Economics Letters 223 (2023) 110974

Contents lists available at ScienceDirect

Economics Letters

journal homepage: www.elsevier.com/locate/ecolet

Does brick size matter? Albert G. Keller on another QWERTY story

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ARTICLE INFO

Article history:
Received 5 December 2022
Received in revised form 26 December 2022
Accepted 28 December 2022
Available online 31 December 2022

JEL classification:
B15
D01
H30
N60

Keywords:
QWERTY keyboard
Institutional lag
Lock in

ABSTRACT

In his seminal "Clio and the Economics of Qwerty", Paul David indicates Thorstein Veblen's famous discussion of the British system of coal rail haulage as an intellectual antecedent to the idea of lock in. This note documents how Albert G. Keller, a Yale sociologist contemporary of Veblen, had presented a similar argument in connection to the establishment of a brick tax in England and its effects on the size of bricks. Like Veblen, Keller used this illustration to emphasize the inertia exercised by certain institutional conditions.

There is now a widespread agreement among evolutionary and institutional economists that superior technologies can be locked-out and less efficient ones can be locked-in, especially in the presence of increasing returns to scale and institutional constraints. Much of this consensus stems from Paul David's seminal paper "Clio and the Economics of QWERTY", published in the May 1985 issue of the *American Economic Review*. In what has become one of the most cited papers in economics (Liebowitz and Margolis, 2013), David noted that the QWERTY typewriter keyboard, designed in 1870 to prevent keys from jamming by slowing down typing speed for the most frequently used letter, achieved dominance through a lucky stroke of being associated with the world's first manufacturer (Remington), but was substantially inferior to other keyboards, particularly the Dvorak keyboard, which arrived half a century later. When, with later technology, typewriters no longer used jammable keys, so that this was no longer a relevant issue, it was "too late" to change and the QWERTY keyboard became a standard which is still in use today with only slight modifications. David attributed this persistence, for which he introduced the term "lock in", to a combination of "historical accidents" and technological–institutional factors, such as the quasi-irreversibility of investment arising from training and habituation.

As we all know, we live on the shoulders of giants and in his paper David recognized that the idea of lock in has some important intellectual antecedents. Specifically, David (1985, 336) mentioned the contribution of Thorstein Veblen who, in his *Imperial Germany and the Industrial Revolution* (1915) had called attention to the problem of Britain's under-sized railway wagons. The British rail system was originally built with a narrow gauge suited to the earlier stagecoach. The result was that it was only able to ship using "silly little bobtailed carriages" (Veblen, 1915, 126). Not uneconomic enough to junk, the fixed track and the small terminals left Britain at a first mover disadvantage compared with the catch-up Germans who could start with a clean technological slate. As Veblen (128) put it, "All this does not mean that the British have sinned against the canons of technology. It is only that they are paying the penalty for having been thrown into the lead and so having shown the way". The British railway lock-in recalls the QWERTY case to the extent that it has condemned future generations to a second-best standard.

As it often happens, and so we come to the topic of this little note, ideas are floating in the air, and there was another figure of the time who presented his own version of the lock-in idea. This is Albert Galloway Keller (1874–1956), a then leading sociologist who had studied under William Graham Sumner and who succeeded him in 1907 as professor of social science at Yale.[1] In 1915, the same year of Veblen's *Imperial Germany*, Keller

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[1] Albert Galloway Keller was born in Springfield, Ohio, 10 April 1874, the son of Jeremiah and Laura Keller. Raised in Connecticut, Keller entered Yale College in 1892 and immediately fell under the influence of Sumner. Keller proved to be an exceptional student. He was elected to Phi Beta Kappa and after graduating in

https://doi.org/10.1016/j.econlet.2022.110974

published his major work, *Societal Evolution*, in which he sought to apply the Darwinian principles of variation, selection, and inheritance to the social domain. Drawing upon Sumner's sociology, Keller argued that certain variations in "mores" and "folkways" (Sumner's jargon for habits and institutions) are selected and then transmitted, through emulation and education, when they increase the adaptation of social groups. This is obviously not the place for an exhaustive scrutiny of Keller's sociology. What interest us is that Keller stressed the inertia, the resistance to change, that is generated by specific institutional conditions in a way reminiscent of David and Veblen's.[2] Accordingly, Keller first advanced a typical "institutional lag" argument. "Selection cannot keep pace with the production of that upon which it is to operate", he wrote (1915, 49), and "so the unfittest variations are not eliminated with the expedition characteristic in nature". As important, he continued, the mores reveal a capacity for producing "inferences". This means, he explained, that "when the original variations come up for judgment, the case is already confused by the existence of numerous corollaries, all of which cannot well be eliminated along with their supporting principle". To support his claim Keller made use of an interesting illustration, citing a small note on the "Size of Bricks" which had appeared by the end of August 1911 in the *Philadelphia Inquirer*:

> If bricks were made larger it would save a great deal of time and labor in building, said a contractor, but the standard has been set and any change would be attended by considerable inconveniences. In England when bricks were first made, and up to sixty or seventy years ago, there was a tax on bricks and in order to evade it the bricks were made of larger and larger sizes. These were used for cellars and other concealed places. To stop this fraud, an act was passed in the reign of George III fixing the legal size of bricks. Early in Queen Victoria's reign the tax was taken off and the bricks may now be legally made of any size whatever. But any change from the standard size would bring about great inconvenience. All calculations are made for building on this standard size, and the Loudon and other building acts have practically fixed it. (Quoted in Keller, 1915, 49–50)

Specific literature on the British brick tax allows us to restate the whole episode in deeper detail.[3] The British brick tax was a tax based on the number of bricks in a building, which was introduced by King George III in 1784 to help pay for the war against colonial America. The tax was originally levied at the rate of 2 s. 6d. per 1000 bricks but it was gradually increased and reached the level of 5 s. 10d. per 1000 bricks in 1805. The brick tax had several unintended effects. The most significant was that since the tax was imposed on the number of bricks, irrespective of size, manufacturers began to increase the size of their bricks to mitigate its effects. In 1801 the British government responded by providing that all bricks larger than 10 in. × 5 in. × 3 in. were to be charged double duty, the provision being charged to cubic in. in 1839. The size of bricks was thus controlled, and the brick industry soon converged to a standard of 9 × 4¼ × 2 in., although thickness continued to vary up to 3⅛ in. When the tax was repealed in 1850, many brick makers had moved from hand-made to machine-made bricks and invested heavily in machinery to make them. That made it harder to revert to larger (but also smaller) sizes, and this brought about an increasing homogenization of the industry. The limitations imposed by the British government in 1801 and the mechanization of the industry, Aston and Bond noted (1976, 192), resulted in the production of "enormous quantities of bricks which were almost identical in size, colour and texture". The standard persisted until 1941, when it was slightly changed before the final conversion in the early 1970s to the British Standard Metric size of 215 × 102.5 × 65 mm (8⅝ × 4⅛ × 2⅝ in.).

This case differs from the QWERTY story in some crucial respects. Whereas in the keyboard case, the standard became dominant by virtue of its head start in the market and Remington's oligopolistic power, the lock in here originated by an external institutional shock, the imposition of a tax on bricks, which caused a strategic response by the brick industry and which, in turn, triggered a further reaction by the British government which set a limit to the size of bricks. This limit led to the establishment of a common standard in the market, a standard which persisted well after the abolition of the brick tax because of habituation and the high sunk costs associated to the rapid mechanization of the industry over the previous decades. We are well aware that as a full lock-in story, the whole brick tax episode would require further investigation. Specifically, more evidence is needed on the fact that the standard which emerged after the introduction of the size bar was sub-optimal with respect to the needs of the construction industry. The whole issue seems controversial. If it is true that the standard was fixed to limit tax avoidance and not on technical exigencies, it is also true that more recent scholarship indicates that at the time opinion on its efficiency diverged and that large bricks continued to be produced after the imposition of the 1801 limits.[4] Discussion of these aspects goes well beyond the scope of this brief note and, one may add, after all both the QWERTY and British rail cases have been found equally controversial (Liebowitz and Margolis, 1990; Van Vleck, 1995). What is relevant here is that Keller, now a largely forgotten figure, has reasons for being enrolled together with Veblen among the forerunners of the idea of lock in. "I believe there are many more QWERTY worlds lying out there in the past", David (1985, 337) wrote in his celebrated paper. The English brick tax story, at least in the way Keller presented it, seems to be one of these.

Data availability

No data was used for the research described in the article.

Acknowledgements

We wish to thank Paul David, Ugo Pagano, and an unknown referee for their helpful comments on an earlier draft of this paper. Massimiliano Vatiero gratefully acknowledges the financial support of Fondo Brenno Galli, Fondazione Ricerca & Sviluppo at USI. The usual disclaimers apply.

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1896 continued to study with Sumner as a graduate student in sociology. Keller received his PhD from Yale University in 1899 and he immediately joined the social science faculty there where he remained until his retirement in 1942. He was the first holder of the "William Graham Sumner Chair of Political Science" at Yale.

2 It should be noted that, like Keller, also Veblen had studied under Sumner during the two years he spent at Yale as a graduate student. Veblen received a Ph.D. in Philosophy from Yale in 1884 with a dissertation on "Ethical Grounds of a Doctrine of Retribution" and Sumner was on his dissertation committee. We thank an anonymous referee for pointing this out.

3 Our reconstruction is indebted to Stebbings (2018) and Conway (2019).

4 See especially Lucas (1997).

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