade effect and the real-exchange-rate effect together form what is known as the trading gains
- 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 GDP function approach to the determination of imports and exports

- Traded goods are viewed as middle products, with imports as an input to the technology and exports as an output
- Imports are not ready to meet final demand
- They must still be combined with domestic labour and capital services; a significant proportion of their final price tag is therefore accounted for by domestic value added
- Similarly, exports must still undergo a number of changes in the foreign country; they are therefore conceptually different from products intended for the home market
- These can therefore be treated as nontraded goods

Definitions

1. GDP

2. ...

3. ...

4. ...

Definitions continued

Q is the implicit Törnqvist index of real GDP:

$$Q_{t,t-1} \equiv \frac{V_{t,t-1}}{P_{Y,t,t-1}}$$

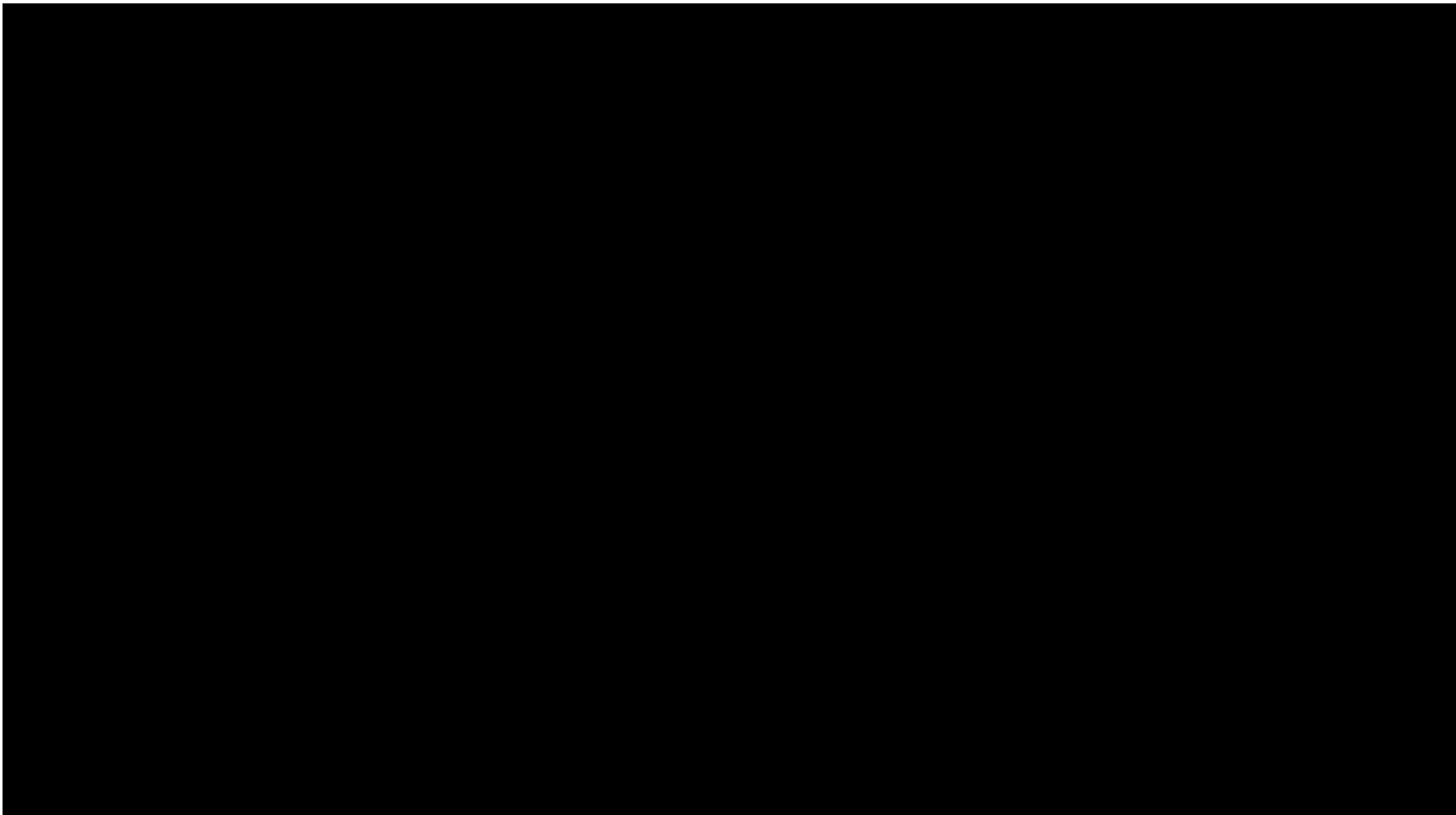
(2)

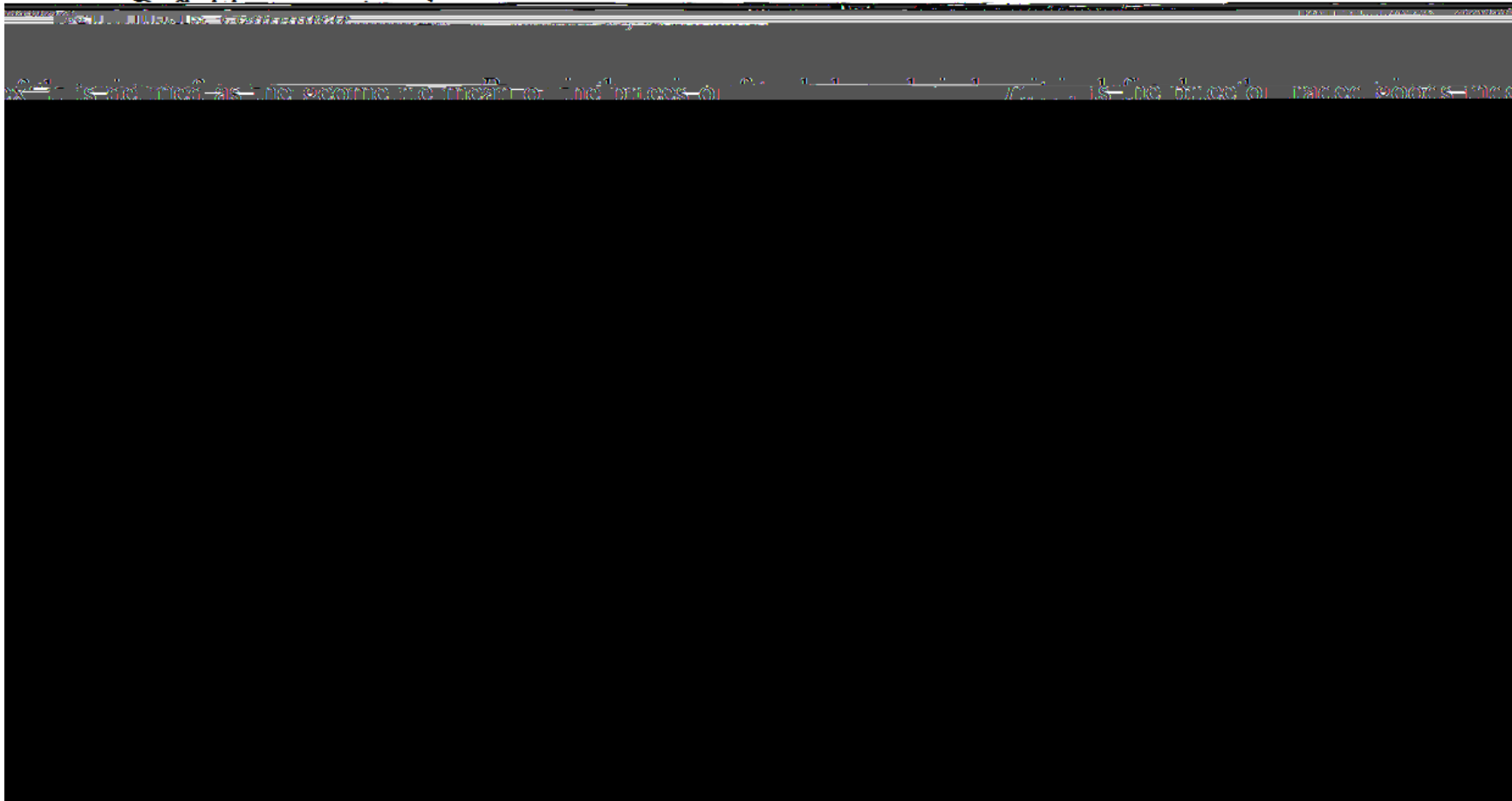
where $V_{t,t-1} = \sum_{i=1}^n \frac{1}{2} (q_{i,t} + q_{i,t-1}) (y_{i,t} - y_{i,t-1})$ (GDP)

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

(2) (1) $G_{t,t-1} = \frac{V_{t,t-1}}{P_{N,t,t-1}}$

G is the trading-gains index:





minimizing the free energy

Deriv

$$-\ln P_{N_t, t=1} \qquad \ln G_{t-1} = \ln P_{Y_t}$$

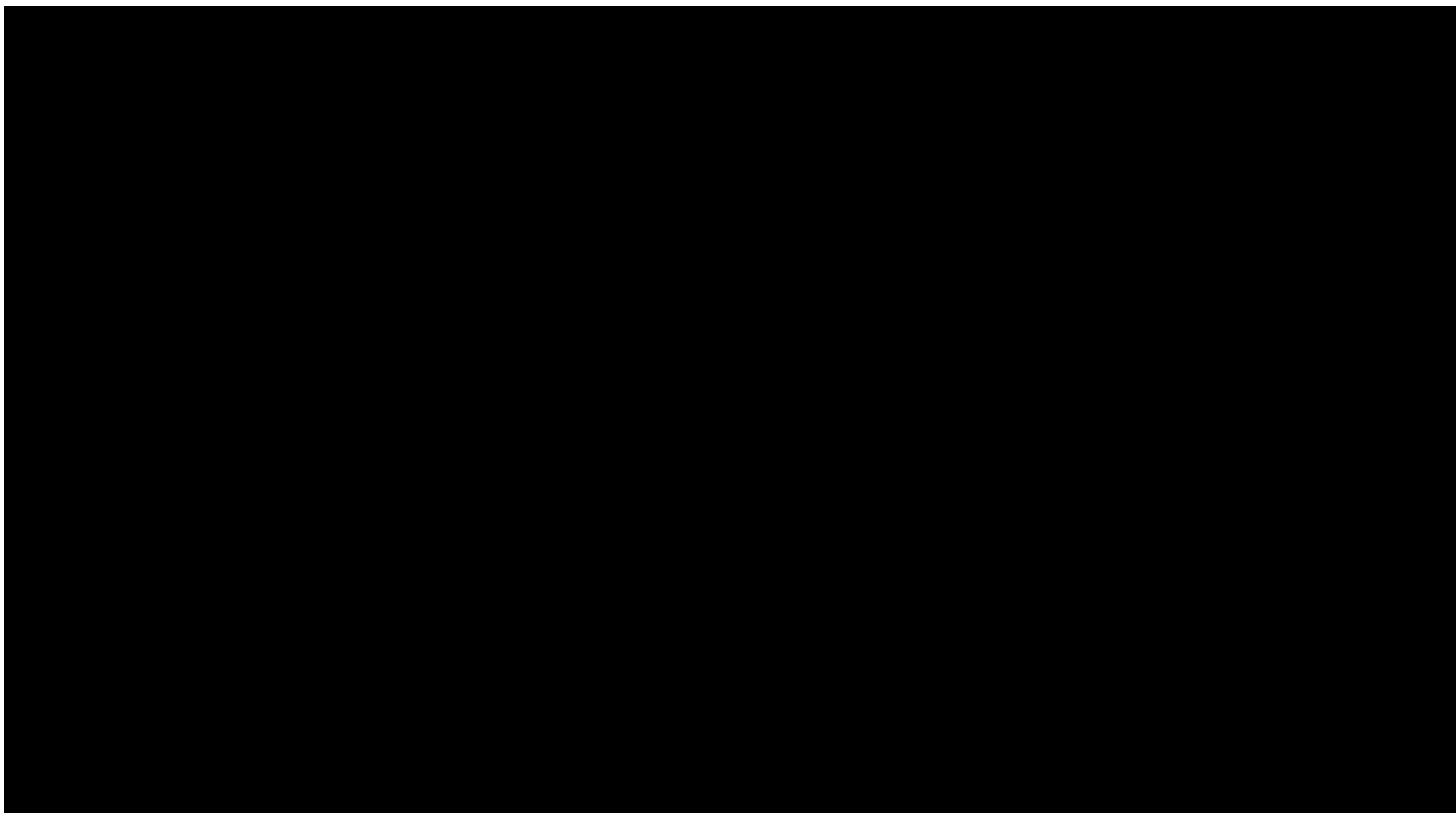
$$\ln P_{X_t, Y_t, M_t, t=1} + s_{X_t, t=1} \ln P_{X_t, t=1} - s_{M_t, t=1} \ln P_{M_t, t=1} - \ln P_{N_t, t=1} \qquad = s_{N_t, t=1}$$

$$+ s_{X_t, t=1} \ln P_{X_t, t=1} + s_{M_t, t=1} \ln P_{M_t, t=1} - s_{N_t, t=1} \ln P_{N_t, t=1} - \ln P_{N_t, t=1} \qquad = (1 - s_{X_t, t=1} - s_{M_t, t=1}) \ln P_{N_t, t=1}$$

$$= s_{X_t, t=1} \ln P_{X_t, t=1} + s_{M_t, t=1} \ln P_{M_t, t=1} - s_{N_t, t=1} \ln P_{N_t, t=1} - \ln P_{N_t, t=1}$$

$$= \frac{1}{2} \left(\frac{s_{X_t, t=1} \ln D_{X_t, t=1} + s_{M_t, t=1} \ln D_{M_t, t=1} - s_{N_t, t=1} \ln D_{N_t, t=1} - \ln D_{N_t, t=1}}{2} \right)$$

$$\ln P_{X_t, t=1} \qquad (s_{X_t, t=1} - s_{M_t, t=1}) \ln P_{N_t, t=1} + \ln P_{M_t, t=1}$$



Trading gains and losses

- The trading gains index over the 1970-2012 period is largest for Australia, Norway, and Switzerland
- ... and lowest for Korea, Ireland, and Japan
- The trading gains varied a great deal over time, however

Table 1
Trading Gains, 1970-2012

| | 1970-2012 | 1970-1980 | 1980-1990 | 1990-2000 | 2000-2012 |
|-------------|-----------|-----------|-----------|-----------|-----------|
| Australia | 0.0007 | 0.0020 | 0.0009 | 0.0057 | 0.0006 |
| Norway | 0.0020 | 0.0019 | 0.0063 | 0.0077 | 0.0055 |
| Switzerland | 1.0124 | | 1.0607 | 0.9987 | 1.0452 |
| Denmark | | | 0.0454 | 0.0020 | 1.0067 |
| Portugal | 1.0122 | | 1.0600 | 0.9515 | 1.0459 |

Table 1. continued

Trading Gains, 1970-2012

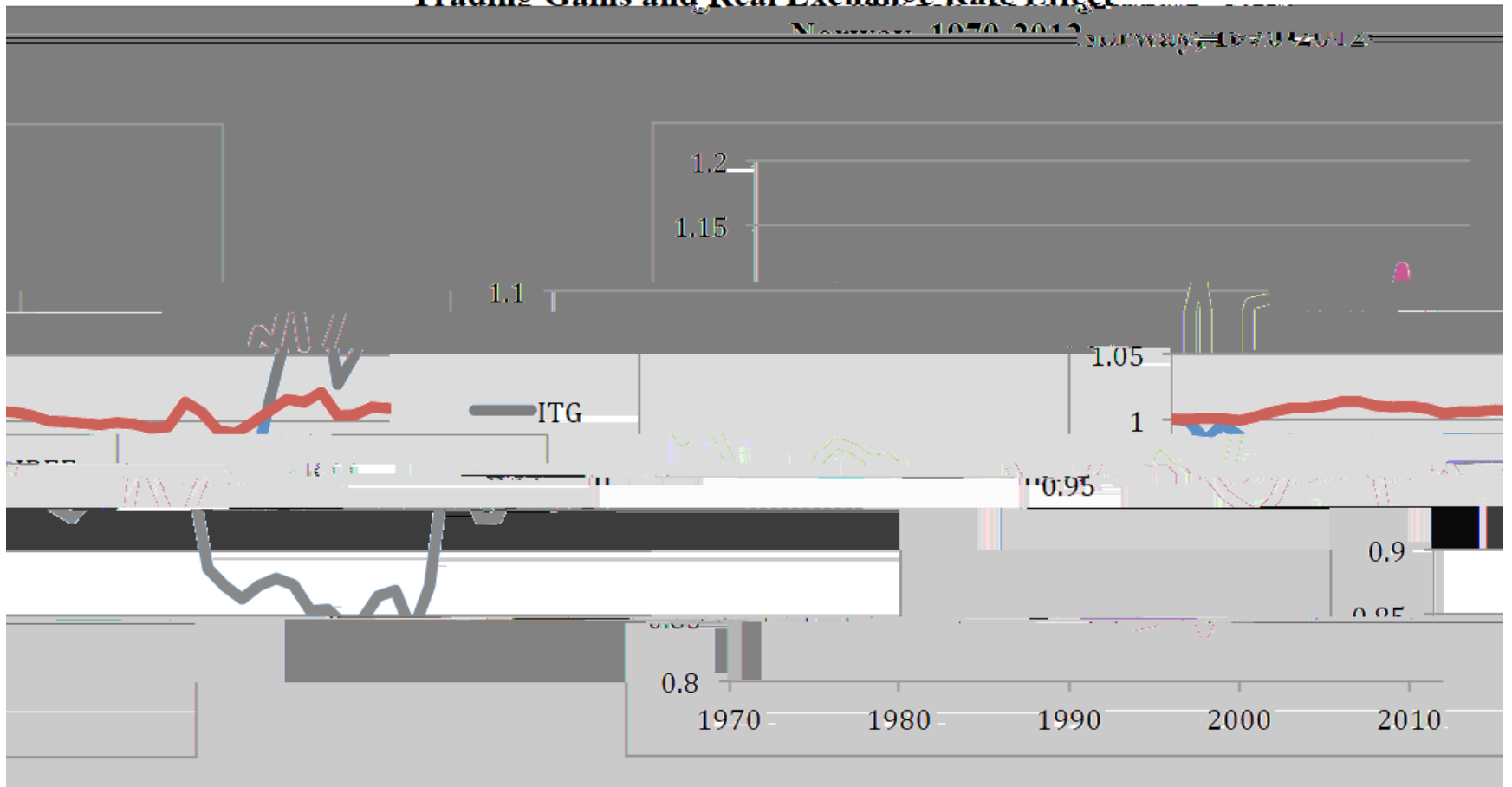
| | 1970-1979 | 1980-1989 | 1990-1999 | 2000-2009 | 2010-2012 |
|---------------|-----------|-----------|-----------|-----------|-----------|
| United States | 0.0757 | 1.0479 | 1.0050 | 0.9971 | 1.0000 |
| France | 0.0662 | 0.9791 | 1.0110 | 1.0035 | 0.9990 |
| Germany | 0.0757 | 0.9721 | 0.9721 | 0.9721 | 1.0000 |
| Italy | 0.9503 | 0.9417 | 1.0211 | 0.9811 | 0.9825 |
| Japan | 0.9472 | 0.9626 | 1.0215 | 0.9886 | 0.9714 |
| Iceland | 0.9399 | 1.0189 | 0.9998 | 1.0087 | 0.9147 |

Real-exchange-rate and terms-of-trade effects

- The real-exchange-rate effect is found to be

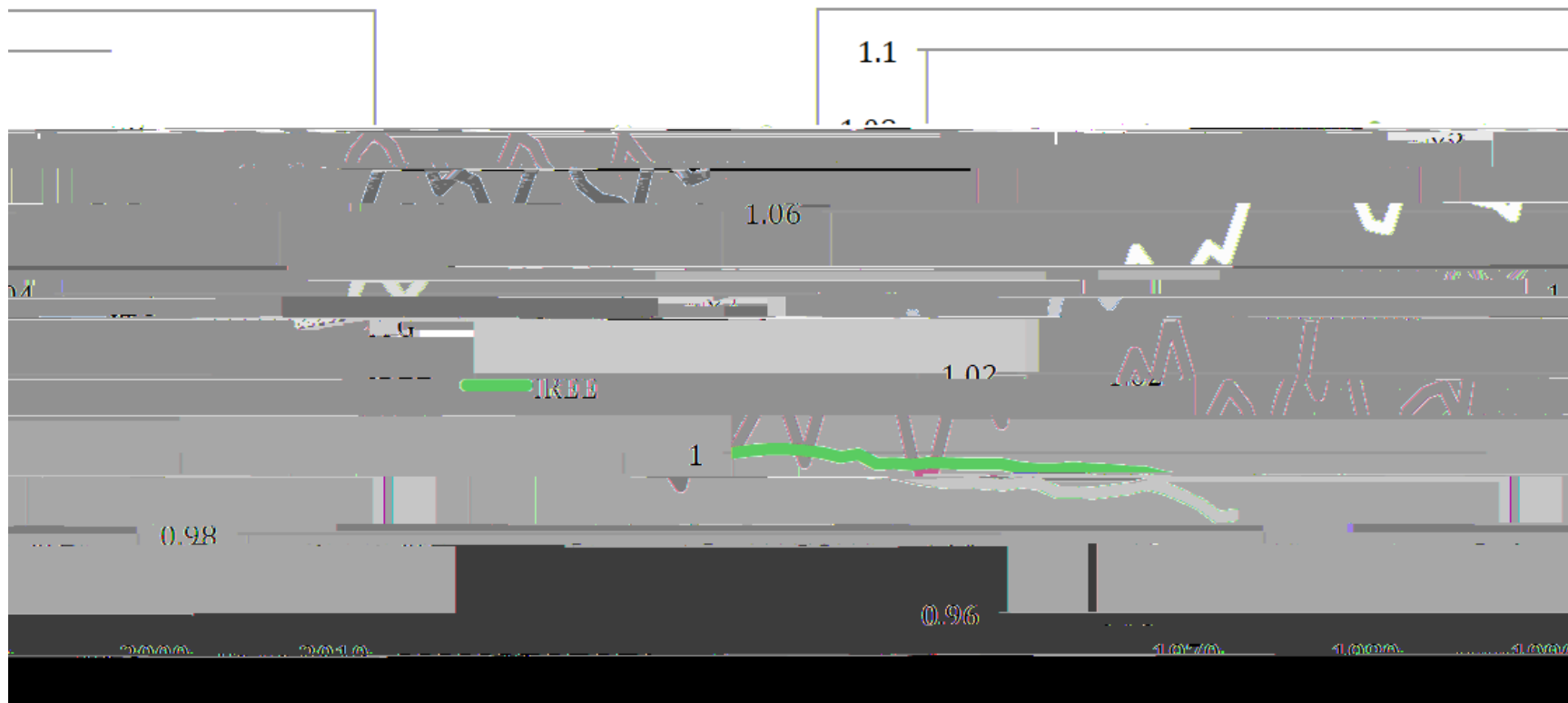
Trading Gains and Real Exchange Rate Effect

November 10, 2012 Sideways 10/70/2012

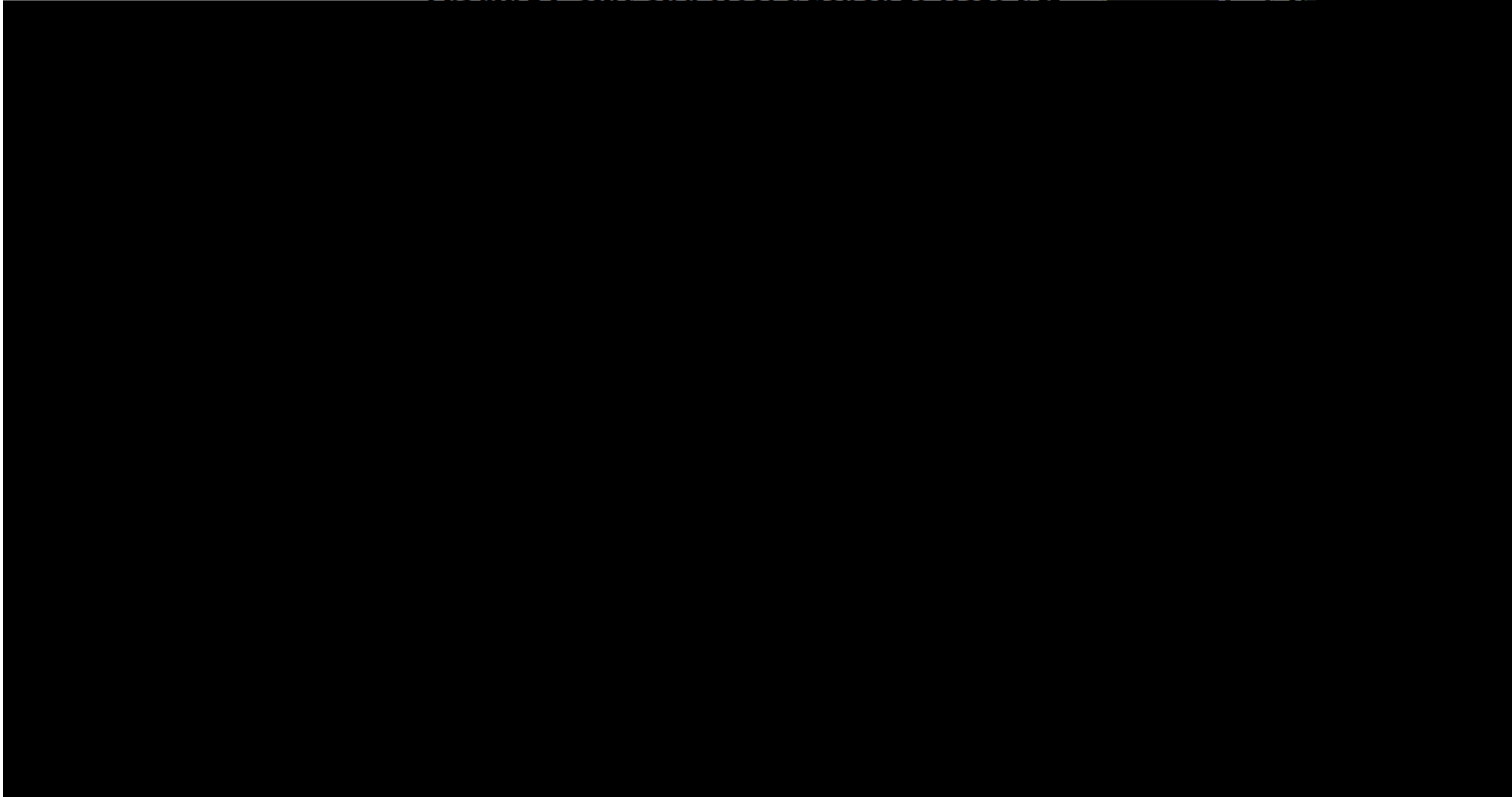


Trading Gains and Real Exchange Rate Effect

Chinn, 1997, 1999, 2001, 2004, 2005

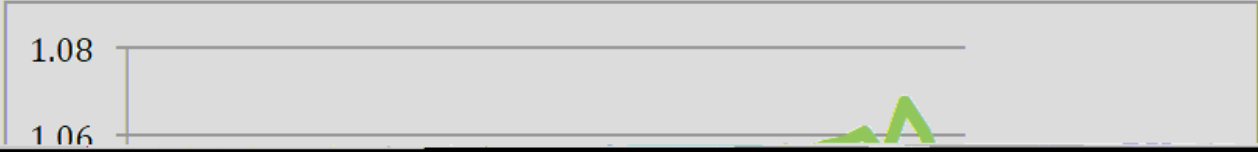


Trading Gains and Losses: Evidence, Policy, and Practice



Training Status Analysis - Ratings - Percentage

State: 9/10/2012



Trading Gains and Real Exchange Rate Effect

Mexico = 1970-2012

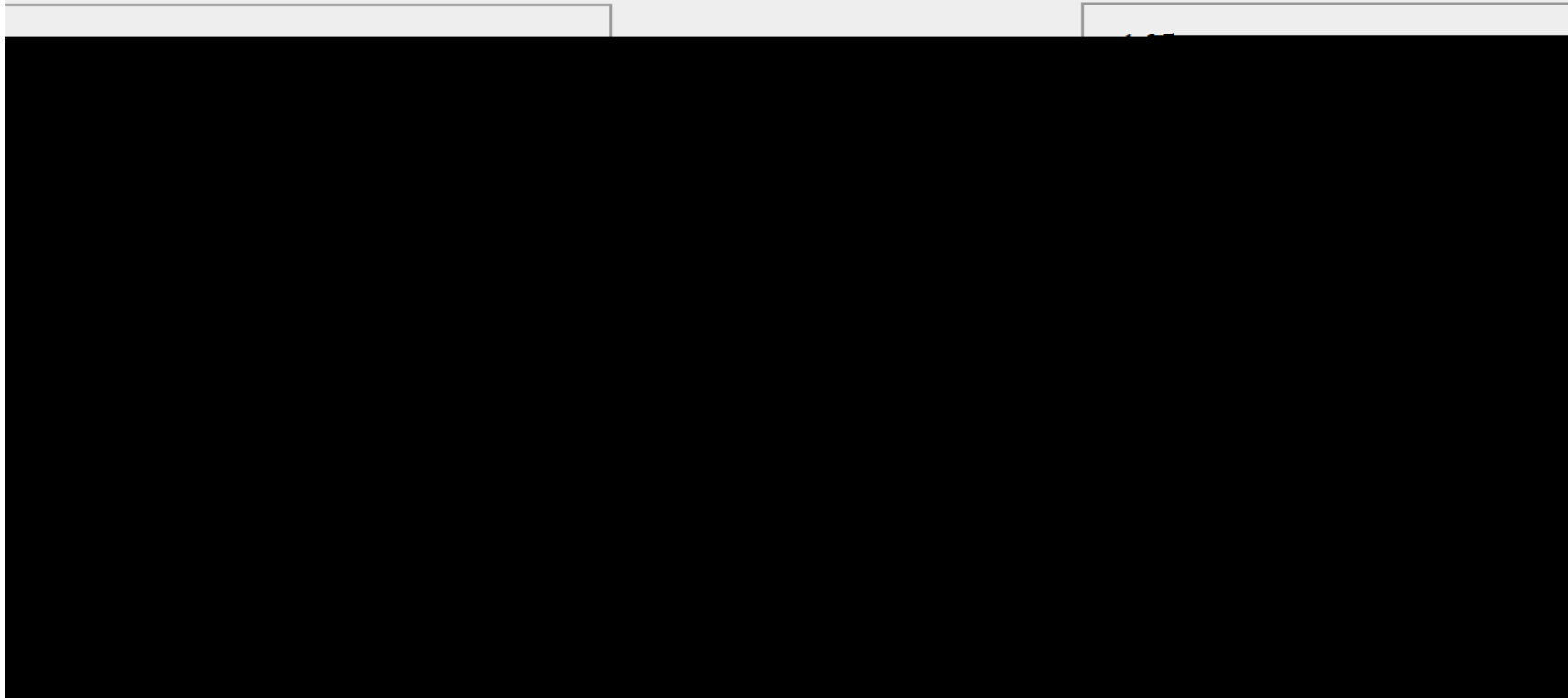


Figure 7

Trading Gains and Real Estate Returns in Japan, 1970-2012

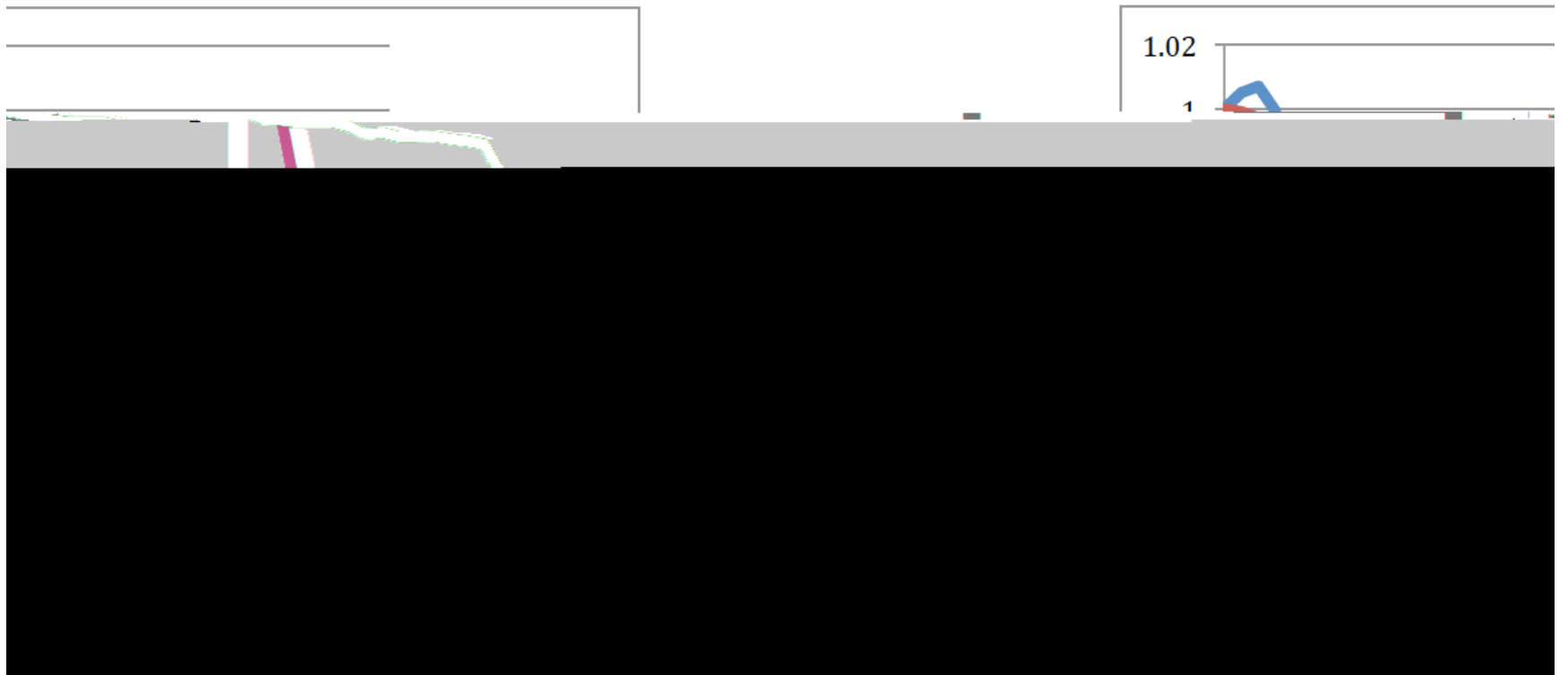


Figure 8

Trading Gains and Real Exchange Rate

1970-1979 2000-2010

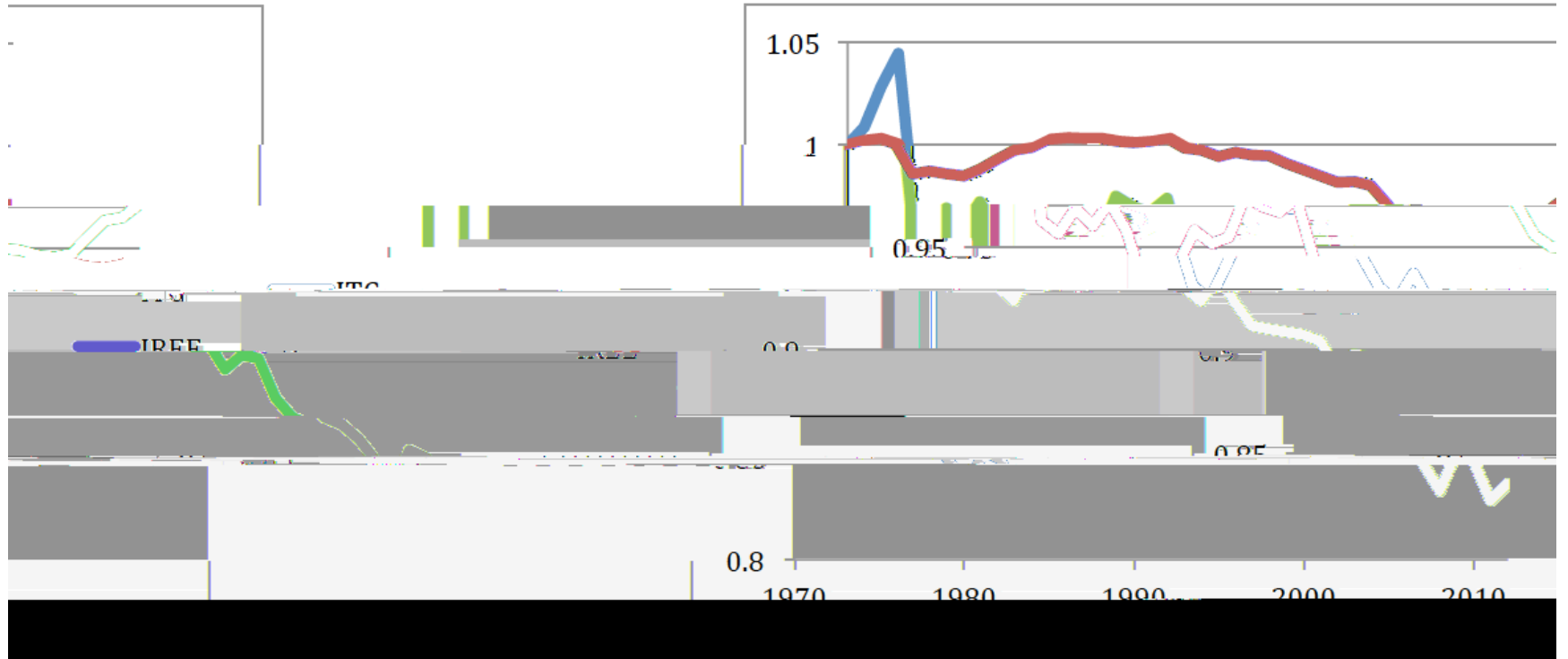
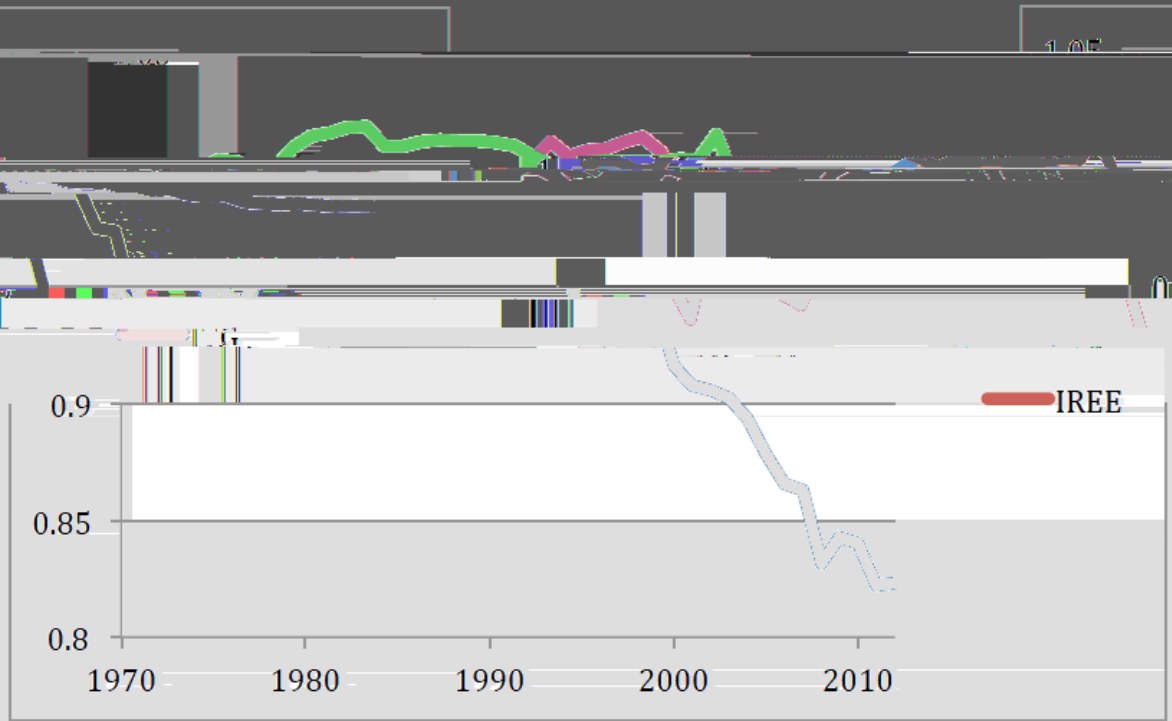


Figure 9

Leading-Gains and Real Exchange Rate Effect

Korea, 1970-2010



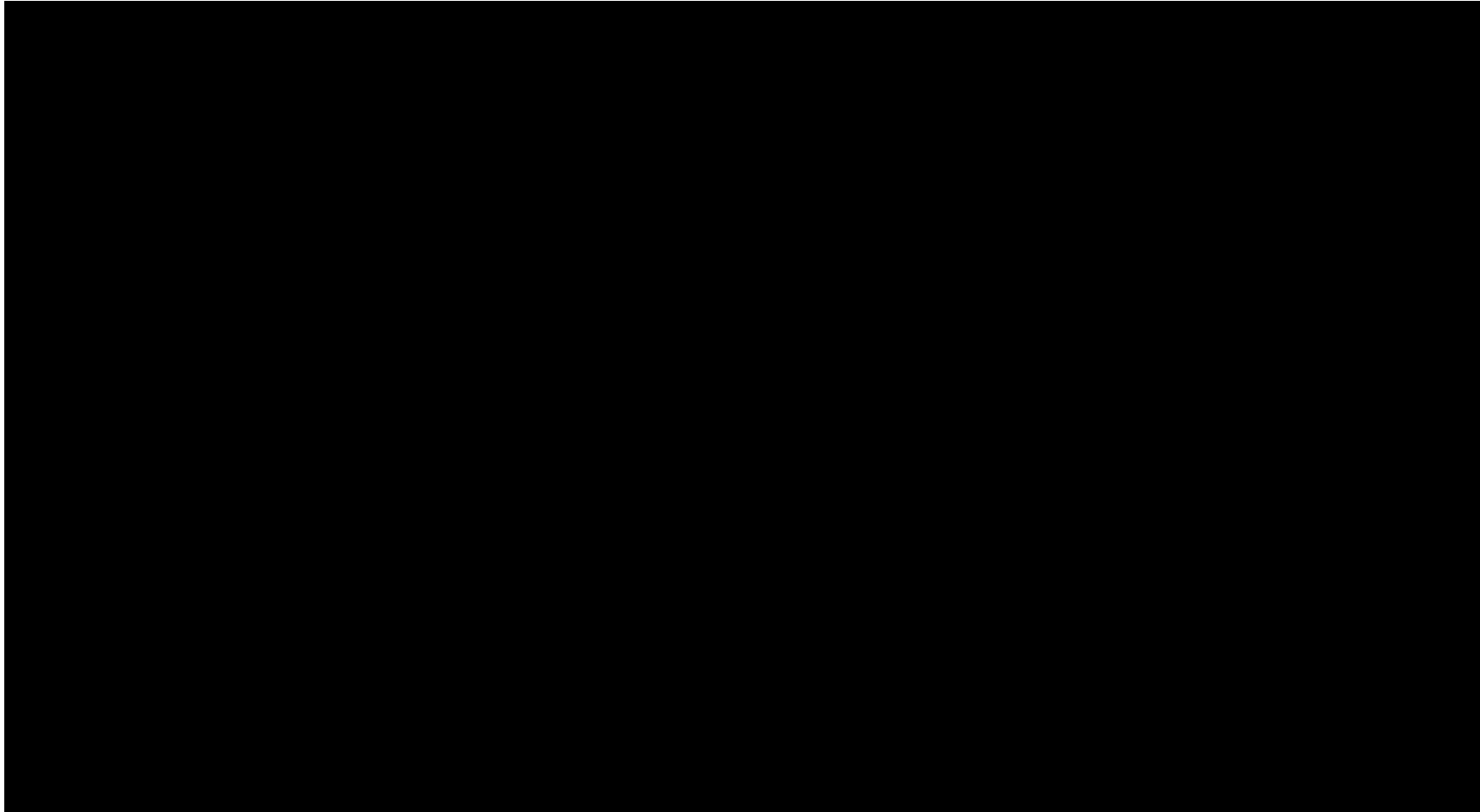


Table 7, continued
 The Dependent Variable: $\ln(Y_{i,t}) - \ln(Y_{i,t-1})$ The Dependent Variable: $\ln(Y_{i,t}) - \ln(Y_{i,t-1})$

| | $\ln(Y_{i,t-1})$ | $\ln(Y_{i,t-1})^2$ | $\ln(Y_{i,t-1})^3$ | $\ln(Y_{i,t-1})^4$ |
|---------------|------------------|--------------------|--------------------|--------------------|
| United States | 0.0670 | 0.0047 | 0.0007 | 0.0000 |
| France | 0.0700 | 0.0060 | 0.0010 | 0.0000 |
| Netherlands | 0.0712 | 0.0017 | 0.0001 | 0.0000 |
| Germany | 0.0583 | 0.0016 | 0.0003 | 0.0000 |
| Canada | 0.0592 | 0.0017 | 0.0001 | 0.0000 |
| India | 0.0306 | 0.0017 | 0.0003 | 0.0000 |
| China | 0.0470 | 0.0017 | 0.0003 | 0.0000 |
| Japan | 0.0470 | 0.0017 | 0.0003 | 0.0000 |
| South Korea | 0.0470 | 0.0017 | 0.0003 | 0.0000 |
| Turkey | 0.0520 | 0.0017 | 0.0003 | 0.0000 |

Absolute-value trading gains and losses

- In absolute terms, the 2012 trading gains amounted to USD 171 billion for Australia
- ... whereas Japan experienced a USD 731 billion loss !!!

2010 FDI in Canada by Country of Origin

| Country of Origin | USD billions | % GDP |
|-------------------|--------------|--------|
| Australia | 171.0 | 10.86% |
| Canada | 116.6 | 6.40% |
| USA | 4.00% | 0.25% |
| Other | 16.8 | 0.25% |
| New Zealand | 5.0 | |

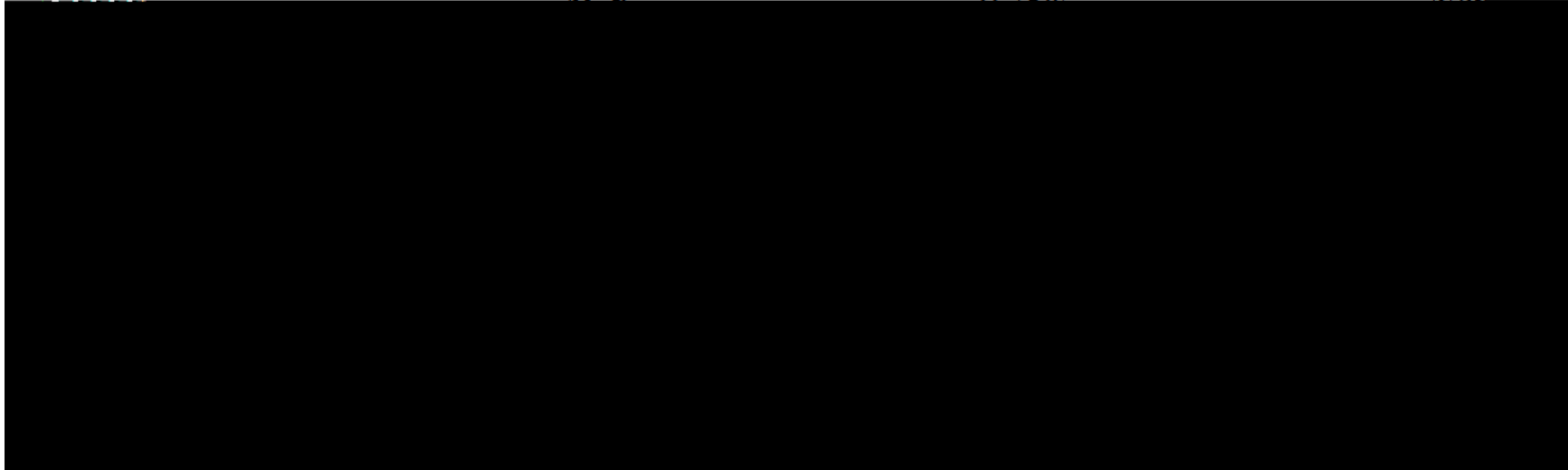


Table 3, continued
2012 Trading Gains in Absolute and Relative Terms



Cumulated trading gains and losses

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Table 4

Country's GDP in US Dollars, 1979-2010

Source: World Bank, *World Development Indicators*, <http://data.worldbank.org>. GDP is expressed in US Dollars. The data are in current prices. The data are in current prices. The data are in current prices.

| Country | GDP in US Dollars (1979-2010) | Percentage of US GDP (1979-2010) |
|---------|-------------------------------|----------------------------------|
| Greece | 237.5 | 95.59% |
| Canada | 111.076 | 43.74% |

Table 4, continued
 Cumulated Trading Gains, 1970-2012

| | Cumulated Trading Gains | % All-Share |
|----------------|-------------------------|-------------|
| United States | 111,784.4 | 69.41% |
| France | 21,011.1 | 13.50% |
| Belgium | 160.6 | 0.10% |
| Australia | | 0.00% |
| Netherlands | | -86.1% |
| Denmark | | 5.00% |
| Canada | | 1.70% |
| Sweden | | 202.01% |
| Italy | | 2.00% |
| Japan | | 171.00% |
| West Germany | | 11.50% |
| Switzerland | | 2.00% |
| Spain | | 1.00% |
| United Kingdom | | 1.00% |
| Other | | 1.00% |

Trading gains and income distribution

- In view of the large potential 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

capital, and then add up terms that

$$= s_X d \ln p_X - s_M d \ln p_M$$

negative for imports and positive for exports.

- For a given price of nontraded goods, the term on the left-

Table 5

Stakeholder Summary on Identification for Subtotal Division

| Stakeholder | Summary |
|-------------|---------|
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 13 | 13 |
| 14 | 14 |
| 15 | 15 |
| 16 | 16 |
| 17 | 17 |
| 18 | 18 |
| 19 | 19 |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23 |
| 24 | 24 |
| 25 | 25 |
| 26 | 26 |
| 27 | 27 |
| 28 | 28 |
| 29 | 29 |
| 30 | 30 |
| 31 | 31 |
| 32 | 32 |
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| 62 | 62 |
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| 67 | 67 |
| 68 | 68 |
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| 85 | 85 |
| 86 | 86 |
| 87 | 87 |
| 88 | 88 |
| 89 | 89 |
| 90 | 90 |
| 91 | 91 |
| 92 | 92 |
| 93 | 93 |
| 94 | 94 |
| 95 | 95 |
| 96 | 96 |
| 97 | 97 |
| 98 | 98 |
| 99 | 99 |
| 100 | 100 |

Distributional effects of terms-of-trade changes

- In Australia, the favourable terms-of-trade effect has benefited capital almost exclusively
- ... 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 favouerely

Distributional effects of real-exchange-rate changes

- In Canada, Switzerland and the United States a real depreciation of the currency 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
- 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

Estimates for the EU-15

- We have no elasticity estimates for individual EU countries, but some estimates are available for the EU-15
- These suggest that the worsening of the terms of trade that most large EU countries have experienced has hurt both factors, but capital more so 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

GDI vs. GNI

- About 109.9% of Australia's trading gains (which, according to Table 3, reached USD 171 billions in 2012) go to capital
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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

Concluding comments, continued

- 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, which together make up the trading gains
- Our sample of 26 countries is necessarily incomplete
- 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
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Thank you for your attention 4600 W