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Does International Trade Catch up with National Trade of Countries? Yes

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Abstract: The paper applies an index suggested by Jeffrey Frankel on how to measure the gap between the intensity of national versus international transactions of a country to more than 100 countries over four periods between 1990 and 2005. The gap stands for "incomplete" globalization. It is shown that the gap has steadily declined for most countries over the sample period irrespective of income levels. While larger economies are still less globalized than small economies, differences in domestic market size have become less important as a dividing line between more and less globalized economies.

Keywords: Globalization, Market Integration, International Trade

JEL classification: F 15

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I. **Introduction**

"We are still far from the day when we buy from across the globe as easily as across the country"[1]

It is widely accepted in both theoretical as well as empirical literature that national borders still matter so that people trade more with their country fellowmen than with foreigners. This holds even if geographical distance between traders is smaller in the latter than in the former case and even if countries trade under free trade agreements and share cultural proximities[2].

To give a benchmark what perfect international integration in terms of equally buying from abroad as from home sources could mean, Frankel suggests a "back on the envelope" calculation[3]. He relates the import (or export) share in a country's GDP to the share of the rest of the world's GDP (world GDP minus the respective country's GDP) in world GDP. If local residents were inclined to buy from (or sell to) foreigners as easily as from (to) domestic suppliers (customers), then foreign products would show the same share in a country's spending (or sales) as the spending (or sales) of citizens from the rest of the world. Then the import (export) share in a country's GDP would equal the share of the rest of world's GDP in world GDP.

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[1] Frankel (2006:3).

[2] Using a dynamic general equilibrium model, Berezin (2000) shows that despite very low trade barriers the presence of national borders can choke off a significant fraction of cross-border trade when firms experience start-up costs in establishing new markets. In studies on trade intensity on both sides of the Canadian-US border (being a low tariff border), intra-Canadian trade and intra-US trade was found more intensive than inter-Canadian-US trade even if the former had to bridge larger distances than the latter. This example has met much attention starting with studies by McCallum, Engel, Rogers, and Helliwell because the two countries share a free trade agreement, a common language, and other cultural proximities and thus approximate internal market conditions more than most other bilateral trade flows. Even taking these factors into account, domestic transactions were more intensive. Border effects also exist when America consumer use the US dollar as a mode of payment in Canadian border retail shops. This mode of payment is accepted, yet at a marked premium as shown by Pisani et al.
See: McCallum (1995), Helliwell and McCallum (1995), Engel (1996), Helliwell (1998), Berezin (2000), Pisani et al. (2008).

[3] See Frankel (2000).

In the following, this ratio is referred to as the Frankel-Index (FI) or degree of globalization. Except for very small open economies of the Singapore/Hong Kong type with their very high trade ratios and very low share in world GDP, the FI is mostly below unity[4].

To discuss the development of the FI over time, it is calculated for more than 100 countries over four years (1990,1995,2000,2005) from the import as well from the export side and is graphically described in detail by plotting it against the size of economies (section 2). It is intuitively plausible that the size of an economy relative to the rest of world influences the country's FI in that the index declines with the rising share of the economy in world GDP. But that might differ within country groups due to country specifics and over years due to factors which are invariant over countries. This is why in the second section the FI is portrayed by income groups of countries and over years.

The third section discusses the importance of two possible determinants of openness, that is primary commodity specialization and transport costs. The fourth section concludes on the results.

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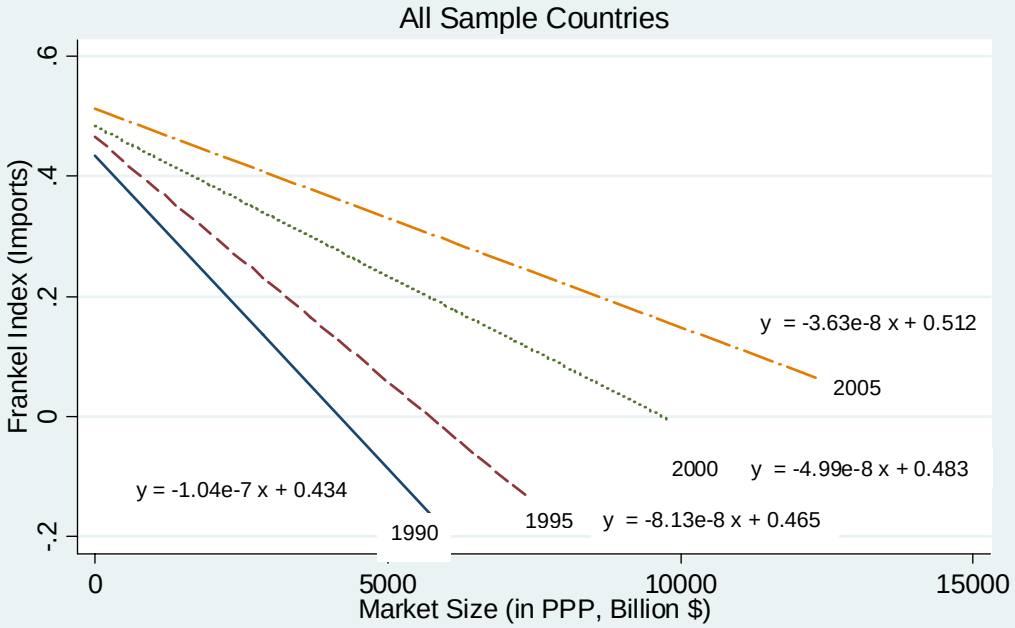
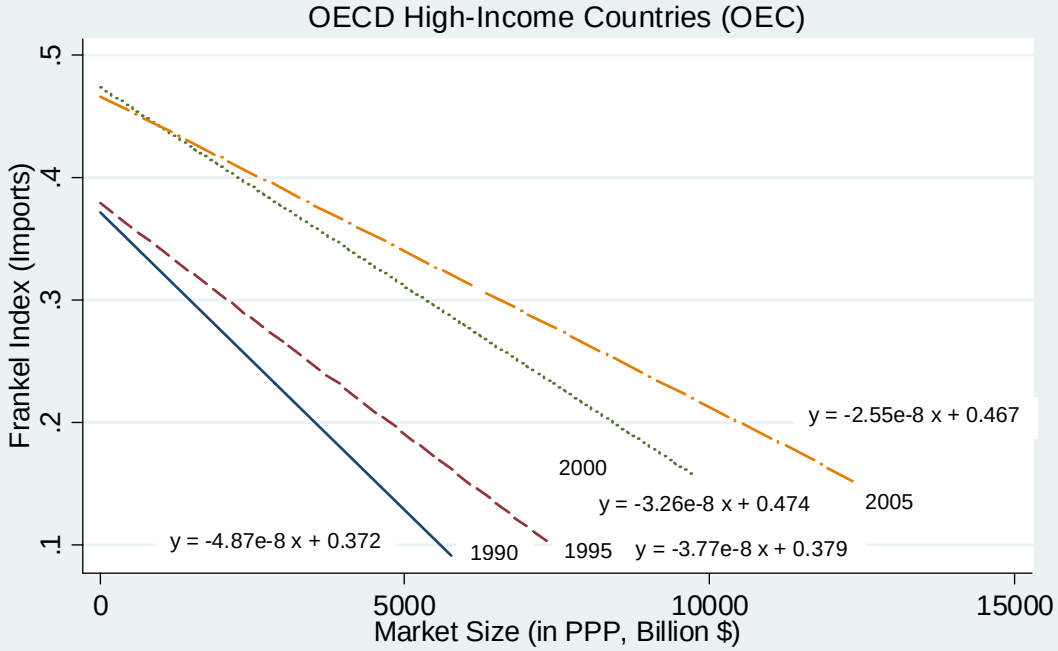
[4] Frankel (ibid: footnote 6) rightly points to the fact that the two city economies export and import more than 100% or their GDP due to the fact that the nominator is a measure of gross sales while the denominator is a value-added measure. For that reason, trade of a country relative to its GDP would have to be much higher than suggested by the FI before one could speak of complete globalization.

Figure 1: Degree of Globalisation and Market Size 1990-2005



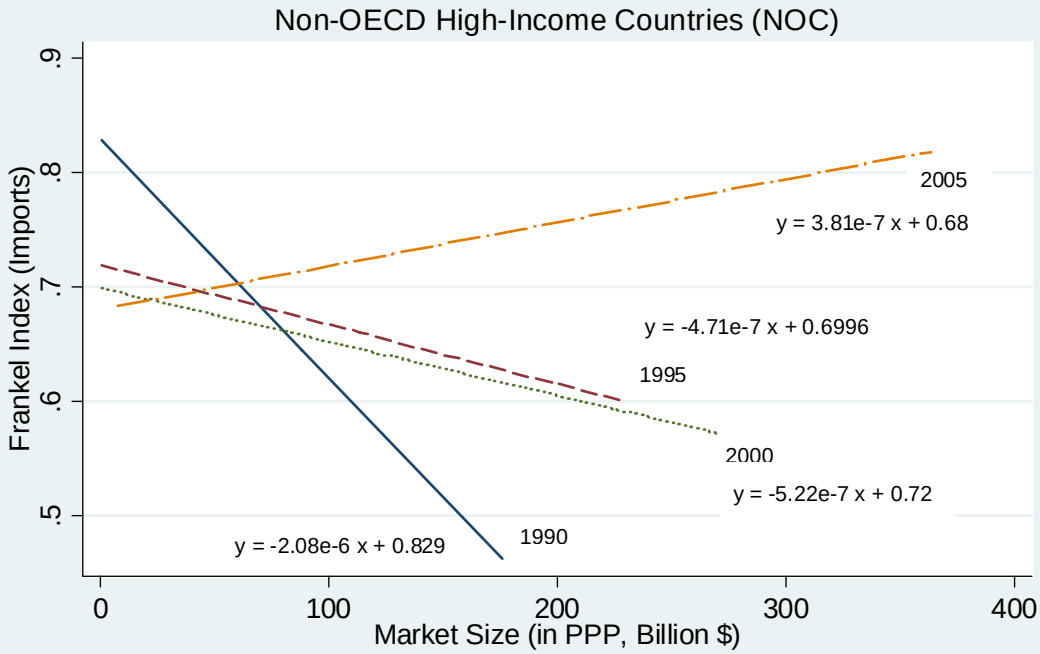
Source: World Development Indicators 2008

Figure 2: Degree of Globalisation and Market Size 1990-2005



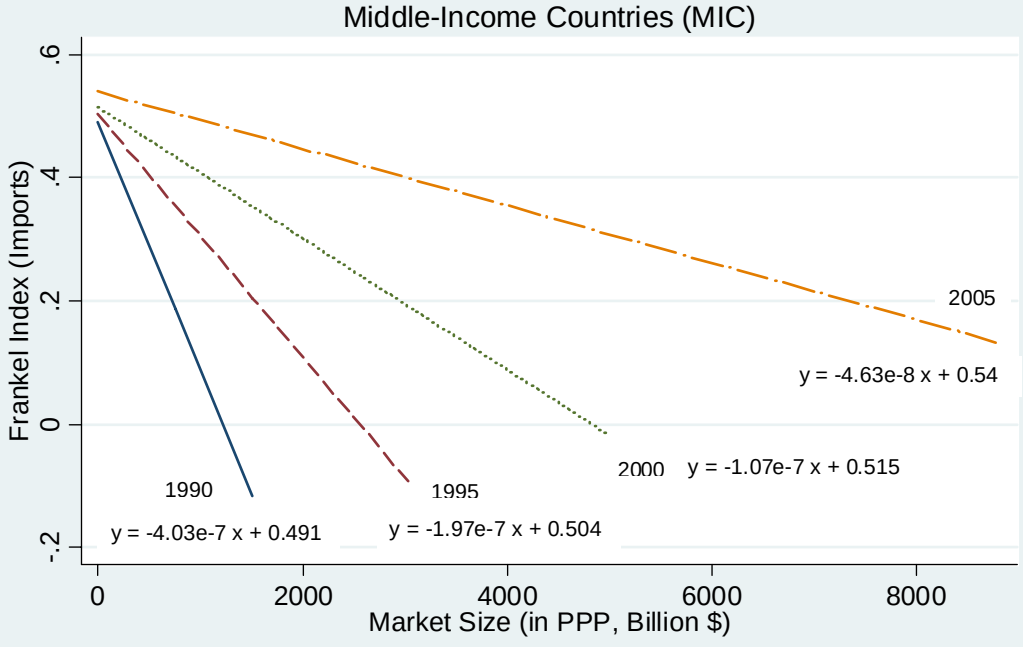
Source: World Development Indicators 2008

Figure 3: Degree of Globalisation and Market Size 1990-2005



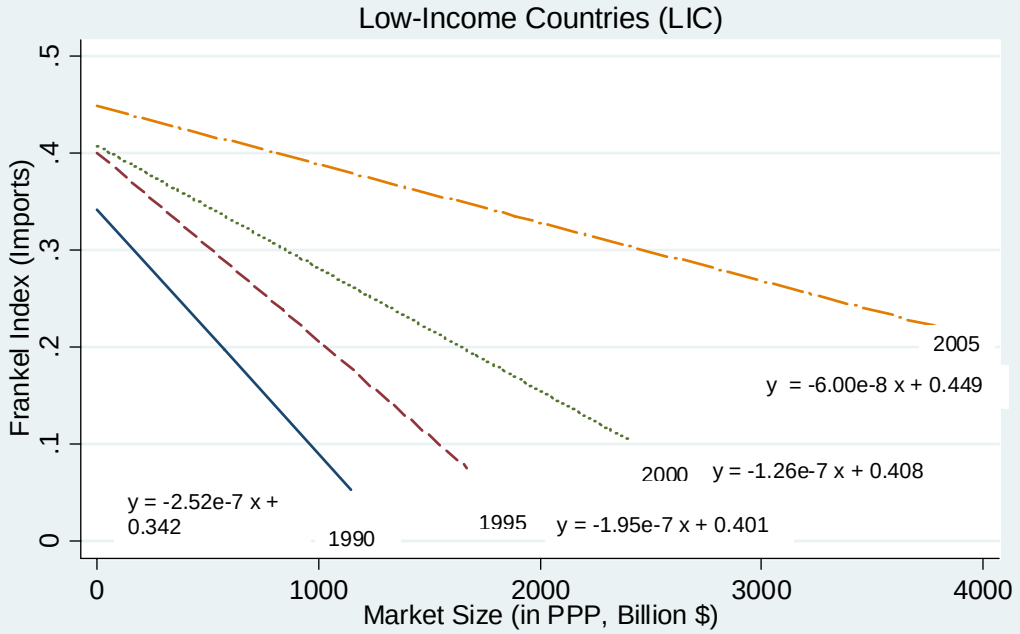
Source: World Development Indicators 2008

Figure 4: Degree of Globalisation and Market Size 1990-2005



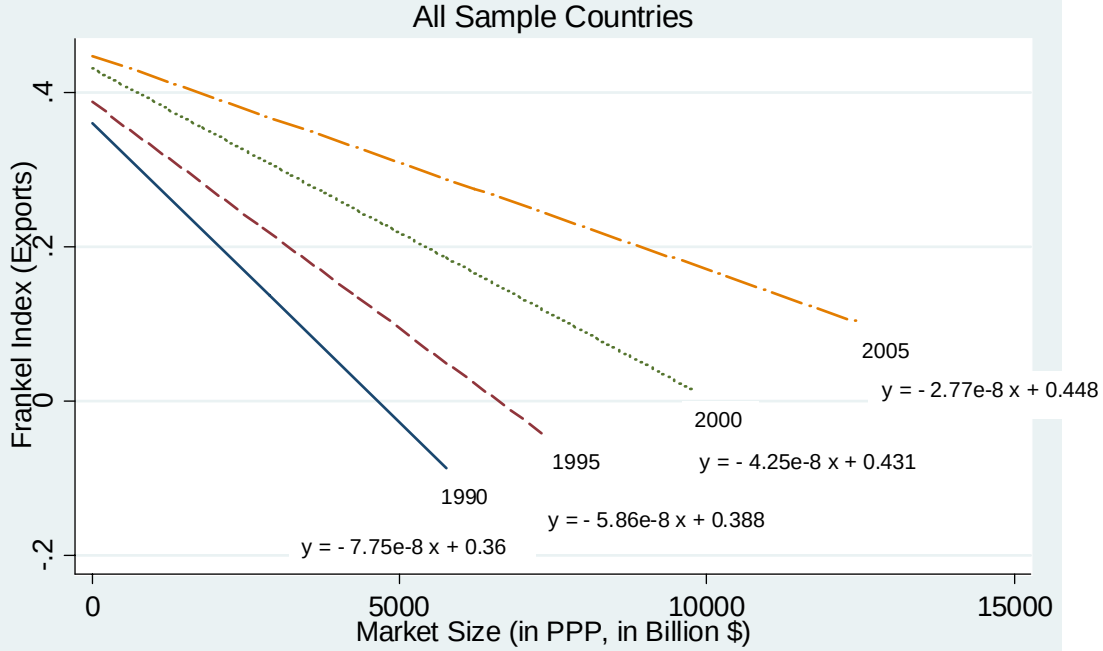
Source: World Development Indicators 2008

Figure 5: Degree of Globalisation and Market Size 1990-2005



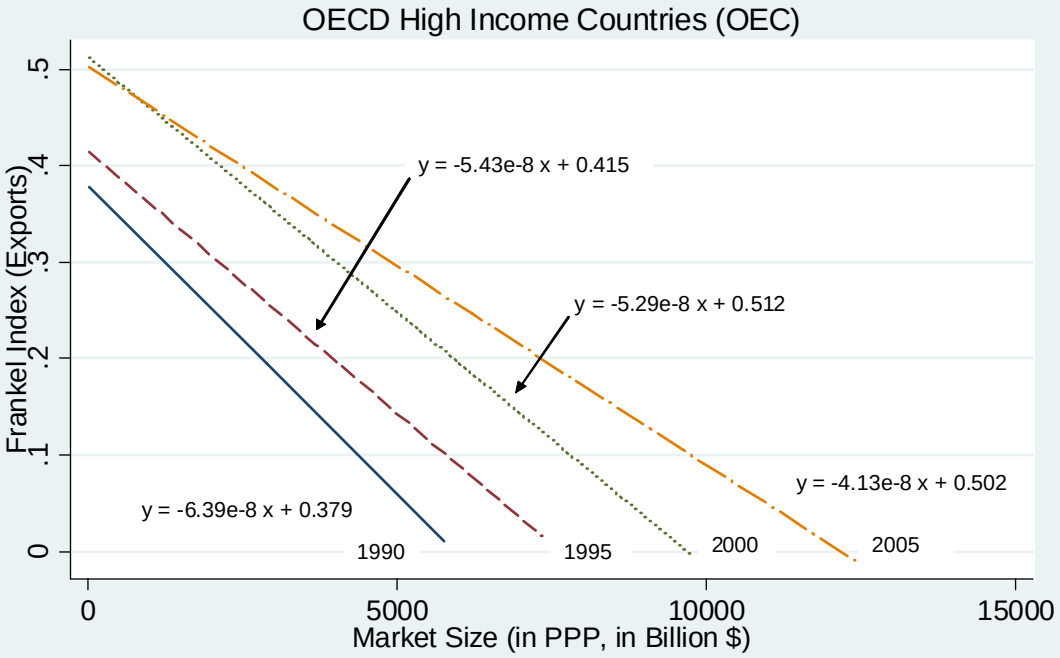
Source: World Development Indicators 2008

Figure 6: Degree of Globalisation and Market Size 1990-2005



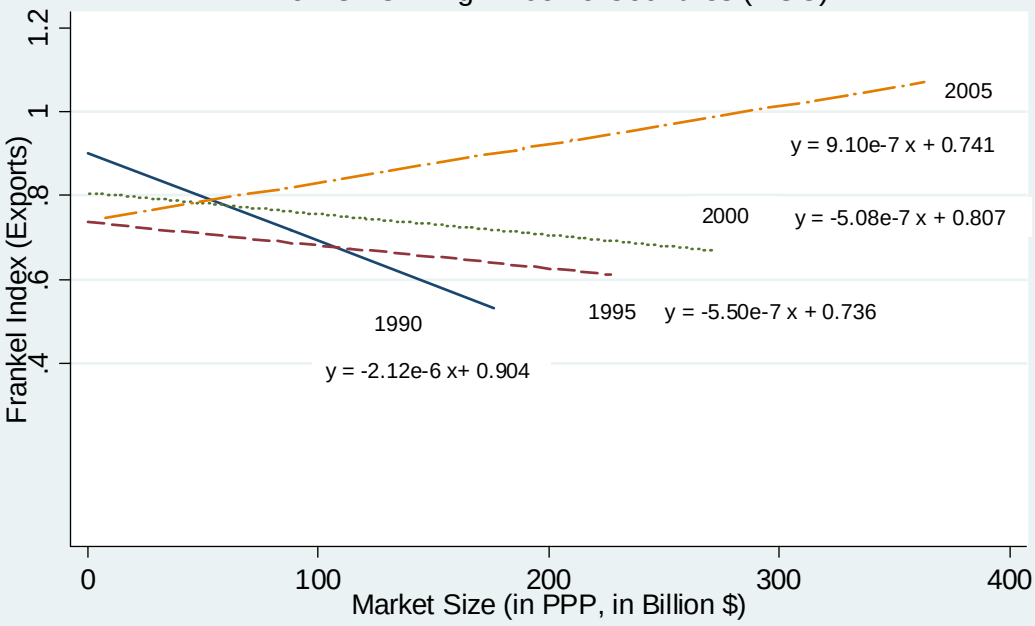
Source: World Development Indicators 2008

Figure 7: Degree of Globalisation and Market Size 1990-2005



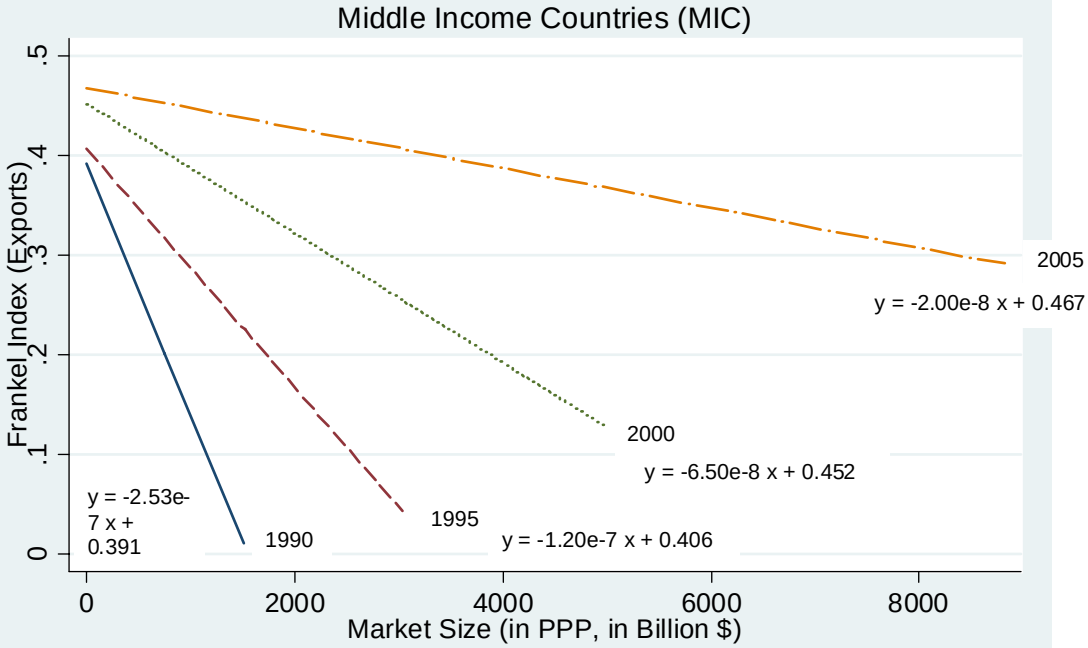
Source: World Development Indicators 2008

Figure 8: Degree of Globalisation and Market Size 1990-2005



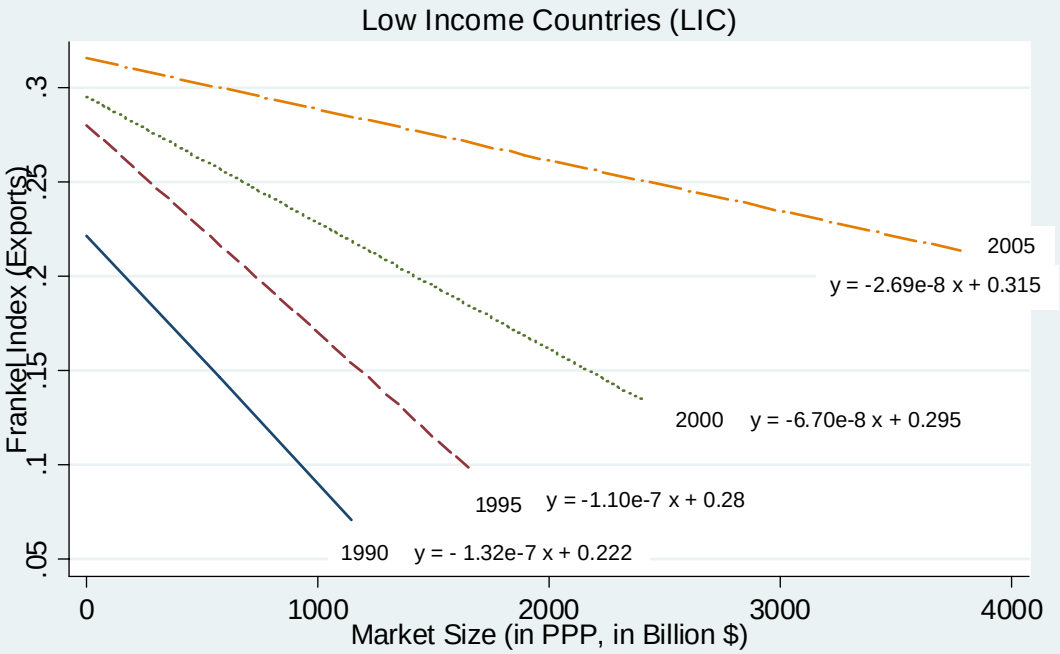
Source: World Development Indicators 2008

Figure 9: Degree of Globalisation and Market Size 1990-2005



Source: World Development Indicators 2008

Figure 10: Degree of Globalisation and Market Size 1990-2005



Source: World Development Indicators 2008

The link between the degree of globalization and market size.

A number of general observations emerge when observing the change of the FI (based on imports (Figures 1-5) and exports (Figures 6-10)) over market size[5] for the entire sample.

- On the import side, the FI decreases with rising GDP (PPP) (Figure 1). While this holds for every year, there is a difference between the 1990 and 1995 pattern on one hand (steeper decline) and 2000 and 2005 on the other hand (flatter decline) pattern. This suggests that inter-country differences in the degree of globalization have eroded

[5] Using the alternative proxy for market size instead of GDP, population, yields similar results except for the very heterogeneous high-income non-OECD countries. In this group, countries with larger

over time so that in 2005 large economies were no longer as far away from the degree of globalization of smaller economies than they were fifteen years ago.

- The FI increases over time. At each level of GDP, the FI was higher in year t than in period t-1. Yet, this year by year increase was not linear. The rise from 1995 to 2000 was by far the largest relative to the other two steps (1990 to 1995 and 2000 to 2005) and especially large for large economies. In this respect, the first five years of the new millennium bear witness to a catching up of large economies to smaller economies with respect to their integration in the world economy. To put it differently, in 2005 the FI of a country with a GDP of the size of Germany was at the same level as the FI of the size of Paraguay in 1990.
- Once we split the sample into four income groups in order to reduce country-specific heterogeneity[6], results – again on the import side - get sizably differentiated. For the OECD high income countries (OEC) (Figure 2), the results for the entire sample are confirmed. The largest step in the rise of FI over time was between 1995 and 2000 when the global economy began to benefit the most from the advancement in communication technology. Differences between OECs declined as seen by the flattening of the regression curve over time. For the NOC (Figure 3), representing basically the oil-rich Gulf States, a few island states and Hong Kong, the link between market size and the FI has been found very volatile over time. Neither can the overall observation that FIs rise over time at given market size be supported. Instead, FIs were higher in 1995 than in the two years afterwards. Nor did FIs decline with rising market size in each year. In 2005, larger NOC economies were more globally integrated than smaller ones. This has probably been caused by the rapid growth in

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population are less open than small-population countries whereas using the GDP variable, countries with large markets in 2005 were more open than countries with smaller markets.

trade in Hong Kong, Saudi Arabia and Israel. In terms of the absolute FI levels, the NOCs are on average the most globalised countries in the sample. The MICs (Figure 4) as well as the LICs (Figure 5) display a clear common pattern of rising FIs over time, declining FI with rising market size and convergence in the degree of globalization between large and small economies over time with higher absolute levels for the MICs than for the LICs. At equal market size of 400 Bill. US$, an average LIC in 2005 should have tripled its imports before trading as intensively with the world as locally while a MIC would have only to more than double its foreign trade to reach ”complete” specialization.

- As concerns the FI measured on the export side (Figures 6-10), results do not differ much from the import side as concerns increasing FI over time. Year over year, countries from their individual level of world market integration have come closer to the stage where they sell as easily to international customers as they sell domestically. And year over year, differences in FI between large markets and small markets have declined.
- As for imports, some differences emerge on the export side when the country sample is disaggregated by income groups. Compared to imports, it holds for the entire sample that the negative correlation between market size and FI is less pronounced (Figure 6). Smaller and larger countries have never been as far from each other in terms of preferring local customers over international customers as they have been in preferring local sourcing over international sourcing. This finding from the entire sample is replicated for the middle-income and the low-income countries (Figures 9 and 10). The underlying hypothesis for this finding could be larger similarities in

[6] Following the World Bank definition, we differentiate between high income OECD countries (OEC), high income non-OECD countries (NOC), middle income countries (MIC) and low income countries (LIC).

export patterns and export trade costs of these countries than in their import patterns and import trade costs.

- High-income countries (Figure 7), however, are different in their FI on the export side. Within this group, the distinction between large more domestic sales-oriented countries and small more export sales-oriented countries is sharper than on the purchaser side. In other words, for the rich countries, trade costs on the import side which are responsible for the home market bias seem to be more indifferent to market size than trade costs on the export side. As parts of these trade costs are tariffs and non-tariff barriers, one can also say that the level of these policy-induced barriers has not only declined over time but has leveled out between small and large rich countries. When looking at the tariff levels between the US and small European countries, there is indeed much less difference than in the past.
- Not too much should be read out of the findings on the export side for the "outliers", the heterogeneous NOCs (Figure 8). As in imports, the slope of the curve changes from negative to positive in 2005 indicating that the large economies within this group became more "global" with respect to selling abroad than the small economies. Comparing the coefficients between GD in imports and exports, differences between large and small economies were larger in exports than in exports and increased over time.

The link between openness, primary commodity specialization and transport costs.

Many of the sample countries (including high-income OECD countries such as Australia, New Zealand or Canada) are primary commodity exporters. For these countries, boom and bust periods of commodity prices can have an influence on both their international

competitiveness of non-traditional sectors via real exchange rate changes (Dutch disease effect) and their capacity to import (income terms of trade) if they are balance-of-payments (BoP) constrained. This is why there are competing hypotheses concerning the correlation between the degree of globalization and specialization in primary commodity exports. On the one hand, an increase in commodity prices relative to prices of manufactures may raise the share of commodities in total exports, drive real appreciation, impede the competitiveness of non-traditional (manufacturing) sectors, give rise to trade-restrictive measures against imports of non-traditional goods and thus deteriorate openness. On the other hand, rising primary commodity export earnings may help those countries dependent on such earnings to relax BoP constraints, to lower BoP-induced import restrictions and thus become more open. Such restrictions are expected to be especially relevant for poor countries

In fact, plotting the Frankel-Index on the import side with the degree of primary commodity specialization in exports yields a special pattern for the low-income countries which differs from the other country samples.[7] While the total sample and the high-income and middle-income countries mirror the expected result that openness is larger in export-diversified economies than in commodity-dependent economies, low income countries show more openness for countries with higher dependence on commodities. At a given share of primary commodities in total exports, countries became more open year by year and a given FI index coincides with a rising primary commodity specialization over the period. However, the correlation between primary commodity specialization and openness weakened over time and was much less distinguishable in 2005 than in 1990. By the end of the period, both more or less commodity-dependent countries showed fairly similar degrees of openness between 0.4 and 0.45 while fifteen years ago the spread was much larger. This confirms previous findings that differences in the degree of globalization have eroded over time irrespective of

[7] Plotter charts are available upon request

the income group. Such rising indifference of openness between income levels complies with the rising indifference between the export structures of countries.

To illustrate the link between the second factors which is expected to influence the degree of globalization, that is transport costs, we plot cif/fob ratios of countries and the FI again over time and over income groups of countries.[8] Cif/fob ratios are annually compiled by the IMF and are widely used in spite of their undeniable shortcomings[9]. As can be expected, differences between the FI on the export side and on the import side arise when cif/ratios are used as an explanatory variable. Except for 1990, the degree of globalization on the export side declines with rising cif/fob ratios. This would highlight costs of bridging distances as a barrier to equality between local and international trade intensity of a country. The relationship holds for OECD high income countries, middle income countries and for low-income countries with the qualification for the latter group that between 1990 and 2005 the FI got less and less responsive to differences in cif/fob ratios. That means that poor countries suffer from a pro-home trade and anti-export bias irrespective of whether or not their transportation costs are high. Or, to put it differently, by the end of the period a degree of export globalization at the 0.3 level held for low-income countries with low and high transport costs alike, probably because of the primary commodity orientation of these countries and the minor importance of transport costs for the export competitiveness of these goods. Again, the very heterogeneous group of high-income non-OECD countries yields inconclusive results which vary strongly over time.

If we plot the FI on the import side with the cif-fob ratio for all countries rising ratios along with rising degrees of globalization emerge, however, by displaying a tendency of

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[8] Again, plotter charts are available upon request.

[9] Hummels shows cif/fob ratios to have continuously declined since 1948. However, the ratios are based on aggregate trade data and thus apart from technology-induced changes of transport costs can be influenced the changes in the product composition of trade and by changes in the regional composition of trade between remote or neighbouring partner countries. Given the relative short

eroding such relationship at the end of the period. This counterintuitive relationship is determined by middle-income and low-income countries and probably driven by factors beyond pure distance costs such as insurance costs, the level of competition on transport routes relevant for these countries and economies of scale in transport volumes. It does not hold for high-income OECD countries which appear the less globalized on their sourcing side the higher are their transport costs. This is the expected result.

In total, both primary commodity specialization and transport costs as possible determinants of the FI have one factor in common. Their influence of the path towards higher degrees of globalization seems to have declined over time regardless of whether we observe low-income or high-income countries.

Conclusions

Measuring the FI over many countries and over a fifteen years period shows three clear results: The degree of globalization has been rising from different levels in different income groups of countries. Second, this rise holds for less globalized large countries as well as for more globalized small countries. Third, the distinction between FI in large and small economies has been vanishing. Large economies have gradually caught up with smaller economies as concerns their degree of globalization.

Distance costs and the composition of trade seem to have some influence on the degree of globalization but it would need a far more detailed sectoral breakdown of trade together with testing different proxies of distance costs to highlight his influence more precisely.

Finally, the 1990 – 2005 period has been the high-time of globalization due to the dismantling of policy-induced trade barriers in the Uruguay Round, IT technology leapfrogs, rapid

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period of fifteen years, we assume both sectoral and regional trade patterns to be relatively stable. See Hummels (1999).

economic growth of emerging markets and the rising global demand for commodities and food products. The development of the Frankel Index seems to mirror such continuity in globalization. To test its robustness against discontinuity, it would be useful to measure it for longer historical time periods which take account of “waves” of globalization including periods of crisis and disintegration.

REFERENCES

Berezin (P.), 2000. Border Effects within a Dynamic General Equilibrium Trade Model. *The International Trade Journal*, 14 (3): 235-282.

Engel, C., and Rogers, J. 1996. How Wide is the Border? *American Economic Review,* 86 (5): 1112-1125.

Frankel, J. A. 2006. What Do Economists Mean by Globalization? Implications for Inflation and Monetary Policy. Paper presented to the Academic Consultants Meeting, Board of Governors of the Federal Reserve System, El Paso Texas, mimeo,

Frankel, J. A. 2000. Globalization of the Economy. National Bureau of Economic Research, NBER Working Paper 7858, Cambridge, MA, August 2000. Revised Version in: Joseph Nye and John Donahue (Eds), Governance in a Globalizing World, 2000, Washington: Brooking Institutions, 45-70.

Helliwell, J. 1998. How Much Do National Borders Matter? Washington D.C.: Brookings Institutions

Helliwell, J., and McCallum, J. 1995. National Borders Still Matter for Trade, in: Policy Options, 16: 44-48.

Hummels, D. 1999. Have International Transportation Costs Declined? University of Chicago, mimeo.

McCallum, J. 1995. National Borders Matter. Canada-U.S. Regional Trade Patterns. *American Economic Review,* 85 (3): 615-623.

Pisani, M.J, Yoskowitz, D.W., and Brusa, J. 2008. The Retail Travels of the U.S. Greenback: A Comparative Study of Currency Substitution Along the U.S.-Canadian and U.S.-Mexican Borders. *The International Trade Journal*, 22 (3): 250-289.