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## **Banks, births, and tipping points in the historical demography of British banking: a response to J.J. Bissell<sup>1</sup>**

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We would like to thank J. J. Bissell for an interesting and thorough comment on our 2015 *Business History* article, and which provides an alternative view on a potential model for the development of the British banking sector.<sup>2</sup> The comment is a useful contribution to the debate and a continuation of our work. We also direct readers to another (more hypothetical) extension of this work where potential models of the growth and subsequent decline of the population are modelled.<sup>3</sup> Rather than dissect each aspect of the comment in turn, we think it might be more useful to respond to certain points and then make some general points about the advantages of different modelling approaches. This lends insight to both the modelled system and the modelling process itself. In what follows below we deal with two issues: first, the question of births (creations) in

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<sup>2</sup> Philip Garnett, Simon Mollan, and R Alexander Bentley, "Complexity in History: Modelling the Organisational Demography of the British Banking Sector," *Business History* 57, no. 1 (2015): 181–201.

<sup>3</sup> Philip Garnett, "A Tipping Point in 300 Years of Banking? A Conceptual Simulation of the British Banking System," *Natural Computing* 14, no. 1 (2015): 25–37.

the banking population; and second, the question of why 1810 marks a 'tipping point' in the historical demography of British banking.

### **The Question of Births**

The question of whether the creation of a bank is a *birth* process is worth revisiting. Obviously, it is not literally a birth process in the biological sense of parent banks producing new offspring banks. Nevertheless, many banks are formed as descendants of existing banks, while others are formed independently as new entities. In any case, the data show a distinct link between the size of the population of banks and probability (or rate) at which new banks enter the system. As Bissell confirms this feature of the system, we can focus on the interesting historical question of why this was the case not only during increasing number of banks before 1810, but conversely in subsequent two centuries of declining population of banks and declining bank creation rate.

As we were, and still are, unable to determine a plausible reason for this link between creation and population size we did not establish this relationship in our agent-based model. In fact, this is why we produce models and simulations as ways of testing simplified versions of a real system. The purpose of our agent-based model was to take plausible rules for the real banking system, that we can justify either historically or based on an understanding of the banking system, and test to see if those rules will reproduce the dynamics of the observed data. Indeed the agent-based model had no specified relationship between the number of banks and the rate of creation of new banks, and yet the simulation

matched the data without this relationship. This leaving it an open question what this potential relationship meant for the real system.

Bissell's model usefully confirms this relationship as a feature of the data, but still does not explain why it exists. Is a feature of the *real* banking sector? Is it an artefact in the data? The remarkable rise and subsequent 200-year decline in the number of banks is worth further investigation by historians as well as complex systems modellers, potentially in collaboration, allowing the investigation of historical data and counterfactual processes.

We looked again at our data and found that during growth in bank population prior to 1810 there was also a higher rate of new bank creation (Figure 1). Since failure rate of banks remains proportional to the population size, the link is relevant for the entire time period, not just the post-1810 period. In the hypothetical model presented by in Garnett (2015) the formation of new banks prior to 1810 is dependent on a supply of new partners for banks, which is a proxy for the supply of money.<sup>4</sup> It is possible, even likely, that demand drove the creation of new banks before 1810. This is consistent with the general history of money, banking and industrialization in this period.<sup>5</sup> This could have led to a

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<sup>4</sup> Ibid.

<sup>5</sup> Michael Collins, *Money and Banking in the UK: A History* (London: Routledge, 1988); Richard Sylla, "Comparing the UK and US Financial Systems, 1790–1830," in *The Origins and Development of Financial Markets and Institutions From the Seventeenth Century to the Present*, ed. Jeremy Atack and Larry Neal (Cambridge: Cambridge University Press, 2009), 209–40; Stephen Quinn, "Money, Finance and Capital Markets," in *The Cambridge Economic History of Modern Britain*, ed. Roderick Floud and Paul Johnson, vol. 1 (Cambridge: Cambridge University Press, 2004), 147–74, doi:10.1017/CHOL9780521820363.007.

bubble in the creation of banks, incentivised by the perception of profitability and need for banking, manifested in an exponential increase in the population of banks.

Perhaps would-be entrepreneurs were dissuaded by the declining numbers of banks after 1810, or the market was saturated with banks and so unpropitious, or the barriers to entry began to increase as banking functions became more complex. These questions cannot be answered by models and simulations, but can help to problematize historical research question to address this issues.

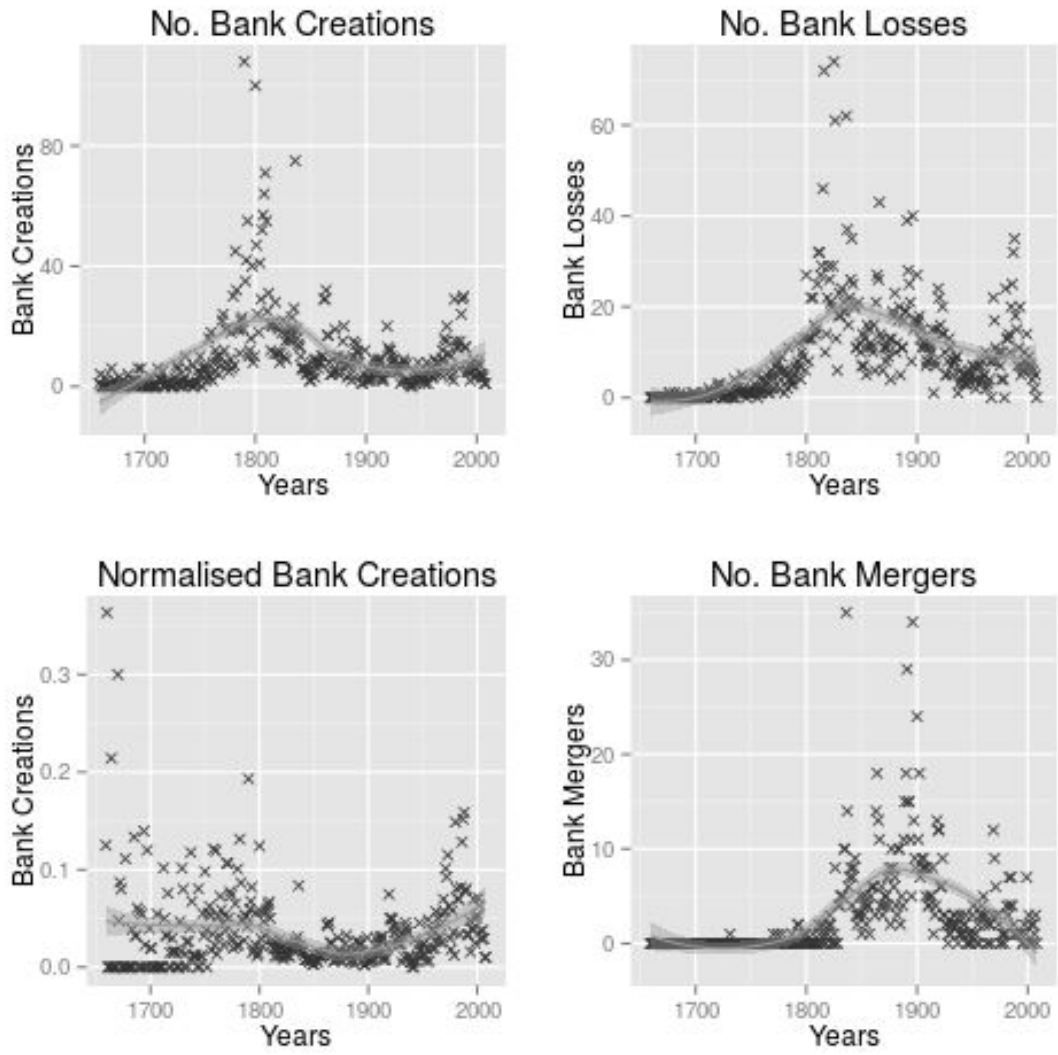


Figure 1: British Banking demographic change.

## **When is a Tipping Point a Turning Point?**

What, then, explains the importance of 1810 as a turning point in the demography of British banks? In our article in 2015 we suggested that this would be the object of future research.<sup>6</sup> However, the answer is relatively straightforward and is present in the existing banking history literature. Two explanations presented themselves to us on the basis of what we knew about the demography and the importance of amalgamation and failure.

The first is that 1810 marks the moment when the first joint-stock banks were introduced (in Scotland), so providing a means of effective amalgamation the absorption of business operations and balance sheets. On the surface this explanation is attractive because it puts an earlier date (1810) on the emergence of the organizational form (joint-stock banks) that certainly became a significant reason for the amalgamation movement in England after they were allowed in England and Wales from 1826.<sup>7</sup> So this explanation goes, Scotland would be the leading edge of this broader secular change in the organizational form of the population of banks as a whole; this change might then have triggered long-run change in the population. Unfortunately, as the history Scottish banks make clear, though 1810 *was* the date when the first joint-stock bank appeared in Scotland, the next Scottish joint stock bank did not appear until fifteen years later around 1825.<sup>8</sup> Further, when we look at the banks that actually disappeared

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<sup>6</sup> Garnett, Mollan, and Bentley, "Complexity in History: Modelling the Organisational Demography of the British Banking Sector."

<sup>7</sup> Joseph Sykes, *The Amalgamation Movement in English Banking, 1825-1924* (London: P.S. King, 1926); Garnett, Mollan, and Bentley, "Complexity in History: Modelling the Organisational Demography of the British Banking Sector."

<sup>8</sup> Sydney George Checkland, *Scottish Banking: A History, 1695-1973* (Glasgow:

in this period, they were largely failing without being amalgamated into other banks (see Figure 2). Between 1795 and 1825, 253 banks failed, 159 banks ceased business or were wound-up, and just 29 were merged, taken-over, or amalgamated. Of those that were amalgamated only four were in Scotland, and the rest in England and Wales. Of the majority of the banks that ceased or failed the vast majority were English "country banks". The emergence of the first joint-stock bank in Scotland in 1810 is simply a misleading coincidence with the peak of the population in our data.

The second explanation must therefore be with the failure of the country banks in years following 1810. Though 1810 is the moment of peak population and represents a demographic change of direction, Figure 2 clearly indicates that while there was an increase in the number of exits in 1810 it was the period 1813-1816 that represents the period of greatest exit, where 1816 was the peak. This is also confirmed the main histories of the country banks.<sup>9</sup> Figure 2 shows that banks "ceasing" was the predominant type of exit before 1814, thereafter replaced by "failure" as the main type of exit, though in practice "ceased" and "failed" express the same essential fact. Figure 2 also shows that while the absolute number of amalgamations was low in comparison to other forms of exit, amalgamation intensified across the period becoming much more common after 1810. After 1826 the history of amalgamations is well known.<sup>10</sup> Before 1826,

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HarperCollins, 1975), 293.

<sup>9</sup> Margaret Dawes and C.N. Ward-Perkins, *Country Banks of England and Wales* (Canterbury: CIB Publishing, 2000); Leslie Sedden Pressnell, *Country Banking in the Industrial Revolution* (Oxford: Clarendon Press, 1956).

<sup>10</sup> Sykes, *The Amalgamation Movement in English Banking, 1825-1924*.



however, it is largely the failure of country banks that explains "exits" from the population. What explains this increase in the number of failures at this time?

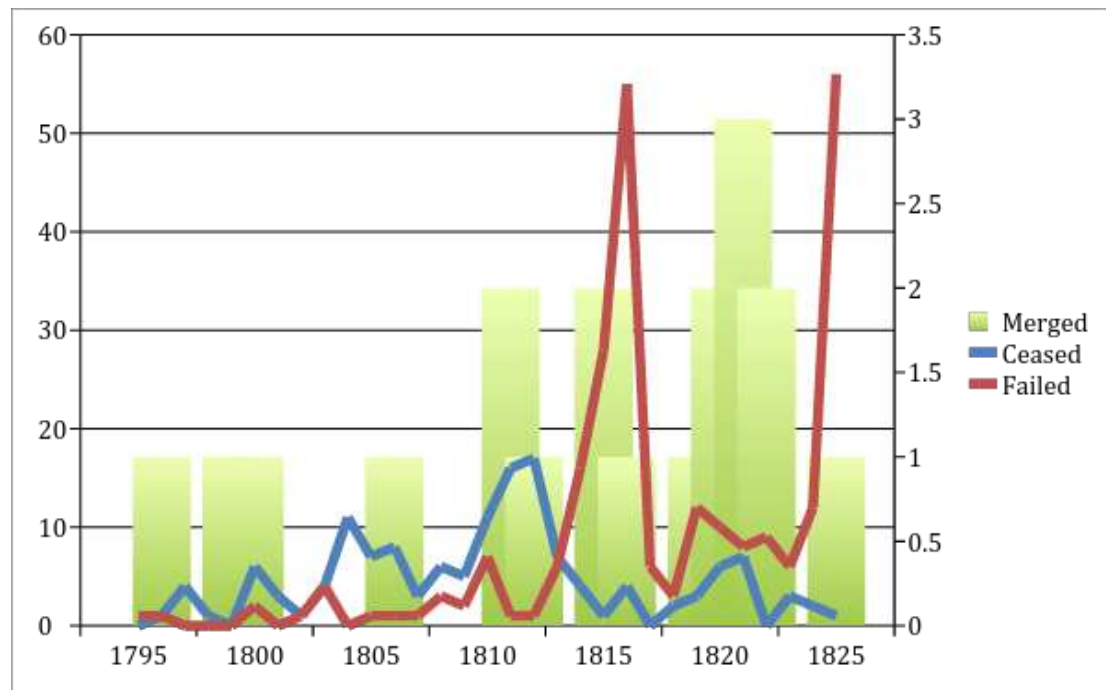


Figure 2: Decomposed exits from bank population, 1795-1825 (two axes: "ceased and failed to the right; merged to the left).

Country banks had increased in number in the 18th Century as Britain's industrial economy grew.<sup>11</sup> They were partnerships limited to no more than six partners, were private companies, did not have limited liability, and issued notes.

<sup>12</sup> The growth in country banking business was therefore connected to an

<sup>11</sup> A useful survey of the growth in country banks can be found in "Chapter 7: The regional growth of provincial banking, 1700-1796" in Gareth Turner, "English Banking in the Eighteenth Century: Bankers, Merchants and the Creation of the English Financial System" (Durham University, 2015), 170-193, <http://etheses.dur.ac.uk/11297/>.

<sup>12</sup> Dawes and Ward-Perkins, *Country Banks of England and Wales*, 2-10; Sylla, "Comparing the UK and US Financial Systems, 1790-1830," 221; Pressnell,

increase in the volume of money in circulation. In 1797 the Bank of England allowed note issue under the value of £5 for the first time while at the same time suspending the convertibility of specie for gold. This was also a period of a trade boom.<sup>13</sup> The banks issued notes on the basis of their assets which included loans. Lending to business was largely via overdrafts. As Brunt observes, '[a]t first glance, the country banks' portfolios were highly liquid ... [h]owever, these overdrafts were only liquid if the businesses were in a position to repay the money.' So if a business suffered a downturn and were unable to repay its overdraft it could in turn cause the bank distress and provoke a run. This, and a lack of diversity in country bank lending patterns, 'frequently caused bank failures and brought many other banks to the brink of catastrophe.'<sup>14</sup> When there was a contraction in trade in 1810 following the boom of the preceding years, and a need to pay for imports of food caused by rising food prices in the years that followed, the reduction in the domestic circulation of money caused the over-extended country banks to begin to fail through a combination of illiquidity and insolvency. Country banks were sensitive to changes in the volume of currency in circulation.<sup>15</sup> The rot began to set in probably as early as late 1810:

It is not to be forgotten that during the second quarter of 1810 ... the crest

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*Country Banking in the Industrial Revolution.*

<sup>13</sup> Samuel Evelyn Thomas, *The Rise and Growth of Joint Stock Banking* (London: Isaac Pitman & Sons, 1934), 23–38.

<sup>14</sup> Liam Brunt, "Rediscovering Risk: Country Banks as Venture Capital Firms in the First Industrial Revolution," *The Journal of Economic History* 66, no. 01 (2006): 86.

<sup>15</sup> Patrick Karl O'Brien and Nuno Palma, "Danger to the Old Lady of Threadneedle Street? The Bank Restriction Act and the Regime Shift to Paper Money, 1797-1821," *EHES Working Papers in Economic History*, 2016.

of the commercial wave was quivering; prices had begun to sag. During the third quarter, after the [Bullion] Report was presented, the failures began—and the Bank did more discounting than in any single quarter of that whole generation. It was giving all the support that it could. The country banks had lost their nerve, as the curtailment of their note stampings show; and the autumn tide of bankruptcies was setting in.<sup>16</sup>

Some country banks were, then, vulnerable to adverse external environmental changes. As Figure 2 shows, while the number of failures fell dramatically to 1819, they grew again to 1823-25, a well known banking crisis that eventually led to the introduction of joint-stock banking in England and Wales.<sup>17</sup>

We can also use this historical episode to caution against a deterministic account of causation. While 1810 is a demographic tipping point in the population of the banks, whether it represents a historical event—as a singular moment or period when something happens that causes or forces things to change—is at least questionable. Though Clapham, above, points the change occurring from 1810 and there is a clear reversal of the demographic trend for growth that existed before 1810, the number of failures intensified over a six year period in our data, 1810-1816. And though "exits" from the population went from seven in 1809 to

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<sup>16</sup> John Harold Clapham, *The Bank of England: A History* (Cambridge: Cambridge University Press, 1944), 25–26; Thomas, *The Rise and Growth of Joint Stock Banking*, 33.

<sup>17</sup> Collins, *Money and Banking in the UK: A History*, 15–17; Larry Neal, "The Financial Crisis of 1825 and the Restructuring of the British Financial System," *Review* 80, no. May/June (1998): 53–76, <https://files.stlouisfed.org/files/htdocs/publications/review/98/05/9805ln.pdf>.

nineteen in 1810 this was small compared to the size of the population as whole, and considerably lower than the number of exits (61) in 1816. This helps us to problematize and periodize change processes, which is especially helpful when switching between long-run (demographic) and short-run (business-historical) time-frames. As we argued in our 2015 article, demographic approaches can be useful in the problematization of new historiographic questions and the revision of the existing historiography but we also must caution against determinism, or looking for dogs that bark. In our 2015 article the principal graph (Figure 2 p. 184) indicated that 1810 was a demographical tipping point. What Figure 3 below indicates is that the period 1813-1816 marks a greater period of crisis in the population than 1810-1816, and so those years may offer greater potential for historical studies to examine how and why individual country banks went into decline.

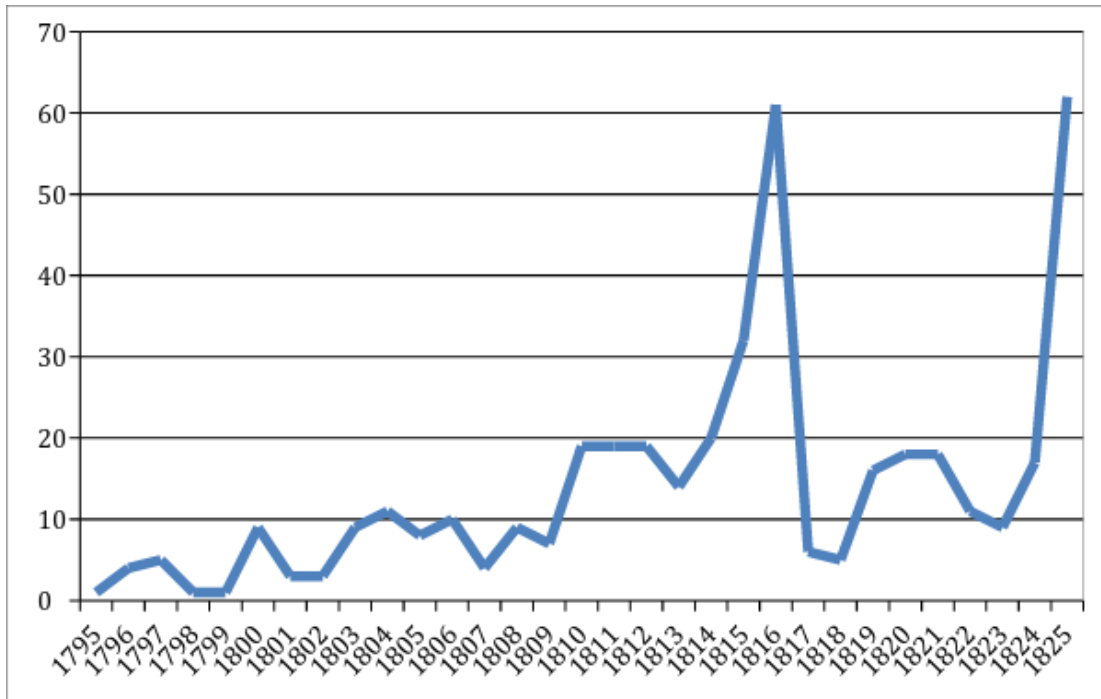


Figure 3: All exits from bank population 1795-1825.

### Conclusion

Our original paper and the contribution of J.J. Bissell highlight that there are system level processes at work in the British banking sector that are driving some of the macro-level behaviour. These simplified models and simulations allow us to test plausible assumptions for system behaviour, and perhaps tell us most when they prove our assumptions as false. As it is when our assumptions are credible challenged that we must look for additional evidence. In this case our assumptions are not proved false, however the assumptions and their mechanistic implementation in the simulation highlight other areas where our understanding of the British banking system is lacking, which invites future historical research. Revisiting this problem has allowed us to challenge another

of our initial assumptions, which was that the tipping point in the size of the bank population in 1810 was indeed a tipping point. Taking a second look, with the benefit of additional modelling and in light of the banking history literature that covers the period indicates that this change in the population is more the symptom of a combination of changes operating at different temporal scales, and in response to different economic factors.

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