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What Do Economists Mean by Globalization? Implications for Inflation and Monetary Policy

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What do economists mean by "globalization"? First and foremost: integration through international trade of markets in goods and services, as reflected in a variety of possible measures. These include direct measures of barriers, e.g., tariffs and transport costs; quantity-related measures of the result, i.e., trade volumes; and price-related measures of the result, i.e., the law of one price and other evidence of arbitrage. Next, financial integration through international trade in assets, again as reflected in a variety of possible criteria: direct measures of barriers, e.g., capital controls and transactions costs; quantity-related measures of the result, i.e., gross and net capital flows, portfolio shares, or consumption sharing; and price-related measures of the result, i.e., interest rate parity conditions and other evidence of arbitrage. Further down the list are foreign direct investment, increased trade in intermediate products (especially within multinational corporations), international outsourcing of services, and international movement of persons. Finally, some truly comprehensive definitions of globalization would include the international spread of ideas, from consumer tastes (Coke and the Simpsons, sushi and manga, etc.) to intellectual ideas (technological patents, management principles, democracy, environmental activism, the Washington Consensus, accounting standards, inflation targeting among Central Banks, etc.)

We probably want to rule out the sloppy thinking that sometimes seems to identify "globalization" with whatever other big trends are underway, such as technological progress, demographic change, nostalgia for rural village life, etc.

How Far Has Economic Integration Gone?

There is no question that economic globalization is one of the most powerful forces to have shaped the post-war world. The two major drivers behind globalization are reduced costs to transportation and communication in the private sector, and reduced policy barriers to trade and investment on the part of the public sector.

Technological progress and innovation have long been driving the costs of transportation and communication steadily lower.[2]

[1] The author would like to thank Sunyoung Lee and Santitarn Sathirathai for assistance, and Alan Blinder for comments.

In the post-war period we have seen major further cost-saving advances, even within ocean shipping: supertankers, roll-on-roll-off ships, and containerized cargo. Figure 1 illustrates the result. Between 1920 and 1990 the average ocean freight and port charges per short ton of U.S. import and export cargo fell from $95 to $29 (in 1990 dollars). An increasing share of cargo goes by air. Between 1930 and 1990, average air transport revenue per passenger mile fell from $0.68 to $0.11. Jet air shipping and refrigeration have changed the status of goods that had previously been classified altogether as not tradable internationally. Now fresh-cut flowers, perishable broccoli and strawberries, live lobsters, and even ice cream are sent between continents.[3] Communications costs have fallen even more rapidly. Over this period the cost of a 3-minute telephone call from New York to London fell from $244.65 to $3.32. More recent inventions such as the internet require no touting. They have had the effect that some quintessentially non-traded services, such as health care, are suddenly becoming partly tradable.

Meanwhile liberalization by governments has progressively lowered tariffs and removed non-tariff barriers. Much took place within the successive round of multilateral trade negotiations under the GATT, culminating in the Uruguay Round which created the WTO. But much liberalization was unilateral as well, especially after it had become clear to fence-sitting countries that trade was accomplishing miracles in East Asia while central planning had failed in the Soviet bloc. Indeed, unilateral liberalization by China and India, bringing 2 billion new people into contact with world markets, ranks as a major recent driver of globalization of its own.[4]

How Much Further Do We Have to Go?

It is easy to get the impression that globalization is almost complete, that most trade barriers have already been dismantled, borders are irrelevant, and nation states are inconsequential. It is easy to imagine that citizens of each country already trade with buyers or sellers on the other side of the globe as easily as the other side of town. But this is not the reality. Globalization is not complete. Nor has the pace of integration over the last years been unprecedented. Nor is its continuation inevitable.

Economic integration still has a lot further to go. Although trade as a share of the economy has increased virtually everywhere over the last half-century, the increase is less impressive viewed by the hypothetical standard of complete global integration. Figures 2-3 show openness, measured as the average of exports and imports as a fraction of GDP. Countries are arrayed along the horizontal axis according to their shares of world income. Large countries can be expected to have a lower ratio of trade to GDP;

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[2] Krugman (1995) emphasizes that many of the most important technical advances occurred before 1870, such as steel-hulled ships, the screw propeller, and the trans-Atlantic telegraph.

[3] Sources are given in Chapter 3 of Frankel (1997). Frankel (2000) elaborates.

[4] The verdict is more mixed on regional trading arrangements. Some, such as the European Union, have clearly helped promote openness within their member economies. But trade diversion is always a risk, and the recent proliferation of bilateral deals around the world – laden with burdensome Rules of Origin -- has not been consistent with the dream of 15 years ago that the regionalist path would provide an ever-expanding zone of free trade.

even in a perfectly integrated world, a typical US citizen would be probabilistically more prone to trade with another American than with the residents of a random country. Indeed smaller countries tend to be naturally more open, by this measure: notice that a regression line would slope downward. [5]

Virtually all countries have climbed upward in the openness graph over the last two centuries. Figure 3 presents the historical perspective for a few countries. As noted, globalization is not unprecedented. The ratio of merchandise trade to GDP increased sharply in the 19th century reaching 7-8 per cent for France and Spain, and far higher levels for Great Britain. During the first half of the 20th century (1914-1950) these and most other countries experienced a large reversal), [6] which was not re-reversed until well into the post-war period. So rapid has been the trend of the last half-century, however, that by 2005 France and Spain had attained trade/GDP ratios of 27 and 28 per cent, respectively -- four times their earlier peaks on the eve of World War I. The US, a more self-sufficient country, attained in 2005 a ratio of 10 per cent -- 2 ½ times its 1913 peak, and quadruple its 1950 level. [7]

Despite this progress, we remain far from complete global integration, defined as the hypothetical condition that would hold if residents of a given country were truly no more likely to buy from, and sell to, each other than to trade with residents of other economies. They lie far below the dotted line that slopes down at a 45 degree angle from the 100% point on the vertical axis in Figures 2, which shows what would be required if everyone in a sense traded with foreign residents as readily as with their compatriots. In the case of the US, even though the trade/output ratio has already quadrupled over the post-war period, it would have to rise another six-fold, from its current 12 per cent to more than 70 per cent, before it fully reflected the share of non-US producers and consumers in the world economy.[8]

We are still far from the day when we buy from across the globe as easily as across the country.

What Are the Barriers?

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[5] Also relevant in the graph is that relatively remote countries like Australia tend to lie at the lower end of the openness range, and countries that are centrally located for trade, like Belgium, toward the top. Countries with a history of high trade barriers, such as Argentina and India, tend to lie toward the bottom, whereas those that have followed more trade-oriented policies such as Malaysia or Thailand lie toward the top.

[6] The downward arrows in Figure 3.

[7] These statistics are based on merchandise trade. If services are included, US trade is now 13% of GDP.

[8] Because of its size, the U.S. appears off the chart, Figure 2b, unless we do it in logs, as in Figure 2a. (There the increase needed to reach the dotted line is seven-fold: exp(2.0)=7.) Openness in France and the UK would have to more than triple, from 28 per cent to 95 per cent. Even these estimates of the required increases are an understatement, because exports and imports are gross transactions, not net value added. Singapore, for example, already shows exports plus imports well over 100 per cent of its GDP. (Because of its extreme openness, it too appears off the top of the chart, except when we do it in logs in Figure 2a.)

It is not difficult to identify some of the impediments to international economic integration that remain. Geographical, social, and policy factors all play a role. Their effect can be quantified in many ways. The following discussion of effects on bilateral trade draws on statistical estimates from the so-called gravity model.[9] Other approaches, such as inspection of the ability of cross-border arbitrage to narrow differentials in prices, give similar results.

Statistically, when two firms are located on opposite sides of a national border, operating for example under different legal systems, trade between them falls by an estimated 2/3, that is, to 1/3 of what it would be if they were located in the same country. This estimate even allows that the two countries in question officially have free trade between them, speak the same language, and use the same currency. If the two countries use different currencies, trade again falls by as much as a further 2/3.[10] That is, the two border effects together reduce trade to 1/9 of what it would be within the same country. Such factors together explain why Canadians are five or ten times more likely to trade with other Canadians than with Americans, despite the physical and cultural proximity of the two countries.[11] National borders still matter a lot.

For most pairs of countries, the impediments to trade are higher still. If the two countries do not belong to a free trade area, but have tariffs and other trade barriers between them that are average in level, trade again falls by roughly 2/3. It falls by even more if the trade barriers are at levels typically found in poor countries. If the two share no common historical or cultural links, the impediments are greater still. If they speak different languages, for example, trade falls by half.

Finally, notwithstanding the long-term historical decline in physical shipping costs, geography still matters. If two countries are not adjacent to each other, trade falls by half. In addition, for every one percent increase in the distance between them, trade falls by another one percent.

As already noted, the increase in trade as a share of the economy over the last 50 years can be attributed in large part to declining trade barriers and declining transport costs. But neither of these sources of friction is yet close to zero. Differences in currencies and languages and the other factors mentioned above have diminished little.

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[9] These estimates of the gravity model of bilateral trade are from Frankel (1997); Rose (2000); and Frankel and Rose (2002). They are to be interpreted as applying to the very long run, not the first few years after a customs union or currency union is adopted.

[10] The estimates in Rose (2000) and the successor papers have been subject to many critiques. Anderson-VanWincoop (2001) is perhaps the most widely cited. Baldwin (2005) is a good survey. In most cases, the bottom line of the critiques is to reduce the estimated magnitude of the effect below the very high tripling estimate, but not to deny its statistical significance. Frankel (2006) offers a defense of the basic Rose finding. In any case, *something* has to explain the large observed home bias in trade.

[11] Indeed, the world is divided into more sovereign countries today than ever before.

Will the Globalization Trend Continue in the Future at the Same Rate?

Globalization, though not in its infancy, has not yet reached full maturity. Will the trend of falling trade barriers and transport costs continue as strong during the 21st century?

At any point in history there are many powerful forces working to drive countries apart, at the same time as there are other powerful forces working to shrink the world. It is true that the shrinking forces have dominated over the last half-century, but there is nothing inevitable about that. From 1914 to 1944 the fragmenting forces dominated (war, isolationism, tariff retaliation, rival blocs, war, and ideology). Trade/GDP ratios fell. It could happen again.

The last six years have seen some worrisome developments. Beyond the lost opportunity for further trade liberalization, the collapse of the Doha Round may signal a more comprehensive sea change in what had been 60 years of a US-led multilateral order. The SARS outbreak led to quarantines of people and goods. The September 11 terrorist attacks led to tightened travel restrictions (visas and airport searches), foreign attempts to boycott US products, US blocking of foreign acquisition of US facilities, and so forth. SARS passed, and the impact of September 11 on trade volumes was also surprisingly brief. Nevertheless, to take a scary example, if there were to be new terrorist attacks with nuclear weapons, the effects could be far more severe, crippling trans-border transactions, from containerized cargo to the movement of persons. The same is true of a future avian flu epidemic or other contagious disease. With high probability, the globalization trend will continue. But future developments of this nature could still slow it down, relative to the rapid pace of the second half of the twentieth century.

The Arbitrage Criteria

The estimates cited above were based on quantity measures of trade. In theory, quantity measures may be a poor indicator of openness, because one is interested in the potential ability of substitution across borders – in the limiting case, arbitrage – to keep relative prices in line.[12] Similarly quantity measures of plant relocation (or migration or whatever other aspect of globalization one is interested in) may be a poor indicator, because one is interested in the *potential* ability of substitution across borders to keep relative wages in line.

In the case of goods trade, the price arbitrage tests tend to give similar results. [13] By this I mean that despite the 60-year trend of falling trade barriers and the centuries-long trend of falling transport costs, integration of goods markets still has a long way to go. For example, price arbitrage is stronger between Vancouver and Montreal than it is

[12] For example, a country that is close to self sufficient in oil may find that its trade in this commodity is close to zero – certainly in a given year if domestic supply happens to equal demand – and yet it may be perfectly integrated into the world market in the sense that the *potential* for trade keeps the domestic price of oil in line (which is arbitrage).

[13] In the case of determinants of wages, the debate is more unsettled.

just across the US border, again despite the absence in the US-Canada case of the usual obvious barriers to trade.[14]

As is well known PPP fails miserably. This is not that surprising; after all, many goods and services are not traded internationally. More surprising is the absence over the centuries of any clear trend movement in the direction of PPP. But perhaps this can be explained as well. For example, exchange rate volatility is higher than it used to be.

Most surprising is the failure of the law of one price to hold for very narrowly defined goods that one would consider perfect substitutes. A subset of the literature is the large body of research on slow or incomplete pass-through of exchange rate changes to domestic prices. This is true of the literature that considers aggregate price indices as well as the literature that considers narrowly defined goods.[15] This pass-through coefficient has always been lower for the United States than for other countries,[16] especially "small open economies." But the evidence of the last 15 years is that pass-through has become slower and less complete,[17] again even for narrowly defined goods. This generalization holds for countries large and small, and regardless whether one looks at the impact on the price of the imported product at dockside, the imported product retail, domestic substitutes, or the CPI. [18] It is a finding that swims strikingly against the tide of globalization and the usual presumption that transmission of goods prices must be increasing. Quite likely the explanation is that the pass-through coefficient need not be the same when the change originates in the exchange rate as when it originates in the foreign price (e.g., a fall in the price of textiles due to the advent of Chinese production, or an increase in oil prices). Exchange rate pass-through may in particular have fallen due to an increase in exchange rate volatility: if firms believe exchange rate fluctuations to be largely transitory, they are more likely to absorb them in profit margins than to pass them through.[19] But the question is intriguing, and open.

Financial Integration and its Implications, Very Briefly

Financial markets are more highly integrated than goods markets, at least when it comes to portfolio capital. Transactions costs and capital controls are by now almost negligible for industrialized countries and much reduced even for developing countries.

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[14] Engel and Rogers (1996).

[15] One survey is Goldberg and Knetter (1997).

[16] A recent example is Goldberg and Campa (2006), who estimate pass-through to the US CPI at about 4%, the lowest of 21 OECD countries. They also find that much of the pass-through to the general price level comes via imported inputs, rather than via consumer imports and their local substitutes.

[17] Taylor (2000) proposed that a decline in pass-through of exchange rate changes into the CPI in the 1990s was due to a lower inflationary environment, citing US data. Gagnon and Ihrig (2004) extended the analysis to a sample of 20 industrialized countries.

[18] Frankel, Parsley and Wei (2005) extend the finding of slower and less complete pass-through to a large sample including small and developing economies, show that it holds even for narrowly defined goods, and explore reasons for the recent decline. We also give many other references.

[19] Krugman (1989), Froot and Klemperer (1989) and Taylor (2000) hypothesized that a given exchange rate change is less likely to be passed through to import prices in an environment where such fluctuations are common and transitory.

But country risk (particularly default risk) remains a major barrier for developing countries, and currency risk remains a barrier for most countries of both sorts. Quantity-based tests still show a world far from perfect integration: strong observed home bias in portfolio shares, the high saving-retention coefficients in the Feldstein-Horioka regressions, and a failure of consumption levels to be correlated across countries in the way that risk-sharing theory says they should be. Price-based tests show the same thing: real interest parity fails and, more remarkably, shares or baskets of shares can sell for different prices in different markets.[20]

Financial integration is often thought to imply loss of independence of monetary policy. But (1) in theory, floating exchange rates should fully restore independence (one of the available choices in the Impossible Trinity), and then some; and (2) in practice, it appears that the Federal Reserve Board retains the ability to set interest rates, with other countries tending to follow, rather than the other way around, even when it comes to the ECB.[21] Furthermore, there is an argument that open financial markets discipline policy-makers, forcing them to face the adverse effects of policy mistakes more quickly.[22]

Implications of Increased Trade Openness for Inflation and Monetary Policy

Global inflation rates peaked in the 1980s (in 1980 for industrialized countries and 1990 for emerging markets).[23] Has the increase in globalization been one reason for the decline in inflation over the last two decades? After all, it is unlikely to be coincidence that inflation has gone done almost everywhere.[24] On the other hand, globalization is unlikely to be the primary influence on average inflation rates. The

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[20] Short-term financial markets *are* highly integrated, as reflected in price-based tests such as covered interest parity (or in quantity-based statistics such as the famous $1.9 trillion in daily FX turnover). One of several explanations why real interest parity fails despite covered interest parity is the imperfect integration of *goods* markets: Frankel (1986) and Obstfeld and Rogoff (2000).

[21] We used to attribute the asymmetry to the fact that Europeans and others had smaller more open economies. But in theory the central bank of euroland should now have symmetric influence in determining world monetary conditions, which it apparently does not. E.g., Chinn and Frankel (2003).

[22] Friedman's (1999) metaphor is that countries agree to put on a "golden straitjacket" when they open their financial markets. The argument for a disciplining effect coming from openness to trade is made below Tytell and Wei (2004) consider the argument for a "discipline effect" from the openness to financial markets. They find some evidence that openness produces low-inflation monetary policy, but not low budget deficits. (The latter finding is consistent with the view that free capital inflows can actually allow governments to finance profligate fiscal policy for a longer period of time than they would otherwise.)

[23] Rogoff (2004) or WEO (2006).

[24] It may certainly be that superior knowledge and skill of central bankers played a role. This need not be a coincidence nor wholly divorced from "globalization" broadly defined, if the international spread of ideas such as the absence of a long-run tradeoff, central bank independence, inflation targeting were key. Still it does not ring true that improved monetary policy is the sole source of the near-universal decline in inflation.

single pin that bursts that bubble is the observation that inflation rates were also low in the 1950s, while globalization was much lower than today.

While economists are consistently pro-trade, the classical theory of the gains from trade did not predict that a given increase in openness would have a permanent positive effect on the real growth rate, much less on the inflation rate. The classical effect of trade is supposed to show up in the *level* of real income, not the rate of change. Furthermore, the classical determinant of inflation is supposed to be the money growth rate, not changes in relative prices or anything else originating in the real sector.

Perhaps only economists could consider the distinction between levels and rates of change so important, but it is worth spending a few pages on this issue. They sometimes assert that real factors such as falling clothing prices or rising oil prices could not have implications for inflation because the latter is determined solely by the rate of growth of the money supply – except "perhaps" in the short run -- and have asserted that claims to the contrary represent a confusion of relative prices with the overall price level.[25] But economists may be less prone than they once were to dismiss such claims. For one thing, money demand is no longer considered stable and the money supply is no longer treated as an exogenous variable.[26] It is recognized that the monetary authorities may react to variables like oil prices and unemployment rates, and that prices for clothing or oil can have implications for inflation via such channels as productivity and wages. To take an unarguable example, if a central bank reacts to an increase in oil prices by increasing the money supply, then the real shock has had a permanent nominal effect.

It is often presumed that an increase in globalization brings an increase in volatility, due to increased exposure to the vicissitudes of global markets. The steadily rising share of imports in the US economy, might lead one to expect a rising coefficient on import prices in an equation designed to determine domestic inflation. And indeed precisely this result has been found at the Federal Reserve Board.[27] During a period of falling import prices (e.g., due in the late 1990s to the East Asia crises and Japanese deflation) the result was downward pressure on US inflation, more so than in the past. But during a period of rising import prices, it might mean upward pressure, more so than in the past. In other words, the effect is symmetric with respect to positive and negative shocks.

On the other hand, an increase in openness to trade could also reduce volatility. If the US average propensity to import has quadrupled over the postwar period and the

[25] E.g., Rogoff (2006, p. 1): "…the popular view that 'China exports deflation'…[a]t some level…confuses terms of trade gains with deflation." Or IMF (2006, p. 110, 123): "the impact of globalization on inflation will be temporary unless it changes the overarching objectives of monetary policy." More stinging is Ball (2006) "Confusion about nominal and real variables is rife in analyses of inflation. The accounting theory of inflation is always and everywhere a fallacy." p.11-12

[26] Indeed the letter M has disappeared from many monetary models altogether.

[27] Kohn (2006). He reports that, on average over the last ten years, core import prices have risen about 1 ½ percentage points less rapidly than the core US CPI, and that this phenomenon held down core inflation by between ½ and 1 percentage points per year.

elasticity is roughly constant, then this means that the US marginal propensity to import has roughly quadrupled. This implies a large increase in the "automatic stabilizer" of the American economy. A large share of fluctuations in income and demand "leak" abroad via imports, dampening the cyclical swing that is felt domestically. Concretely, in the late 1990s the US economy grew substantially more rapidly than expected (in part due to booming investment in business office equipment). That this boom did not push inflation up is partly due to the fact that imports acted as a safety valve: much of the demand spilled abroad, which reduced the effect on domestic prices.

In any case, an effect on variability (whether upward or downward) is not what people have in mind when they say that trade with China lowers the US inflation rate permanently. One interpretation is that we are not in practice dealing with a one-time increase in globalization, but rather with steadily rising integration as measured, for example, by trade/GDP ratios. This should lead to steadily rising real income. Steadily rising real income could, in turn, lead to a lower inflation rate. One channel arises if workers have expectations or aspirations for particular rates of growth in real wages. If globalization delivers growth in real wages (think cheap Chinese manufactures sold at Wal-Mart) then nominal wages, unit labor costs, and domestic prices need not rise as fast. A related argument is that increasing exposure to international competition leads to increasing competitiveness of the domestic economy, again lowering unit labor costs.

Another interpretation is that even a one-time increase in openness might lead to an increase in productivity growth that is permanent (or at least very long-lasting).[28] The argument is that productivity growth takes place via innovation, and that firms that interact with the rest of the world tend to absorb faster the latest technological and managerial innovations. Again, a higher rate of productivity growth could in turn deliver lower inflation.

A possible piece of evidence against the hypothesis that firms have lost pricing power is the record profit shares of US corporations in recent years. Perhaps the explanation is that the increase in competitiveness applies to labor markets even more than to goods markets. (There is the same combination of internationally-driven pressure – the threats posed by plant relocation, overseas outsourcing and immigration – and more domestically located competitive pressures such as the decline of labor unions, minimum wage legislation and other labor regulation.) This would explain the stagnation of US real wages over the last 6 years at the same time as relatively low inflation in goods prices.

Slope of the Phillips curve

Much of the most recent thinking focuses on the slope of the Phillips Curve: the magnitude of the increase in inflation *resulting from a given expansion of domestic demand* (or the fall in inflation resulting from a given contraction in demand). Some suggest that globalization implies that inflation is less sensitive to domestic demand

[28] Grossman and Helpman (1991a, b).

conditions, and more to global demand conditions, than it used to be: Borio and Filardo (2006), Fisher (2005), IMF (2006, pp. 106-108), Kohn (2006), and Yellen (2006), who calls this the "new view." The argument is that foreign supply is more readily substituted for domestic output than before, so that the Phillips curve is flatter. (Firms have "less pricing power.") Others suggest that globalization has produced a *steeper* Phillips curve: Dornbusch and Krugman (1976, pp. 570-573), Romer (1993), Rogoff (2004). The argument is that it is harder to raise output -- a country pays the price of monetary expansion more quickly, especially if the exchange rate is floating -- because the economy more closely approximates the frictionless perfectly competitive neoclassical paradigm. As much as international competition, Rogoff (2004) has in mind domestic sources of increased competitiveness from deregulation, privatization, decreased union power, and the advent of Wal-Mart, Amazon and EBay. [29]

Remarkably, both camps, those who argue that globalization makes the Phillips curve flatter and those who argue that it makes it steeper, are suggesting that it results in lower inflation. In the "new view", a given monetary expansion, or a given target in terms of output, is associated with lower inflation. The Romer (1993)-Rogoff (2004) claim that the Phillips curve is steeper of course recognizes the implication that a given monetary expansion will lead to higher inflation. But it goes on to point out that precisely because it would accomplish little, central banks in highly open economies will refrain from monetary expansion. People are aware of this, which reduces their expectations of inflation. The result in the general equilibrium of rational expectations (Barro-Gordon, 1983) is that open economies will exhibit less inflationary bias than less open, less competitive economies. The attractiveness of this model from a theoretical viewpoint is that it provides a rationale for an increase in the *level* of globalization producing a permanent fall in the average *rate* of inflation. Romer (1993) and Lane (1997) produced evidence that more open countries indeed have lower inflation rates.[30]

The April 2006 *IMF World Economic Outlook* finds that a trend increase in trade openness in a given sector tends on average to lead to a trend decline in the relative producer price in that sector (for 1987-2003; Fig. 3.11). This suggests a microeconomic competitiveness effect. While the effect cannot come from aggregate Phillips Curves or monetary policy, it does validate the link from increased trade to decreased monopoly power – increased import competition drives down profit margins – which in turn firms up the link between globalization and domestic sources of increased competition such as deregulation, privatization, and decreased power of organized labor.[31]

I offer a tentative proposal for reconciling the "new view" with the Romer (1993)-Rogoff (2004) view. Individual firms in many sectors face increased international competition. As a result, it is true that they operate in more competitive markets and

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[29] A variant of the argument in Rogoff (2004) is that the higher level of real income that results from globalization narrows the gap between desired output and potential output, and thus reduces the inflation bias in the Barro-Gordon model. (This is close to the "wage aspiration" argument made above.) Loungani and Razin (2006) reach the same conclusion.

[30] A more recent examination is Gruben and McLeod (2004).

[31] There are signs of this even in Europe, where regional integration through the European Union is a possible contributing factor. (Blanchard and Philippon, 2003).

have less "pricing power." In other words, they face more elastic demand for their products because of elastic supply from competitors. In response, they develop new pricing policies, which involve setting prices more frequently and more flexibly in response to market conditions. But it would be a fallacy of composition to say that American producers in the aggregate have more elastic supply. Rather, the Aggregate Supply relationship becomes closer to vertical. It becomes harder for monetary policy to push output away from the potential.

But perhaps the slope of the Phillips curve is a red herring. If globalization and other sources of increased productivity narrow the gap between potential output and the level of output to which the public aspires, it can bring down the rate of inflation. This is true regardless the slopes of the Phillips curve, and regardless whether we are talking about the discretionary policy equilibrium for a given level of expected inflation or the long-run rational expectations equilibrium.

Conclusion

Asia

For much of the public, statistical measures of economic integration would be beside the point. The 800-pound panda in the boat is China, which is accompanied by various other tigers and jaguars. It is pointed out that (in the roundest of numbers) a billion low-wage workers are in the process of joining the world economy. It is already clear that China has put substantial downward pressure on prices of clothing and many other manufactured goods.[32] It is important to remember that China has also put upward pressure on oil and other agricultural and mineral products. But for most countries, the effects on the terms of trade and real income have been positive – certainly for commodity producers, including to an extent the United States … though not for rival producers of labor-intensive manufactures.

The effects do not necessarily show up in econometric studies to date. A limitation to statistical analysis of China's impact on US inflation or other international variables is that China's substantial weight in the global economy is such a recent phenomenon.[33] But the effect is clearly there. And the public's intuition is right, that the biggest impact of low-wage Chinese and Indian workers joining the world workforce remains in the future. It is but the most dramatic illustration of how globalization is indeed changing the parameters of the American economy.

Summary of conclusions

- Globalization can refer to the ease of international movement of capital, people, corporations, or ideas. But economists think foremost of the ease of international trade, which is also the easiest to measure.

[32] E.g., Fishman (2005).
[33] Kamin, Marazzi and Schindler (2004).

- Integration with respect to trade has been rapid over the last half century. Among other measures, the ratio of trade to GDP has quadrupled in the United States.
- Globalization is not unprecedented: the trend was also rapid in the century preceding World War I.
- Nor is globalization complete: by a conservative calculation the US trade/GDP ratio would have to increase another six-fold before it would be true that Americans trade with foreign residents as readily as with their fellow citizens.
- Nor is the trend inevitable. Trade contracted between 1914 and 1950. It could happen again.
- The large home bias in international trade can be attributed to barriers decomposed into transport costs, tariffs and other trade policies, and differences in languages, political systems, and currencies. While technological progress always reduces transport costs, the trend is less uniform with respect to the other factors.
- Financial integration, like goods market integration, has been a powerful form of globalization, whether measured in terms of barriers, observed quantities, or price arbitrage. It can reduce the effectiveness of monetary policy, but less so in a floating-currency country and particularly in the US case. These considerations are, in any case, adequately considered elsewhere, and not expected to be the focus of this September 2006 meeting.
- Many have surmised that it cannot be a coincidence that inflation has declined almost everywhere in the world since the 1980s, and have surmised that globalization must constitute part of the explanation. A counterargument is that inflation was equally low in the 1950s, when economic integration was far less advanced than today.
- Increased shares of imports or traded goods in the economy have probably made the CPI more responsive to changes in world prices, e.g., to recent declines in the price of clothing and rises in the price of oil.
- The pass-through of exchange rate changes to domestic prices of specific imports has fallen rather than risen. It is a bit paradoxical in that it constitutes a decline in the power of arbitrage rather than the reverse, though there are possible explanations.
- In any case, current popular discussion of the nexus between globalization and inflation envisions something more than that increased international integration raises sensitivity to international developments, up and down. It envisions a downward effect on inflation generally, particularly as workers in China, India, and other low-wage countries enter the global work force.
- Classical theory says that an increase in trade can lower prices and raise real income a one-time basis. Some more recent theories, however, posit a permanently lower rate of inflation.
- Some observers, including some members of the FOMC, have argued that globalization has flattened the Phillips curve ("the new view").
- That individual firms face more elastic demand due to foreign competition does not imply flatter supply. Romer (1993) and Rogoff (2004) have argued that globalization has *steepened* the Phillips curve (the "dynamic consistency" model).

- Both conclude that inflation may be permanently lower. The Romer-Rogoff view is that precisely because globalization (along with deregulation and other sources of increased competition) has reduced the growth payoff from any given monetary expansion, it has made expansion less attractive to central banks. The resulting rational expectations equilibrium features permanently lower inflation.
- The author would rather emphasize that globalization, by raising real income and productivity, can narrow the gap between aspiration and reality -- between the target level of income and the constraint of potential output. This can in turn reduce inflation, for example, via lower unit labor costs.
- Admittedly, with the U.S. corporate profit share currently at all-time highs, it is not clear that unit labor costs are driving inflation anyway. Perhaps globalization has recently increased competition in labor markets even more than in product markets.

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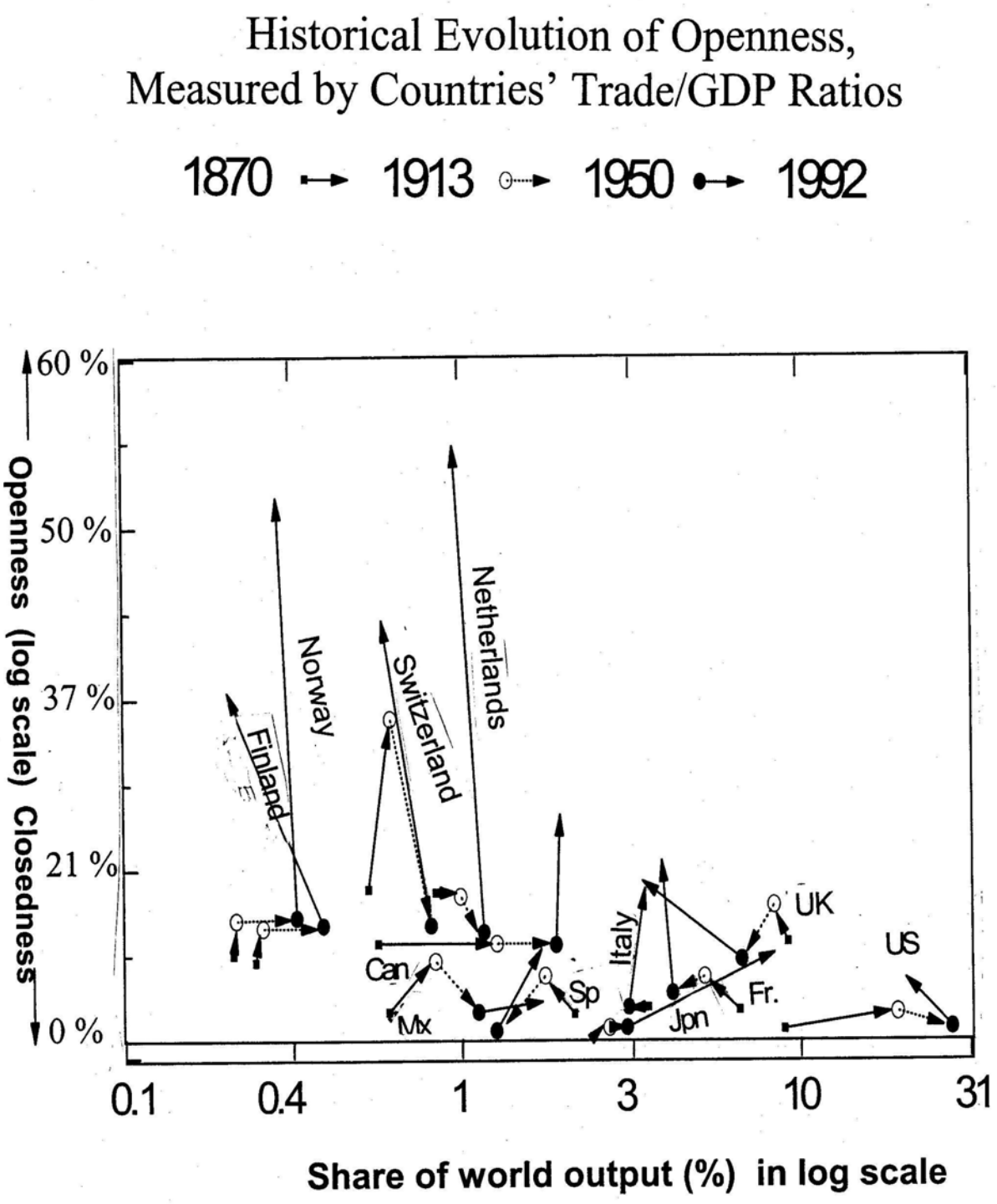
Figure I:



Source of data: A. Maddison (1995)

Figure II: The Gap in Wheat Prices between Britain and the US -- arbitraged away in the course of the 19th century, only to re-emerge in the 20th.

Source:
Kevin O'Rourke, "Europe and the Causes of Globalization, 1790 to 2000," in H. Kierzkowski, eds., *From Europeanization of the Globe to Globalization of Europe* (Palgrave, 2002).

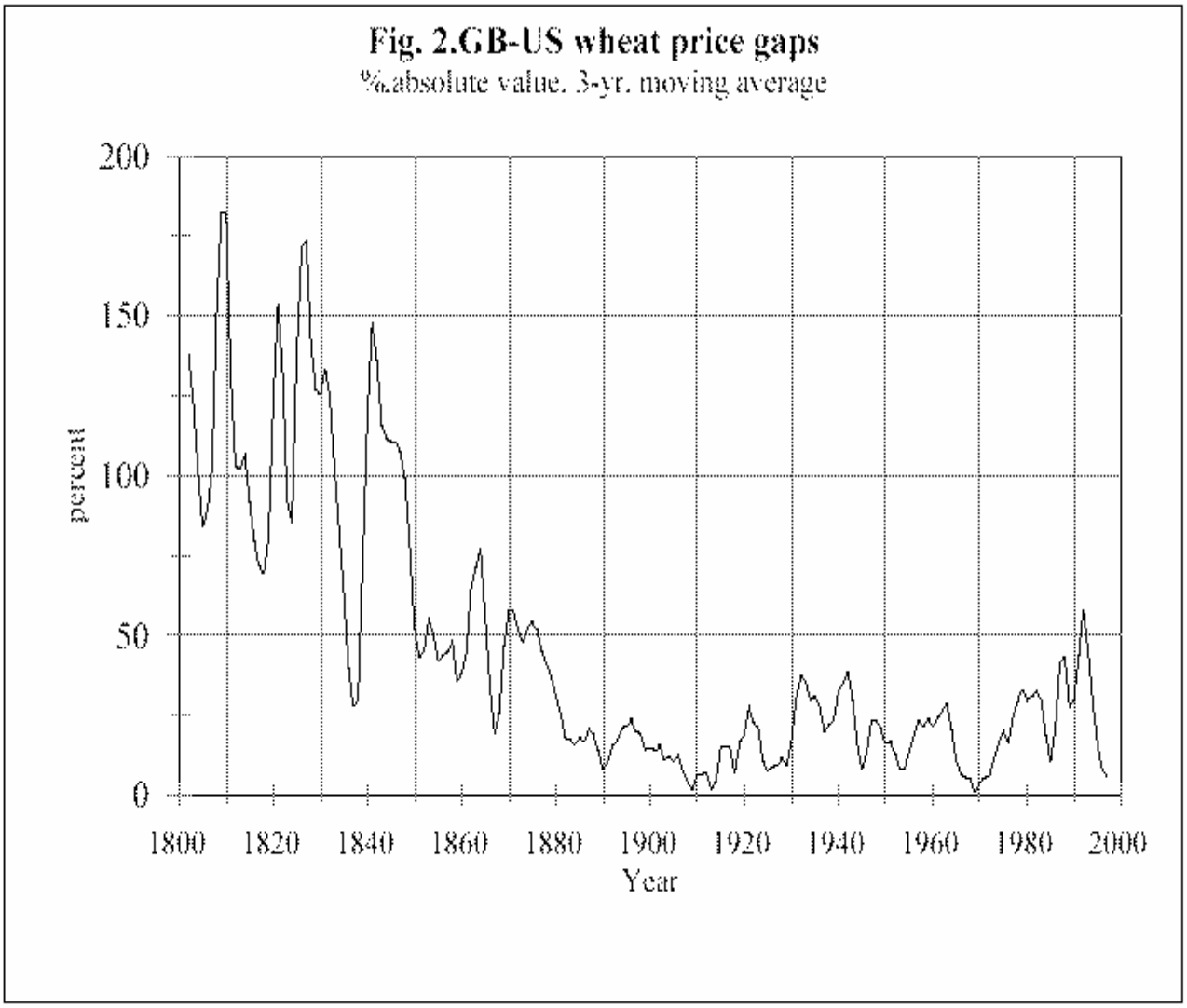


Figure 1: Technological progress in trade

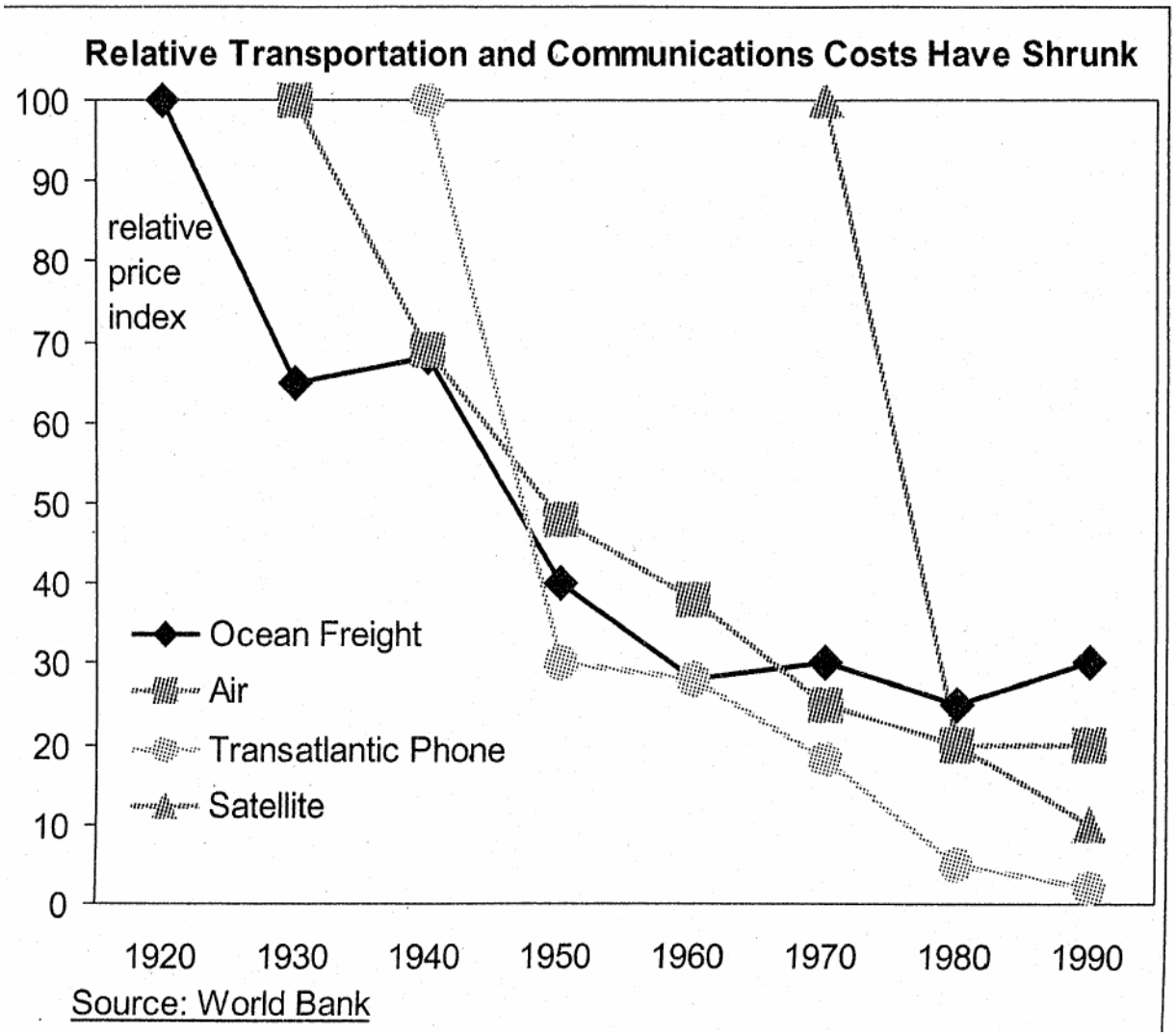
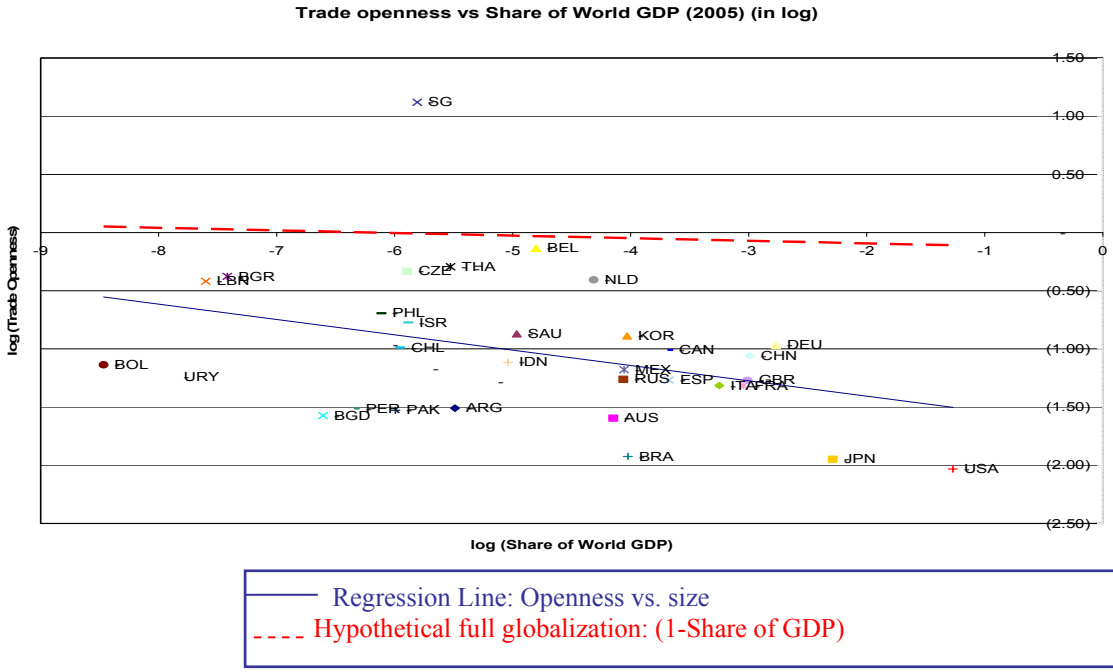


Figure 2a: Openness, Measured as Trade/GDP (log scale)



Data sources: IFS and WDI (but for Singapore where 2005 trade data are only available from Singapore National Statistics Bureau).

Figure 2b: Openness, Measured as Trade/GDP (Level scale) Without US Singapore

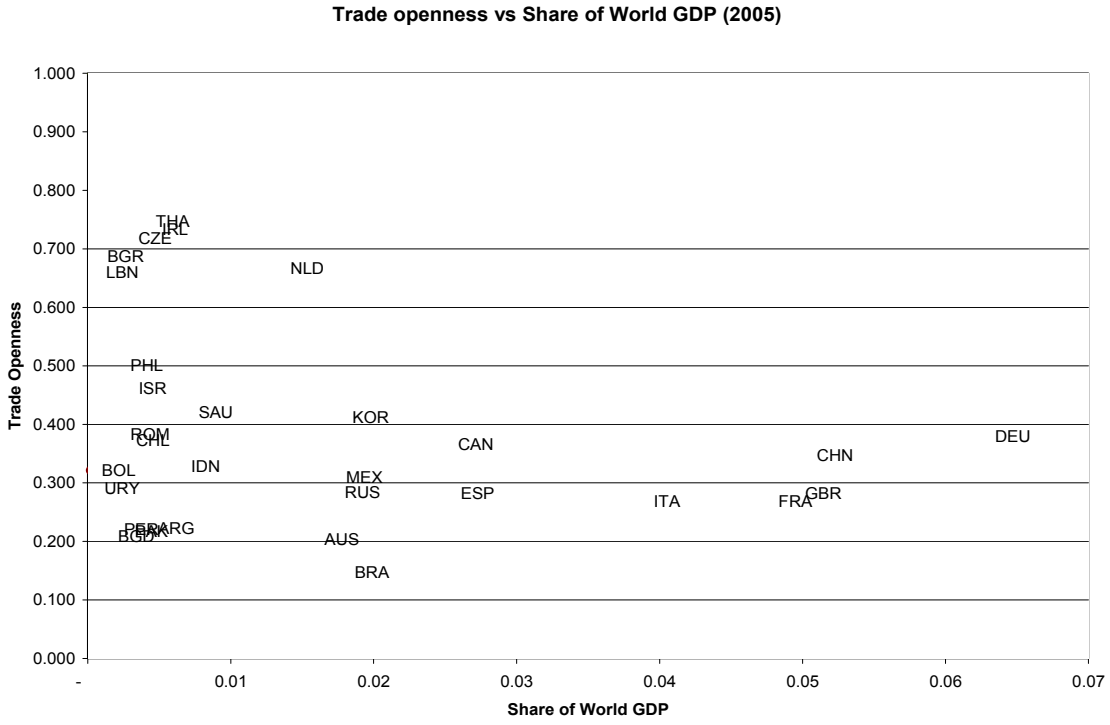


Figure 3: Globalization reversed in the first half of the 20th century

Data Source: Maddison (1995).