

To the editors:

In a recent issue of *Capitalism and Society*, Giovanni Dosi, Alfonso Gambardella, Marco Grazzi, and Luigi Orsenigo (2008) take up some interesting and important questions surrounding the evolution of industry structure in the last few decades. Have we seen a revolutionary reorganization affecting the boundaries of firms, and maybe even the passing away of the large vertically integrated corporation described by Alfred Chandler (1977)? What has been the effect of modern information and communication technology (ICT) on industry structure? As both this article and William Lazonick's (2008) accompanying discussion begin by invoking my 2003 paper "The Vanishing Hand," it seemed appropriate that I offer a few comments.

My 2003 paper and subsequent efforts (Langlois 2004, 2007) did not make the claim that Chandler's visible hand has been fading away. Rather, I took this phenomenon as a widely agreed-upon starting point. The last few decades have witnessed a widespread "deverticalization" of production in the United States and other advanced economies. My objective was to *explain* the phenomenon, which I attempted to do not by rejecting Alfred Chandler's original account of the rise of the large vertically integrated corporation in the late nineteenth century but rather by showing how Chandler's account might be fitted into a larger framework that could admit of forces both for vertical integration and for disintegration. (I will say a bit more presently about the nature of this explanation.)

Armed with a statistical analysis of firm-size distributions, Dosi *et al.* challenge the very existence of the phenomenon I sought to explain. As the article's abstract puts it, "we do not observe any abrupt fading away of the Chandlerian multidivisional corporation in favour of smaller less-integrated firms." In his discussion, Lazonick puts the matter this way.

The Dosi *et al.* paper takes issue with the Langloisian point of view. The authors adduce statistical evidence on changes in the size-distribution of firms and industrial concentration in the advanced economies over the past few decades that contradicts the notion that there has been a significant movement toward market coordination of the advanced economies. They argue that, if anything, organizational complexity has become greater in the ICT age, requiring industrial enterprises to engage in more, not less, organizational interactions, as distinct from market interactions. Indeed, they raise the possibility that organizational complexity, and hence the challenges for the visible hand of managerial coordination, may be greater across vertically specialized firms in the New Economy than it was within the vertically integrated firms of the Old Economy. (Lazonick 2008, p. 1.)

Thus there seem to be two issues: (1) what is the nature of the empirical evidence against the phenomenon of deverticalization? And (2) does the New Economy (however we understand that) imply less — or more — "organization" within the process of production? I will take these points in order.

Since the empirical argument of Dosi *et al.* is offered in quantitative terms, let me also frame my response quantitatively: the amount of empirical evidence Dosi *et al.* actually bring to bear on the question of recent changes in the vertical structure of production is precisely equal to zero.

Begin by noticing the words Dosi *et al.* use: they are concerned with the “fading away of the Chandlerian multidivisional corporation in favour of smaller less-integrated firms.” First of all, it is not primarily the *multidivisional* corporation that raises issues of vertical integration. As Chandler discussed in *Strategy and Structure* (1962) and later in a somewhat different way in *Scale and Scope* (1990), the M-form is about diversification not vertical integration. Chandler raised the issue of vertical integration in *The Visible Hand* (1977), in the context of the *multi-unit* (functionally organized) firm. The more important confusion, however, inheres in the phrase “smaller less-integrated firms.” It is one thing to be specialized; it is quite another thing to be small. The popular romanticism of the New Economy is most certainly that ICT technology has brought forth both specialization and smallness. But this is not my view, nor has it been the view of the long-standing Smithian tradition on which I draw (Stigler 1951; Young 1928). In this latter account, indeed, stages of production often become organizationally specialized precisely in order to take advantage of the greater size that specialization permits. So one can logically have an increase in specialization without any change in the size distribution of firms. The distribution could even shift in favor of larger firms. The various stages of computer production once comprehended within the boundaries of IBM in its heyday are nowadays undertaken by a number of more specialized firms. But these firms — Intel, Microsoft, Dell — are extremely large firms by any measure.

To put it another way, the question of the size of the firm in the sense of price theory — that is, size as measured by output, value added, or number of employees — is entirely orthogonal to the question of the size of the firm in the sense of Coase (1937) — the number of transactions, activities, or stages of production within the firm’s boundaries. As fully all the empirics in Dosi *et al.* is about firm size in the sense of price theory, that evidence has no bearing whatever on the question of deverticalization.<sup>1</sup> Other authors have looked beyond size distribution to actual proxies for vertical structure — and have found evidence of deverticalization (Baldwin, Beckstead and Caves 2002; Feenstra 1998).<sup>2</sup>

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<sup>1</sup> Section 3 of Dosi *et al.* promises to shed light on the question of vertical boundaries. But that section turns out to be a sketch for a theoretical model and contains no empirical evidence of any kind.

<sup>2</sup> Moreover, using actual data on ICT investments, Brynjolfsson *et al.* (1994) find that ICT technology does indeed tend to reduce firm size. But, again, that was not my issue in “The Vanishing Hand.” In footnote 21 on page 30, Dosi *et al.* also accuse me of arguing that ICT technology is what leads to vertical disintegration. In fact, I try hard to distinguish my argument from that position. What I actually say is that ICT “may well be part of the story. But the hypothesis I offer here is a bit more subtle, or at least a bit more complicated, and arguably more general. In my view, the phenomenon of the vanishing hand is a further continuation of the Smithian process of the division of labor on which Chandler’s managerial revolution was a way station. Thus

Let me now turn to the second, and perhaps more interesting, point. In his discussion, Lazonick maintains that the statistical evidence of Dosi *et al.* stands against the claim “that there has been a significant movement toward market coordination of the advanced economies.” As we saw, the statistical model in Dosi *et al.* speaks not at all to this issue. More important, however, is the way Lazonick spins the discussion. He actually agrees with me that there is evidence of considerable evidence of deverticalization, and that the New Economy is not organized along the lines of the Chandlerian multi-unit enterprise. But, he argues in effect, this is not a return to “the market,” since there is a lot of “organization” going on in the New Economy, maybe even “more organization” than in the Old. Grasping the inevitable physiological conceit, Dosi *et al.* make a similar point: “one could legitimately argue that the management of supply chains is a more organisationally complex activity than straightforward vertical integration. In this perspective, the Visible Hand is not disappearing. Perhaps the grip of its fist is relaxing. But its strength is not weakened: its grip is perhaps smoother but firmer” (p. 35).

Here again, I think the problem is one of conceptual imprecision. It is perfectly common, and often unobjectionable, to contrast a market and an organization, that is, to contrast the institution called a market and the institution called an organization (such as, notably, a firm). But the opposite of “organization” *in the abstract sense* is not “market” but *disorganization*. More helpfully, the opposite of *conscious organization* is unplanned or *spontaneous coordination*. In this sense the market-organization spectrum (and similar spectra one could imagine) are arguably orthogonal to the planned-spontaneous spectrum. One could well wonder, as I have (Langlois 1995), whether large organizations do not in fact grow far more as the unplanned consequence of many individual decisions than as the result of the conscious planning of any individual or small group of individuals. And it is certainly the case that, as Alfred Marshall understood, both firms and markets “are structures for promoting the growth of knowledge, and both require conscious organization” (Loasby 1990, p. 120).

As Gary Fields (2004) has noted, there is considerable similarity between the intricate system of logistics that Gustavus Swift set up using an archetypical Chandlerian multi-unit enterprise in the nineteenth century and the one that Michael Dell set up in the late twentieth. Both systems are highly organized. But the point is that Dell could achieve this level of organization through markets, that is, by contractual arrangements with legally separate entities.<sup>3</sup> Charles Sabel and his collaborators have begun looking

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the vanishing hand is driven not just by changes in coordination technology but also by changes in the extent of markets — by increasing population and income, but also by the globalization of markets” (Langlois 2003, p. 377). So when Dosi *et al.* say that their findings are “more consistent with secular Smithian processes of division of labour, rather than with the thesis of a drastic revolution giving a systematic advantage to smaller size firms” (p. 30), they are making my case rather than attacking it.

<sup>3</sup> Here is what I actually say in “The Vanishing Hand” (p. 373): “In many respects, the structure of this new model looks more like that of the antebellum era than like that of the era of managerial capitalism. Production takes place in numerous distinct firms, whose outputs are coordinated through market exchange

into the nature of the relationships that characterize the New Economy (Gilson, Sabel and Scott 2008; Jennejohn 2007; Sabel and Zeitlin 2004). And what they find is not common ownership or hierarchy but rather a “form of contracting [that] supports iterative collaboration between firms by interweaving explicit and implicit terms that respond to the uncertainty inherent in the innovation process” (Gilson, Sabel and Scott 2008, p. 3). The New Economy may be highly organized. But it is fundamentally contractual, in a way that large Chandlerian multi-unit enterprises are not. These latter, properly understood, are indeed fading away in a world of extensive, capable, diversified markets.

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broadly understood. It is in this sense that the visible hand of management is disappearing. Unlike the antebellum structure, however, the new economy is a high-throughput system, with flows of work even more closely coordinated than in a classic Chandlerian hierarchy.”

## **References.**

- Baldwin, John R., Desmond Beckstead and Richard E. Caves. 2002. "Changes in the Diversification of Canadian Manufacturing Firms (1973-1997): A Move to Specialization," Statistics Canada, Analytical Studies Branch, Research Paper 179.
- Brynjolfsson, Erik, Thomas W. Malone, Vijay Gurbaxani and Ajit Kambil. 1994. "Does Information Technology Lead to Smaller Firms?," *Management Science* **40**(12): 1628-1644.
- Chandler, Alfred D., Jr. 1962. *Strategy and Structure: Chapters in the History of the Industrial Enterprise*. Cambridge: MIT Press.
- Chandler, Alfred D., Jr. 1977. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge: The Belknap Press.
- Chandler, Alfred D., Jr. 1990. *Scale and Scope: The Dynamics of Industrial Capitalism*. Cambridge: The Belknap Press.
- Coase, Ronald H. 1937. "The Nature of the Firm," *Economica (N.S.)* **4**: 386-405.
- Dosi, Giovanni, Alfonso Gambardella, Marco Grazzi and Luigi Orsenigo. 2008. "Technological Revolutions and the Evolution of Industrial Structures: Assessing the Impact of New Technologies Upon the Size and Boundaries of Firms," *Capitalism and Society* **3**(1), Article 6. <http://www.bepress.com/cas/vol3/iss1/art6>
- Feenstra, Robert C. 1998. "Integration of Trade and Disintegration of Production in the Global Economy," *Journal of Economic Perspectives* **12**(4): 31-50.
- Fields, Gary. 2004. *Territories of Profit: Communications, Capitalist Development, and the Innovative Enterprises of G. F. Swift and Dell Computer*. Stanford: Stanford University Press.
- Gilson, Ronald J., Charles F. Sabel and Robert E. Scott. 2008. "Contracting for Innovation: Vertical Disintegration and Interfirm Collaboration," Columbia University manuscript.
- Jennejohn, Matthew. 2007. "Collaboration, Innovation, and Contract Design," *Columbia Law and Economics Working Paper No. 319*. <http://ssrn.com/paper=1014420>
- Langlois, Richard N. 1995. "Do Firms Plan?," *Constitutional Political Economy* **6**(3): 247-261.
- Langlois, Richard N. 2003. "The Vanishing Hand: The Changing Dynamics of Industrial Capitalism," *Industrial and Corporate Change* **12**(2): 351-385 (April).
- Langlois, Richard N. 2004. "Chandler in a Larger Frame: Markets, Transaction Costs, and Organizational Form in History," *Enterprise & Society* **5**(3): 355-375 (September).

- Langlois, Richard N. 2007. *The Dynamics of Industrial Capitalism: Schumpeter, Chandler, and the New Economy*. London: Routledge.
- Lazonick, William. 2008. "Comment on 'Technological Revolutions and the Evolution of Industrial Structures' (by Giovanni Dosi, Alfonso Gambardella, Marco Grazzi, and Luigi Orsenigo)," *Capitalism and Society* **3**(1), Article 3. <http://www.bepress.com/cas/vol3/iss1/art3>.
- Loasby, Brian J. 1990. "Firms, Markets, and the Principle of Continuity," in J. K. Whitaker, ed., *Centenary Essays on Alfred Marshall*. Cambridge: Cambridge University Press.
- Sabel, Charles F. and Jonathan Zeitlin. 2004. "Neither Modularity nor Relational Contracting: Inter-Firm Collaboration in the New Economy," *Enterprise & Society* **5**(3): 388-403 (September).
- Stigler, George J. 1951. "The Division of Labor Is Limited by the Extent of the Market," *The Journal of Political Economy* **59**(3): 185-193.
- Young, Allyn A. 1928. "Increasing Returns and Economic Progress," *The Economic Journal* **38**(152): 527-542 (December).