Multidimensional theorizing: Some methodological comments about John Dunning’s eclectic approach

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Introduction

This chapter treats the OLI framework as a 3-dimensional analytic space laid out by the constructs underpinning Dunning’s definitions of the O-, L-, and I-assets. While the eclectic paradigm has not been presented as a structured space, it is revealing to approach it this way. We begin by analyzing spatial presentations (matrices) common in the strategy field, move on to Bartlett & Ghoshal’s theory of MNE activity, and the analysis of spillovers. The use of a 3-dimensional space to consider policy and managerial matters is illustrated in the Advanced Technology Program. We conclude that the OLI approach is a powerful way of meeting the conceptual needs of business and government decision makers, rather than those of economic and business theoreticians with positivist tendencies.

Background

I was lucky to arrive at Rutgers during John Dunning’s time, to share some of his many PhD students, and to experience his academic leadership as he created the Rutgers CIBER. As its initial Director, I promptly let him down by taking a year off in Washington with the Department of Commerce. Then I quit Rutgers to become a Dean elsewhere and so generally did not do all I should have done to help our CIBER succeed, of which more in due course. So I feel lucky to be invited to take part in this Festschrift in his honor.
Both JHD and I served our academic apprenticeships in the UK. Though we never met there, and worked in different fields, I like to feel we both benefited from the broader methodological attitudes that prevailed there. We were pressed to think broadly - even arrogantly - about theory without being constrained - as are many PhD students in the US - to produce statistically significant findings. Maybe it was an L advantage that gave our modest God-given O assets some leverage as we struggled to internalize our discipline. Although I began with a behavioral theory of industrial location I soon found my way into ‘corporate strategy’. Both of us were interested in firms, their management and competitive behavior. I suspect such illustrious compatriots as Marshall, Sargent Florence, EA Robinson, and Shackle influenced us both, and tempered any narrow focus on the specifics of the firm with attention to those of its industry. Putting distance between our micro-economic colleagues and ourselves, we both concluded that any meaningful analysis of the firm needed to be couched in the peculiarities of its industry – even though no one was convincing about what that meant. Attempting to bracket different levels of analysis - firm, component, and industry - we chose methodologies that invited criticisms that continue to this day. But the fruitfulness of JHD’s choice is obvious in his long line of successful students and colleagues who have found research value and even careers in the eclectic paradigm.

I am no expert in International Business so I shall restrict my comments to JHD’s choice of method and resulting conceptual model. While its richness creates many problems for those educated into narrower ways, I believe the evident achievements of the eclectic approach illustrate well the subtle possibilities and travails of multidimensional theorizing.

**Theory or framework? And is there a difference?**

Kuhn’s (1970) great contribution was to provide historical leverage to raise concerns about the ways even the most widely accepted scientific enquiries were framed. In the natural sciences these frames – approaches or paradigms – seem secure. Kuhn helped us realize these frames are not as stable as most of us were taught to believe. In no sense could we be completely sure - post Kuhn - that our descriptions of nature captured ‘reality’.

Social scientists had long recognized, at least since Marx, that we start our analyses from patterns of assumptions, axioms. Those of social science are very insecure. As social beings we are never able to see social things ‘as they truly are’. We can never fully abstract ourselves from the phenomena observed. We are captive to our axiomatic conceptual structures - which Marx believed were grounded in the class structure. As in Ancient Greece, much of what social scientists do is to probe and challenge current axioms using two very different methods. First, we
use empirical evidence to test the truth content of the current theoretical paradigm. This process is somewhat passive, for irrespective of whether we believe in falsification or in verification, it does not lead to new axioms. Second, we apply a rather different kind of creativity to conjure up new axioms. Plenty of creativity is required when developing a more powerful test of current theory, so I do not suggest that one kind of research is more creative or of higher order than the other. They seem complementary and I would argue that scientific progress follows their rigorously controlled interaction.

JHD has often spoken of the eclectic approach as a method rather than as a predictive theory. I want to press the distinction between theory testing and framing, in part because I am probably more enamored of the dialectical model of enquiry sketched above than is he, but also because I want to point up some consequences of the difference. It is worth noting that the history of the social sciences—among which we must count the kind of economics that interests FDI researchers—treats those who develop new frameworks better than those whose talent lies in using them to gather data and test theories. As with the Constitution, the framers are remembered better than those whose job it was to make it work.

Novel framings arise when we make two—or more—concepts ‘interact’. Concepts are axiomatic, the taken-for-granted point of departure. As empirical scientists, we hope they are empirically useful. The resulting interactions all fall into a ‘universe of discourse’. This sounds lofty but is really quite simple (Spender, 1979:394). To illustrate: most organizational theorists remember Ansoff’s (1965) matrix, which neatly defined the meaning he attached to the term ‘diversification’. There are products old and new, and markets old and new. Only when firms produce new products for new markets are they diversifying. As the Lockheed Aircraft Corporation’s ‘diversification manager’, Ansoff cautioned against diversification – too risky. Peters & Waterman (1982), using the same ‘universe of discourse’ and with the collapse of LTV and the diversification bubble behind them, offered the same advice, urging firms to ‘stick to basics’. Thus once Ansoff had framed the strategic discourse, Peters & Waterman, and many strategy PhDs, were able to test the proposition that diversification away from the firm’s established knowledge base would likely result in disaster.

Chandler (1962) had earlier created a rather different discourse for strategists. For him the defining concepts were market engagement and corporate structure. His proposition was that engagement in several different markets required the firm to adopt a divisionalized structure. Simple market engagements called for simpler structures. In the divisionalized firm the knowledge necessary to operate in the different lines of business (industries) would be located close to its point of application. It would be structurally separated from the financial and legal
knowledge used to build the collection of heterogeneous divisions. While diversification would increase the heterogeneity, Chandler was not especially concerned with the problems it might produce for top management should be able to encompass it with their coherent set of legal and financial skills. They ran the corporation, not its industry-specific divisions.

I offer these oversimplifications of two of the strategy field’s principal framers to illustrate (a) that testable theory is inevitably lodged within a specific universe of discourse, (b) that universe is often created by the interaction of two sets of variables adopted as axiomatic, and (c) it is sharply delimited by the axioms adopted. The result, at its most elementary, is the familiar two-by-two matrix, an interaction of two binary variables. The BCG (Boston Consulting Group) strategic matrix of dogs, stars, milch-cows, and question-marks, that interacted market share and market growth, is another that was hugely popular.

Many who accept their discipline’s choice of concepts and variables uncritically get very impatient with this kind of discussion. That is the point, of course, for the academic world is indeed divided between those who are uncritical of the frames they inherit and those who struggle to replace them. Again I see neither kind of intellectual activity as inherently superior to the other. Both, so long as they are allowed to interact freely, are part of the dynamic of human knowledge. But from the simplifications offered above we can see a third important characteristic. Each universe of discourse defines its own population of events – or, to put it another way – each frame captures a different set of empirical phenomena. Actually there is some deceit here, for we often presume that empirical phenomena have an identity independent of any frame and, as I suggested above, they do not. What really happens is that we have ‘lay’ or pre-scientific notions of events, which are incompletely defined. As we use our measurement systems to fit these events into a frame and gather population statistics and experimental samples, they become sufficiently defined to be brought into rigorous scientific discourse.

The eclectic approach

The OLI model began when JHD chose to interact the resources that a firm was able to move to a different country (O) against those that could not be so moved (L), whilst also assuming a theory of the firm as an apparatus for integrating these types of resource (factors of production). This provided an uncontroversial framing for his hypothesis that some non-national firms seemed able to import strategically significant resources not available to the national firms and so overcome the other penalties of foreign-ness. Had he followed the presentation style then common in the strategy field, JHD would have drawn a matrix of mobile and immobile resources, binary in the sense of their being strategically significant or not. In the event he moved on to
puzzle why the firms owning these strategic and mobile resources integrated them into their operations rather than trade them in the open market. That led to the possibility that some firms found strategic superiority in their ‘internalization’ (I) capabilities, as well as in their mobile and immobile strategic factors of production. Thus organizational capabilities are interacted with resource mobility and strategic significance. We sense a rich and conceptually complex universe of discourse.

As we consider JHD’s frame, it clearly restricts the phenomena to be analyzed to between-nation operations since mobility is defined – at least initially – in terms of crossing national borders. The frame implies a theory of international trade, but one that may have little comparability with other international trade theories whose axioms - and phenomena captured - are quite different. It is worth noting that JHD has answered Kojima’s (1982) critique by asserting that their theories are incommensurate (2001:14). He makes similar points about Rugman’s (1997) work on risk diversification.

The 3-dimensional framing

As one moves from a two dimensional analysis into a three dimensional one, there is a huge increase in complexity. The bad news is that not everyone has a taste for this kind of complexity. Some react viscerally and with impatience. The good news is that more of the real world may be framed, for the world is clearly a place whose richness demands we apply a staggering range of concepts. Frames adapted to deal with abstract phenomena can be simple, and this undoubtedly gives them greater rigor. But it seems appropriate to construct complex frames to grasp complex phenomena like international trade.

A second question is about the intended beneficiary of this intellectual labor. The social sciences may or may not be about developing powerful theories of social phenomena that can stand shoulder to shoulder with the theories of the natural sciences, but they are certainly about providing those who operate in and on society with more powerful insights. International trade theory – even in its present nascent state – is already vitally important to business and government. It is clearly going to be even more important in the future. And in these arenas decisions are seldom made with scientific precision. Far too many matters must be borne in mind. There is no framework that can take account of them all.

This implies two rather different notions of the power of a theory. The philosophy of science teaches us that the fundamental test of a theory’s truth content is its predictive power. But a theory’s ability to grasp (frame) and provide insight into complex everyday managerial concerns is
a different type of power –of equal importance. International trade is complex and those involved in it seem ready to use whatever useful tools fall to hand.

The 3-dimensional OLI approach can be illuminated by contrasting it with the two-dimensional international business frame offered by Bartlett & Ghoshal (2000). They interact the concepts of global integration (GI) and local responsiveness (LR) to define firms as 'international', ‘multinational’, ‘global’, or ‘transnational’:

| Low GI | Low LR | International |
|        | High   | Multinational |
| High GI|        | Global        |
|        | High   | Transnational |

**Figure 1: The Bartlett & Ghoshal matrix**

This matrix has given many managers good insight into their firms and the dynamic challenges they face. The definitions may be of some value in themselves but the matrix gets more interesting as an exploration of differences between the quadrants and therefore of the firms located within them. For Bartlett & Ghoshal (2000:255) the different types of firm reflect differences in strategic orientation and resource disposition. While there are some commonalities, the international firm exploits home-base assets. The multinational meets local needs. The global firm exploits economies of scale. The transnational firm finds ways of exploiting all of these strategies. Some firms find themselves attached to particular quadrants by the physical constraints of their factors of production. The cement business, Bartlett & Ghoshal tell us, is international for it gains no strategic advantage from either greater LR or GI. Consumer electronics – with voltages corrected - are the archetypal ‘global’ products, while packaged foods – even McDonald’s hamburgers - need to be re-fashioned to respond to local conditions and tastes. Transnational firms, such as ABB, are often both knowledge- and capital-intensive and learn to exploit the inherent flexibility that derives from the mobility of these resources.

In addition to providing a system for categorizing extra-domestic firms, the matrix provides a universe of discourse within which Bartlett & Ghoshal can consider the evolutionary paths through the matrix - from international to global to transnational – or equally from international to
multinational to transnational. Their point is that wherever the inherently mobile firm is located in their space, increasing global competition will drive it to become more transnational, steadily growing in complexity and sophistication. Strategic and competitive advantage accrues to those able to organize their operations so that they increase both GI and LR – quite a managerial challenge. And they can argue that if these firms do not evolve, they will be raided from elsewhere by those that do.

But while the matrix carries some implications for organizational structure and internalization capabilities it is not dealing directly with the distinction between mobile and immobile strategic resources. JHD’s framing does deal with this – and since management’s actions include both the design and administration of corporate structures, and the allocation and transfer of resources, one might argue that JHD’s framing is likely to provide senior management with more relevant insights than Bartlett & Ghoshal’s framing – even though their framing is simpler and much easier to explain. Likewise JHD’s framing may be more useful to government and regulators. They are not concerned with firms’ organizational structures, on the other hand their legislative levers enable them to control directly the cross-border movement of resources.

The heterogeneity of the OLI space

The matrices mentioned above – Ansoff’s, Chandler’s, BCG’s, and Bartlett & Ghoshal’s – are useful in several ways. First, they offer researchers a typology, a way of categorizing and defining the admissible phenomena. A binary matrix framed by variables A and B allows only four statements: A/B, A/~B, ~A/B, ~A/~B. Each is associated with an observation, which is thereby categorized.

Second, a matrix can help us probe why some areas of its space are not only inhospitable – such as Ansoff’s diversification - but also non-viable – such as BCG’s dogs. If we make an analogy to physical chemistry, we can think of the universe of discourse as setting out a complex ‘phase space’. We can plot how water changes its physical state under various combinations of temperature and pressure. While water’s phase space is ‘continuous’, for it is always solid ice, liquid water, or gaseous steam, in sub-atomic physics we know that particles cannot occupy all energy-states. Their phase-space has discontinuities that are highly significant – and lead us to quantum theory. Third, an international business matrix may offer insights into the possibilities and problems of moving around the space, of transforming a firm from one category, such as an MNE, into another, such as a ‘global’ enterprise.
I am not aware of anyone yet researching the heterogeneity of the OLI space but it would seem useful to know, for instance, if some combinations of O (mobile) strategic assets and L (immobile) strategic assets cannot be compensated for by an infinite amount of I (internalization) capabilities. This would mean that some parts of the OLI space are ‘blacked out’ and non-viable. The reader will gather that I see this an interesting research project.

Considering the ‘independence’ of the framing axioms can help map the space. This is an important matter. If the axioms are completely collinear, then the space collapses. Some will deal with the ideas being considered here as terms within a regression equation. Given some assumptions about the comparability of the data points, statistical tests can reveal co linearity much better than a wordy discussion about ‘phase spaces’. I appreciate this, but the real issue is that regression and multivariate approaches presume the continuity of the variables in ways a geometric or graphical approach need not – and an examination of the discontinuities and incompatibilities in the axiomatically created space can be crucial to the development of more powerful strategic insights.

JHD has taken considerable criticism on the matter of his axioms’ independence (2001). In some senses his responses focus on the dynamics through which immobile resources become mobile, and vice versa. He also suggests that the most immobile resources are those that comprise the host nation’s strategically relevant infrastructure. This raises the interesting possibility of a theory of the production of a nation’s infrastructure, making a distinction between ‘home grown’, ‘imported’, and ‘grown as a result of FDI’. A theory of much subtlety, it would deal with putting infrastructure in place through firms’ activity in the host country, rather than simply importing such facilities and having them put in place by overseas suppliers. I am reminded of concerns about ‘screwdriver’ plants that contribute little to the host infrastructure and simply exploit local assets such as cheap labor.

**Spill-overs – an example of 3-dimensional analysis**

Recognizing that the axes of these matrices are not fully independent leads to the idea of ‘spillovers’ from the properties of one axis to another. In Ansoff’s matrix new products eventually create new – and old - markets. In the Bartlett & Ghoshal matrix the firm’s ability to raise LR becomes generic and eventually enables a different kind of GI. Thus a dynamic version of JHD’s framework could focus directly on these interactive dependencies. Understanding more about them could be of great value to managers and legislators as they plan beyond the present time period.
The heterogeneity of the space is one measure of its research value. A space without discontinuities, blacked-out regions, trajectories, and so forth is scarcely worth researching. JHD has suggested that the heterogeneity of the OLI space is a complex dependent on the industry being analyzed and the host nation’s infrastructure of assets, attitudes, policy and history. That is clearly true. So the value of the OLI analysis will likely vary widely, contingent on the particulars and context of the nation and industry being considered. Hence I would argue that one of the richest areas for future OLI research is the examination of the spillovers that can be considered – such as those from created assets, whether mobile or not, and the infrastructure of the host country.

When I left Rutgers and the Directorship of the CIBER to work for the US Department of Commerce, it was because I had been invited to help analyze the spillovers resulting from the public funding of US private sector technology research. The program, the Advanced Technology Program (ATP), was politically sensitive and many eminent economists and public policy theorists – to say nothing of powerful Senators – were dead set against this use of the tax-payers’ money. It was labeled ‘corporate welfare’ even though the public funding merely ‘matched’ the recipients' own private funding. In spite of many attempts to shut the program down, it survives and since its inception in 1991 has invested some $3 billion of matching funds in some 600 projects (http://www.atp.nist.gov). There is little doubt that it has more than fulfilled its mission.

The underlying agenda was to understand the program in ways that would allow it to be (a) managed more closely, (b) explained to non-participants, and (c) evaluated in cost/benefit terms. The conceptual task was to bring its several fundamentally different kinds of activity – scientific research, product development, commercialization, and generating the public benefits – into a single frame in order to analyze their interaction.

The prevailing analysis was based on the notion of market failure, specifically the unwillingness of private sector research-intensive companies to develop methods and technologies for which they saw only the most distant possibilities of profit for themselves (Tassey, 1992). ATP’s process – without going into its details - is to invite research proposals and assess the likelihood of public benefits, including profits for others, if the project succeeds. If these benefits are judged significant, the proposers are invited to provide a business plan. ATP evaluates whether the proposer have the resources to develop the technology, product or service, and the ability to bring it to market. The assumption is that spillovers then occur and the public benefits. Awards can be given to large companies as well as to individual researchers and entrepreneurs, though past awards to IBM, GM, Ford, and Chrysler drew particularly hostile political attention.
The reader may well be skeptical. In ATP’s defense I have to say that the possibility of public benefits always depends on the specifics and details. For example, one area of ATP’s involvement is in software programming tools. These tools can be enormously expensive to produce but if made widely available, might have a significant impact on US software productivity. This is a matter of rising strategic and economic importance, for we now see both India and China competing with the US to become the principal producers of software. Currently US quality and productivity gives us an edge over their lower labor costs in most areas of the market. In spite of this, the history of attempting to commercialize such tools is depressing and most companies feel there is insufficient market to encourage them to invest in their development. But if the cost of the tools is partially covered by ATP and the prices lowered, then the resulting volume might be considerable. In this sense ATP might ‘pump-prime’ the market much as high profit defense contracts have primed many high-tech markets in the past. Which technology then ‘trickled down’ or ‘spilled over’ into private sector to the considerable benefit of the nation.

A group of the nation’s leading industrial economics researchers was assembled to help monitor ATP’s activities. They were funded to produce position papers about the program, do relevant conceptual and empirical research, attend conferences, and so forth. Immediately it was appreciated that the key to the possibilities of a proposal succeeding lay in understanding the spillovers from the private firm’s commercial activity into the public domain. Spillovers are poorly understood, so the economists debated at great length how to advance the state of their art. There was some research at the national level, comparing the technology support programs in Europe, Israel, and Canada. There was some research about the aggregated effects of national policies. But there was little that could illuminate industry or firm level phenomena.

As a non-economist, I was left to think about these matters in rather different ways and eventually developed the three dimensional space shown below (1997). Its purpose was to explore possible relationships between the three types of activity – technical research and product development, commercialization, and producing public benefits – while assuming that they were largely independent. In particular I wanted to explore whether all parts of the analytic space created were equally viable, or if there were discontinuities, where they might be located.
Using this space (Figures 2 and 3) I could argue that ATP was chartered to seek and then help manage proposals to move through this space from the origin (A) to some destination point (Q) which captured the project’s expected public benefit (PB) component as well as its corresponding PD and CM components. There seemed to be a logical sequence, suggesting some parts of the space are blacked out. Product development necessarily precedes both commercialization and public benefits. While product development might create technical and scientific knowledge of benefit to the public – so long as it is not closely held by the awardee through trade secrets, patents, etc. – this kind of spillover was not that most expected. Indeed one of the on-going policy questions was whether the frequent involvement with universities and the need of their researchers to publish was consistent with or contrary to the program’s objectives. The ATP policy was to focus on the public benefits that would follow commercialization. It is important to note that while ATP retained residual ‘national need’ rights to all knowledge or products produced, the government did not require the awardees to pay a royalty or give up equity. The ATP funds thus leveraged the awardee’s own funds at zero cost.

The most expected path was that which would follow the trajectory ATPQ. This raises interesting policy, economic and managerial problems. First, the spillovers occur at the points T and P.
While one might imagine that knowledge could spill into the public domain while moving up the PD axis (from scientific publication) or while moving along the CM axis (from trade and professional publication), or by both as employees leave the firm, the awardees were not asked to ensure that happened. Rather the proposals were restricted to those likely to produce public benefits after commercialization. In this sense, the PD and CM variables are binary – complete or not - and of no great policy concern. Secondly, there are some interesting issues around consumer surplus or pricing the resulting product or service so that it is of substantially greater value to the purchaser than the price charged. This is often a demarcating characteristic of tools, i.e. methods of creating value rather than simply satisfying market needs.

Perhaps of greater relevance, the diagram illuminates some of the managerial and accounting problems encountered by ATP. It is well known that one of the challenges facing technology companies is the transition from ‘knowledge generation’ to revenue generation. The switch of trajectory at point T shows this is a spillover problem – and because it entails a switch of concepts, is not a straightforward project management problem. To evaluate and manage that part of the trajectory requires an understanding of how to resolve and integrate two very different kinds of activity. There has been a considerable amount of research into the problems of transferring technology from the laboratory into production. It is neither conclusive or worth citing. The spatial approach shows it as a quite different task from that of managing either the production of the technology or the development of marketable goods and services. Among the
messages for ATP is the one that they need people with special skills if they are to monitor the awardees effectively.

Even more challenging is understanding the spillovers occurring at point P, where the result of commercialization is not simple customer satisfaction but more widespread public benefits. Economists have traditionally focused on the direct measurable public benefits such as job creation, enlargement of the tax base, and other ways in which the firm’s needs and activities leads to ‘economic multipliers’. ATP was chartered to look beyond these, in particular to provide a means of preventing a version of the ‘short-termism’ so widely criticized in corporate America – resulting from stock-market demands to produce short-term returns for investors – depleting the stock of technologies which, long term, has provided the US with its current competitive edge. Recalling Hardin’s comments about over-grazing the commons, there is a major policy concern that the US pool of public technological knowledge is being drained, and ATP was seen as a publicly funded mechanism to add to it. Finally the diagram suggested the methods for evaluating progress needed to be matched carefully to the particular types of activity being tracked.

The orthogonal tracks AT, TP, and PQ imply that while they connect at discrete points T and P, they are otherwise independent activities. The notion of spillovers is that something, maybe some form of economic asset, passes from one kind of activity to another that is largely independent. Simon (1962), among other social scientists, has explored the idea of the decomposability of social systems. One way to analyze spillovers is to determine the boundaries and processes of the social systems of which the activities AT, TP, and PQ are part. We already appreciate that the processes of technological discovery are different, and must be differently managed, from the processes of taking a product to market. More mysterious are the processes of public goods. Clearly the spillovers at P are a function of the receptiveness or ‘absorptive capacity’ of the ‘public’ social processes they impact as well as of the quality and quantity of the economic assets being transferred from the process TP. Consumer surplus depends on the consumers’ system of use and consumption.

From a methodological point of view we can see that creating a 3-dimensional analytic space facilitated discussion in ways that would have been much more difficult without it. It certainly cannot substitute for a rigorous statistical or regression analysis of the variables and outcome measures, and it might not please those used to a more quantitative approach. But the policy and management issues are well illuminated for those whose direct responsibilities lie in these areas. We need to appreciate that the needs of managers, policy-makers and legislators may not
be the same as those of academics, and that the methods used to deal with matters that are both interesting to academics and or national importance may need to be different too.

Final remarks

The overall thrust of my comments is that methodologies need to be matched to needs, and in many nationally important matters the needs of non-academics loom large. JHD’s choice of field, and choice of method, reveals his commitment to do more than simply publish – though his record in this respect is truly astonishing. It is also to do work that has value and impact on matters of national significance. Far too much of what passes for of academic activity in business schools lies gathering dust unread, un-referenced and un-remembered. My hunch is that the impact of the OLI framework will continue to grow simply because the methodology chosen suits the needs of the business and government managers who have to make decisions about allocating and transferring assets between nations.

JHD and a generation of colleagues and students are now exploring, articulating and refining the OLI model. I would argue that there would be tremendous value in metrication of the space he spelt out – even in basic binary terms. As experience grows these metrics can be ordinalized and more rigorous quantitative research begun.

Considerable effort is going into evolving dynamic models such as that implied by the investment development path (IDP). I see this as researching the viable trajectories through the OLI space, trying to get a sense of the relative priorities of the dimensions, and discovering the space’s discontinuities and blacked-out regions. As this work continues profound questions about the interplay between foreign firms, domestic firms, the local infrastructure providers, and the host country legislators will emerge.

But at the same time JHD himself continues to press forward and be more eclectic than ever – to extend the 3-dimensional paradigm into 4 or more dimensions. His recent interest in non-equity alliances is an attack on the simplicity of the distinctions on which the OLI model was grounded. Non-equity alliances imply splitting the internalization (I) dimension into operational level capabilities and strategic level capabilities in ways reminiscent of the divisional and head office separations in Chandler’s model. Likewise the exploration of R-assets attacks the notions of ownership and, therefore, of O-assets in the earlier literature. Through alliances and ‘relations’ firms increasingly have access to O-assets everywhere without having to own them.
Who knows? This second Festschrift could well be followed by a third in ten years or so celebrating JHD’s success in evolving the OLI model into a theory of international trade policy making, or maybe, given the rising capabilities of neural networks, a WTO based simulation of the whole world’s trade. Clearly, the OLI space presents us with a world of work to be done, and JHD’s achievements so far provide us with powerful tools that will continue to yield much public benefit all over the globe.

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