SYMPOSIUM COMMENTARY

Multinationality: Size of Firm, Size of Country, and History Dependence

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Mira Wilkins has raised an important series of questions related to the size of firms, their multinationality and (though this is muted in her paper) the size of host and headquarters countries. The answers to her questions will not be universal and timeless. I believe that some countries have taken a global view earlier and more effectively or wholeheartedly than others. That, in turn, is partly a consequence of history and the size of countries as well as of their firms. And, again, these complex interactions have changed over time. The barriers to enterprises in small countries developing a global vision are different at the end of the twentieth century than they were at the beginning.

Sometimes extreme cases can mislead, but I would like to suggest that, in looking at some of the extreme cases with more statistical precision, we might focus the questions more clearly. The problem for historians is that our historical data for multinational investments at the firm level is patchy. For more recent years, however, UNCTAD's Division on Transnational Corporations and Investment profiles the multinationality of transnational corporations, with detailed information on the world's 100 largest transnational investors. A strong measure of multinationality – though one which Mira Wilkins has presciently warned me will exclude most American transnationals – is whether 50% of some measure of the firm's activity is outside the headquarters country. The UNCTAD study uses a composite index of the degree of transnationality or global reach: it is the average of three measures: foreign assets as a proportion of total assets, foreign sales as a proportion of total sales and foreign employment as a proportion of total employment. Table 1 shows, by headquarters country,[2] the number of large transnational

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[2] This is still a good indicator of corporate nationality, though it is becoming less so. For example, in 1995, when Swedish Pharmacia merged with U.S. Upjohn, they located their new world headquarters in Britain, creating a "British" firm with a transnationality index approaching 100%! Similarly, BAT (though headquartered in London from its formation in 1902) might be considered more American than British (until the 1920s).

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investors, as well as the number of firms that surpass the 50% threshold for foreign activity that identifies them in columns 5 and 6 as "significantly global" rather than "nationally focused" (though the latter also typically have very large foreign interests if they are listed in this table).

Table 1: The Top 100 Transnational Corporations 1993

1 Country size category	2 Country of Headquarters	3 Real (1985 $ equivalent GDP in 1989 $B	4 National Total	5 "Nationally Focused"*	6 "Significantly Global"*
Large	USA	4,557	32	27	5
Large	Japan	1,859	21	18	3
Large	Germany	867	11	7	4
Medium	France	777	9	4	5
Medium	UK	770	8*	0	8*
Medium	Italy	745	3	3	0
Small	Canada	461	3	0	3
Small	Australia	228	1	1	0
Small	Netherlands	189	2*	0	2*
Small	Belgium	128	1	0	1
Small	Sweden	126	3	0	3
Small	Switzerland	104	5	0	5
Small	New Zealand	–	1	0	1
	TOTAL		100	60	40

Source: Author's calculation from UNCTAD (1995), pp.20-23. The 100 firms are the largest 100 measured by the size of their foreign assets. The GDP data in column 3 is from Maddison (1991), pp.198-9.

* Royal Dutch-Shell and Unilever have been allocated half each to the UK and the Netherlands.

* "Nationally-focused" firms are those with an UNCTAD transnationality index (see text) of less than 50%; "significantly global" firms have transnationality indexes in excess of 50%.

The countries in which the major transnational corporations are based offer few surprises. They are all OECD economies and the three largest advanced economies – the USA, Japan and Germany – alone account for nearly two-thirds of these major transnational corporations. A comparison of columns 3 and 4 suggests that countries headquarter large transnationals broadly in proportion to their economic size. There are several major exceptions: Italy – much the same size as the UK and France – has markedly fewer transnationals. As the home of efficient small firm networks, Italy usually figures less than its economic weight would suggest in all lists of large firms, multinational or national. It is also clear that some very small countries – notably Switzerland and Sweden – figure as hosts to transnationals beyond the level that their size would suggest.

Transnationals in the larger countries are, of course, more nationally focused: as column 5 shows, large US, Japanese and German transnationals are

unlikely to have the major part of their activity abroad. By the same token, the smaller countries' multinationals tend to have far more activity abroad than at home: the Swedish firms on the list, for example, weigh in with an average transnationality index of 74% and the Swiss ones with 85%. The three mid-size European economies, however, show no conformity to the obvious statistical interpolation of this law. France, it is true, lies squarely in the expected middle, with a roughly equal number of "nationally focused" and "significantly global" companies; but Italy's few large transnationals are all domestically focused, even in industries like petroleum, where, for example, its ENI has a transnationality index of only 30%, compared with over 50% for most oil multinationals. Britain is nonconformist in the opposite direction: with all of its firms in the table exceeding the 50% transnationality threshold and an average transnationality index (at a level of 69%) that would be expected in countries only one quarter Britain's size. Indeed, Britain has as many "significantly global" rather than "nationally focused" transnationals as America and Japan combined. The domestic focus of the great majority of American, Japanese and German firms is principally explained by their very large domestic production base and markets.[3] At the other end of the spectrum, the markedly global focus of Switzerland or Sweden is equally readily explained by their small size. The strong international focus of British corporations implied by this data is, however, both greater than 'necessary' given the size of Britain's economy and not paralleled by similarly mid-sized countries like France and Italy.

II

The roots of this divergence are plainly historical. It would be desirable to produce similar listings of large transnational corporations with their transnationality indexes at various points in time, but the available historical data lack such precision. It is, however, possible to trace back some of the national differences to a representative listing of the largest 100 industrial (i.e. mining and manufacturing) corporations in the world in 1912, ranked by their equity market capitalization.[4] These firms are again predominantly in the three major industrial economies of the time: the USA (with 56 of the global top 100 corporations), the UK (with 16) and Germany (with 15). It is noticeable that, at that time and unlike today, it was very difficult for smaller European countries to headquarter firms as large in global terms as the major industrial

[3] Though in the case of Japan part of the explanation is also its relatively recent taste for transnational investment and in the case of Germany the cutting off of an earlier taste by multiple foreign expropriations of overseas assets during the century.

[4] The listing is similar to that in Schmitz (1994) and Hannah (1995), though it incorporates some additional countries and corporations and a larger proportion of firms is valued by equity market capitalization, rather than the surrogate balance sheet assets used for some firms in the earlier studies. Note that, unlike the 1993 population described in Table 1, this is a list of the largest firms by absolute size on the stock exchange, not by absolute size of foreign investments.

countries' firms.[5] This was partly due to the tariff restrictions on their access to the major advanced markets (except the free trading UK), but it also derived, in at least one case, from a preference for international technology licensing over fully-owned investments in foreign markets. Solvay of Belgium (then still a private family company, though its balance sheet assets of $33.3m qualified it by proxy for entry to the 1912 global top 100 list) did directly own assets in France as well as Belgium, but it exploited its world lead in alkali technology in the three main industrial markets (i.e. the USA, Germany and Britain) by licensing independent domestic producers there.[6] No industrial firms in economies like Sweden or Switzerland were, before World War One, large enough to enter the global top 100, though companies like Nestlé & Anglo-Swiss (later Nestlé) and Brown-Boveri (later ABB) were developing significant domestic and overseas capabilities.[7] They would grow further to consolidate their global position when conditions for international trade and investment were more favourable to the broader exploitation of their undoubted capabilities from their small domestic base. (By 1993 98% of Nestlé's revenues were to be generated outside Switzerland (Economist 1996, p.135).)

There is no systematic data on the three-part UNCTAD transnationality index for the American, German or British firms on the 1912 list, but the general characteristics of the three countries are clear. In terms of export sales, the American firms were significantly less internationally-orientated than the German or British ones.[8] The other UNCTAD

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[5] Apart from the Dutch interest in Royal Dutch Shell, the only small European countries to have industrial firms above the $25m equity market capitalization threshold necessary to enter the global top 100 of 1912 are Belgium and Luxembourg. The Luxembourg steel firm ARBED was able to benefit from its access to neighbours' markets by special agreements. The Belgian-headquartered company Lothringer Hüttenverein was hardly Belgian: it was a front company for German-owned coal and steel interests in Lorraine. See also the case of Solvay of Belgium in the text.

[6] Only one of these licensees, Brunner Mond in the UK (of which the Belgian licensor owned nearly 20%), was large enough to enter the global top 100 in its own right in 1912, with an equity market capitalization of $48.6m and balance sheet assets of $44.2m, i.e. in excess of those of its licensor ($33.3m). The privately owned U.S. and German licensees (the Solvay Process Co. and Deutsche Solvay) appear to have been smaller, though they had access to larger domestic markets than Brunner Mond and gained more financial backing from Belgium, e.g. Solvay owned 46% of Solvay Process Co. by 1914, see Wilkins (1970) pp. 402-6.

[7] Brown Boveri was worth only $6.4m and Nestlé & Anglo-Swiss only $2.9m on the Swiss stock exchanges in 1912; well below the cut-off point for the global top 100 of 1912 of $25m equity market capitalization. For Nestlé's already global spread of factories see Heer (1966) pp. 89, 100-106.

[8] U.S. industries overall exported only about 5% of their output, compared with about 30% for Germany and about 40% for the UK. While U.S. *large* firms may have been more export-orientated than small firms (and that may have been less true in Europe where small firms had efficient wholesaling networks and closer foreign markets), this is unlikely to eliminate for the 1912 large firms this large overall measured gap in export-orientation between America and Europe, which exceeds the modern differential. "Foreign sales" in the UNCTAD listing include sales of foreign subsidiaries from local production as well as

transnationality measures, the proportion of assets or employees abroad, are not generally available. Tracking the 56 American giant corporations of 1912 in standard sources such as Moodys and Mira Wilkins' (1970) own encyclopedic work, however, it seems unlikely that their overseas assets or employees averaged much more than 10-15% of their total assets or employment. Only four U.S. companies of the 56 in the 1912 list have so far been identified as possibly having levels of more than 50% for these or similar transnationality indicators: US-owned Mexican Petroleum was essentially a free-standing company with most of its assets abroad, though it was formally headquartered in Los Angeles (and eventually became part of Jersey Standard); Singer did more manufacturing in Scotland than in the USA and had 72% of its marketing outlets abroad; International Harvester (40% of whose turnover was abroad) probably earned most of its profits overseas; and International Nickel's Canadian mining and smelting and other overseas interests may have dominated its US-based smelting and refining companies. Several more U.S. corporations registered transnationality indicators as high as 25% or more,[9] but the majority had foreign assets that were small relative to their domestic operations and many had no foreign production at all.

A few German large corporations – notably Siemens, AEG and Mannesmann[10] – had significant overseas investments, but the focus of giant German firms, as listed in Saling's Börsenjahrbuch at that time (e.g. in steel, coal, shipbuilding, armaments), was domestic, or, when it was more international (e.g. chemicals), was achieved overwhelmingly by exporting rather than by manufacturing abroad. There must be some guesswork in the result, but the 15 giant German firms in the 1912 list seem likely to have only matched the American average for overseas production, with perhaps 10-15% of their assets or employment abroad, though they were significantly more export-orientated than American giant firms.

By contrast, perhaps a third or more of the 16 British firms on the 1912 list already had the majority of their assets or production abroad. This was largely because of the absence of significant raw materials (other than coal) in

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exports, and these may partly redress the U.S. balance, even as early as 1912. The U.S. raw materials industries (e.g. oil and copper) also had an unusually high export orientation, with around 50% of production exported overall.

[9] e.g. Phelps Dodge mined about a quarter of its copper in Mexico, and other non-ferrous metals companies had significant Latin American interests. In the 1911 break up of the Standard Oil Trust, Jersey Standard, New York Standard and Vacuum Oil all inherited significant foreign assets (e.g. stock in foreign companies accounted for 36% of Vacuum Oil's balance sheet assets in 1912); though most American oil companies still had largely sales offices abroad and only small foreign production, or none, in 1912. General Electric, Westinghouse and Western Electric also had foreign assets which were probably large even when compared with their enormous domestic businesses. Kodak had 30% of its employees abroad (Brayer 1996, p.356).

[10] e.g. Feldenkirchen (1995) p.662 suggests that 22% of Siemens' employment and 36% of its turnover was overseas around 1912. There was probably no giant German corporation at this time with more than 50% of its assets abroad.

Britain: oil companies like Shell and Burmah Oil (which then owned the predecessor firm of BP) or non-ferrous metal miners like Rio Tinto (later RTZ) and Consolidated Goldfields (later acquired by Hanson Industries) had to go abroad for their materials; their domestic British activities used a tiny part of their assets and were usually focused on the downstream, distribution side[11]. Others with a substantial overseas share (often approaching or exceeding half their operations) were Nobel Dynamite (later part of ICI), British-American Tobacco (which also had extensive Asian interests)[12] and J&P Coats (the sewing thread manufacturer whose overseas interests paralleled Singer's from a similar Scottish manufacturing core). The two major British branded household products manufacturers, Lever Brothers (later Unilever) and Reckitt & Sons (later Reckitt & Colman), probably still had less than 50% of their operations abroad but they already had very substantial world-wide interests, in the Empire, America and Europe (whereas their U.S. equivalents, Procter & Gamble and Corn Products, were still almost entirely domestic operations). The steel, armaments and shipbuilding firm, Vickers, had a 50% interest in a pioneer Japanese steelworks, jointly with its main rival Armstrong-Whitworth, and the latter British armourer had substantially built the Japanese navy that had recently defeated the Russians; each firm had a complex network of interests in shipyards and other production units overseas. Rather fewer large UK firms than in Germany and the USA invested almost entirely domestically (the steel fixings manufacturer, GKN, the Solvay licensee, Brunner Mond, the cotton spinner, FCSD, and the brewery, Guinness), though even they had significantly greater export-orientation (and occasionally foreign production) than American (and German) firms in comparable industries.

It is not possible to construct an UNCTAD transnationality index with the precision of the 1993 listing of global firms, but, were we to do so, it is quite likely that the giant British firms in 1912 would attain an average level above 30% and certainly more than double the American level. It is also clear that Britain is the only one of the three major industrial countries in 1912 in which a significant proportion of the largest industrial firms could plausibly be said to exceed the 50% level which we used as our cutoff point for classifying companies as "significantly global" in the 1993 sample. It seems reasonable to suppose, then, that the modern tendency of Britain's giant corporations to act globally has exceptionally strong historical roots: moreover, it dates from a

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[11] If companies like El Aguila (Mexican-registered but British-owned and -managed and fundamentally similar to the case of US-headquartered Mexican Petroleum) or South African headquartered mining houses with London connections and significant participation by British capital and management (De Beers, Crown Mines, Rand Mines, East Rand Proprietary Mines) were included, the "British" firms with most of their assets abroad would approach half the UK total, but we have excluded such clearly "free standing" companies with no significant domestic assets, no London headquarters or no incipient British-based capabilities.

[12] for an analysis, see Cox (1989). This company was a minority-owned associate of Imperial Tobacco, though no longer connected with American Tobacco, both of whose overseas interests had been amalgamated into BAT in 1902.

period when Britain's overall manufacturing output could rival that of Germany, if not of the USA. Global orientation can clearly be exceptionally well developed, even in countries with domestic markets large enough to permit a more nationally restricted focus to their large companies.

III

It is tempting to see this extensive and precocious global involvement purely as a legacy of Empire, but that is quite unconvincing. The significant foreign investments of these large British industrial firms in 1912 were more likely to be in industrially developed economies like the USA (J&P Coats, BAT, Lever Brothers) or Germany (Nobel Dynamite, Shell) or the 'emerging markets' of the time, like Russia (Shell, J & P Coats) or Spain (Rio Tinto). For giant British industrial corporations, imperial outposts in the underdeveloped economies of Asia or Africa offered few attractions (oil in the east and gold in South Africa being major exceptions). The more promising, rich, self-governing dominions, like Australia and Canada, welcomed British immigrants and capital and even offered tariff preference to imports from a mother country that deplored their tariffs, but some of their businessmen were already beginning to be defensively distrustful of mother's corporate involvements and control, in a recognisably teenage manner. The global reach of British business derived not from empire as such, but from Britain's related maritime tradition and developed commercial skills, which reached far beyond the formal empire and arguably performed best in more self-confident and independent host nations that accepted or invited British participation more positively. A further bonus to British companies investing in such countries, where the hosts imposed high protective tariffs, was the potential for exploiting local consumers: as, for example, Coats was able to do in its highly profitable, U.S.-based, thread manufacturing (Wilkins, 1990, pp.362-8), whereas it sometimes found this less easy in its (free-trading) colonial economies.

The City of London's nodal position as a provider of commercial, financial, insurance and shipping services to the more industrially advanced countries meant that Britain (then, as now) had a far more central position in world trade and investment than Britain's more modest share in world industrial output would suggest.[13] That international commercial orientation and the habit of thinking globally that it engendered (as well as Britain's role as a mature European power with notably fewer natural resource endowments than America) ensured that large British corporations were, from an early stage, more internationally orientated than their major competitors. It is a legacy that remains, despite the interlude from 1914 to 1958, when national and imperial autarchy was damagingly reinforced, sterling transactions were increasingly restricted to the empire and wider internationalism was under-rewarded in a depressingly more nationalistic world.

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[13] Michie (1992); see also the contribution of Geoffrey Jones to this volume for the more significant role of British *trading* houses in the less developed empire countries.

IV

A global orientation was never, in that nationalistic divided world, nor indeed in its brighter precursors and successors, likely to go uncriticised. Indeed, the raw facts inevitably invite critical comment among the usual suspects rounded up by the traditional posse of analysts of British economic failure. Robert Reich's famous question – "Who is Us?" (Reich 1990) – applies with markedly greater force to Britain than to the USA, but the answers in both cases are complex. It is never easy to judge whether diverting nationally-based corporate resources abroad (or, for that matter, keying into foreign corporate resources as a multinational host) provides gains, and much popular discussion suggests the opposite. Large British corporations, both in 1912 and more recently, had a more international orientation than those of Germany and the USA, yet the GDP of these two rival countries between 1912 and 1995 grew twice as fast as Britain's GDP.[14] This is not because the large British globally-orientated firms were unsuccessful. On the contrary, it is striking that, despite the relative failure of their home economy, not only were the large British firms of 1912 more likely to retain their position in the top 100 industrial firms in 1995 than American or German ones, but that more British firms survived in any independent form to 1995 and those that did survive had grown more rapidly than the German or American survivors (Hannah, forthcoming). Britain's largest global corporate capitalist enterprises in fact had a notably successful century, while the British people's experience of growth was markedly less favourable than Germany's or the USA's.

Yet those who draw the obvious negative conclusion from the juxtaposition of the two facts may not be right. The capacity of Britain's large-scale, globally-minded, corporate capitalists to develop organisational capabilities, at least on a par with their major competitors based in apparently more successful economies, was potentially an advantage for their headquarters country. If the British economy failed, it may have failed despite, rather than because of, such transnational corporate achievements, which yielded considerable rents to British managers, stockholders and workers. Countries which are unusually avid hosts to transnational companies may also be gainers and Britain also figures prominently in this category (Jones, 1996, pp.226-7). It is hard to believe, for example, that Britain was unwise (in view of its clearly inadequate capabilities in the field) to accept placidly (if not always graciously) the offers of American, German and Japanese capitalists and managers to reconstruct its ailing automobile industry. The explanations for Britain's poor economic performance may lie elsewhere,[15] while Britain's penchant as transnational host and headquarters might plausibly have improved rather than compromised its relative performance.

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[14] In 1912-1995, the USA's real GDP multiplied by 9 times, Germany's by 8 times and the UK's by only 4 times. Some of the differential is due to more rapid population increase in the USA and Germany, but much of it (in the USA pre-1945 and in West Germany post-1945) is due to superior productivity performance.

[15] e.g. in declining relative performance in services or among smaller manufacturing firms, as is implicit in Hannah (1995).

V

The consequences of the globalization of investment, management and trade have received varying attention in the literature. We habitually devote more attention to international trade than to (quantitively far more significant) intranational trade. That is a silent tribute to the modern nation state for facilitating trade within its borders, though it also signals the state's less benign role in inhibiting free international exchange. Even groups of states that have established a customs union or common market often find that path-dependent processes (shaped by their earlier separate development) slow adjustment, or that non-tariff barriers to trade still inhibit market integration. Yet Mira Wilkins has – I believe correctly – frequently reiterated that the multinational enterprise is a generalised case of the national firm and that the fundamental frame of analysis must be similar.

Table 2: The "Regional" Distribution of Employment in the USA and Europe

	Automobiles	Textiles	Steel
USA (1990)	%	%	%
Northeast	8	14	13
Midwest	66	3	52
South	23	80	25
West	7	4	10
EC (1989)	%	%	%
Germany	35	13	20
France	25	16	19
Italy	10	17	19
UK	13	19	16

Source: Krugman and Venables (1992), p.22, based on OECD, *Employment Statistics*.

Table 2 illustrates the effects of fuller intra-national integration by dividing the USA into four hypothetical "quasi-nations" of approximately the same size as the four largest nations in the European Union. The contrasts between the resulting industrial specialisations of the American "quasi-nations" and those observed in Europe are very large. Despite nearly four decades of a European common market, with increasingly free movement of goods, services, capital and labour across their borders, the four largest EU countries still have a more equal distribution of industries like textiles, automobiles and steel than the equivalent American "quasi-nations". Since there is no reason to believe that Californians use significantly less textiles than southerners or that New Englanders drive many fewer cars than mid-westerners, it seems reasonable to conclude that there is a good deal more "trade" within the USA than there is across national borders in the similar economic space of "unified" Europe.

Investment and management flows across the U.S. "quasi-nations" are less easy to proxy, but, if the data existed, intra-US flows would surely greatly exceed those shown by the standard measures of foreign direct investment flows across European Union borders. A Minneapolis-based corporation is far more likely to have managers and assets in California or New England, than a Munich-based firm is to operate in Piedmont or Scotland. Like international trade, foreign investment flows (inward and outward) may be better the more there are, and our interest in multinationality is, in part, a backhanded tribute to the tendency of the nation state, consciously or unconsciously, to inhibit all cross-border developments.

In that perspective the first two sections of Mira Wilkins' essay (on "thinking big" and "thinking small") must necessarily flow directly – if haltingly – into her third section (on "thinking multinationally"). I would agree with her that the general determinants of company size – the complex and changing advantages and disadvantages of large or small size – are not, in principle, different for firms within borders and firms across borders. What differs in the multinational case is the grit that the existence of nation states injects into the global economic system, inhibiting exchange either across markets or within corporations. Nations can remove some of that grit voluntarily and, when they do, multinationals benefit. Telecoms manufacturers in small countries, like Northern Telecom (Canada) or Ericsson (Sweden), had significant capabilities but simply could not have expanded as fast as they did in the 1980s and 1990s (to rival the American, French and German leaders) if the major countries' national governments had not deregulated and privatised telecoms operators, rendering ineffective their nationally segmented vertical links with their suppliers.[16] Much activity by multinational corporations is also designed to remove the national grit or minimise its effect. When Michelin in 1927 began to manufacture tyres in Britain, it ensured that, despite the newly extended tariff, its capabilities would be available (albeit more expensively than under free trade) to the British motorist. When Daimler-Benz listed on the London Stock Exchange in 1990 and the New York Stock Exchange in 1993, that also was an implicit recognition that 'government' in financial matters from London, New York and Washington might, on some dimension, be better than (or at least beneficially different from) the 'government' it got from Frankfurt and Bonn.[17]

That is surely why states sometimes worry about multinationals, but it is also why citizens are probably wise to consider celebrating globally-minded capitalists. If the USA were instantly divided à la Europe, the four new American "nations" we have hypothesised would have proportionately more "multinationals" even than Britain and Switzerland. They would also be more

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[16] though Ericsson had earlier developed overseas subsidiaries to overcome national protectionism, the company was most effective when it was less constrained to do this in the 1980s.

[17] Daimler-Benz's first set of dual accounts showed a $370m profit under German rules and a $1b loss under U.S. GAAP.

"globally-minded": their average "transnationality index" could easily be more than double the USA's present level, i.e. perhaps higher than Britain and near Switzerland. But, then, if the USA had really been four nation states, it might also now be less effectively integrated, enjoy fewer scale economies and less domestic competition and thus have the lower living standards and productivity levels of Europe rather than those it now achieves![18]

VI

Business development, as we are increasingly coming to realise, is significantly path-dependent and national borders predetermine some aspects of the path. The world may have had some impressively globally-minded corporate actors (especially before World War One and more recently), but for much of the twentieth century the main focus of industrial policy-making, democratic legitimation, organised violence and macro-level popular emotional identification has been the nation state. Even the globally-minded have often desired (or been constrained) to behave internationally and multi-domestically rather than truly globally. Moreover, not all the institutional mutations that result from the power of nation states are economically harmful. Indeed, the variety rooted in differing national cultures, legal systems and business practices may be as valuable an element in global evolutionary selection in business as the global competition that economists have traditionally emphasised. A world in which Minneapolis's "post-it" notes, Sassuolo's ceramic tiles, Toyota City's kanban or Augsburg's mechanical engineering apprenticeships had never existed would be as poor as one in which competitive foreign emulation of their lessons or multinational investment by their innovators had not partially eroded the profitability of their local inventions. Yet, because no country has as much to teach as it has to learn, attempts in the developed world to inhibit global emulation and competition – from British bans on skilled workers' emigration in the early stages of the industrial revolution to German restraints on multinational integration in the 1930s and U.S. controls on its multinationals' capital flows in the 1960s – have surely done more harm to the world (and ultimately to themselves) than the multinationals that have generally been working in the opposite direction.

[18] or perhaps, as Mira Wilkins has pointed out to me, be more like Canada in degree of integration of its economic geography. If there is strong path-dependence, it would not, of course, follow that the American distribution of industry was necessarily better than the European one, though the direction in which Europe is moving (following the reduction of trade barriers) suggests it was, at least up to some point.