

Globalization and Knowledge Flows

An industrial geographer's perspective

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1. Location, trade, and knowledge

Geographers and economists view globalization through the Amirror images of location and trade. The analysis of trade asks to what extent the trade flows of goods or money are becoming more international than they are national or regional, and it assumes that such changes are due to changing location patterns of production or investment. We often try to derive changes in the patterns of location of economic activities from the analysis of trade and investment flows, and then to ask what this might mean about the degree of specialization of national or regional economies. In concert with information about ownership or foreign direct investment patterns, others try to determine whether the locus of control over competition or investment is changing.

This focus on Adirect exchanges (in the sense of hard flows of goods and money) may miss the most important aspects of the process, however. The geographical origins, destinations, and mastery of economically-useful knowledge have more profound impacts on the changing shape

of development than do standard issues of location and specialization. Moreover, with an analysis of such knowledge flows, some of the predictions of location and trade theories about physical location, specialization and the economic performance of regions and nations, can be called into question.

2. Standard approaches to the question of globalization and territory

Analyses of trade and their impacts on location can be viewed through a number of different location theories, and each tends to lead to different interpretations of similar sets of trade data, by asking rather different questions of the data.

The first is standard comparative advantage theory, which holds that patterns of location, specialization and trade will be driven by the geographical distribution of factors of production. Since Ricardo, this theory has been recognized, at one and the same time, for its utility and its limits. It helps us to understand the rough match between labor-intensive low-wage activities and labor-rich developing areas, especially in activities with low-barriers to entry and few necessary relations of proximity with other activities. As an account of the geography of economic development, however, it falls quite short, especially when it comes to the most complex and most advanced economic areas. It ignores spatial interdependence or proximity relations between activities (i.e. forces for localization and clustering) or even straightforward economies of scale; and, it has no way to account for the build-up of humanly-created factors in particular places (e.g. knowledge, skill, institutions), treating all such factors as exogenous.

A second theory of location is the modified neoclassical theory of the Anew geographical

economics, or -- as it is also known -- the New Trade Theory, whose main exponents are Paul Krugman and Elhanan Helpman (1987). In place of the assumptions of constant returns to scale, divisibility and hence perfect competition process of the standard theory, they introduce scale economies and imperfect competition over space. In the context of the current globalization process, where traditional locational constraints are declining (transportation and communications improvements; institutional barriers to trade falling; diffusion of capitalist economic practices and norms), the theory predicts a world of greater territorial economic specialization, as market territories for particular goods and services are defined increasingly by the optimal scale of production. These activities, in effect, create territorial shadows or oligopoly effects around them; thus, a world of highly imperfect competition, but one which is also efficient, and where market contestability, though territorially uneven, is still strongly present.

The third line of attack on globalization might be defined better as a framework than a theory: it consists of a large body of work concentrating on the development of firms and production systems. It explores the general theme that the strategic, financial, and technological capacities of large firms have developed to the point that what goes on inside these firms or, alternatively, in networks of key firms and their principal partners and dependent contractors, has become at least as important as the classical relations between firms and territories (Harrison, 1997; Dicken, 1998).

Because this is a more empirical and hence more complex body of work, we need to spend a bit more time examining it here. We may begin with its opposite, which can be called Alocalization or, better, Aterritorialization. Territorialized economic development is something quite different from mere location or localization of economic activity. It consists, for our purposes, in economic activity that is dependent on territorially-specific resources. These resources can range

from asset specificities available only from a certain locale or, more importantly, assets that are available only in the context of certain interorganizational or firm-to-market relationships that necessarily require geographical proximity, or where relations of proximity are markedly more efficient than other ways of generating these asset specificities. An activity is fully territorialized when its economic viability is rooted in assets (including human practices and relations) that are not available in many other places and cannot easily or rapidly be created or imitated in places that lack them. Locational substitutability is not possible, and feasible locations are small in number, making locational markets \cong highly imperfect.

In contrast to this we might imagine a pure flow-substitution economy. \cong Resources would flow between parts of a firm, between places, without having any particular dependence on any particular place. Such assets -- whether goods or information -- would be producible in so many different places as to constitute a true (almost) perfect market \cong in locations for their production. It matters little whether they are actually produced at many locations; one could imagine the extreme case of global supply from a single place (due to scale economies, for example) but where that place has no specificities that render it immune to substitution by another place.

This sort of economy could be the result of two possible developmental processes. On one hand, activities that are well developed in a wide variety of places make certain kinds of resources which are necessary to production available in near ubiquity, but have historically been separated by transport barriers or differentiated tastes. Improvements in transportation, standardization of tastes, or increases in the optimal scale of production open up these locations to global business organizations, who then enjoy huge potential locational choice and ubiquitous markets, but are not bound by locational specificities or local interdependencies. On the other hand, such organizations

may develop production processes that eliminate the need for locationally scarce specific assets; technological change via product standardization and routinization of production processes does the job. In both cases, a pure flow form of direct globalization becomes possible.

2.1 The Limited Extent of Direct Globalization; the shape of emerging specializations

The three theories referred to above, notwithstanding their differences, have a shared vision of the essence of globalization. It consists of the direct, physical de-nationalization, of input-output relations, through progressively more international location of production relative to markets. Each theory has a somewhat different prediction about the ultimate spatial shape of the economy and its trade and specialization patterns, but all predict greater overall territorial specialization. All three see this process of increasing direct globalization as driven by the loosening of technological and institutional constraints referred to earlier. The logical extension of all three theories is to hold that the current globalization process has no natural ending point. They extend the notion (hyperbolic, it must be said)¹ that in the past, regional economies ceded to national territories as loci of input-output relations, to claim that now this process is shifting from the national to the global scale. National economies as physical units will become progressively less and less relevant to economic life. The process of globalization which was evident at the beginning of this century will now continue its inevitable upward sweep.

These claims of the three dominant theories can be questioned, however. There are reasons to doubt that certain input-output relations will inevitably come to be carried out at global scale;

hence, there are also reasons to doubt the degree to which national economies will disappear as important physical components of the world economy. But, as we shall see, this story about direct (input-output) globalization may not be the most important one to tell nowadays. Instead, the globalization of knowledge and of certain forms of accompanying competition are likely to figure as the most important ways globalization is transforming the economy. We can get a first approximation of these claims by reviewing some common empirical categories found in discussions of globalization.

Developing areas and global commodity chains. The absolute magnitudes of increases in foreign economic presence in certain zones of the developing world in recent years, and in the peripheral and cheaper regions of developed countries, are very impressive. Overall growth rates in many of these places have generally been greater than in densely developed core areas of wealthy countries. There are now global commodity chains, especially in consumer nondurables and electronics, sometimes taking the form of direct global relocation of certain phases of the production process (Gereffi and Korzeniewicz, 1994). But this is only a small part of the story of development in these places.

The vast majority of increases in output in the major developing areas of the world, especially the Asian Tigers,≡ have to do with local ownership of production. That is, even though a good proportion of their exports are caught up in global commodity chains (orders coming from major multinational firms abroad), local entrepreneurship plays an important role in the spatial distribution of such activity and in its organization and local economic consequences (Wade, 1992; Amsden, 1992 Evans, 1995). It thus becomes difficult to claim that global network systems (in the sense of deterritorialized commodity chains) are the principal animus of the developmental

experiences of these places. This is equally true whether we consider small-firm economies such as Taiwan or Hong Kong, or big firm economies such as Korea. It is widely admitted that, underlying the Asian successes in export-oriented production are specific forms of local economic coordination, relationships between local economic agents which permit them to meet global market needs and ultimately to profit from these interactions.²

The global firm. Another image we are given is that of the A global firm,≡ an organization that supposedly works on a planetary scale with ease. But most of the world=s biggest firms are not very globalized. Of the 500 biggest firms, only a handful -- virtually all originating in small, highly-export oriented countries with small internal markets, such as the Netherlands or Sweden -- have more than a quarter of their sales, workers, or production volumes outside their country of origin (van Tulder and Junne, 1988).³ For Japanese firms, these rates are generally under ten percent.

Multinational enterprises (MNEs) are, however, the key agents in global trade, where the largest of these firms account for over a third of the total. They are also key agents of global finance. Most critically, as we shall see, they are the key agents in globalization of soft and intangible knowledge resources in many of the large-scale mass production industries.

Commodity trade. Trade in goods as a percentage of total world output has risen rapidly since the mid-1960s, and is now just about at the same peak it previously reached in 1914, about a quarter of the total. This includes all inputs and outputs, manufacturing and services, capital goods and consumer goods. It is lower for certain countries such as the United States (about 13%) and highest for small countries with dense neighbor-to-neighbor relationships, such as Belgium, The Netherlands, Austria or Switzerland. The big countries in the European union, such as France and Germany, trade about 35% of their total inputs and outputs. In general, outside of the neighbor

countries in the EU and North America (intra-continental, neighbor trade), most industries import and export only a small percentage of their inputs and outputs from elsewhere in the world, i.e. regions that are not neighbors. The highest percentages of such intercontinental trade relationships are found in consumer non-durable industries such as clothing and footwear, where Third World - First World trading relationships around a division of labor are common (Gereffi and Korzeniewicz, 1994). Even relationships between neighbor countries with many reasons to trade, however, remain a fraction of those between regions of the same country: this is the case even for the US and Canada (McCallum, 1995).

From this, we need to consider the meaning of this trade. Overall trade patterns show that the advanced countries are becoming slightly more specialized in what they trade (Amendola, Guerrieri and Padoan, 1991; Balassa, 1992). They are coming more and more to concentrate in particular capital goods or final products.⁴ This may be due to the existence of scale economies. However, many analysts believe that the explanation lies in the knowledge specializations of these countries, embedded in complex institutional and inter-firm relationships (Nelson, 1993; Lundvall, 1996; Romer, 1986). For certain kinds of goods, particular places develop superior innovation or know-how capacities, and are able to keep learning and updating their knowledge faster than competitors, enabling them to take important shares of world markets in those goods. Frequently, this superior knowledge and know-how are externalities are attached to a cluster of firms within a particular region of the country. Such clusters may have a few big leader firms or they may be comprised of firms of equal sizes. Usually, they have very complex local labor market processes which also serve to transfer knowledge between firms and enhance the knowledge development capacities of the whole cluster. Such clustered, knowledge-based industries are highly localized as

production systems, but globalized on the output side; that is why they show up as export specializations. Some draw a high proportion of their inputs from the national economy or even the region, as in the mechanical engineering industries of Germany or the craft industries of Italy; some draw a moderate percentage from abroad, as in the aircraft or electronics industries of the United States. But their degree of import-openness on the input side is usually a lot lower than their degree of export penetration on the output side. They are cases of local economies which are motors of world trade.⁵

This is a form of globalization stimulated in part by the increasing openness of world markets which heightens the value of local resources. It is completely distinct from globalization via the construction of deterritorialized network production systems, even though both may involve the production networks of multinational enterprises.

Technology. The production of technologies (i.e. knowledge) and know-how are not becoming placeless. Countries are very specialized in terms of what kinds of technologies their firms patent (Patel and Pavitt, 1991). The big firms of the world, moreover, generate a high percentage of their worldwide patents in their home countries, and these are quite consistent with the overall profiles of export specialization of the home country's economy. This is because even large firms partake of wider institutional contexts and systems of externalities which enable them to generate new, commercializable knowledge (systems of innovation), and these are highly specific to particular countries and regions.

In contrast, for their routine activities, large firms have technology *use* profiles which are much broader than the profiles of the technologies they *invent* and *export* (Patel and Pavitt, 1991). A given firm is therefore mostly using technologies which it does not invent or export. We will argue

that it does so through increasingly international technology and technique borrowing⁶; it will only produce, patent and export a subset of its technologies, those which underlie its specializations (Ben-david and Loewy, 1997).

Non-tradeables. At least two-thirds of employment and output of developed economies today are in services. Most of these services have to be fabricated \cong through delivery at the point of consumption. While some of their component elements can be produced at long distances and imported (their manufactured components, for example, or logistical services which the final service worker draws on to help the final consumer), substantial parts of the service industries are essentially non-tradeable at the present time and will remain so. They are another case where input-output globalization is not very important. By the same token, many services seem to involve high levels of internationalized intangibles, especially knowledge, symbols (trademarks), and notions about product quality on the part of consumers (recognition, expectations, conventions). In a more restricted, but nonetheless important set of cases, they involve presence of MNEs and considerable foreign direct investment.

This rapid tour of a complex subject suggests that neither firms, nor national economies, are close to the image of a placeless network economy, where all factors of production are highly mobile and all locations can substitute for one another, and it is unlikely that they will be so anytime in the near future. This gives us the ability to reject the simplest and wrongest version of *globalization as a simple transformation of the geography of material or knowledge linkages, on the input or on the output side, leading to economies consisting of deterritorialized international networks*. We have also suggested that in every category of analysis used here, globalization of knowledge and its role in competition is important, but would tend to slip between

the cracks of the standard location and trade categories.

3. The four levels of globalization

Since the standard categories reviewed above do not give us a coherent perspective on the globalization (and territorialization) of economic activity, in their place the economy can be decomposed into different degrees and types of globalization; this is a starting point for constructing a more sensible picture of what is going on. There seem to be four essential tiers in the major developed economies today: these categories consist of activities (sectors), or parts of sectors, each of which has a distinctive economic dynamic and different overall degree and type of globalization or its opposite forms of territorialization.

The first tier can be labelled *world-serving local industrial specialisations, and specific-skill based activities*. It describes some of the most advanced activities in our economies, and all are highly territorialized. This tier takes two major forms.

Winner-take-all products and services. In industries such as financial services, media, sports, higher level corporate management, business consulting, science and medicine, there are functions which are assured by individuals who either take part in an international labor market (in the sense that there is international competition for them, especially as consultants), or where the products or services they render are identifiable, scarce, and consumed over an increasingly wide market area. The legal services assured by the high-powered corporate attorney, the cinema which has internationally-known stars in it, doctors with a global reputation, are examples of this internationalization of labor services. Internationalization enables them to earn very high returns with

very low marginal costs of expansion to international markets. This is an example of specific skills taking the market over a wide territory, through increases in information (e.g. about doctors or lawyers) or through generalization of consumption patterns (e.g. cinema, television). It is driven, on the one hand, by supplies that are produced in highly localized networks, and on the other, by increasingly internationalized consumer action and appropriation of information.⁷ Thus, it represents an interesting case of globalization driven by two very different geographies of knowledge.

Export-oriented specialized industrial clusters. The second part of the first tier of the economy in the major developed countries has to do with their export specialization products. These specializations, as noted, have increased over the last twenty-five years (the coefficient of difference has risen, when it is measured at the 4-digit or more levels) (Amendola, Guerrieri and Padoan, 1991). These are the sectors or parts of sectors that each economy is particularly good at. Such advantages have many potential causes, among which are scale, resource-based comparative advantage, or skill and institutionally-embedded know-how.

There is much reason to believe that the importance of the latter has generally increased, and that knowledge-based, export-oriented industries are major components of the emerging, knowledge-driven system of world capitalism. This is because such clusters are capable of continuous technological learning, and the resulting ongoing product differentiation continuously renews their competitive advantages, outrunning their imitators. They are capable of technological learning for many reasons, ranging from benefits conferred by the formal institutions of the national system of innovation to various kinds of informal advantages -- including conventions, rules and practices -- which coordinate the production system's agents such that they learn.⁸ It has frequently been observed, as well, that such export specialization industries function as networks of firms

(ranging from small to big in size), often tightly clustered in a few subnational regions, variously known as *Industrial districts* or *Technology districts*.⁹ We recognize here such famous cases as Silicon Valley, Hollywood, Emilia - Romagna, Baden Württemberg, or the City of London. This *local, path-dependent, and highly embedded technological change* is a strong and positive driver of globalization on the output side, precisely because it supplies scarce resources to the global economy in the form of temporarily unique knowledge embedded in products or services. Technological learning makes immediate imitation and diffusion rather difficult, generating processes of imperfect competition, involving significant technological or knowledge rents in the prices of these outputs.

In both these cases, internationalization is reflected principally through exports of the output. There is a strong role for international demand, presupposing the international diffusion of information to consumers. But such demand meets up with a supply structure defined by strong barriers to imitation or diffusion of skills and knowledge from place to place. Hence, it leads to specialization and trade. It shows up as *Hard* globalization (trade), but it is largely driven by the soft factors of embedded knowledge and skills.

Globalization through deterritorialization (global commodity chains). The second tier consists largely of routine manufacturing and services which are amenable to offshoring to low-wage countries because of low-levels of place-specific assets in the production process. In terms of our theoretical categories, they have a low level of territorialization and a high level of international flows.

By place-specific assets, we mean physical or intangible assets that are rooted in the environments of particular places, blocking transfer of production elsewhere. Certain firm-specific assets, however, could be transferred through FDI or licensing. In general, this situation allows low-wage

product competition to develop. These are the spectacular cases of offshoring which are so prominent in the media. Direct globalization -- in the sense of production which is carried out through deterritorialized networks -- is present here.

What is the overall importance of such deterritorialization? When measured in terms of its impact on labor markets in the developed countries, virtually all studies conclude that it creates low-wage competition for about 5% of the workforce in the developed countries and accounts for about 12% of the increase in wage inequality in the developed countries in recent years, through its effects on their labor markets (*Quarterly Journal of Economics*, 1992; Mishel, Bernstein and Schmitt, 1998; Levy, 1999).

This process also involves complex international flows of knowledge. For example, it is not uncommon for local partners of multinational firms in developing countries to speak the language of international product standards (ISO 9000), confirming that they are part of an international knowledge community. It may well be, in the long-run, that such knowledge flows (and accompanying experience effects) have important impacts on which activities can be deterritorialized.

Locally-serving partially- or non-tradeables. Large parts of the economy consist of partially- or non-tradeable products and services. These industries must do point-of-purchase delivery, limiting their direct input-output globalization. Some such activities are purely and simply local, consisting of production for specialized local tastes; as a result, it is difficult for foreign firms to gain entry. Many, however, are carried out by firms with global brand names (whether through FDI or franchising); thus a long-distance commodity chain can supply point-of-consumption service delivery. The upstream producers deploy their firm-specific assets in many local markets. This globalization is a complex mix of the global and the local, motivated by changes in consumer

behavior, in the sense that consumers in different countries are imitating each other more and more, in the presence of more transparent and more abundant consumer information. This leads to a replication in many places of very similar locationally - immobile services. It generates a certain statistical similarity in the economic bases of different places. The physical (input-output) system involves significant interpenetration of the global and the local.

More important is the knowledge and competitive forces which animate these locational processes. Insofar as services are standardized by a multinational corporation - its product lines, brand names, personnel practices and so on -- there is globalization through deployment of intangible assets, essentially the global circulation of information and ideas belonging to the MNE (Dunning, 1988).

To place this in wider perspective, recall that in the case of tier 1, we suggested that in the presence of strongly asymmetric and place-bound producer skills/knowledge, but with increasingly internationalized consumer information, globalization takes the form of enhancing export specialization; this is a sort of A comparative advantage \cong effect (but recast in terms of the notion of a knowledge economy). In the present case, where there is locational immobility of production (point-of-service delivery), such consumer convergence leads to locational diffusion of the activity as it locates near its markets. International flows of information about consumption are critical to both. We know very little about why and how consumerism develops over formerly - separated territories, but certainly it needs to be analyzed as a complex historical and geographical process, involving the creation of institutionalized networks which bring not just neutral bits of information to widely separated people, but also bring about the complex social practice of consumer demand and choice.

Contestable markets in manufacturing and services. The fourth tier is routine manufacturing and services, generally of the capital-intensive type, whether in consumer durables or in capital goods and other intermediates.¹⁰ At the level of these *activities*, theory suggests that globalization should be very high. Routinized activities generally use codified information, so there are not problems of information impactedness or specificity which impede geographical transfer of this information, whether inside firms, or via inter-firm imitation. As a result, their markets are inherently highly *contestable* (Baumol, Panzar and Willig, 1988).

Such contestability should also transform the geography of production. Routinization dramatically lowers transactions costs of all kinds (Scott, 1988). In the presence of these conditions, theory then goes on to predict that -- even when classical comparative advantage differentials do not exist (because information and inputs can be easily produced in many different places) -- scale effects should lead to a pronounced pattern of locational concentration and hence specialization of regional economies and dramatic increases in international trade (Helpman and Krugman, 1987). This trade could take many specific forms, whether intra-sectoral or intra-firm trade around a division of labor (capital-goods, components, final assembly), or exchange of final outputs.

4. Internationalization of productivity and price norms in routine contestable production

These routine, mass-oriented sectors are highly contestable, but less directly globalized than theory predicts they should be. For the OECD, even though trade levels have risen rapidly in comparison to output, most of these sectors have not had significant changes in the degree of unevenness of their spatial dispersion.¹¹ In response to this, we would expect New Trade Theory

to claim that intermediate (mostly intra-industry) trade would increase; as a result, a powerful specialization effect might go statistically undetected, to the extent that intermediate goods representing different parts of the commodity chain are classified as being in a given industry. This is an extremely important issue, and one which is also unfortunately very tricky to measure. We do know, however, that at the level of particular products in most of the big consumer-oriented sectors, both intermediate and final goods are subject to competition from quite similar products through international trade. For example, there is enormous international trade in automobiles of a *given* size and horsepower. This trade in similar products, measured at a very fine level, averages about 30% of the trade of the Triad and goes beyond 50% the trade of certain sectors (Fontagné et al, 1996). There is thus an increase in the number of very similar products in many markets of the Triad countries (more so in the USA and Western Europe than Japan, of course). In other words, it appears that a good amount of the increase in intra-industry trade does *not* represent the locational concentration and upstream specialization effect to which it is assigned by the New Trade Theory; instead, it represents inter-territorial market contestation by firms doing similar things -- precisely the opposite of specialization. So the rise in trade in these sectors has to be driven by something quite different.

A further consequence of this reasoning is that - insofar as multiple competitors from different countries remain in the same product markets -- there is considerable *within-sector international quality, price and hence productivity convergence* (Baumol, Nelson and Wolff, 1995). This brings us back to standard theories, which would tend to argue that such price convergence is the result of converging productivity and techniques in the countries under consideration, in turn stimulated by their nearly-identical factor prices. But there are significant

problems with this explanation. Total factor productivity and techniques have probably converged more significantly than real factor prices. Factor prices in the Triad certainly converged from the mid-1950s to the mid-1970s, as did aggregate productivity. But labor and capital prices have remained far apart, whether in nominal unit terms or because of the institutions that regulate their usage. Labor market regulation, and banking, credit, and investment institutions, as well as custom are said to affect labor and capital prices and quantities. If then, in fact, there is price, quality and productivity-technique convergence, it needs a different explanation from the standard one. So this leaves us with a process of international convergence in prices and qualities, and, it is hypothesized, productivity and techniques, without the factor price convergence predicted by standard theory and without the degree of locational concentration predicted by the new trade theory.

Thus, there appear to be two basic kinds of technological change occurring in advanced capitalism today, which correspond to the different parts of the 4-tiered economy. On the one hand are the local, embedded, technological pathways of the (tier 1 and 3) global-motor activities, their regions and the occupants of winner-take-all positions within them; on the other hand is the appearance, *in many countries at roughly the same time*, of techniques of flexibilized mass or diversified quality production in manufacturing or mass services in the tier 2 and 4 industries. A plausible hypothesis concerning the latter, drawn from the management, organization and technological change literatures, is that in spite of significant factor price differences and investment conditions in the developed countries, an indirect internationalization process exists, consisting of more and more thorough and rapid large-scale technology and technique diffusion in these tier 4 sectors. In other words, a major element of the knowledge economy is this large-scale diffusion of technique in certain sectors.

It is to this problem that we now turn in greater detail in order to build an alternative possible explanation.¹²

4.1 Technological diffusion and market contestation through exchange of ideas

Let us imagine the scenario for diffusion of a set of norms for product quality, productivity, and prices of goods of the type we are considering here (routine manufacturing, with codifiable knowledge and reproducible assets), using the common example of the world car industry, and starting with the case of Japan and the United States. In the latter, car companies experienced a productivity slowdown and profitability crunch in the early 1970s, just like many mass production firms in a number of industries, in both North America and Western Europe. They experimented with their own *indigenous* solutions to these problems. Following this, they were also strongly shaken by Japanese imports, where the new production techniques were implemented earlier and more powerfully than elsewhere. So, in a sense, the American story is one of import competition, not from a cheap or unregulated labor country, but from one where new productivity techniques and resulting prices and product qualities outcompeted the domestic producers and forced them, unwillingly, to take on restructuring toward what were to become global norms. The elites in the United States initially did not understand the import threat in manufacturing and simply let their markets be flooded with better products, especially from Japan, in the late 1970s and early 1980s. Later on, they did try to stem the tide with voluntary import restrictions and various stillborn attempts to restructure the firm, but did so when the damage was already done. These managerial elites were themselves quite divided over the appropriateness of any intervention in markets. Consumers in the

United States voted massively for imports from Japan. The American producers finally responded to the new techniques in the late 1980s and early 1990s. There was no longer any possibility for staying with the old strategies for the American \approx two-thirds of the market, because consumer loyalties were being tendentially tested. The norms of price and quality for cars, for about a third of the American car market, were completely revised in a ten-year period. In essence, this amounted to a new set of *conventions of product quality, responsiveness to market trends, and relationship to price and long-term performance*.

This resembles a standard account, at first glance. Japanese firms invent a better method, invade markets, are copied, a new configuration of market shares and productivity, price and quality norms restabilizes the situation. The extent to which domestic goods are exposed to foreign trade affects the extent of knowledge spillovers across countries, insofar as this knowledge is codifiable.

Behind this sequence of events, however, there is a very interesting geographical process that the standard account assumes to exist, but does not take any pains to explain: the large-scale, long-distance diffusion and mastery of a set of post-Fordist production techniques -- knowledge, essentially -- which align American quality, productivity and price norms with those of their Japanese competitors. This may not be the most typical case, however, since it is not often that a major industrial nation has a major and sudden spurt of integration into world markets, is strongly export-oriented, and encounters a major consumer market which is exceptionally open.

The more typical case may be that of Western Europe and here we must construct a richer account of how trade, technology and national institutions interact in the contemporary knowledge economy. In most of the Western European car markets, Japanese competition has not had a strong direct influence. Today in France for example, Japanese car imports are less than 3% of the

total; and virtually the entire market is comprised of cars from other Western European countries with similar labor laws and wage levels often higher than those of France. In Europe, the response of producers to the severe slowdown of the late 1970s and early 1980s was to resist the new techniques. In the high-quality car market, this was not initially an issue, as there were no substitute products. In the mass market, producers were also quite sheltered from non-European (non Alaborist \equiv) imports. Some, such as Peugeot in France, turned to protectionism as a way of slowing down the process.

Even so, virtually all of the producers began to inch forward to the new world standard techniques. One presumes that this was either because they saw the inevitability of competition arriving one day (an expectations effect), or because they wanted to realize all the labor savings and quality advantages of the new techniques, even though this would involve a long and difficult process of political and social dialogue and conflict. We could say that, up to this point, relatively modest trade is a means of international exchange of productivity, price, and quality information, practices, and routines in the sense that moderate trade combined with intense mutual scrutiny of products is the spur to adapting one's techniques to those of one's competitors.

An extension of this reasoning takes us far away from the predictions of new trade theory. It appears that in the kinds of contestable markets under consideration here, once international diffusion of these ideas reaches a certain point, domestic producers effectively use those ideas to restructure and rebuff further import penetration. In this way, internationalization of knowledge switches from being a complement to direct internationalization to a *substitute* for it. If this hypothesis is correct, it follows that the current phase of globalization in these kinds of industries ultimately will reach a certain maximum point and level off, and that therefore the national economy

will not become irrelevant as territorial scale at which input-output systems operate. The current statistical evidence for the European car industry supports this view of things. Existing companies are surviving through restructuring to achieve quality and variety within rather narrow product ranges, rather than coming to specialize or to disappear (Fontagné et al, 1996). As noted, this appears to be generally consistent with the statistical evidence on location in the OECD.

In this view, moreover, the nature of current globalization process can be thought of as being quite different from that which occurred earlier in the 20th century: instead of primarily concerning direct (physical input-output) internationalization, it has a stronger component of indirect globalization by ideas and knowledge. A major issue for the future of national economies, and in particular the major firms of any nation, is the appropriation and application of global ideas, and the degree to which this can substitute for input-output globalization.

4.2 The politics of globalization by ideas

Of course, in most industries and countries, the techniques referred to are associated with a powerful labor-saving bias.¹³ Since they are heavily labor-saving, workers have resisted them, and some national governments resisted because of the unemployment costs to both. But in the end, they did not succeed. In Europe, why haven't the firms and workers been able to shelter themselves from these techniques, and thereby preserve labor demand, maintain wage shares and keep them

growing with productivity? In other words, why do national institutions for national production not keep staffing, wage and skill levels in a different configuration from that associated with the new technological, productivity and price norms in this part of the economy?¹⁴

I would argue that in the late 1980s, the benefits of this process to *consumers* began to be apparent to the latter. In France, for example, both Peugeot and Renault dramatically increased the quality of their cars, their design, their reliability, the range of models; they adapted models more quickly to market changes by the late 1980s; and real prices declined when adjusted for quality. The evidence is quite clear that the real prices for many goods and services -- sometimes in absolute terms, sometimes in quality-adjusted terms -- have dropped over the past 15 years in the United States and Western Europe (Gordon, 1990; Maddison, 1990). This, as in the United States, was the real point of no return, when *conventions of product quality between producers and consumers were irretrievably altered*.

In other words, in certain industries the knowledge exchanges from trade are not only between producers, but are embedded in consumer behavior, while in sectors with little trade, the diffusion of consumer knowledge and practices probably comes about through media, travel and other such means. Consumer expectations with respect to prices and qualities, a new set of conventions that links consumers and producers, have made it much more difficult, if not impossible, for a given country to use its local institutional structure (especially its labor market structure) to enforce local technical norms, especially those that would involve greater labor-intensity, less product differentiation, lower quality or higher prices.¹⁵

This provides a starting point for understanding the diffusion of such techniques, in that producers in countries with strong labor laws and institutions may not have initially intended to go

head-to-head with those strong social forces. There are at least three major elements of the way the story unfolded in different places: the commitment of producers to the new techniques in relationship to the labor market rules and institutions we have referred to; the degree to which they supported open markets; and the role of consumer society, in the form of consumption norms and conventions.

The first two are the almost-exclusive terrain of the literature; the latter, I want to argue, is a hugely important missing element of the story and has enormous implications for contemporary economic change.

Notice that this story of a globalized process of path-dependent technological change is different from those stories frequently told about A globalized best practice \equiv through competition and selection. It is not just about import competition, because it is reflected just as much in non-traded and non-tradeable goods and services as in trade, and it concerns the way that convergence of techniques through idea diffusion acts as a substitute for locational concentration at world or continental scales. The account here is about strategies and politics which take place against a large-scale collective action problem, the conventional interaction between producers and consumers. On the producer side, there is *an endogenization of learning as a way to head-off potential loss of market share*; on the consumer side, there is *a diffusion of calculating, internationally informed and consciously comparative consumer behavior*; and the two interact in a mutually supportive way. This space- and time-sensitive interaction between production norms and consumption norms has not been well studied, to my knowledge. I believe the geography of knowledge holds the key to many dimensions of industrial Ahypermodernity \equiv -- the ever more frantic race for product quality, variety, rapidity of adjustment, and cheapness -- at the end of the 20th century.

5. Analyzing ideas and knowledge

We have chosen deliberately to eschew the standard economist's focus on *Ainformation* in referring to the global exchange of ideas, even though there will be some areas in which the economics of information is useful to the present inquiry. This is because though information transfer is always necessary to knowledge exchange, the reverse is not always true. The category *Ainformation* is too general to get at the transfer of *economically-useful practices, routines and conventions*, which are complex and coherent assemblages of different kinds of information.

How are these institutions transferred? In this part of the economy, they appear to be transferred by imitation. In social science, a unit of reproduction-through-imitation, a pattern of behavior or idea stored in the human mind and then transmitted through culture (practices, language) is known as a *meme*. In theories of cultural evolution, memes have observable phenotypic effects, in the sense that the behaviors based on them encourage their own reproduction and discourage those at variance with them. Memes can be thought of as units by which patterns of coordination between actors are transmitted, such that those actors who do not observe the coordination pattern will be penalized. That is how the systemic effect comes about.

Memes, and their constituent practices, routines, and conventions, do not have a deterministic effect on behavior. They interact with the environment and only insofar as they are pragmatically effective can they work. They do constrain and direct behavior which, depending on other conditions in the environment and other memes, will make it likely that certain types of behaviors will be adopted over others. Moreover, in the social evolution we refer to here, there is

nothing that insures that the memes which are selected are in any way optimal, ideal, or even good in the long run.¹⁶

6. Conclusion

Location and trade appear to be underpinned by, and heavily influenced by, exchanges of knowledge. Knowledge, in this context, has to be understood not as information,¹⁷ but as institutionalized, embedded social practices, conventions, and rules, or memes, which are essential elements of economic coordination in the sectors of the economy. By understanding the geography of knowledge in different sectors, it becomes possible to interpret the outward tangible aspects of globalization -- location and trade -- differently, and in this light, their significance and probable evolution are viewed differently from in standard analyses. Knowledge exchanges take many different geographical forms. In some cases, they are sourced from highly localized knowledge, which initially generates specialization effects in location. In other cases, there is internationalization of knowledge, and its tendency to make possible certain forms of deterritorialization, on the one hand, and to substitute for relocation and specialization, on the other. The development of better categories for analyzing these intangible forces in the globalization process would be better adapted to contemporary knowledge-based, institutionally reflexive capitalism, than are the standard ways of thinking, with their limited images of an economy as either physical input-output relations or prices and quantities. Knowledge flows may be just as important.

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¹ A substantial proportion of production, even in a highly integrated country like the USA, is still regionally sourced. It is difficult to get precise figures on this, because input-output data are not gathered regionally in the USA. But in France, where such data are available, the regional sourcing proportion is often as high as 50%. National proportions are much higher (e.g. 87% for the USA, 65% for France).

² On the other hand, it probably is true that the case of the garment industry in Central America is a deterritorialized commodity chain, and there are undoubtedly many other such

examples.

³ See also the well-known debate between Laura Tyson and Robert Reich on the nationality of firms.

⁴ Thus it often shows up as intra-industry or intra-firm trade.

⁵ I have made this argument in a bit more detail in *The Limits to Globalization*, Storper, 1992.

⁶ This does not exclude the possibility of subsequent local adaptation, including significant modifications. Antonelli, C., 1995.

⁷ There are important misallocation effects that can occur when the best push out the satisfactory. Frank and Cook, 1996.

⁸ On the role of conventions in learning, and different ensembles of conventions and products, see Storper & Salais, 1997.

⁹ The literature on this subject is vast, of course. Since it's now so familiar to most students of the subject, we will not cite it here in detail.

¹⁰ These are no longer easily distinguished from tier 2 activities via their structural characteristics, such as capital intensity, durability, and so on, as used to be done. The distinction is better related to the nature of the production process. On average they are more durable goods, often involving a complex multi-phase production process, dense supplier networks and with certain skill-intensive phases upstream. For services, there is an adaptation to customer and a skill-intensive phase or content.

¹¹ This observation comes from my own as yet unpublished research, in which we calculated Herfindahl equivalent indexes by sector, for the OECD countries, from 1971 to 1995.

¹²

First we need to consider the possibility that such diffusion occurs through indirect globalization, which is a major theme of another branch of the existing literature. The main arguments center on the roles of financial globalization and of management strategies to threaten workers.

The volume of foreign direct investment (FDI) is much higher than it used to be, suggesting an increase in globalization. In the domain of finance, there are enormous flows of capital in the world economy, and financial globalization appears to be greater than productive globalization. We can immediately dismiss the hypothesis that the globalization of finance is primarily about clubbing developed economies into lowering their costs to Third World levels. More than 85% of foreign direct investment, the supposed vector of locational hypermobility, is between the rich, developed countries of Western Europe, North America and Japan. This proportion is *much higher* than in the 1970s, when a much greater share of total world FDI went to developing countries. Because it is among countries with similar costs, the search for lower factor costs is largely irrelevant to it.

There are no reliable overall estimates of the magnitude of financial globalization and even less is known about how the financial economy relates to the real economy. Many analysts claim that globalization of finance causes firms to restructure production systems leading to: plant closings, deindustrialization, reindustrialization with less labor and a more unequal income distribution, and (in Europe) higher levels of unemployment.

The argument is that firms have to show performance which corresponds to global financial performance norms, or they will not be able to attract money. The structure of the now highly

globalized global capital market is now the club which allows firms to introduce international productivity and best practice norms into even their nationally-oriented production activities. Newspapers are full of stories about how stock prices rise when firms announce layoffs of workers and this relationship is probably true for some set of cases. However, there is essentially no evidence which shows this cost-cutting logic to be the result of direct, institutionalized pressure by something called Ainternational financial markets,≡ or even indirectly via competition for capital. Firms borrow on international markets for a variety of reasons, some of which are simply speculative (recent Asian financial crisis).

In sectors with something approaching perfect competition with interchangeable products, in the short-run, firms do have to try and align their production costs with sectoral standards. What does financial globalization have to do with this? Most accounts suggest that both domestic and foreign stock buyers and institutional investors (and their counsellors) seem to have subscribed, in some industries, to a logic which holds that cost-cutting will lead to greater profits and stock price increases. The question is why, if this account is true, such an idea has come to be central to investor behavior. Does this idea reflect an efficient market-driven process of diffusing best practice, or a path-dependent behavior-driven diffusion of an idea?

Firms= stock values rise and fall essentially on their profitability data, which are, in turn, the indirect result of their financial and productive performances. Research by Webber and Rigby, 1996, confirms the existence of enduring differences in profit levels between regions and firms. In highly differentiated markets, usually characterized by market imperfections, the role of finance capital becomes more complex. There are numerous cases where investors do not demand any particular strategy on the part of the companies they invest in: they want the profits, and however they can be found is fine with the investor. Highly differentiated markets should leave a wide margin of maneuver from firm to firm and hence from region to region.

Moreover, financial institutions, risk perception and evaluation, the degree of financial market capitalization, and financial incentives and pressures vary enormously from one country to another. That is, there is *not* one, big centralized world system of capitalizing firms, but a considerable diversity of practices (but we do lack definitive research measuring the relationship between local standards and global standards).

In addition, *even if*, as certain literature claims, there were one perfect global market with transparent information for financing companies -- i.e. a single set of profit, asset value, and returns criteria for receiving investments -- it would not follow that this would translate directly into precisely converging production techniques. This is true for a disarmingly simple reason: companies -- especially big, multi-product and multinational ones -- have financial results which are aggregates of many different lines of activity. The markets would merely dictate that they come up with a given *aggregate* result. But there would be no necessary relationship between these aggregate criteria and what firms actually do. Even in a given line of business, the result would be a loose one, rather than a tight one.

These remarks suggest that finance -- as a globalized market or institution -- does not have the independent motor force which some analysts have assigned to it. There is indeed a striking gap in the literature on globalization and international economic convergence: reasoning on exactly *how*, in terms of investor behavior and the process of finance, the results attributed to financial globalization are concretely brought about by the agents of finance on one hand and corporate

decisionmaking on the other. Is there a financial market for control of production?≡ Probably not; there is a market for the aggregates (Abottom line≡) referred to above. As is, the literature which claims existence of such a market for control uses simple functionalism to get from postulated cause to result.

Another argument claims that there is a threat effect≡ at work, where the threat is direct, not passing through financial markets. With more open markets, firms tell workers that if they do not adopt something equivalent to the best obtainable productivity and price norms then their products would be pushed out by cheaper or better imports. Cases of companies obtaining big concessions from workforces, and acquiescence to layoffs, via this threat, are frequently aired in the literature and in the newspapers. Thus, there might be effects of globalization that do not show up as measurable flows of capital, labor or products. Two problems crop up here. One is that the proportion of total restructuring which is carried out through such threat-based concession bargaining is probably fairly low. The other is that the provenance of production techniques to which managers aspire still would need to be explained.

¹³ For the historian of such techniques, the fact that they are labor saving would say nothing about whether labor-saving is a principal reason for their adoption. Indeed, while some accounts suggest that labor-saving is the principal motivation of employers who adopted in the early days, many other accounts focus on the need to change practices of labor utilization (including staffing level, of course) in order to get the other benefits of the new techniques; labor-saving is something like a secondary and opportunistic benefit of adoption, not its only or primary purpose as is often assumed. Some analyses do claim that managers are aware of, and are explicitly promoting, a declining technology-skill complementarity. See Lazonick and O'Sullivan, 1997.

¹⁴ Of course, to some extent they have, as in the differences in the low-wage service sector between continental Europe, the USA and Great Britain. But these differences are quite limited in manufacturing and they are being reduced in services.

¹⁵ The advent of consumer society predates the contemporary technological revolution. It has been a long-standing sociological phenomenon in the United States. But there were seeds of it already in the early 1960s in Europe. With the end of the post-war reconstruction in Europe, the consumer revolution got into full swing there. The advent of ICT=s and the strong spur of the 1970s crisis of mass production≡ did not put an end to it, but seemed to coincide with a great deepening and widening of consumer society in countries, such as those of Western Europe, where producer identities had up to then occupied at least a strong place as consumerist ideologies.

¹⁶ Among some of the many relevant references: Boulding, K. 1981; Boyd, R. & Richerson, 1985; Cavalli-Sforza & Feldman, 1981; Dawkins, 1976; Mayr, 1982; Mokyr, 1990; Waldrop, 1992. On the firm, see Douglas, 1986; Douglas and Isherwood, 1996; Appadurai, 1988.