Afterthoughts

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Those who reflect on the title of my contribution -- "The American Miracle" -- may rue that miracles are events for which there is no scientific explanation. Of course that has never prevented devotees of particular religions from making startling, revelationary claims held with messianic certainty. The American miracle -- like the German and Japanese ones that followed -- attracted its fair share of claimants to exclusive understanding of the magic ingredient. I do not believe all of these claims, but fortunately they are not as mutually exclusive as religious ones, and I am very sympathetic to the richness of understanding of twentieth-century capitalism that they have sometimes stimulated. I therefore agree with much of what the commentators say.

There are two main differences of emphasis. First, I was not trying to substitute my own magic recipe for earlier ones, but rather to advocate a more rounded approach, for example, by recognizing the vital role of the non-manufacturing sectors and a more eclectic range of sources of U.S. organizational and technical capabilities. I pointed out that sometimes there was convergence and sometimes divergence: this hardly amounts to an uncritical admiration of convergence theories. I pointed out that networks, small firms, medium firms, and liberal market institutions had some merits, and that large firms sometimes embodied paralyzing organizational incapabilities; this is not equivalent to saying that large firms never (or small firms always) embody technological and organizational capabilities, nor that those capabilities, wherever embodied, are unimportant.

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[20]The chairman of the session, doubtless feeling that I got my retaliation in first, provided no opportunity for a reply to the comments at Fort Lauderdale; the editor of the *Proceedings* has been more indulgent. I am grateful to him and to the commentators.

There was a reason why, as Mary O'Sullivan accurately complains, I did not advance the claims of my own magic ingredient (or, as she more neutrally puts it, "an alternative conception of the foundations for economic performance"): there is a systematic bias in capitalist market systems rendering all such approaches of limited long-run value. If I did chance to be right, my magic formula would be rapidly copied and profits from its use would be competed down to zero. That is why convergence tendencies are (reasonably) strong and competition (eventually) works (though it is interesting to observe the exceptional occasions when the general model does not work). It also emphasizes why my eclectic approach, though less incisive than Chandler and Hikino's single-minded clarity, is likely better to capture the complex reality of modern global capitalism's constantly changing variety.

A second difference of emphasis is that, though we might all agree on some factors that explain why all the countries mentioned in my paper have grown remarkably rich in the twentieth century, I wish to argue that these may sometimes be different from the factors that explain why some countries have done better at some times than others. We talk about miracles when we are trying to explain marked outlying observations, not when describing the normal experience. Generally, these miracles involve only temporary divergences (even in the case of the largest productivity lead ever achieved that was the American miracle). Business historians seem to have a fatal urge to explain shifts that are merely a consequence of population changes, declining natural resource endowments, or wars by often-imagined, sustainable, shifts of competitive advantage achieved by some grand institutional innovation (or disabling institutional paralysis) in a zero-sum world.

That perspective can occasionally be helpful, but it often leads instead to an absurd promotion of national caricatures and blurred understanding of historical contingency. It is fortified by casual perceptions that confuse absolute size with efficiency and prosperity, and levels with rates of change. Chemical and machine technologies developed by large corporations in several key new industries have

been important in all successful industrial countries (and Chandler and Hikino's Table 2 underlines this familiar point convincingly), but it may be that *differences* in these countries' performances are due to other factors, ranging from war losses to differences in the regulatory regimes of service industries. The confusion of these questions matters; our profession has to be more systematic and disciplined in its formulation of explicit models and their testing if it is to avoid errors of interpretation.

That is why I part company with Mary O' Sullivan's comments (with many of which I agree) when she condemns wholesale the policies and practices of the economics profession. We can all enjoy ridiculing the idiocies of bad neoclassical economics, charmingly innocent of anything as real as a firm, especially microeconomic theories of markets that held sway thirty years ago; but the "new" industrial economics -- neoclassically based -- has much of interest to say about all the issues she considers important. We surely need to fill in the remaining trenches between us, not widen them unnecessarily. In so doing we need to take on board not only their theoretical rigor but also their tradition of carefully specified quantitative testing. I am worried by our own brand of counterfactual history (no relation to the original neoclassical version) that explains an outcome that never happened ("manufacturing productivity consistently increased faster in the twentieth century United States and Germany than in the United Kingdom") by a cause that is equally imagined ("Germany and America developed proportionately more large firms than Britain that lasted longer"). Industrial economists and business historians should both, in principle, be averse to that. Statistics can be disputed, indexes can be re-based, aggregate measures can be disaggregated -- I share many of the commentators' doubts on these matters -- but they are a firmer starting point than crude stereotypes that lack any quantitative support.

Mary O' Sullivan also suggests that large firms spend more on training and are critically central to subcontracting networks. All this may sometimes be true, as sometimes is the opposite: small or medium firms buy inputs from -- or train workers for -- large firms;

networks exist without a node, etc. This does not surprise me: in a capitalist economy, firms transact with each other across markets. So what? Well, sometimes relationships and distinctions between transactors *are* important. In praising Siemens's excellent training, the commentator was right but missed the critical point about social versus organizational capability. In fact, it is in the "Anglo-Saxon" economies, not those with German-style apprenticeship systems, that large firms are mainly responsible for training. This is, of course, because in mobile labor markets like the United Kingdom and United States, only large employers (if they dominate the local labor market) can internalize the benefit of incurring training expenditure and ignore the free-rider problem that renders some training by small firms commercially suicidal. In Germany, by contrast, a great deal of training is done in the *Handwerk* sector, which in 1967 had a median firm size of only ten employees: this sector accounted for only 10 percent of manufacturing employment but for as much as 42 percent of all manufacturing craft trainees [Prais, 1981, p. 30]. Many of these employees went on to work in large firms: mass production technologies there often made it inconvenient to stop lines in order to train apprentices, but they valued trained personnel. This is why the distinction between *social* capability (in the restricted sense rather than the all-inclusive Abramowitz sense) and *organizational* (that is, firm-based) capability is vital. It is German *society's* arrangements to distribute the costs of training equitably among workers, firms of varying sizes, and government, thereby avoiding the free-rider problem, that enables Germany to overcome the externality problem experienced by large U.S. corporations' attempting to develop internal organizational capabilities in competitive labor markets. What is in some respects a social benefit can, however, as Professor Feldenkirchen reminds us, sometimes be a social cost: there is much concern in Germany today about the inflexibility of training arrangements. Marriott Hotels trains people to make beds in a few days; German hotel workers' apprenticeship takes years: do you notice the superior German quality when staying there, or just the high costs?

Chandler and Hikino's remarks on the relative efficiency of manufacturing and services are an example of the confusion between levels (on which they triumphantly focus) and rates of change. My purpose was to explain the American miracle -- why a country that had a GDP per head only slightly above the most advanced European level in the closing decades of the nineteenth century had a GDP per head more than twice that of its nearest rivals by the mid-twentieth century. That change, at first sight, seems more likely to be accounted for (in a statistical sense) by a sector in which the relative U.S. productivity performance is improving (for example, services) than by one in which it is not (for example, if Broadberry's figures are accepted, manufacturing), whatever the initial levels.

The key qualification to this point, hinted at in my footnote 6, is that there might be compositional effects. If one country has a stronger productivity lead in manufacturing than in non-manufacturing and it is more rapidly shifting labor into manufacturing, then even if sectoral productivity differentials internationally do not change at all, that country's GDP per head will rise faster than one where sectoral labor force shares do not change. This is in fact observable during the American miracle of 1875-1950. In that period the United States, of course, never allocated as high a proportion of its labor resources to manufacturing as, say, the United Kingdom[21] (which had an unusually high share of its labor force -- around a third -- in manufacturing throughout). But manufacturing's share of the U.S. labor force did increase from under a fifth to around a quarter over the "miracle" period. This slightly weakens, but does not undermine, my oversimplified characterization of the relative importance of manufacturing in the U.S. miracle. Another important qualification is made by Professor Feldenkirchen: manufacturing output per person-*hour* in Germany is much nearer to U.S. levels (and the Japanese are much further away) than the output per person-*year*

[21]The proportion was also higher in Germany, which from a higher level than the United States was increasing manufacturing's share more slowly. For labor force shares in the long run, see, e.g., Bairoch [1968].

on which I focused. Germans now have among the shortest hours and longest holidays in the world.

Chandler and Hikino's plea for disaggregation of the varied industries in the service sector is obviously sensible. However, international service-sector productivity comparisons (mine *and* theirs) are more fragile than those for manufacturing, and the recent Dollar and Wolff results for 1970-90 are not germane to my core historical arguments about the 1875-1950 period. For what they are worth, the two historical studies covering that period confirm that the United States developed stronger productivity advantages over the Europeans in some non-manufacturing industries than in manufacturing: notably in mining (1937 and 1950), utilities (1950 only), and transport and communications (1937 and 1950), but that the U.S. lead was smaller in agriculture, government, financial services, retailing, and construction [Rostas, 1948; Paige and Bombach, 1959].[22]

I agree with Feldenkirchen that state ownership may be an important variable in determining these differentials, and I am skeptical that the U.S. productivity leads over these sectors in Europe depended fundamentally on manufacturing capabilities (though the growth in those sectors' productivity certainly depended everywhere on the use of improved, manufactured machines). Chandler and Hikino's example of computer hardware and software is not persuasive: even if no computers were made in the United States, Microsoft software would probably survive as the industry standard (just as the QWERTY keyboard survived changes in the location of typewriter manufacture) for reasons of path-dependency in standard-setting processes, which are now better understood and give a market with the size and living standards of the United States a big advantage [David, 1986; Farrell, 1990]. Why, then, are there such large differences in service-industry performance? American Airlines and

[22]Land productivity is far more important in agriculture, and capital productivity in utilities, transport, and communications, so one also worries more, particularly in these industries, about the value of a simple labor productivity indicator.

Delta are low cost and low profit; British Airways is low cost and high profit; but Lufthansa and Air France are high cost and low profit. There is little difference in the size of the firms or the manufactured capital goods they fly, but there are differences in the structures of their markets. That is not the "invisible hand." Indeed, the airline service market is replete with very visible hands: it is structured by a complex (but nationally variegated) web of bankruptcy laws, regulations, premium airport landing-slot allocations, state ownership, and bilateral aviation agreements. These factors, not the virtually identical Boeings and Airbuses the airlines all fly,[23] generate the surprising national differences in productive efficiency and distributional outcomes that we observe, even in this pre-eminently global service industry. I suspect that these factors are less important in other service industries than in airlines, and less significant in the 1914-1970 period of increased national autarchy than before or since. There were, for example, somewhat greater differences in the turbo-alternators used by U.S., German, and British electric utilities in the 1920s, though even then performance contrasts appear to have had more to do with traditions of technocratic industry-government cooperation and the structuring of markets than with differential electrical manufacturing capabilities [Hannah, 1979; Hughes, 1983].

Chandler and Hikino suggest that my use of the more rapid rise in Imperial Tobacco's equity valuation than American Tobacco's is "simplistic." It is far from an ideal measure, and changes in Imperial's quoted shares undoubtedly exaggerate its relative growth rate, but other measures -- such as market share or the number of cigarettes produced -- confirm that its performance by the 1930s was better than American Tobacco's. The account in *Scale and Scope* leaves little doubt that Chandler believed American Tobacco's organizational capabilities to be significantly greater than Imperial's in the 1912-1937 period. If that were so, why was Imperial, not

[23]Again note the distinction between improved base *levels* everywhere and differential *rates of change*: air travel everywhere is cheaper and more efficient than it used to be because of better aircraft; but nations have made very different rates of progress in using the available technology sensibly because of differences in their markets.

American Tobacco, by 1937 the most highly valued industrial firm in the capitalist world's stock markets after General Motors? That question is certainly simple, but is it satisfactorily answered?

Their suggestion is that the relative growth rates may be explained by the 1911 antitrust break-up of American Tobacco and the differential results from the BAT shareholdings that each firm began with. In a statistical sense, neither of these explanations holds water. I measured American Tobacco's rate of growth from its size *after* the 1911 break-up (then independent, Lorillard and Liggett also performed worse than Imperial), so the effect of the divestitures is presumably already substantially allowed for.[24] It is true that Imperial (but no longer American) had the benefit of an equity interest in BAT's growth in 1912-1937, but since Imperial's shareholding in BAT (which, at least by the crude stock market value indicators, was growing more slowly than Imperial) decreased over the period (from about a third to a quarter), it seems that the suggested stripping out of BAT from Imperial's growth might even improve Imperial's measured growth performance. Imperial simply performed better because it was better at marketing, developed better links with machinery manufacturers, raised its market share, converted British customers faster to branded, packaged cigarettes from other tobacco products than American Tobacco did in the United States, efficiently exploited its resulting large clientele by suppressing price competition, and maintained superior organizational capabilities by fostering internal competition (which Chandler and Hikino criticized as a malfunction) and niche specialization, rather than, like American, becoming an "elephant that did not learn to dance" [Goodman, 1993; Monopolies Commission, 1961; Corina, 1975].

[24]American Tobacco divested its holdings of shares in the new companies between 1911 and 1915; but, judging from the balance sheets in *Moodys Manual of Industrial Securities*, the great bulk had been divested by 1912.

The antitrust divestiture, which I believe had desirable effects,[25] might have taught American Tobacco to behave better by increasing competitive pressure on it, but in fact it simply created opportunities for rivals. In its key market for cigarettes, American Tobacco suffered at the hands of competitors that were initially small. At first it was mauled by R.J. Reynolds (which on its 1912 divestiture was a large plug tobacco specialist, with no significant capabilities in cigarette making; thirteen years later it had 42 percent of the U.S. cigarette market, twice as much as American); after World War II, American's most effective competitor was Philip Morris, which in 1912 was a tiny, independent British producer; it later migrated to America and became one of the world's most efficient marketing machines [Tennant, 1950, p. 80; Wilkins, 1989, pp. 339-40]. Britain's Imperial Tobacco, incidentally, did better at first, but was in the long run little better than American Tobacco. It too became flabby, adopted an American-style multidivisional organization, and made massive commercial misjudgments; though it still has 37 percent of the British cigarette market, American and South African firms have almost all the rest. Cigarette making was not, in either country, an industry in which organizational and technical capabilities entrenched formidable first-mover advantages; it was an industry in which initially small rivals often upset the market leaders with new business and marketing strategies that left them standing.

Indeed, if antitrust divestiture did have the effect of destroying American Tobacco's capabilities, as Chandler and Hikino (in a striking reversal of the narrative in *Scale and Scope*) appear now to imply, one must ask: precisely what was destroyed? Was it the capacity to control the market monopolistically and to exploit smokers, or was it something of greater social value? Comparative analysis surely helps. There were drastic divestitures at the same time for Standard Oil and Du Pont, but the divested firms' capabilities plainly survived. In Europe, too, the capabilities of chemical firms

[25]The stronger monopoly power of Imperial as opposed to other aspects of its superior performance, was not a social advantage, but only a private one.

divested from IG Farben seemed resilient to antitrust pressure. The failure of American Tobacco to survive antitrust enforcement of domestic and foreign competition in the very long run suggests that skepticism about the sustainabilty and nature of those capabilities (at least in the cigarette industry) should be nearer to the forefront of our analysis than Chandler and Hikino appear willing to allow. One might be able to make a better case that American Brands, which remains a large inheritor of American Tobacco's capabilities, has had continuing strength in marketing other packaged products and insurance rather than cigarettes; but that would be a different argument.

Patrick Fridenson happily reminds us that international controversies in business history are not as new as I suggested. Stereotypes have always been difficult to avoid and, like the earlier Landes view of France, perhaps they serve the useful purpose of generating rebuttal and hence advancing the subject. Sometimes it is better to be wrong and interesting than right and boring.

Fridenson also agrees with other commentators that I undervalue tacit knowledge in the creation of technical and organizational capability. I plead guilty, with mitigating circumstances. This concept, like the "architecture" or "culture" of an organization advocated as key concepts by other scholars, is clearly important. Yet these seductively all-inclusive terms unfortunately encapsulate a lot of what we do *not* know, and I have not yet seen a sufficiently precise definition of such concepts to generate a testable hypothesis. The norm is the tautological assertion that "tacit knowledge," or "culture," or "architecture" was presumably created within a firm and that was why the firm was successful. I do strongly agree that this is an area where we should try to make more progress. But we also need to consider whether our intellectual failure may have deeper causes. Tacit knowledge, culture, and so forth are extremely important because they are *not* easily analyzed and thus copied. Indeed that is why they provide firms with unique, sustainable sources of competitive advantages. As Don McCloskey [1990] has pointed out in a related context, if I -- or Professor

Fridenson -- really understood these matters, we would be rich men, not academics (and we would not tell you the secret if we wanted to remain that way).

On businesses influencing the political constraints on their growth, I am more pessimistic than Fridenson. First there is the question of business people's ability to influence the state. German industrial corporations would certainly have had a better twentieth century than my Tables 1 or 2 indicate if Germany had not invaded Belgium in 1914 or Poland in 1939, but industrialists' powers to influence these events were extremely limited. There is also the problem of business leaders' wisdom and inclination. Business people know how to run their businesses, not how to set the rules of the game under which they operate. Business attitudes to tariffs or antitrust laws, for example, would not be likely to improve the rate of growth of the economy, if they were listened to, which fortunately is now more rarely than in the past. But perhaps I was being too pessimistic about current possibilities: American business people may be more able to affect, for example, current U.S. quality problems in education or cost problems in health, which may be the source of some of America's current economic malaise, whereas such business interference would be considered intolerable in Europe.

Feldenkirchen points out that the deconcentration and deconglomeration in Germany and Japan to which I refer was imposed by the Allies, not undertaken voluntarily. That is partly true. But it is surely no accident that, whereas the bank break-ups imposed on Germany in 1945 were reversed within a decade, Hoechst, BASF, and Bayer still prosper as separate firms; and that at the British equivalent to IG Farben -- ICI -- spin-offs were also adopted, without U.S. pressure, in the longer run. Managerial and financial considerations led to its separation into three companies in the 1960s and 1990s -- Imperial Metals, Imperial Chemicals, and Zeneca -- and the last two are still in the global top 100 industrials by stock market valuation, along with the three German chemical firms. The source I quoted [Kleinschmidt and Weslkopp, 1993] also suggests that, in the 1930s, Vereinigte Stahlwerke's head office did not add value to its

constituent parts, and its passing was not sensibly mourned. In Japan, too, many top firms, including Toyota, Fujitsu, and Fanuc, are voluntary spin-offs from large firms, not compulsory divestitures. There are, I think, real business and economic factors, as well as the more obvious political ones, behind the processes I described. There are limits to managerial economies of scale and to "organizational capability," and there are real economic benefits to recognizing that and carefully -- or roughly and by force -- dismantling some over-large corporations.

Let me reiterate my fundamental point. Explaining miracles may be possible, but, by definition, doing so is difficult and complex. I do not think I provided a full explanation, but I think I did show that those who had attempted it earlier oversimplified (and sometimes misunderstood) the issues. Their work was, nevertheless, a constructive contribution to advancing analysis in business history. I hope this dialogue has signposted our pathway to furthering that agreed objective. On the need better to understand two central issues, American service-sector productivity leadership and the sources of organizational and technical capabilities in manufacturing, we appear all to agree.

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