Journal of Management & Organization, 21:5 (2015), pp. 695–700

doi:10.1017/jmo.2015.32

Can a Darwinian nomenclature help reconcile alternative perspectives of the dynamic capabilities view?

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Abstract

The confusion concerning the theoretical roots of the dynamic capabilities view and the fact that it was often being positioned as an extension to the resource-based view in strategic management, prompted a paper by Galvin, Rice, and Liao (2014) that suggested that the dynamic capabilities view would benefit from adopting a more explicit Darwinian approach. In response to this paper, Arndt and Bach (2015) highlighted that the seminal papers in the field do indeed take an evolutionary perspective and that in operationalizing the variation–selection–retention cycle in an empirical setting it is necessary to move away from firm performance as a dependent variable and instead use survival, which more closely aligns with the concept of natural selection. In this paper, we respond to this recent critique to articulate the benefits of a Darwinian nomenclature and how this will assist in positioning the dynamic capabilities view as an independent, though complementary, theory to the resource-based view. However, we do clearly recognize that until the key terms of variation, selection and retention can be operationalized at the routine, firm and industry level, such an approach may not in itself bring the field towards a common understanding of how dynamic capabilities operate in different environments.

Keywords: dynamic capabilities, resource based view, evolution

Darwinian notions of evolution shocked the sensibilities of late Victorian Britain. Its heterodoxy was confronting in at least two respects – first, that selection was not the product of a deity, but rather based on blind luck, and second, that humans were descended of some primordial ancestral species of primate.

Charles Darwin proposed that all natural life is the product of millennia of variation and selection. Unusual traits or characteristics are said to emerge that predispose individuals and whole species to positive and negative selection – to increase and decline. Evolution thus leads to the success of some individuals and groups at the expense of others – at its most stark the *survival of the fittest* (Darwin, 1859/1958).

Analogies are useful in social sciences – indeed a whole body of knowledge entitled biomimicry (Lurie-Luke, 2014) has emerged that allows rational humans to learn how to improve our own constructed systems by observing the processes of natural systems. However, analogies to nature do not tell us all we need to know about social systems, their emergence and optimization.

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The processes of evolution offer profound insights into the manner in which nature and society progress. Increasingly, nature's progress is a function of choices, rational or otherwise, and for better or worse, by nature's human occupants. Even the evolution of species is now partially controlled by science. The interplay of decision making, variation and selection lie at the heart of modern innovation in science and technology. An understanding of evolution lies at the heart of an understanding of social, economic and technological progress.

For most scholars that focus on dynamic capabilities (DCs), it is relatively clear that there is an evolutionary tradition to the field (Agarwal & Selen, 2013). If there is a problem with confusing theoretical underpinnings, the confusion tends not to lie with scholars engaged specifically with furthering the DCs approach, but instead it is most prevalent in those works that apply DC ideas into other fields.

As of April 2015, the seminal DC paper by Teece, Pisano, and Shuen (1997) had received over 4,500 Web of Science citations. The notion of DCs have been widely applied – being used to explain diverse phenomena in fields as disparate as supply chain management, e-commerce, interfirm alliances and marketing. It is against this backdrop that we seek to respond to the research note of Arndt and Bach (2015) that critiques our original paper (Galvin, Rice, & Liao, 2014).

The central tenet of the Galvin, Rice, and Liao (2014) paper was that with the massive and rapid uptake of the dynamic capabilities view (DCV) literature, many scholars were either ignoring or were unaware of its evolutionary tradition. Instead, the DCs perspective was often positioned as an extension of the resource-based view (RBV) with DCs being just another type of resource.

This is problematic, not least because the RBV is more commonly associated with a Ricardian perspective. In the Ricardian-inspired world, variation is aimed at creating heterogeneous and defensible product and service niches. A Darwinian world view sees variation quite differently (Hodgson & Knudsen, 2010). In a Darwinian frame, economic progress, innovation and competitive sustenance emerges as a process of variation, replication and competitive 'winnowing' (Dickson, 2003). Above all, Darwinian notions as they are applied in business, strategy and economics are concerned with causation and determinacy in the progression (and indeed arguably regression) of social and economic systems.

Thus, treating the DCV as an extension of the RBV is to fail to fully appreciate the way that DCs may drive competitive advantage and the underlying assumptions of the two perspectives. This is a sorry loss, as the varying insights of the two traditions are fundamentally complementary. We therefore proposed that adopting a Darwinian perspective with Darwinian nomenclature will focus the DCV back towards its evolutionary roots and help to differentiate it from the Ricardian-based RBV.

DEFINITIONS AND THEORETICAL ROOTS

At the heart of many of the criticisms of the DCV (e.g., Arend & Bromiley, 2009) is the issue of definitions and thus conceptual clarity. This is not uncommon, and similar criticisms have been levelled against the RBV (e.g., Priem & Butler, 2001) and other well-known frameworks applied in strategic management (e.g., Davies & Ellis' [2000] critique of some of Michael Porter's work). The challenge facing the DCV is perhaps even more pronounced, given the split of the field into two major camps (Peteraf, Di Stefano, & Verona, 2013) – where scholars tend to align themselves with either the Teece, Pisano, and Shuen (1997) approach or that presented by Eisenhardt and Martin (2000). Without theoretical clarity to clearly articulate the key assumptions and processes that drive the DCV, the field risks diluting its contribution to strategic management and failing to capitalize on the strong work done to date to provide a clear rationale for sustained competitive advantage.

Arndt and Bach (2015) highlight that the seminal papers that make up the DCV present their work through an evolutionary lens. However, such links are not always obvious. An exemplar is the paper by

https://doi.org/10.1017/jmo.2015.32 Published online by Cambridge University Press

Zollo and Winter (2002) that has an evolutionary macroperspective, but more obviously aligns with Nonaka's (1994) knowledge-creating cycle, given the terminology used.

Perhaps more importantly, the two papers that seem to have split the DCV field into two camps – Teece, Pisano, and Shuen (1997) and Eisenhardt and Martin (2000) place the emphasis on their processes on alternative components of evolutionary theory. Teece, Pisano, and Shuen (1997) clearly aligns with the Nelson and Winter (1982) approach where DCs are routine based. In this approach, we see the traditional variation–selection–retention logic at work. However, Eisenhardt and Martin (2000) suggest DCs often appear in the form of best practice. There are differences in how the processes play out in different environments. In moderately changing environments, for example, they note that the emphasis is on variation in the form of the firm's exploration processes. For rapidly changing environments, the emphasis leans towards selection of different opportunities.

Without a clearly understood and agreed upon theoretical base, the way in which the evolutionary approach is applied in different papers varies. Furthermore, the classic Darwinian cycle of variation–selection–retention is often not even apparent in many of the papers applying the DCV to different fields. Thus, although we agree with Arndt and Bach (2015) that the seminal papers in the field view the DCV through an evolutionary lens, given these definitional issues and the varying way that papers apply an evolutionary perspective, we suggested in the Galvin, Rice, and Liao (2014) paper that there may be value in adopting a more explicit Darwinian perspective to highlight the evolutionary nature of DCs and ensure recognition of its theoretical roots.

UNIT OF ANALYSIS

One (of many) challenges with the DCV literature is the unit of analysis – particularly as it applies to empirical studies. Teece, Pisano, and Shuen (1997) focussed on studying idiosyncratic processes at the firm level. Invariably the variation–selection–retention process incorporates an industry-level dimension, if for no other reason, than the variation process will often occur in response to and in the context of some broader external change. In comparison, more recent work concerning the microfoundations of DCs (e.g., building on the work of Teece [2007] and others) has focussed attention at the routine or process level.

Arndt and Bach (2015) suggest that the empirical component of the Galvin, Rice, and Liao (2014) paper would have benefited from a study that effectively captured data on DCs as best practice (i.e., as per Eisenhardt and Martin) at the routine, firm and industry level. Indeed, this would be a useful aim as such multi-level work is undertaken too infrequently. However, as is often the case generally, and is always the case with secondary data, perfect measures of all relevant phenomena were not available. Owing to the limitations of the data that were available, and the fact that our focus was on the microfoundations of DCs and the way they drive a firm's actions, we were only able to look only at specific routines in respect of select firms. Felin and colleagues have suggested that the microfoundations can be clustered into 'three core or overarching categories: (1) individuals, (2) processes and interactions, and (3) structure' (Felin, Foss, Heimeriks, & Madsen, 2012, p. 1357) and it was this categorization that we looked to in trying to operationalize a Darwinian take on the data we had available.

EMPIRICAL STUDY

Arndt and Bach (2015) identify a range of issues with the empirical study that featured in the Galvin, Rice, and Liao (2014) paper. Many of these criticisms are valid and are a reflection of the limitations of the third-party collected (Australian Bureau of Statistics) data that were available. Perhaps one of the benefits of using this data set was that it allowed us to look at a range of firms across a range of

https://doi.org/10.1017/jmo.2015.32 Published online by Cambridge University Press

industries in a manner that considered some broad DCs over a number of years. Importantly, we departed from the typical estimation of innately cumulative effects with cross-sectional data – a common characteristic flaw of far too much management research. Nevertheless, the challenges associated with, and the limitations of, using this data set are appreciated.

In terms of the way we operationalized certain measures, Arndt and Bach (2015) suggest we define our capability measures akin to Eisenhardt and Martin's (2000) 'best practice' notion. This is not entirely accurate. Eisenhardt and Martin see 'best practice' as a convergence towards equifinality among competitive peers. In Galvin, Rice, and Liao (2014), we see the investment and divestment in new capability development as a dynamic and ongoing processes – with increasing *capability investment* not necessarily associated with laggard 'catch up' and *capability divestment* not necessarily present among leading firms who have reached the 'best practice' state.

This resource investment dynamism, that is indeed observed in our paper, is what would be expected among firms employing a Darwinian frame characterized by continuous processes of variation, selection and retention. Indeed, constant re-evaluation of resource endowment would seem to be imperative in a system characterized by both internal (competitor) and exogenous (macroenvironmental) perturbation.

As noted, a strength of our paper – rare in the DC literature – is that we employ cumulative and directional dependent and independent variables. These allow us to investigate dynamic processes at work – separating our work from the great majority of empirical work in this field, which draws on cross-sectional data. This is of fundamental importance. In a Darwinian framework, firms are in a constant process of variation emergence and decline, sensing and winnowing. They are concomitantly reaping the rewards and perils of those variations – choice based or path dependent. Our research explores a window of firms during a window of time. Our data set can be compared with a *movie trailer* in comparison with the typically employed *movie poster*.

Indeed, firms in our sample reported significant fluidity in their investment and divestment of resources in these processes. This was heartening in the context of our search for evidence of dynamic explorations by firms for their optimal resource commitments. In our paper, we looked at changes in the use of four key internal capability measures – namely on-the-job training, management training, administrative computer systems and accounting software use. Clearly, these measures are but proxies for a variety of capability development processes, but we feel they give some useful insights into the disposition of the firm with regards to its emerging commitment to, or retreat from, DC development.

Arndt and Bach (2015) make the following critique:

> The authors *de facto* study 'best practice' and exclude internalization processes that would reflect the idiosyncratic character of routines.

As we have said, we feel that our paper does the opposite – viewing the resource investment decisions as sources of divergence and perturbation within the competitive environment, rather than convergence and stabilization, as envisaged by Eisenhardt and Martin (2000).

The authors also take exception to the operationalization of our dependent variable.

> First, instead of survival, the authors study firm performance. It would have been interesting to see differences between the 75% survivors and the 25% non-survivors in the original ABS sample.

This is certainly a possible avenue for investigation and would potentially provide new insight into the questions posed. However, the decision to choose sales growth rather than survivorship is clearly discussed in the paper and was a choice that we needed to make. In the end, the choice to focus on sales growth as our dependent variable, concomitant with screens discussed in the paper, clearly allowed for a larger and more coherent group of firms to be identified that would allow a better isolation of the impacts of our hypothesized effects to be studied. Focussing on firm closures would be

https://doi.org/10.1017/jmo.2015.32 Published online by Cambridge University Press

a very different (but potentially interesting) paper – susceptible to other criticisms that such an analysis would use an underspecified model that ignored exogenous effects not related to capability development decisions. Choosing a sample of relatively stable firms, we decided, was the best solution to this empirical challenge.

CONCLUSION

We welcome the critique by Arndt and Bach (2015) of the paper by Galvin, Rice, and Liao (2014). They make a series of well reasoned and generally accurate observations pertaining to both the Galvin, Rice, and Liao (2014) paper, along with the DCs literature more broadly. The original paper by Galvin, Rice, and Liao (2014) was inspired by the confusion around the theoretical roots of the DCV and the way it was being applied in a range of fields within the broader business and management literature. This tends not to apply to the seminal works in the DCV that either overtly or at least implicitly incorporate an evolutionary component to their work. In this respect, we still believe that there is value in developing a nomenclature that aligns more explicitly with the evolutionary roots of DCs.

What this critique has done is forced us to reconsider how we went about positioning this Darwinian perspective and the way that it was operationalized. Given the fundamental split in the field between those taking a position that aligns with Teece, Pisano, and Shuen (1997) and those associating more with the Eisenhardt and Martin (2000) position, it would have been entirely appropriate to define the key elements of variation, retention and selection in line with one school of thought – especially as they are interpreted in different ways in different studies. This clarity would benefited the empirical component of the research.

So where to from here? The Darwinian nomenclature centred on variation–selection–retention still has validity, given the evolutionary roots of the DCV, but in some respects may add to the confusion as to what DCs actually are and how we might measure them until we resolve the split in the field as articulated by Peteraf, Di Stefano, and Verona (2013). Furthermore, do these concepts work well at the routine, firm and industry level, given the simultaneous focus on articulating the microfoundations of DCs as well as recognizing industry- and firm-level factors that initially drive the evolutionary (or coevolutionary) processes of change? Given the DCV has become something of a touchstone within the strategic management literature, clarity around the evolutionary theoretical roots of the field to ensure consistency in theory building is critical, but this does not necessary have to occur through the adoption of a pure Darwinian view.

References

Agarwal, R., & Selen, W. (2013). The incremental and cumulative effects of dynamic capability building on service innovation in collaborative service organizations. *Journal of Management & Organization*, *19*(5), 521–543.

Arend, R., & Bromiley, P. (2009). Assessing the dynamic capabilities view: Spare change, everyone? *Strategic Organization*, *7*(1), 75–90.

Arndt, F., & Bach, N. (2015). Evolutionary and Ecological conceptualization of dynamic capabilities: Identifying elements of the Teece and Eisenhardt schools. *Journal of Management & Organization*. doi:10.1017/jmo.2015.22.

Darwin, C. (1859/1958). *The origin of species*. New York, NY: Mentor Books.

Davies, H., & Ellis, P. D. (2000). Porter's 'competitive advantage of nations': Time for a final judgment? *Journal of Management Studies*, *37*(8), 1189–1213.

Dickson, P. R. (2003). The pigeon breeders' cup: A selection on selection theory of economic evolution. *Journal of Evolutionary Economics*, *13*(3), 259–280.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, *21*, 1105–1121.

Felin, T., Foss, N. J., Heimeriks, K. H., & Madsen, T. (2012). Microfoundations of routines and capabilities: Individuals, processes, and structure. *Journal of Management Studies*, *49*, 1351–1374.

https://doi.org/10.1017/jmo.2015.32 Published online by Cambridge University Press

Galvin, P., Rice, J., & Liao, T. S. (2014). Applying a Darwinian model to the dynamic capabilities view: Insights and issues. *Journal of Management & Organization*, *20*(2), 250–263.

Hodgson, G. M., & Knudsen, T. (2010). *Darwin's conjecture: The search for general principles of social and economic evolution*. Chicago, IL: University of Chicago Press.

Lurie-Luke, E. (2014). Product and technology innovation: What can biomimicry inspire? *Biotechnology Advances*, *32*(8), 1494–1505.

Nelson, R. R., & Winter, S. G. (1982). *An evolutionary theory of economic change*. Cambridge, MA: Belknap Press.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, *5*(1), 14–37.

Peteraf, M., Di Stefano, G., & Verona, G. (2013). The elephant in the room of dynamic capabilities: Bringing two diverging conversations together. *Strategic Management Journal*, *34*(12), 1389–1410.

Priem, R. L., & Butler, J. E. (2001). Is the resource based 'view' a useful perspective for strategic management research? *Academy of Management Review*, *26*(1), 22–40.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*, 1319–1350.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*, 509–533.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, *13*, 339–351.

https://doi.org/10.1017/jmo.2015.32 Published online by Cambridge University Press