Elhanan Helpman   &   Daniel Trefler
Harvard University and   University of Toronto and
Canadian Institute   Canadian Institute
 for Advanced Research   for Advanced Research

2

The New World Division of Labour*

INTRODUCTION

CHINA AND INDIA ARE SETTING HISTORICAL RECORDS with the pace of their integration into the world economy. For those living in Organisation for Economic Co-operation and Development (OECD) countries that must compete with this remarkable growth, adjustments are needed. Many commentators believe that these adjustments will become so severe that the OECD countries will not be able to maintain their current standards of living. It is argued that China and India are poised to move beyond "merely" adopting OECD technologies and strategies (a remarkable ability in and of itself) and are ready to become technological juggernauts themselves. When this happens — and we are told that it will happen soon — China and India will have become an economic steamroller that hurts OECD countries.

This scenario is possible, but not likely. To understand why, one must understand — or at least be reminded of — some basic economic principles, such as the theory of comparative advantage, as well as some basic facts, such as the huge gaps that still exist between these Asian countries and North America. Moreover, it is important to understand that the emerging world division of labour is very different from the past. The emerging division is due to technological developments that enable fragmentation of production on an unprecedented scale. As a result, a variety of new considerations now play a central role, such as the variation across countries in the quality of legal and financial institutions, which affects the competitiveness of national economies.

These considerations are reflected in complex organizational forms of production that exploit cost advantages in different parts of the world and of which labour costs represent only a fraction of the overall cost calculation.

The first observation worth making is that, no matter how cheap a country's manufacturing costs might be, such a cost advantage is unlikely to be uniform across all products. As a result, there will be products in which the country has a *comparative advantage*, namely, products in which its cost advantage happens to be particularly large. Such comparative advantage can arise from a variety of sources, such as technological know-how, the availability of certain production resources such as cheap labour, and various determinants of the business environment. Be that as it may, there exist powerful economic forces driving countries to specialize according to their comparative advantage. There also exist complementary economic forces that eliminate broad cost differentials over time, thereby closing gaps in average production costs. In other words, absolute advantage is not a sustainable state across the board.

For these reasons, we should not take seriously the doom-and-gloom commentators who tell us that China and India will soon have an absolute advantage in producing all goods and services and that this advantage will be used to dominate world trade.

Since the mid-1950s, when the post-Second World War recovery was well under way, no single country — not even the United States — has dominated world trade. Whenever a country has come sprinting onto the world trading scene, as did Germany in the late 1950s and Japan in the late 1970s, it has eventually experienced rising wages, a strengthening currency, and a productivity slowdown relative to Canada and the United States. Why this happens is complex and how it evolves over time varies from country to country. However, at the heart of the process lies the limit of absolute advantage.

If China were to export massively and import nothing over long periods of time, then China would effectively be giving away goods in exchange for foreign assets. They will not want to do this indefinitely. More importantly, North Americans will need yuan to buy Chinese goods. As we demand more yuan, the yuan will rise in value. Eventually, the yuan will rise so much that Chinese wages are no longer so competitive. Also, over time, as China passes its period of "catch-up" and rises to U.S. levels of production sophistication, Chinese productivity growth will slow relative to that of the United States, thus eroding China's absolute cost advantage. In short, even if China is able to compress the successes of Germany and Japan into an incredibly short time span, the pace of these successes will be dampened over time.

## ABSOLUTE ADVANTAGE AND THE CHINESE MANUFACTURING ONSLAUGHT

CHINA HAS EXPERIENCED A dramatic increase in its exports across virtually the entire spectrum of manufactured goods. As shown in Figure 1, Chinese *net* exports to the United States grew from just $25 billion in 1993 to $131 billion in 2003. And exports from the older Tigers grew from $93 billion to $115 billion. The picture for Canadian trade with Asia is very similar.[1]

FIGURE 1

THE U.S. MERCHANDISE TRADE DEFICITS WITH EAST ASIA
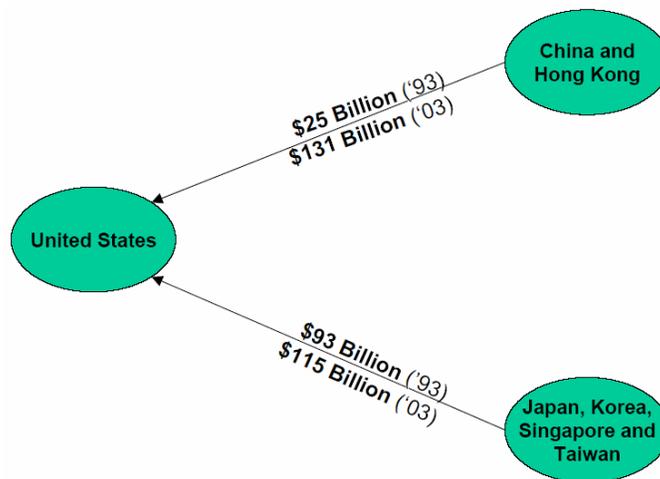
Simultaneously with this widening trade imbalance, employment declined in U.S. manufacturing. Figure 2 shows that over 3 million jobs have been shed since 1998 with much of this on the backs of production workers whose hours worked have fallen by 25 percent. (In Figure 2, the top curve is employment; the bottom curve is hours.) Other Western European countries have also experienced sharp declines in manufacturing hours.[2] Observers have interpreted this correlation between rising trade deficits and declining employment as causal, in the sense that the rising trade deficits caused employment to shrink; both situations are seen as reflecting the Chinese onslaught. Our view is that, although there is some truth in this interpretation of the data, the issues are much more involved. There are three points worth making. First, it has not been established that the quantitative relationship between trade deficits and employment is big enough to explain the *entire* loss of jobs; part of the decline in manufacturing employment reflects other influences, such as the differential productivity trends in manufacturing and service industries.[3] Second, the trade deficits reflect not only the Chinese onslaught; they also reflect the economic policies in the U.S. economy, such as massive tax cuts, which have little to do with China. Third, and perhaps most telling, is the fact that the emphasis on this correlation misses other extremely important developments and therefore provides a biased picture. We now expand on the last point.

FIGURE 2

**U.S. MANUFACTURING EMPLOYMENT AND HOURS**
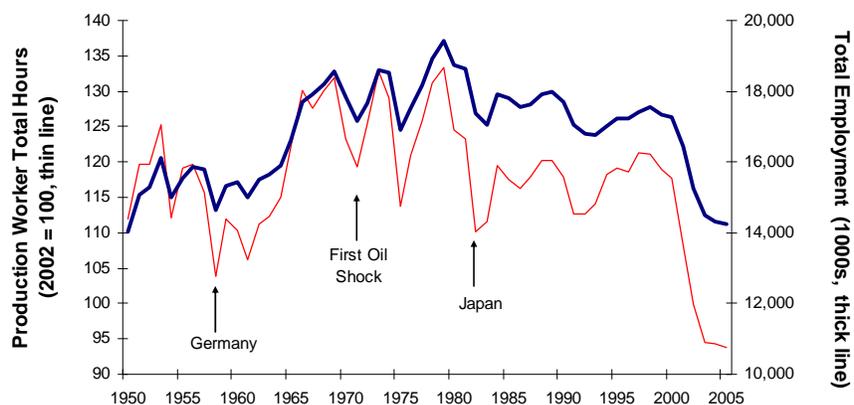
VALUE ADDED VERSUS EMPLOYMENT

THERE ARE TWO REASONS why the correlation between Chinese exports and U.S. employment losses is misleading; both reasons have to do with what economists call "value added." "Value added" is the sum of wages and profits. The sum of value added across all sectors of the economy is gross domestic product (GDP). Much of the design for manufactured goods is carried out in OECD countries such as the United States, Japan and Canada. In other words, most of the highly paid jobs (skilled design work) and profits (returns on investments) are generated in these countries, meaning that much of manufacturing value added is produced in these countries. Consider U.S. value added: its growth rate since 1950 is shown in Figure 3.[4] The most striking feature of the figure is that the events since 1999 show up as only a tiny blip in otherwise long-standing growth. Figure 3 also displays GDP growth. One expects manufacturing employment as a share of total employment to fall over time because of rising manufacturing productivity relative to service-sector productivity. (This also explains why agricultural productivity has slashed agriculture's share of employment.) One might also expect manufacturing value added as a share of GDP to fall as we move to a more knowledge/service-based economy. This is not the case. U.S. manufacturing value added has remained robust.

It is worth looking at historical instances in which manufacturing value added has grown more slowly than GDP for long periods. There have been two such episodes with the first occurring in the early 1960s as German manufacturing recovered. This led to massive German trade surpluses and a restructuring of the world financial architecture, starting in 1969, which culminated in the collapse of the Bretton-Woods system. Eventually U.S. manufacturing recovered. The second episode was the rise of Japanese manufacturing in the late 1970s, which decimated U.S. manufacturing, led to huge Japanese trade surpluses and to the 1985 Plaza Accord. U.S. manufacturing survived this onslaught as well. Figure 3 shows that, in comparison with the German and Japanese manufacturing onslaughts, the Chinese onslaught is minor. U.S. manufacturing value added shows no sign of collapse.

There are two important messages here. First, if and when China captures as large a share of world manufacturing as was captured by Germany and Japan in their heydays, the impact on North America will not be overwhelming. There might be transition pains similar to those of the 1980s, but not much more. Second, the flexible financial system of the current world economy is better equipped to handle persistent trade surpluses such as China's than were the systems in the 1960s and 1980s. For this reason, the disturbances caused by China should be small. Moreover, as we will argue later, the international organization of

FIGURE 3

U.S. MANUFACTURING VALUE ADDED
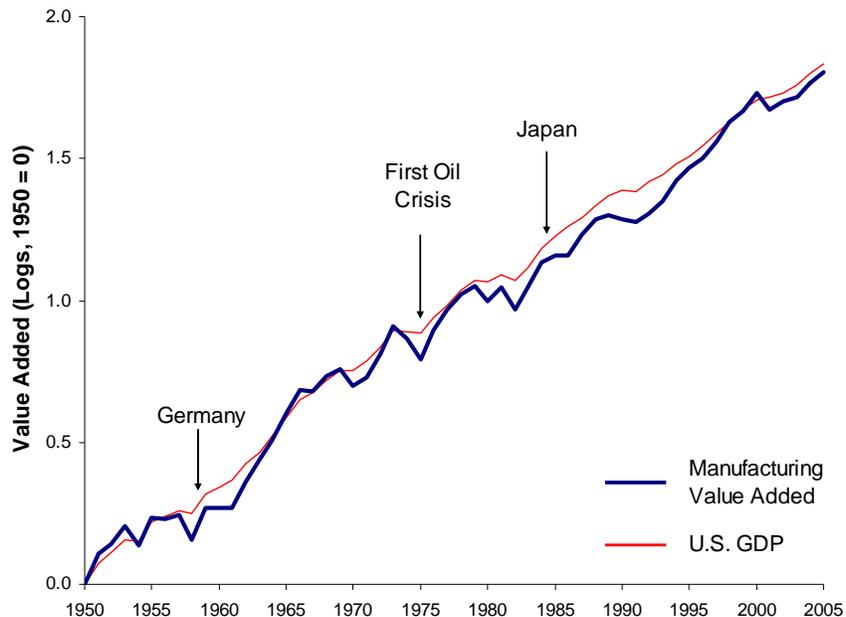
production is now much more flexible than in the past, which should also ease the pain of transition in response to such shocks.

VALUE ADDED VERSUS TRADE

We have seen that data on value added paint a very different picture than do the data on employment. We turn next to value added embodied in trade. Recall that trade statistics report sales, not value added. It turns out that very little of the U.S.–China trade imbalance is about value added. To understand, one must realize that most trade is in intermediate goods. For example, Japan produces very sophisticated parts for consumer electronics, e.g., Sony plasma televisions and PlayStations. Japan's *net* exports of these parts to China are large, about $60 billion in 2005.[5] These parts are then assembled in China and shipped to North America as finished consumer goods. Thus, most of

the value of the finished products is generated in Japan while only a small part is generated in China.

With this in mind, Figure 4 revisits the trade data to argue that there is a sense in which surprisingly little has changed since 1993. To make this point, note that U.S. trade flows approximately doubled between 1993 and 2003. (U.S. imports from Canada exactly doubled.) If 1993 trade flows had all doubled over this period, then by 2003 they would have been at the levels indicated in Figure 4 as "'93**." That is, the old Asian Tigers (Japan, South Korea, Singapore and Taiwan) would have had net exports of $186 billion to the United States. In addition, they would have shipped $59 billion in net exports (mostly parts) to China; and China would have shipped $50 billion in net exports (mostly final goods) to the United States. The U.S. net imports from China and the old Tigers would have been $235 billion. This calculation is made without any reference to the rise of China.

FIGURE 4

THE U.S. TRADE DEFICIT — REALLY SOMETHING NEW?
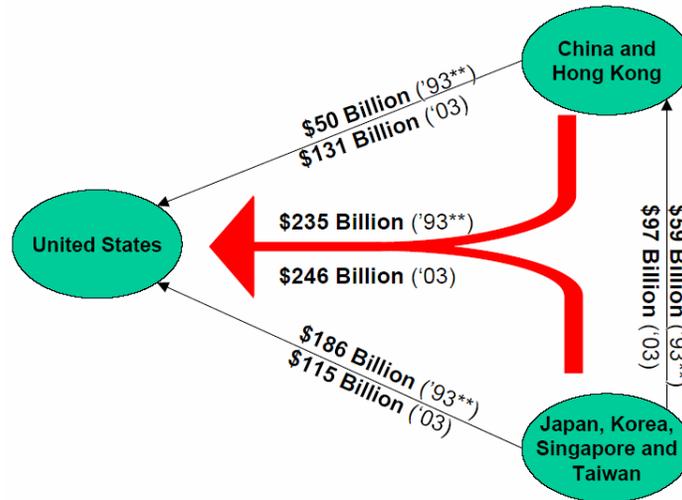
Why is this not what actually happened in 2003? That is, why in Figure 4 do the "'93**" numbers differ from the "'03" numbers? What *has* happened is that the old Tigers are no longer shipping as many final goods to the United States. Instead, they are shipping parts and know-how to China and China is shipping the assembled final goods to the United States. But none of this matters from the U.S. perspective. The United States' net imports from China and the old Tigers is $246 billion, a number virtually identical to what one would have predicted from a doubling of the trade flows even if there had been no rise of China.

We are not saying that the rise of China is not spectacular, historically remarkable, or unimportant for 21st-century world history. We are only saying that its impact has not dramatically changed U.S. manufacturing value added. The U.S. weathered the rise of Germany and Japan. To date, there is no hard evidence that the United States and Canada are failing to weather China.[6]

SUSTAINABILITY OF CHINESE TRADE SURPLUSES

An important part of the theory of comparative advantage is that each country exports something and no country exports everything (as long as trade imbalances are not too large). Is it possible, for example, that China will cease importing and will only export? Two facts have been used to argue that comparative advantage arguments do not apply in this case. The first is the large China–U.S. trade imbalances. The second is low wages in China. Both of these facts need to be thought about more carefully.

Three factors determine unit labour costs in China relative to the United States:
1. Chinese wages in yuan relative to Canadian and U.S. wages in dollars
2. The exchange rates
3. Chinese productivity relative to Canadian and U.S. productivity.

Let us examine each of these.

Chinese Wages in Yuan

Chinese manufacturing wages are incredibly low, 2.5 percent of U.S. manufacturing wages in 2002.[7] Furthermore, this gap is likely to remain as China has announced a plan to bring 300 million unskilled workers to its coastal cities in the coming decades. There are two minor caveats here. First, wages seem to be on the rise; and salaries for skilled labour, especially management, are skyrocketing in cities such as Shanghai. Second, as China moves up the ladder of sophistication,

unskilled labour costs become a smaller and smaller share of total costs. Thus, rising skilled labour costs and a decreasing importance of unskilled labour will become more important over time.

Exchange Rates

Is it possible for China to keep its exchange rate undervalued so that it continues to run huge trade surpluses in manufactured goods? No one knows how long such surpluses can be maintained, but there is a cost to them. It requires China to supply the United States with enough yuan for Americans to actually pay for the Chinese goods being bought. This forces China to print money — which is inflationary — and to hold large foreign exchange reserves, which earn low interest or no interest at all. There is no answer for how long China can hold out against these pressures or against U.S. pressures for a Chinese revaluation. But it is unlikely that it will accumulate foreign assets without any limits.[8]

The most interesting evidence on this question comes from the historical record for countries that have run up similar trade imbalances with the United States, namely, Germany starting in the late 1950s and Japan starting in the late 1970s. We have already seen in Figure 3 that U.S. manufacturing value added eventually recovered from these onslaughts. What was the mechanism? Part of it was exchange rates. Consider Figure 5, which shows dollar-denominated hourly compensation of manufacturing workers in various countries relative to the United States.[9] In 1960, German wages, converted into U.S. dollars at current exchange rates, were 31 percent of U.S. wages.[10] By 1975, they equalled U.S. wages. Dollar-denominated Japanese wages in 1960 were 16 percent of U.S. wages. By 1992, they equalled U.S. wages. Two mechanisms drove these developments. First, wages in local currency rose. This is already happening in China, a fact that is behind the rise shown in Figure 5 in Chinese dollar-denominated wages from 0.9 percent of U.S. levels in 1990 to 2.6 percent of U.S. levels in 2002. Of course, there is a lot more room for yuan-denominated wage increases in China. Second, systemic German and Japanese trade imbalances led to large revaluations of their currencies. The German imbalance contributed to the breakdown of the Bretton-Woods system during the 1969–1973 period and to a revaluation of the mark, while the Japanese imbalance contributed to the Plaza Accord of 1985 and to a revaluation of the yen. No one can say for certain, but a future revaluation of the yuan may be in the cards.

FIGURE 5

DOLLAR-DENOMINATED WAGES
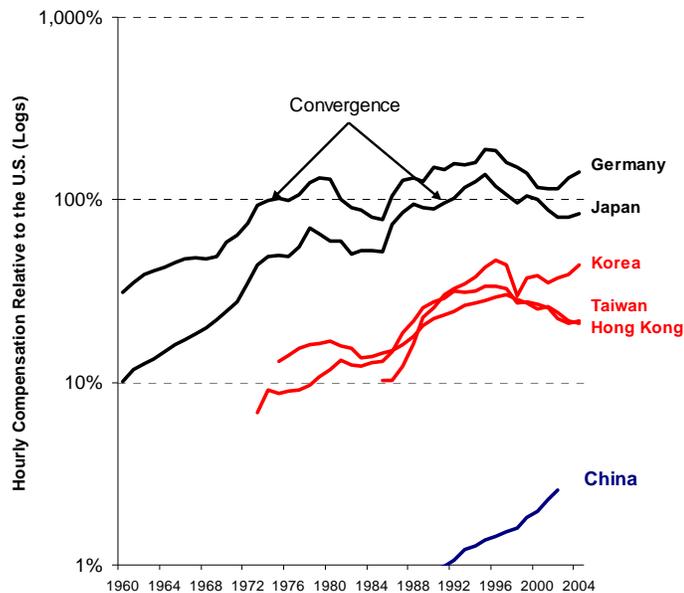
Productivity

What matters for competitiveness is not just wages, but also productivity. Productive labour can be paid more and indeed, rising productivity is by far the most important proximate cause of rising wages. Dollar-denominated wages adjusted for productivity are called "unit labour costs." Unit labour costs are the dollar-denominated wages needed to produce one dollar of output. We fret about the rapid pace of Chinese productivity growth, a pace fuelled by Western technologies that are acquired legally and often illegally. However, U.S. and Canadian manufacturing are also on a productivity tear. We have already seen this in another form. Productivity is often measured as value added per hour worked. U.S. manufacturing value added has been growing steadily while hours worked have fallen off dramatically, reflecting rapidly rising productivity.

Figure 6 provides the annual average growth rate in unit labour costs over the 1975−2004 period for countries for which long-term data are available.[11] Data are relative to the United States. The red (or dark) bar is unit labour costs and, as is apparent from the figure, unit labour costs have risen relative to the United States in all countries. For example, it has been rising at 2.5 percent per year in South Korea. Why is this, given that Korea has experienced rapid productivity growth? Indeed, Korean productivity growth in manufacturing has outstripped U.S. productivity growth by 4.6 percent a year for more than a quarter of a century. *However*, dollar-denominated Korean wages have grown 7.1 percent faster than U.S. wages over the same period. The difference, 7.1 percent minus 4.6 percent, is the rise in unit labour costs. One does not expect yuan-denominated Chinese wages to grow at such a fast clip, but it is possible that an appreciation will lead to rapid dollar-denominated Chinese wage growth. In short, the experience of Asian Tigers has been one of steady erosion of their competitiveness over a period of a quarter century.

FIGURE 6

RISING UNIT LABOUR COSTS RELATIVE TO THE UNITED STATES
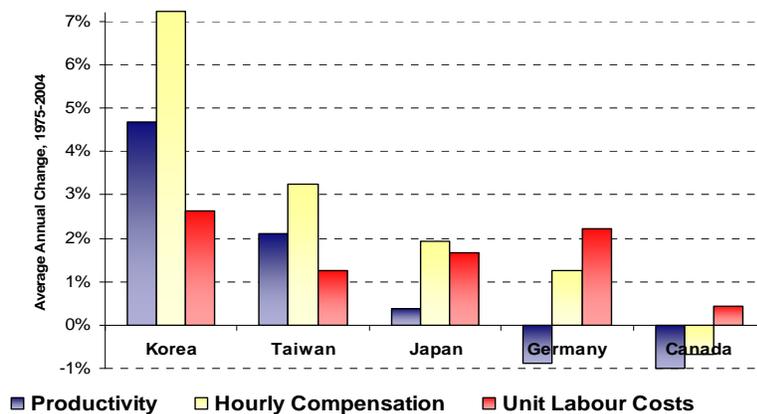
It is often argued that once the manufacturing jobs leave for China, even a massive strengthening of the yuan will not bring the jobs back to North America. There is no doubt that as Chinese know-how and productivity rise, they reduce China's unit labour costs. But as shown by the long-term robustness of North America in the face of German and Japanese competition, such "hysteresis" arguments are vastly overstated.

SUMMARY

We have argued that low wages in China and India cannot be used to justify extreme predictions of the type often encountered in the press.
1. North American value added is remarkably robust, just as it was in the face of German and Japanese competition.
2. Measured in relative terms, the U.S. trade deficit with Asia is not all that much different from what it was in 1993 when China was not yet a major economic entity.
3. And over time, successful low-wage countries are expected to become successful — but not dominating — higher-cost trading partners.

Beware of doom-and-gloom media hype.

NEW SPECIALIZATION PATTERNS

IN THE PREVIOUS SECTION, we discussed what shapes comparative advantage. The logic of these arguments applies to final goods, capital goods and intermediate inputs, as well as to a variety of stages of production that can be separated from each other. Which stages of production are most effectively handled jointly and which can profitably be separated depends on technology, transport costs and the costs of alternative organizational forms. The organizational costs can be explicit, such as the cost of managers, or hidden, such as the agency costs embodied in the organization's incentive structure. The agency costs result from conflicting incentives faced by suppliers, workers and final good producers. And they are reflected in productivity: the greater the conflicts, the lower the productivity.

In recent years, business firms have substantially modified their organizational forms. As a result of computer-aided design, computer-aided manufacturing and other IT innovations, it has become much cheaper to fragment the production process and disperse various stages of production across different locations. These segmentation decisions are based not only on out-of-pocket costs of inputs but also on the organizational costs. If, for example, a firm examines the merit of

outsourcing an input, it does not just consider the price it has to pay to a supplier. It also factors in the extent to which it can secure the requisite characteristics of the input and its timely delivery. Indeed, the choice of suppliers often entails a trade-off between low price and high reliability.

FRAGMENTATION

Fragmentation of production has recently had a great impact on service industries. First, back-office services such as accounting and bookkeeping are now often outsourced to specialized suppliers. As a result, industrial production has declined in an accounting sense because the outsourced services are measured as part of the service sector whereas they were measured as part of manufacturing when supplied internally by integrated industrial firms. The growth of outsourcing in the United States is illustrated in Table 1 with the numbers taken from Bartel, Lach and Sicherman (2005). The table shows that between 1992 and 1997, outsourcing of services more than doubled and accounting, bookkeeping and communications expanded particularly fast. They were more than 13 times larger in 1997 than in 1992 as a percent of total value added.

Second, the new technology allows many services to be traded internationally. The traded services now include banking and insurance, as well as specialized business services such as computer, information, management and consulting. Table 2 shows the rapid growth of service exports from the United States from $44 billion in 1997 to over $65 billion in 2002. Significantly, this rapid growth took place both within firms (affiliated) and across firms (unaffiliated).[12]

TABLE 1

INDUSTRY AVERAGE SPENDING ON OUTSOURCING*

Type of Service	1992	1997	1997/1992
All purchased services	4.25%	10.68%	2.51
Accounting & bookkeeping	0.14%	1.95%	13.93
Communications	0.35%	2.82%	8.06

Note: *As percentage of total value added

TABLE 2

U.S. BUSINESS SERVICES EXPORTS BY SUB-SECTOR (BILLION DOLLARS)

Sector	1997	2000	2002
Business, professional and technical services	44.0	55.2	65.4
Unaffiliated	21.5	25.3	28.8
Affiliated	22.4	29.9	36.6

The growth of trade in intermediate inputs has been widespread, reflecting similar trends in many industries. Moreover, this trade expansion has taken place between subsidiaries of multinational corporations and their parents on one hand, and between unaffiliated firms on the other. Campa and Goldberg (1997) document these findings for the United States, the United Kingdom and Canada; Strauss-Kahn (2003), for France; and Hummels, Ishii and Yi (2001), for other OECD countries.

INSTITUTIONS

Agency costs differ across countries; they are low in countries with good institutions, such as reliable courts of law, and high in countries with weak institutions, such as erratic or corrupt courts of law. And the extent to which the quality of institutions matters differs greatly across sectors. A firm producing a sophisticated product requires highly specialized intermediate inputs, and it may therefore be particularly vulnerable to weak legal protection. Under these circumstances, a Canadian firm may prefer to source such an input in Canada where it is expensive but where the firm can obtain legal protection from a Canadian court of law rather than sourcing the input in low-cost China, where contracts are not enforced with the same accuracy and reliability. Discussing obstacles faced by foreign companies in China, Banister (2005c) writes: "China's legal system is very slow and ineffective at enforcing legal contracts; it is also subject to corruption and arbitrary rulings" (p. 50).

This insight has three important implications. First, it suggests that the quality of a country's institutions affects its comparative advantage because costs in some sectors are more sensitive to the quality of institutions than in others. As a result, countries with good institutions

have a comparative advantage in sectors whose costs are particularly sensitive to the quality of institutions. As examples, we discuss below the role of legal systems and financial institutions in shaping comparative advantage. Second, the quality of institutions affects which parts of the production process firms choose to outsource. Among the stages of production that can be technologically separated from core activities of a firm, some entail more severe agency problems than others in dealing with outside suppliers. They therefore have outsourcing costs that are more sensitive to the quality of institutions. Namely, the make-or-buy decisions, or the integration-versus-outsourcing decisions, are sensitive to the institutional environment. We discuss this issue in more detail in the next section. Third and lastly, when a firm considers whether to source an input at home or in a foreign country, its overall cost comparisons are influenced by differences between the two countries in the quality of institutions. A firm will be reluctant to offshore the production of an input to a foreign country with weak legal protection if the input's overall cost is particularly responsive to the quality of the legal system. This issue is also discussed in more detail in the next section. In summary, comparative advantage, internalization decisions and offshoring decisions all respond to the quality of institutions.

To illustrate, consider sectoral trade flows. Nunn (2007) studies the export performance of countries with better legal systems relative to countries with worse legal systems in a large number of sectors.[13] What he finds is that countries with better legal systems export relatively more in sectors that use intensively inputs that do not have organized exchanges. Inputs that have organized exchanges are highly standardized and do not require complex contracting arrangements. Products that use such inputs intensively are less sensitive to the quality of the legal system than are products that use intensively highly specialized inputs that do not have organized exchanges.[14] It follows that the ratio of

$$\frac{\text{cost of goods that intensively use inputs with organized exchanges}}{\text{cost of goods that intensively use inputs with no organized exchanges}}$$

should be higher in countries with high-quality legal systems than in countries with low-quality legal systems. This prediction is supported by the data, as depicted in Figure 7. The figure shows a clear positive correlation between relative exports from countries with better legal systems (measured on the vertical axis) and the intensity with which sectors use inputs that do not have organized exchanges (measured along the horizontal axis). The figure depicts the marginal effects, after controlling for other determinants of trade flows.

FIGURE 7

**RULE OF LAW ENCOURAGES EXPORTS OF GOODS WITH NO
ORGANIZED EXCHANGES**
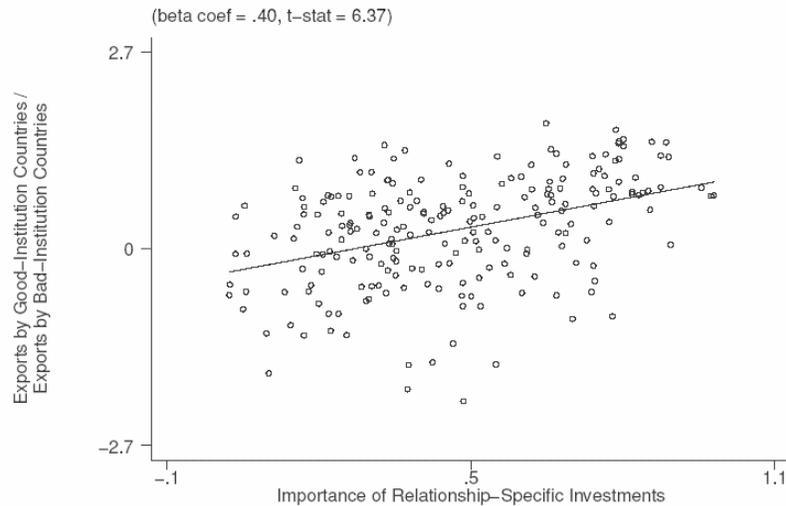
Results with a similar flavour are obtained by Manova (2005) who studies the impact of financial development on trade structure and finds that the quality of a financial system affects comparative advantage. Manova argues that exporters face borrowing constraints and that exporters' capacity to export depends on a sector's asset structure and its reliance on external financing. As a result, countries with better financial systems should export relatively more in sectors that rely more heavily on external finance and in sectors that have fewer tangible assets to serve as collateral. The empirical findings support these claims. Manova also finds that financial liberalization raises exports in sectors that rely relatively more on external finance. In other words, the quality of the financial system affects comparative advantage and trade flows.

An interesting question is whether the impact of these institutional variables on relative costs, and therefore on trade flows, is large. Nunn (2007) argues that they are. As a metric for comparison, he estimates the impacts of other, more standard, determinants of trade flows, such as the availability of human or physical capital. We expect, for example, that countries with relatively large endowments of human capital will export relatively more in sectors that are human capital intensive (such

as software) as compared with countries that have relatively little human capital. And, indeed, his estimates confirm these predictions. He then compares the impact of the index of the rule of law on trade flows with the impacts of human and physical capital.[15] His estimates are 0.2 for judicial quality, 0.14 for human capital, and 0.07 for physical capital. In other words, not only is the impact of the judicial system significant, it is larger than the impact of human or physical capital and as large as the impact of the two forms of capital combined.

It is important to note that both the quality of a country's legal system and the quality of its financial system affect the country's productivity and growth. It has been established in numerous studies that better legal and financial institutions are positively correlated with better economic performance.[16] As a result, institutions are important determinants not only of trade, but also of income.

There are competing theoretical models to explain these findings, which for the most part emphasize the role of contracts. Of particular interest are the papers by Levchenko (2004), Nunn (2007), Constinot (2005), and Acemoglu, Antràs and Helpman (2007). Each one of them identifies a mechanism through which differences in the quality of the legal system differentially affect costs of various industries and thereby generate comparative advantage. In other words, the relative productivity structure across sectors is correlated with the quality of a country's judiciary, as suggested by the evidence. In particular, sectors that are more sensitive to the quality of the legal system have relatively higher productivity in countries with better law-enforcement institutions. As a result, they all have similar predictions about correlations of the type depicted in the Figure 7. There exists, however, no evidence on the exact mechanisms that generate these correlations, and this shortcoming makes it difficult to draw policy conclusions.

ORGANIZATIONS

Fragmentation of the production process enables business firms to spread the value chain across many countries and to develop a distinctive relationship with every supplier. This new flexibility has dramatically changed the division of labour in the world economy, leading to rapid expansion of trade in intermediate inputs and to the emergence of new patterns of trade and foreign direct investment (FDI). For example, the traditional classification of FDI into "horizontal" and "vertical" now captures only a fraction of FDI flows because multinational corporations engage in what the United Nations Conference on Trade and Development (UNCTAD) (1998) calls "complex integration strategies."[17] Such complex strategies include locating subsidiaries in countries that can serve as convenient export platforms to other destinations, or the production of intermediates in

foreign countries, close to assembly lines, in order to exploit complementarities between these alternative forms of FDI. Evidently, fragmentation opens many new sourcing possibilities.

While technological change has opened up new sourcing options, the forms and locations of profitable sourcing patterns depend on characteristics of the product and its technology, sectoral features and characteristics of the destination countries. Here again institutional features, such as the quality of the judiciary, play a role.

Two different types of decisions are influenced by these considerations: the decision to outsource or integrate and the decision to source domestically or internationally (offshore).[18] Although these decisions are interrelated, it is convenient to use this simple two-by-two classification system, which yields four possibilities: integration at home, outsourcing at home, integration in a foreign country (i.e. FDI; the acquisition of a foreign subsidiary) or arm's-length imports from an unaffiliated firm.

In choosing between outsourcing and integration, the strength of agency costs plays a key role. Grossman and Hart (1986) and Hart and Moore (1990) have developed what is known as the "property rights" approach to the theory of the firm, which focuses on this consideration. A major insight from this theory is that the importance of the contribution of the final good producer to the value of the enterprise relative to the contribution of a supplier of an intermediate input is a major determinant of the preferred organizational form. If the supplier's activities are particularly valuable, he or she should be provided with strong incentives to contribute to the joint undertaking; this is best achieved via outsourcing. Outsourcing enables the supplier to capture a larger fraction of the profits associated with his or her efforts at raising quality and reliability. If, however, the final good producer's activities are relatively more important, that person should be provided with strong incentives; this is best achieved via integration. These considerations, because they apply to both domestic and international organization form, have a bearing on trade flows. Antràs (2003) has shown, for example, that they help to explain why, in capital-intensive sectors, large fractions of U.S. imports are from subsidiaries of foreign affiliates, and why these fractions are particularly large for imports from countries with relatively large capital endowments.

The trade-off between outsourcing and integration naturally involves additional considerations, which are discussed in the trade literature. For one, the overhead costs of an enterprise depend on the organizational form. An integrated firm suffers from managerial overload, as managers need to handle a broad array of diverse activities. Yet there might also exist what economists call "economies of scope" in management, in which case integration saves managerial costs by

pooling the management of intermediate inputs with other management tasks of the firm. Finally, specialization within firms plays a role. Specialized suppliers of intermediate inputs may have a cost advantage over final good producers who supply their own inputs. And the extent of this advantage may depend on the match between the supplier and the final good producer. If the match is a good one (e.g. the technological needs of the final good producer are close to the technological capabilities of the supplier), outsourcing is preferred. If the cost advantage is bad, integration is preferred. Moreover, the quality of the match also depends on the contracting environment. When the match takes place in a country with a strong rule of law, outsourcing is more likely. This generates what is known as a "thick market" effect, which implies that outsourcing should be more prevalent in larger markets. Under these circumstances, the removal of trade barriers discourages integration and encourages outsourcing.[19]

As for offshoring, the main trade-offs emphasized in the literature are between lower production costs, particularly in less-developed countries such as China, and either higher agency costs that result from weak judiciaries or lower probabilities of finding suitable suppliers. In either case, not all firms from industrial countries find it equally profitable to offshore. Those that do are those that derive particularly large benefits from lower costs, or those that are less sensitive to the disadvantages of sourcing abroad. Their extra direct costs of foreign sourcing are not particularly high; they are less vulnerable to contractual frictions and therefore to the quality of the rule of law; or they expect to find particularly suitable suppliers in a foreign country.

These trade-offs in integration versus outsourcing and domestic sourcing versus offshoring help in understanding the substitutability between FDI and arm's-length imports of intermediate inputs. Antràs and Helpman (2004) illustrate this sort of analysis. They show theoretically that, in sectors with small components of activities that have to be carried out only by final good producers, outsourcing prevails, and that the larger and more productive firms outsource from a low-cost country while less productive firms outsource at home in the high-cost industrial country. In sectors with large numbers of activities that have to be carried out by final good producers, the more productive firms also offshore. Yet, between them, those at the high end of the productivity distributions engage in FDI while those at the lower end outsource. In the home country, the sorting is similar; more productive firms integrate while less productive firms outsource.

As an empirical illustration, consider the study by Feenstra and Hanson (2005). They first note that export processing plays a major role in China's foreign trade, accounting for more than half its foreign trade during the 1997–2002 period. Factories engaged in this activity were either Chinese or foreign owned, while the control of the inputs

imported for export processing was either under foreign buyers or the Chinese factory. Building on the above-described considerations from the property rights approach to the theory of the firm, they construct a model that predicts four organizational forms: foreign ownership of factory and foreign control of inputs; foreign ownership of factory and Chinese control of inputs; Chinese ownership of factory and foreign control of inputs; and Chinese ownership of factory and Chinese control of inputs. Estimating the model's parameters, they find a close fit to the data. Close to half the activity takes place in foreign-owned factories with inputs controlled by the Chinese factories. This is the most prevalent organizational form. At the other extreme, foreign-owned factories with foreign-controlled inputs is the least prevalent organizational form, amounting to a little over 8 percent. The remaining organizational forms fall in between; slightly more than 27 percent for Chinese-owned factories with foreign control of inputs and close to 15 percent for Chinese-owned factories that control the inputs.

SUMMARY

To summarize, a large number of studies have examined the conditions under which companies choose to locate in foreign countries and the forms in which they choose to organize the supply of different parts of their value chain. This literature has provided many interesting theoretical insights but little evidence so far on the dominant channels of influence. It is necessary to expand the empirical study of these issues to obtain a better understanding of the new world division of labour.

CONCLUSIONS

THE GLOBAL ECONOMY IS CHANGING RAPIDLY, even more rapidly than our theories about new patterns of international specialization. The second section of this paper points both to the success of these theories in explaining the new empirical patterns and to the need for more detailed empirical explanations of the causal mechanisms involved. These include the role of national institutions (such as the quality of legal systems) and the role of agency problems between firms and their foreign suppliers.

In the first section, we used comparative advantage theory to identify new evidence about the long-term impact of the rise of China, India and other low-wage offshore destinations. We showed that much of the doom-and-gloom media hype is overdone.

ENDNOTES

[1] Data are from the IMF *Direction of Trade Statistics (DOTS)*. It is interesting that Western Europe, with the exception of the United Kingdom, continues to essentially run a balanced trade with China. Thus, Figure 1 should not be viewed as being driven exclusively by Asian absolute advantage. It is also driven by circumstances that are unique to the North American–Asian relationship.

[2] Figure 2 is from the authors' calculations based on data from the U.S. BEA website. Data on other Western European countries are from the OECD STAN database. It is worth noting in passing that Canada alone in the OECD has seen both employment and hours expand significantly over the last decade, e.g., Canadian employment expanded by 16 percent. Canadian manufacturing employment statistics are reported on a consistent basis since 1981. Over the 1981–2005 period, employment was at its highest in 2004. This is good news for Canada. The only dark spot has been the recent decline in manufacturing employment.

[3] See, for example, Ngai and Pissarides (2005).

[4] Figure 3 data are from the BEA website's chained index series (VAQI).

[5] Data are from Hong Kong Trade and Development Council website: www.tdctrade.com/chinastat/img/20MIP.xls

[6] As an aside, consider the following table, which provides data on the share of world manufacturing value added generated by each region:

	1990	2003	Change
China-Hong Kong	3%	9%	6%
United States	23%	25%	2%
Japan	17%	14%	-3%
Europe EMU	28%	25%	-3%
World	100%	100%	0%

Since 1990, China has increased its share by 6 percentage points, so that it now produces 9 percent of world manufactures. Interestingly, both Canada and the United States have also managed to increase their shares. The bigger losers in terms of shares (though not in terms of absolute levels of value added) are Japan and Europe. Data are from the World Bank's *World Development Indicators*.

[7] Authors' calculations from data in Banister (2005a, 2005b) and the Bureau of Labor Statistics website.

[8] Note that once a country ceases to accumulate foreign assets on net, its trade surplus has to turn into a trade deficit equal to its net income from foreign asset holdings (i.e. the country's income on its foreign asset holdings minus the foreigners' income from holding the country's assets). This means that, if we expect China to cease accumulating foreign assets on net at some point in the future, we should also expect its trade surplus to evaporate.

[9] Authors' calculations based on data from the BEA website.

[10] Note that the scale is logarithmic so that halfway between 10 percent and 100 percent is only 31 percent.

[11] Authors' calculations based on data from the BEA website.

[12] These data are from the *World Investment Report 2005*.

[13] Nunn uses several proxies for the quality of a country's legal system. One is an index of the rule of law, which is a weighted average of a number of variables that measure the effectiveness and predictability of the judiciary and the enforcement of contracts, as perceived by a sample of individuals. This index assigns the highest score to Switzerland, which is 0.972; it assigns 0.854 to the United States and 0.664 to South Korea. All these scores belong to the high end of the index. At the low end, we find countries such as Kenya with 0.296 and Zaire with 0.106 (the lowest score).

[14] Among the inputs that do not have organized exchanges, Nunn also distinguished between those that have a reference price and those that do not. Inputs without a reference price are considered to be more sensitive to contractual frictions than those with a reference price. But he finds that aggregating the inputs with a reference price with those that do not have a reference price, or aggregating them with the inputs that have organized exchanges, has similar implications.

[15] For this comparison, he uses standardized, or beta, coefficients. This method of standardization transforms all estimates into comparable units, which makes the estimate of the impact of the rule of law comparable to the estimate of human capital.

[16] See, for example, La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999) and Rajan and Zingales (1998).

[17] Horizontal FDI refers to investment designed to serve the host country's local market. Vertical FDI refers to investment designed to exploit lower costs in the host country; it may involve the production of intermediate goods, final goods or assembly. According to Feinberg and Keane (2006), among the U.S. affiliates in Canada, only 12 percent are of the purely horizontal type and only 19 percent are of the purely vertical type. The remaining 69 percent represent "complex integration strategies."

[18] We use the terms "integration" and "outsourcing" in the standard way, as is common in industrial economics. Some writers use the term "outsourcing" for imports from a foreign country, which we find misleading. We therefore reserve "outsourcing" for sourcing from an unaffiliated supplier, be it a domestic or foreign firm. And we use "foreign sourcing" or "offshoring" for imports of intermediate inputs or services from foreign countries.

[19] See Helpman (2006) for a review of this issue as well as other issues discussed in this section, including references to the literature.

ACKNOWLEDGEMENTS

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