

Path Dependence and QWERTY's Lock-In: Toward a Veblenian Interpretation

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Abstract: In “Clio and the Economics of QWERTY,” Paul David challenges an overarching, mainstream assumption that market forces should indeed lead toward efficient and optimal outcomes that include technology selection. David seeks to explain the endurance of technologies that his use of historiography judges inefficient and suboptimal. We challenge David’s research, arguing that failure to consider the original institutional economics (OIE) tradition limits his grasp of complex processes to reduced notions of “path dependence” based upon a “lock-in.” This inquiry offers an alternative account of QWERTY and technology selection based upon Veblenian thinking, further supported by Paul Dale Bush’s emphasis upon the ceremonial.

Keywords: ceremonial encapsulation, lock-in, path dependence, Paul Dale Bush, Thorstein Veblen

JEL Classification Codes: B25, B52, O33

What Paul David advances as path dependence based upon a lock-in could be viewed as an extension of “path analysis” (Tunali [1987] 1991) that also runs parallel and mostly congruent with several contributions of W. Brian Arthur.¹

Both Arthur (1983, 1988) and David (1985, 332) note that path dependence arises especially under conditions of increasing returns.² A related emergence of non-ergodic properties portend that small events found at an outset later generate deciding effects on such variables as a product’s market shares. While Arthur offers seminal advances into this area of inquiry, David appears responsible for bringing technology selection into core discussions in the Economics profession through his many scholarly contributions toward his field of Economic History. In this manner,

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inquiries into path dependence based upon a lock-in have also served as a foundation for promoting an overarching field known as *Cliometrics*.³

With this inquiry we shall endeavor to establish that David's understanding of the irreversible character of technology selection for the most part duplicates contributions of Thorstein Veblen and some of his finest disciples. While paralleling a Veblenian approach David's thinking, however, fails to account for important human and societal proclivities as well as institutional processes at work. In this sense we shall suggest that David's project rides upon a reinvented and cheapened version of a long-used and well-greased Veblenian wheel. And has been driven off of a nicely paved, Institutionalist road only to become mired in the mud of a path of doubt.

Reinventing the Veblenian Wheel

In his article, "Clio and the Economics of QWERTY," David (1985, 336) references Veblen, but as an afterthought to the body of his inquiry. On the last page of his article David considers two pages (126-127) from *Imperial Germany and the Industrial Revolution* (Veblen [1915] 1964). What interests David is Veblen's idea that penalties could indeed be associated with "taking the lead." This reference suggests that David seriously considers some of Veblen's thinking. If David is versed in Veblen, why did he endeavor to register his contribution to path dependence as original: instead of helping to further strengthen the well established school of Original Institutional Economics (OIE)?

Ronald Coase and Douglass North also borrow from Veblen. Taking Veblen's concept of institution and remolding it as cornerstones in their respective understandings of "New Institutionalist Economics" (Coase 1998), their efforts have been judged important enough to deserve recognition with Nobel Prizes. David is different. In his 1985 QWERTY inquiry David expresses no particular interest in institutions.⁴ What interests David are technologies and their selection and endurance over the course of history.

In this sense, David's contribution toward a theory of path dependence could also be seen as a challenge to mainstream theory. What appears heretical regarding David's (1985, 336) thinking is that there could indeed occur the selection of a technology that becomes increasingly inefficient and suboptimal over the course of time, creating what could be thought of as a suboptimal path. And, because of what he refers to as a "lock-in" technology could exhibit staying power, even over a long term, and under conditions that resource allocation is assumed to take place propitiously through the invisible hand of the market.

Like Veblen, David (1985, 336) acknowledges that the last train is likely to run fastest, as the nation that constructs the most recent rail system has the advantage of learning and correcting mistakes that plague those who went before and drove an "industry into standardization *on the wrong system*" (David's emphasis). What Veblen introduces and what David also seems to grasp is that history needs to be considered as economies exhibit textures that are deserving of careful exploration, and that cannot be assumed away by the neoclassical belief in universalism. In this sense what

David promotes as *Cliometrics* seems inherently Veblenian in at least some essential respects.

David's Understanding of Path Dependence in a Nutshell

David endeavors to explain the staying power of a keyboard developed in the second half of the nineteenth century. According to David (1985, 333), one Christopher Latham Sholes – whom he describes as a Wisconsin printer exhibiting proclivities as a tinkerer – focused diligently on advancing designs for typewriters. With assistance of his friends, Carlos Glidden and Samuel Soule, and supported by the entrepreneurial energies and “bullying optimism” of one James Densmore (David 1985, 333), Sholes developed a typewriter *cum* a keyboard configuration that he registered with the U.S. Patent Office in 1867.

David's version of the story goes that Sholes improved on a technological standard known as the “up-stroke” typewriter. This standard includes embossed letters attached to metal flanges known as *typebars*. When a key is pressed the connected typebar arcs up from a horizontal to a vertical position so that its embossed letter might strike an inked ribbon that rises up for the occasion.

In David's view what proves novel regarding Sholes advances is that he addressed and solved a nagging technical challenge. Namely, that if the typist proceeded with typing too quickly and pressed the keys too rapidly, an engaged typebar would tend to encounter other arcing typebars sporting their respective, embossed type-letters. Such an encounter could result in the typebars clashing and also jamming together. To relieve such a jam would typically require the operator to stop typing, and then manually – and with ever so much dexterity – undo the jam and return the typebars back to their horizontal positions so that the typing might be renewed. Inefficiencies would be incurred as time would then be lost as the rate of producing words is interrupted.

David alleges that to solve this operational challenge Sholes developed a keyboard configuration intended to slowdown the typist sufficiently so that such jams might be reduced, and, ideally, eliminated. Sholes's design efforts resulted in a “QWE.TY” configuration, reflecting the left-to-right order of sequential letters and a period on the top row of Sholes's keyboard found by the four fingers of the left hand of a touch-typist. David (1985, 333) qualifies a point: namely that mechanics at Remington, the arms and ammunition producer, shifted the “R” up to replace the “.”. This technical advance then created the more familiar QWERTYUIOP configuration, elevating the importance of the “R” for “Remington,” and in a manner that also invites reflection upon William Dugger's (1980, 1988, 1989) research into the evolution of corporate hegemony. The relocation of this “R” also allowed those in departments of marketing and sales the advantage of pecking out the word “typewriter” without their finger(s) leaving the top row of letters. Instead of speed, David emphasizes that slowness in typing that reduced and ideally prevented the jamming of typebars – combined with a quickened sales pitch – became embodied in the Remington modified Sholes, QWERTY keyboard.

Sholes's keyboard configuration solved the pressing technical challenges and thereby satisfied improvement criteria, and at a time when "touch typing" that made use of a typist's ten digits was also becoming widespread. Over time, Sholes's QWERTY became widely established as a standard keyboard configuration. And, so it seems, "[t]hings have been that way ever since," to quote David (1985, 336).

However, what proves challenging to David's world-view – while also offering grist for his thought mill – is that QWERTY has remained a world standard. That is, QWERTY benefits from a lock-in and thereby indicates dependence upon a suboptimal path David relates to three features characteristic of touch-typing that became especially important in a production system changing over time. David (1985, 336) notes these three features as a "strong technical interrelatedness, economies of scale, and quasi-irreversibilities [of investment] due to learning and habituation." In short, the interplay and dynamic created by these three features is argued to result in QWERTY's one hundred and thirty-plus-year-lock-in. In this manner, David explains QWERTY's staying power over a span of history, even as this configuration is judged over time to become increasingly inefficient and also suboptimal, and, arguably to have driven the "industry into standardization *on the wrong system*" (again, David's emphasis, 1985, 336).

However, David's line of argumentation has been sharply and also effectively critiqued. In "The Fable of the Keys," S. J. Liebowitz and Stephen Margolis (1990, 8-17) explore the historical sources upon which David bases his QWERTY argument. Challenging studies that David references, their research plausibly establishes that the keyboard configuration that David so earnestly critiques is not as inefficient and suboptimal a technology selection as he cracks it up to be. Our reading of "Path Dependence, Its Critics and the Quest for 'Historical Economics'" (2000) suggests that David altogether fails to regain any high ground that Liebowitz and Margolis had taken in their critique from ten years earlier.

Path Dependence, Lock-In and Veblen's Ceremonialism

In his *Absentee Ownership and Business Enterprise in Recent Times* [1923], Veblen (1967, 101), teaches us that an institution is "of the nature of a usage which has become axiomatic and indispensable by habituation and general acceptance." What is important to note, and what William Waller (1982, 759-760) so cogently emphasizes, is that Veblen's understanding of an institution evolved over his years of active inquiry. After Veblen's passing some of his finest disciples carried on his project, endeavoring to clarify, in cases – to systematize, and, to degrees – to make his contribution operational.

As one of these fine disciples, Paul Dale Bush offers contributions to Institutional thought that not only serve to shed light on, but also to challenge David's QWERTY story. Unlike David, Bush roots his thinking in the OIE tradition. And, following the tradition established by Veblen, he is clear to discern differences between "instrumental values" and "ceremonial values," what composes two key dimensions of a system of value in a society.

Bush (1983, 37; 1987, 1079-1080) teaches us that instrumental values include tools and skills employed. In addition, effects and outcomes related to the instrumental might also be measured. Bush draws from Veblen's notion of "efficient cause," suggesting the importance of efficiency in measuring instrumental values that lead toward "instrumental efficiency." On the other hand, ceremonial values are argued different from instrumental values in that these provide standards for judgment that could define status and also discern society's invidious distinctions.

What Bush teaches us and what David fails to consider is that technology and instrumental behavior are fundamentally and categorically different. When considering QWERTY, a Veblenian view suggests the QWERTY keyboard itself would be considered as the technology. The typing technique (touch-typing on a familiar configuration) would be considered the instrumental behavior. Tangentially, David (1985, 336) considers habit formation, as "learning and habituation," and how these two variables contribute toward QWERTY's lock-in. However, David fails to consider what Bush introduces categorically as "ceremonial behavior" and "ceremonial values," and their roles in affecting innovation and technological change, including tendencies to thwart technological change: a phenomenon that could also be categorized in a parallel fashion as a "lock-in" contributing toward an appearance of path dependence related to reliance on a technology David's historical research might judge as suboptimal.

As a way of helping us understand QWERTY's staying power, Bush (1987, 1077) stresses that two essential and related dimensions of an institution need also be considered. One is the "patterns" of correlated behavior, and the other is the values that function as the "correlators" of behavior.

That many of us type on QWERTY keyboards provides evidence of a pattern of correlated behavior. That we willfully or passively accept that typing on a QWERTY keyboard is a suitable activity suggests a value structure (Bush's correlators of behavior) that effectively supports QWERTY's long term staying power and widespread use. We think this is what David is trying to pass as his "lock-in."

From a Veblenian-Bushian perspective, let us consider a tool and technology like a QWERTY keyboard, as well as a set of skills employed to make use of it, such as widespread dissemination of touch-typing. And, if this combination of tool and skills employed register with a level of instrumental efficiency that could be judged acceptable from the perspective of society's ceremonial values, then we have explained David's lock-in. Liebowitz and Margolis (1990) add support to our view as their research found no reasonable gains in instrumental efficiency through changing to a new keyboard. We, then, think it prudent to assume that members of world society imbued with Veblen's notion of "workman instincts" are a bit sharper than David offers credit. Many of us continue with the useful QWERTY tool, and this explains its staying power over a time span that stretches more than one century.

Paul Dale Bush, along with J. Fagg Foster; Louis Junker (1982, 1983); Phillip O'Hara (2001); William Waller (1987); and Zdravka Todorova (2009) in her insightful and recent book, *Money and Households in a Capitalist Economy: A Gendered Post Keynesian Analysis*, considers the ceremonial and instrumental dichotomy and

what could also emerge as “ceremonial encapsulation.” In a key sense, variables and forces that contribute toward what some OIE thinkers ponder as ceremonial encapsulation could also serve as an alternate manner for understanding what David emphasizes as a lock-in leading toward a technology finding itself stuck on a suboptimal path.

Bush (1987, 1093) teaches us that ceremonial dominance could indeed lead to invidious interests of the community resisting technological innovations that cannot be encapsulated within an existing status and power structure. In this way, what Bush (1987, 1093) refers to as ceremonial encapsulation is suggested to deprive a community of higher levels of instrumental efficiency in the problem solving process. Bush’s cogent ideas appear two years after David’s seminal article. However, we should note that some years prior to the publication of David’s 1985 AER article Bush (1979, 1980) had already beat David to the “lock-in” punch, going to great lengths to explore and also explain how ceremonial dominance contributed toward instrumental inefficiencies enduring in the U.S. economy, and, in particular, in its energy sector over long courses of time.

The Veblenians and Bushians Versus the Davidians

By several decades Veblen’s thinking anticipated David’s efforts to establish the novel importance of path dependence based upon his understanding of a lock-in. But we think Veblen did a better job of it, as he did not engage in a reduced and simplified presentation of complex processes. With a preference for clear and penetrating analysis over quasi-scientific formalizations, Veblen did not stress details such as “technical interrelatedness, economies of scale, and quasi-irreversibility of investment,” upon which David’s analysis (1985, 334) relies. Veblen would be more likely to attribute QWERTY’s staying power to “habits,” what could be understood as an integral dimension for his understanding of human proclivities that find their ways and become embedded in institutions. Dale Bush skillfully fleshes out and also schematizes Veblen’s insights, rendering them more operational for analysis by introducing key distinctions between ceremonial and instrumental values, and the tendency for ceremonial values to dominate and also result in ceremonial encapsulation.

However, we suspect that QWERTY’s staying power has as much to do with instrumental efficiency that is supported by ceremonial values, a view congruent with Liebowitz and Margolis (1990). Bush cogently argues how ceremonial encapsulation describes and also thwarts technology selection in the U.S. economy. Though his perspective is important, we are not advancing the idea that QWERTY serves as a prime example of this phenomenon.

Conclusion

That David suggests history matters fails to free him from what Liebowitz and Margolis (1990) point out as shortcomings in his reliance upon historical materials.

We could even prudently note that in the case of QWERTY history matters to David in so far as historical examples might be relied upon to support his notion of the existence of the lock-in. And, its roles in keeping the technology he considers on a path that could be argued as suboptimal.

Interest supporting competitions in speed-typing died down decades ago. There has also been a withering away of the typing pool. Rather than replacing the QWERTY tool with another, similar “QWERTY-plus” tool like a Dvorak Simplified Keyboard (DSK), the community has added supplementary tools that David fails to consider. The photocopier and scanner, with the latter suited nicely for sending documents via the internet, has altered the QWERTY equation altogether. To put it in Bushian terms: the problem solving process of our community does not involve improvements in typing speed anymore. In this respect the vested interests with their predatory proclivities really have no reason or incentive to switch the industry away from QWERTY, as no profitability gains are to be realized. Those of us habituated with QWERTY have no incentive for typing faster – assuming we could – as this would likely mean generating poorly formulated ideas at yet a higher speed. David and some Davidians could use this as evidence of a lock-in contributing toward path dependence. We think that Veblenian notions of habituation embedded in tradition and customary use of a technology – that has proved less suboptimal as the businessman’s interests in speed-typing has died down – better explains QWERTY’s staying power.

Notes

1. See, especially, Arthur’s “On Competing Technologies and Historical Small Events: The Dynamics of Choice Under Increasing Returns.” With this paper published in 1983, Arthur introduces QWERTY as an example of technological choice under conditions of increasing returns. However, as Arthur advances this reference to QWERTY he also references David’s contribution to the literature (1969, 1975), suggesting the close research association of these two colleagues, who at that time, were also members of the “Technological Innovations Project Workshop” at Stanford University (Arthur 1983, 18).
2. These are but three of several possible references to their focusing on the economic character of increasing returns and non-ergodic properties.
3. Cliometrics involves the study of historical data by the use of statistical, and, typically computerized techniques. A Cliometrics Society was founded in 1983. This is an academic organization of individuals interested in using economic theory combined with advances in statistical techniques for inquiries into Economic History.
4. As a point of qualification: almost one decade after his QWERTY article of 1985, David published an article that needs to be considered. In “Why Are Institutions the ‘Carriers of History?’: Path Dependence and the Evolution of Conventions, Organizations and Institutions,” David (1994) carefully considers the importance of institutions, and, in a manner critical of New Institutionalists thinkers such as Ronald Coase and Douglass North. While not being too critical he does avoid bringing his project into the OIE camp. In this 1994 paper David more or less goes it alone, without affiliations to any other, larger efforts or schools of institutional thought.

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