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UPON DAEDALIAN WINGS OF PAPER MONEY:
ADAM SMITH AND THE CRISIS OF 1772

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Upon Daedalian Wings of Paper Money: Adam Smith and the Crisis of 1772
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ABSTRACT

Adam Smith advocated laissez faire for most sectors of the economy, but he believed that banking and finance required several forms of regulation including usury laws and the prohibition of small-denomination bank notes. Smith's support for banking regulation appears to have been a response to the shocks that hit the Scottish banking system during the time that he was composing the Wealth of Nations. The most important was the Crisis of 1772, which has been described as the first modern banking crisis faced by the Bank of England. It resembles the Crisis of 2008 in a number of striking ways. This paper describes the Crisis of 1772, the other shocks that hit the Scottish banking system, and the evolution of Smith's views on the regulation of banking. It is based on Smith's writings, the secondary sources, and a quantification of the new issues of Scottish bank notes during Smith's era.

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1. A Wagon Road through the Air¹

The commerce and industry of the country, ... cannot be altogether so secure when they are thus, as it were, suspended upon the Daedalian wings of paper money as when they travel about upon the solid ground of gold and silver.

Rather than being a model builder in the modern mathematical style, Adam Smith was a metaphor builder. We can better understand how Smith reached the conclusions that he did about money and banking by focusing on his most important metaphor for money, a highway, and his metaphor for banking, a highway through the air supported on Daedalian wings of paper money. Smith is not unique: Many famous economists have used metaphors to explain the nature of money. For example, Milton Friedman (1969) begins his collection of essays entitled the *Optimum Quantity of Money* by explaining that the theory of money is like a Japanese garden: simple on the surface, but filled with subtleties that emerge after contemplation. And the lead essay in that volume begins by asking what would happen if a helicopter flew over an economy and dropped a 1000\$ on it, a story made famous more recently by Ben, "Helicopter Ben," Bernanke. But the most useful metaphor at the present time, I believe, is Adam Smith's from the *Wealth of Nations*.

"The gold and silver money which circulates in any country may very properly be compared to a highway, which, while it circulates and carries to market all the grass and corn of the country, produces itself not a single pile of either. The judicious operations of banking, by providing, if I may be allowed so violent a metaphor, a sort of waggon-way through the air, enable the country to convert, as it were, a great part of its highways into good pastures and corn-fields, and thereby to increase very considerably the annual produce of its land and labour. The commerce and industry of the country, however, it must be acknowledged, though they may be somewhat augmented, cannot be altogether so secure when they are thus, as it were, suspended upon the Daedalian wings of paper money as

¹After completing an early draft of the paper I encountered Paganelli (2006) a fine paper that also uses the Daedalian wings metaphor in its title. However, it is such a wonderful metaphor, one that deserves to be better known, so I felt there is a justification for using it again.

when they travel about upon the solid ground of gold and silver. Over and above the accidents to which they are exposed from the unskillfulness of the conductors of this paper money, they are liable to several others, from which no prudence or skill of those conductors can guard them (*Wealth of Nations* II.ii.86)."

This is not the only metaphor that Smith used to describe money and banking. He also likened money to a great (water) wheel that provided the motive force for commerce, but the wagon-road in the air was the most extraordinary. It captures both the benefits of banking and the dangers. We know what happened to Daedalus. He made wings of feathers held together by wax. Daedalus used them wisely, but his son Icarus flew too close to the sun, the wax melted, and Icarus plunged into the sea. A meltdown – clearly Smith has a wonderful metaphor for the crisis of 1772, or for that matter, the crisis of 2008.²

The evolution of this extraordinary metaphor can be traced in some detail because we have, thanks to the indefatigable work of many scholars, a preliminary draft of part of the *Wealth of Nations* and lecture notes from his course in Jurisprudence. The preliminary fragment, which is said to have been written before April 1763 contains an early version of the metaphor; it has the wagon-road through the air, but no Daedalian wings.³

"They [banks] enable us, as it were, to plough up our high roads, by affording us a sort of communication through the air by which we do our business equally well. That therefore, to confine them by monopolies or any other restraints, except such as are necessary to prevent frauds and abuses, must obstruct the progress of public opulence" (Smith 1982, *Early Draft*, 36).

In the Lecture on Jurisprudence given on April 8, 1763 Smith used the high road metaphor, but in that lecture, assuming the student's notes were accurate, everything was strictly on the ground.

"The high roads may in one sense be said to bear more grass and corn than any ground of equall bulk, as by facilitating carriage they cause all the other ground to

² Smith had given considerable thought to the construction of metaphors; he discusses them in his *Lectures on Rhetoric and Belles Lettres*, lecture 6 "On what is called tropes and figures of speech." One fascinating part of that lecture described why some hyperbolic metaphors succeed and others do not (Smith 1981 [1763], 31-32).

³ Some of the key dates are collected in the chronology which precedes the table and charts.

be more improved and encourage cultivation, by which means a greater quantity of corn and grass is produced. ... Now if by any means you could contrive to employ less ground in them by straightening them or contracting their breadth without interrupting the communication, so as to be able to plow up $\frac{1}{2}$ of them, you would have so much more ground in culture and consequently so much more would be produced, viz a quantity equall to what is produced by $\frac{1}{2}$ the road. ... Paper money is an expedient of this sort" (*Lectures on Jurisprudence* (A) vi.128).

In the lecture on banking in the course on jurisprudence given in the following academic year, Smith returned again to the metaphor, but again, everything is on the ground (*Lectures on Jurisprudence* (B) 245). Indeed, Smith goes on to explain to the class that a banking crisis could not do much damage in Scotland. Imagine, says Smith, the extreme case:

"all the money of Scotland was issued by one bank and it became bankrupt, a very few individuals would be ruined by it, but not many, because the quantity of cash or paper that people have in their hands bears no proportion to their wealth" (Smith 198, LJ(B) 250).

Smith then draws the conclusion that competition that divided the banking system would reduce the effects of a single failure still further. Conclusion: Do not worry about bank failures. One interesting aspect of this thought experiment, one that Smith apparently did not consider, is that if the total of cash and paper money is small relative to total wealth, then the social savings from replacing more or all of the cash with paper is going to be small relative to total wealth as well. The amount of additional land that could be brought into production, in other words, by building wagon roads through the air will be small relative to the total amount in production.

The question, clearly, is what had happened to change Smith's thinking between the *Early Draft* and the *Lectures on Jurisprudence*, on the one hand, and the *Wealth of Nations*, on the other. Why did Smith change his mind about the dangers of paper money? I believe that the change was the result of the shocks hitting the Scottish banking system in the interim, especially the Crisis of 1772. The idea that Smith's view of banking was transformed by the events that he experienced, I should hasten to add, is not new. The most compelling evolutionary treatment of

Smith's views are Checkland (1975b) and Gherity (1994). My paper is in that tradition, but I think that by using quantitative data to frame the experiences that were shaping Smith's thinking, by relying on some analogies with American banking history with which I am familiar, and by uncovering some hidden gems in Smith's work, I have been able to add something of value to their interpretations.

Smith's metaphor shows how bank issued paper money saves real resources. Suppose the stock of money in circulation is £100, all gold and silver. That means that at some time in the past £100 worth of labor and capital were used to dig gold out of the ground, if there were domestic gold or silver mines, or that £100 of labor and capital were used to produce goods for export that were exchanged for gold or silver. If the money stock had been paper, the resources saved could have been invested, and that investment would yield a return. The innovation of paper money would benefit the economy as a whole it would create a "social savings" to use the term that became standard after Robert Fogel used it to describe his estimate of the contribution of the railroad to American economic growth.

Smith considers seriously only a bank issued paper currency. Although he mentions John Law and legal tender paper money issues in the American colonies, he appears to have seen little benefit in fiat paper money issues as a way of saving additional real resources or as a way of stimulating a slumping economy. Paganelli (

Smith was not content to simply note that paper money created a social savings. Like any modern economist, Smith attempted to go further and compute the social savings.⁴ But here I think Smith ran into a problem, the social savings implied by Smith's metaphor were not as large as Smith's intuition told him they should be. In the *Wealth of Nations* (II.ii.30) Smith imagines a

⁴ Lawrence White (1999, 42-49) is a comprehensive modern discussion of the resource costs of a commodity currency. Milton Friedman (1986) in a famous paper argued that fiat money could also impose resource costs.

country in which the circulation consists of £1,000,000 sterling (gold or silver).⁵ This money is now replaced by a paper currency of £1,000,000 in bank issued paper for which the banks hold one fifth, £200,000 in reserve.⁶ This frees £800,000 that can be used to purchase consumption or investment goods abroad. The paper money, Smith points out, would not have been accepted abroad, but the gold and silver replaced by paper in the Scottish circulation would be. The money could be invested in various ways, for example in the “carrying trade” (transporting goods from one place to another.)

A modern economist would then finish the social savings calculation by dividing an estimate of the profits in, say, the carrying trade by an estimate of the net domestic product. (We usually use gross domestic product, but as Smith pointed out, net is better). Suppose that the carrying trade produced a profit of 10 percent per year;⁷ a good return in an economy where long-term bonds were yielding 4 percent. Then the £ 800,000 invested in the carrying trade would yield £80,000 per year. What would be the neat revenue, to use Smith's spelling, or annual product, appropriate to this hypothetical example? Smith thought that it was difficult to determine the proportion that the circulating medium bore to the annual produce, and pointed out that estimates ranged from one fifth to one thirtieth (*Wealth of Nations* II.ii 40). If we take, one fifth, the assumption most favorable to the role of banking, then the increase in annual produce that we could attribute to banking, measured as a percentage of the total annual product, would be 1.60 percent. If we use the least favorable estimate of the ratio of money to annual product, the result would be 0.27 percent. Even the larger figure, 1.60 percent, is relatively small. The

⁵At a later point in the text, Smith estimates the actual circulation of Scotland to be about £2,000,000; £500,000 in coin and £1,500,000 in paper (*Wealth of Nations* II.ii.30).

⁶ Smith considers the adjustment process from the old equilibrium to the new one in detail. It is clear that he has a version of Hume's Price-Specie-Flow Mechanism in mind.

⁷ In Scotland, Smith thought, “the ordinary profits of stock in the greater part of mercantile projects are supposed to run between six and ten per cent...” (*Wealth of Nations* II.ii.69).

conclusion would be that replacing gold and silver with a bank issued currency, would have a positive impact, but not a major impact, on the standard of living.

But Smith did not finish the calculation in this way. Instead he followed another path and concluded that the effect was rather large (*Wealth of Nations* II.ii.40). Smith argued that only a small part of the annual produce is “ever destined to the maintenance of industry.” If the sterling freed by the introduction of banking is compared with this small amount we reach the conclusion that banking can make a very considerable addition to ... the annual produce of land and labour.”

What does Smith have in mind? I believe that it must have been something like the following.

Suppose that the annual produce of a farm is 100,000 tons of grain. Then it would be a mistake to consume the full 100,000. Some part must be retained to provide seed for the next year.

Suppose that we require 10,000 tons of seed to produce a crop of 100,000 tons. Then the annual produce will be (net) 90,000 tons of grain. Year after year the economy will produce 100,000 tons, consume 90,000, and save 10,000. Suppose that by buying grain from abroad with hard money consumption can be maintained at 90,000 while a stock of 20,000 tons is made available to be planted next year. The harvest will therefore increase to 200,000 tons. If consumption is increased to 180,000 tons and 20,000 saved then production can be maintained year after year at nearly twice what it was before! Alchemy!

Here, I believe, Smith nodded. Smith is implicitly assuming a very high rate of return to investments in agriculture. In my example the return is 900 percent. Clearly the returns to agriculture can't be that high. Normally, there will be much more investment required to increase output. Land must be cleared and manured, farm implements must be purchased, houses must be built for workers, and roads must be built, and so on. We simply don't observe the high returns necessary to make Smith's calculation yield a large social savings.

There is an interesting juxtaposition of descriptive phrases in the passage which contains the Daedalian wings metaphor. In the second sentence of the metaphor Smith tells us that the effect of replacing gold and silver with paper would be to “increase very considerably the annual produce of its [a nation’s] land and labour.” But in the very next sentence Smith tells us that commerce and industry “may be somewhat augmented.” The two phrases are not necessarily in contradiction, and the use of two different phrases is probably simply an example of "elegant variation." However, today I think most people would prefer that their income was “very considerably increased” rather than “somewhat augmented.” It may be that the ambiguity stems from the results of Smith’s social savings calculation. Only by assuming implausibly high rates of return can we get Smith’s social savings calculation into the range where banking could be seen as a cause of economic growth in Scotland.

Smith, to put it somewhat differently, may have been conflicted about the role of banking because his wagon road metaphor, and the social savings calculation based on it, do not lead to the conclusion that banking was crucial to Scottish economic development. On the other hand, Scotland had made enormous economic progress in the eighteenth century, and Scotland’s banking system, with its system of branches, had also made enormous progress. Surely, one feels, there must have been some connection. There must have been something the banks were doing to promote economic development. But it is not easy to say precisely what it was, and move on to a quantitative calculation. Rondo Cameron (1967) wrestled with precisely this problem in *Banking in the Early Stages of Economic Development*. Cameron was able to show in detail how the Scottish economy and its banking system had progressed over the course of the eighteenth century, and in this and other studies was able to establish a relationship between banking and industrialization. He was able, moreover, to identify many of the possible causative connections

between banking and economic development. But he did not carry out the exercise that Smith recognized was important and quantify the contribution of banking to economic development in Scotland.

The sanguine views of banking that Smith held at the time his lectures on jurisprudence were recorded were altered by a series of shocks that hit the Scottish banking system in the following decade. The first was a wave of small (less than £1) notes issued by banks and individual merchants: the small note mania.

2. The “Small Note Mania”

When, exactly, the small note mania took place has been described in various ways. Checkland (1975b, 508), for example, writes broadly of the “small notes mania of the 1750s and 1760s,” but others, including Smith, have described it, narrowly, as the early 1760s. With the aid of James Douglas (1975) catalogue of Scottish bank notes we can be more specific. Douglas’s catalogue was compiled for numismatists, and attempts to describe all notes known to have been issued by the Scottish Banks, by date of issue. With a few exceptions it does not include the notes issued by individuals, the merchants Smith referred to as “beggarly bankers.” Nevertheless, it appears to be a very carefully compiled and thorough list and should give us some idea of the timing of events. The first note for under £1 issued by a Scottish bank (as opposed to an individual entrepreneur) appears to have been a 10 shilling note issued by the British Linen Bank in 1750. The first note for under £1 issued by the Bank of Scotland appears to have been a 10 Shilling note that bears the date 15 May 1760. Figure 1 shows new issues of Scottish Bank Notes in denominations of less than £1 each year from 1725 to 1810. On the basis of this evidence it

appears that the Small Note Mania reached its zenith in 1763 and 1764. Smith was probably right: it was a phenomenon concentrated, if not confined to, a few years.

The notes that we have been discussing were issued by banks. It appears that in addition many small notes were issued by local merchants. Apparently notes for as little as one shilling Scots (one penny) were issued (Munro 1928, 122; Kerr 1902, 86-88). These small notes, moreover, were mocked by the issue of bogus notes. According to Munro (1928, 122), and other sources, one of the best of these was the Wasp note: "One penny sterling or in the Option of the Directors three Ballads six days after a Demand." It was elegantly printed in Glasgow, had an ornamental border of wasps, bore the motto "we swarm," and was signed "Daniel Mcfunn."

Why there should have been a small note mania is also unclear. One possibility, of course, is that it was, as the name suggests, a mania: People saw an opportunity to make some short-term profits by issuing small denomination notes, and they simply got carried away. If my neighbor can get into banking and issue notes, why can't I? This interpretation has been advanced by a number of Scottish banking historians. Another possibility that has a substantial body of adherents is that a shortage of small denomination coins created a market for small denomination bank notes.⁸ The two explanations, mania and scarcity of small denomination coins, of course, are not mutually exclusive. It is possible that there was a shortage of small coins, that banks and individuals rushed in to fill the gap with small denomination paper notes, and that some people were carried away and issued too many notes.

My guess is that the shortage of small denomination coins was the most important factor, and that it was the result of a familiar process: wartime inflation that raises the value of coins as foreign exchange or as a raw material above their value as coins. The Seven Years' War (1754-1763) produced a net drain of specie from Britain. It was a world war and Britain was forced to

⁸ White (1992, 163-164) summarizes the positions of the Scottish banking historians.

send funds abroad to support British military actions, and those of its foreign allies (Kerr 1902, 88; Graham 1911, 86; Munro 1928, 121). Scotland, moreover, seems to have suffered a balance of payments crisis with England and the rest of the world in 1762 (Hamilton 1953). This was partly the result of the winding down of the war. Up to that time Scotland had benefited from the war because its chief export, linen, had benefited from the absence of European competition. The end of the war produced a decline in Scottish linen exports. However, this was not the only factor; A shift of investment toward London financial markets also undermined the Scottish balance of payments. The balance of payments deficit in turn must have been covered by an outflow of specie, including, presumably, small coins.

Like most big wars, moreover, the Seven Years' War was accompanied by inflation, although, the amount was small by the standard of the Napoleonic and the First and Second World Wars: Britain was not forced off the specie standard in the Seven Years' War as it would be in subsequent "World Wars." Clapham (1945, vol. 1, 240-41), it is true, perhaps because of the absence of massive inflation, suggests that there was little connection between the Bank's efforts to finance the war and the small note mania, but as he also notes (Clapham 1945, vol. 1, 236), the government strained to finance the war, and this must have at least added to the inflationary pressures that contributed to the shortage of small denomination coins.

The market prices of gold and silver (in £s/ounce), are shown in Figure 2 for the years 1730 through 1790. The price of gold is measured on the left vertical axis and the price of silver, because it was worth much less per ounce than gold, is measured on the right vertical axis. Both series rose during the Seven Years' War. The price of silver, moreover, reaches its highest point in the sixty years shown in the Figure in 1760, just at the onset of the small note mania. The price

of silver, of course, was crucial for the small note mania because the notes would replace silver shillings. If the price of silver was high enough shillings would be hoarded for export.

The increases in the price indexes (Figure 3) were not, as I noted above, of the extreme nature that characterized subsequent major wars. But there was a sustained rise after 1760. As shown in Figure 3, Gilboy's index of the Cost of Living in London rises by nearly 10 percent in 1762. In 1764 there was a parliamentary enquiry into the causes of the high prices of provisions (*Wealth of Nations* I.xi.b.17). There were, undoubtedly, non-monetary forces at work. There was an unparalleled drought in 1762, and poor harvests that drove up agricultural prices (Hamilton 1953, 355; Kindleberger 1978, 48). The price indexes (Figure 3) confirm that the inflation was concentrated in agricultural prices: The consumer price index net of cereals and the producer price index do not increase very much. Nevertheless, it seems likely that monetary expansion contributed to the inflation. In the absence of monetary accommodation the increase in the real price of cereals might have been accomplished through a fall in non-cereal prices that left the more complete consumer price indexes unaffected.

It is common, incidentally, for wartime inflation to produce hoarding or melting of small coins creating a vacuum in the circulation that can be addressed by the issue of small notes. This is what happened, for example, in the United States during the Civil War. The silver coinage disappeared from circulation, spent about fifteen years on a working vacation in Canada, Central and South America, and the West Indies, and returned after the war (Carothers 1967 [1930], 259)! Another piece of evidence along the same lines suggesting that the small note mania was a wartime phenomenon is contained in Figure 1. Evidently, there were two periods during the eighteenth century when the Scottish banks issued small notes: in the early 1760s during the Seven Years' War and in the late 1790s during the Napoleonic Wars, when a ban on small notes,

discussed below, was temporarily lifted. It is well known that there was a shortage of small coin during the latter period. Indeed, it was the shortage of small change that gave rise to the innovations in the production of small coins introduced by Matthew Bolton (Selgin 2008). Bolton, of course, is famous now as the business partner of Scottish engineer James Watt, although Bolton was responsible for the production of coins. Although Bolton is famous for his association with Watt and their innovative technologies, the solution to the problem of small coins, as Selgin shows, was more prosaic and was solved by a number of issuers: the selling of coins at cost plus and the offer to redeem quantities of them on demand in banknotes. We are probably observing a similar shortage of small coins arising from similar causes in the 1760s. Indeed, Selgin (2008, 34-35) suggests that legislation limiting the issue of small notes passed in response to the small note mania made the production of a high quality small change even more important than it otherwise would have been.

Unfortunately, we do not have data on the Scottish money supply for this era. Thanks to Checkland, however, we do have balance sheets for the Bank of Scotland, one of the two dominant banks in the Scottish system. Table 1 shows notes and deposits of the Bank from 1747 to 1810. There was a very rapid increase in notes and deposits between 1753 and 1764, one year before the Seven Years' War – if we take the nine-year definition of the Seven Years' War (!) which includes the actions in North America – until one year after. The note issue increased by a factor of more than 2.5, an annual rate of 8.5 percent per year; deposits increased by a factor of almost 3.3, an annual rate of 10.8 percent per year. The Bank did not significantly increase its capital during these years. Instead, as Table 1 shows, it increased its leverage. If other banks in Scotland were following a similar trajectory, the inflationary pressures must have been substantial.

Figure 4 shows the circulation (total bank notes issued and not returned) of the Bank of England, the Bank of Scotland, and for part of the period, the Ship Bank of Glasgow. The Scottish banks were dwarfed by the Bank of England so the circulation of the Bank of England is measured on the left vertical axis and the circulations of the Scottish banks are measured on the smaller scale of the right vertical axis. All three series show a strong upward thrust during the Seven Years' War.

In the American Colonies, incidentally, something similar was happening. The Seven Years' War (for Americans the French and Indian War) was financed in several colonies by issues of legal tender paper money, producing inflation, although there has been some debate about the degree of inflation. The American system, it might be said, was more "modern" than the British system in the sense that in the colonies the government moved directly to the printing press. These issues led Parliament in 1764 to extend a ban on Colonial paper money issues from the northern colonies to the middle and southern colonies (Wicker 1985).

The high price of silver produced by the forces outlined above meant that the mint was not producing shillings, a key denomination, that could be replaced by small notes. George the III ascended the throne in 1760, but it was not until 1787 that the mint struck shillings with his picture on them in volume. The one exception was the "Northumberland Shilling," a small issue, undertaken by the Duke of Northumberland in 1763, to celebrate his appointment as Lord Lieutenant of Ireland (Mays 1982, 78-82). The issue of copper tokens by the mint in 1762 and 1763 is also evidence that the shortage of small denomination coins was a problem (Redish 2000, 124). Somewhat later, privately produced underweight coins known as "evasions" were produced, mainly copper halfpennies. Evasions were similar to coins issued by the mint, but were

distinguishable so that they would not violate the laws against counterfeiting. They were put into circulation by being sold at half price to wholesalers (Redish 2000, 123-24).

In his *Lectures on Jurisprudence* (vi.126) Smith noted the lack of small denomination silver coins, attributing it to a mistake in the bimetallic ratio: silver would purchase more gold abroad than at home; so little silver was brought to the mint. He also noted that underweight foreign shillings were tolerated because of the lack of domestic coinage. Smith, evidently, was aware of the shortage of small change, but he does not seem to have been deeply concerned about it, and left it unaddressed (Checkland 1975b, 515).

3. The Crisis of 1772

Many changes were going on in Scottish banking between 1763 and 1776 that might have changed Smith's thinking about the risks of a banking crisis. The growth of the system, might itself have led to some rethinking about the costs of a major failure. But the decisive event in reshaping Smith's thinking about banking, I believe, was the failure of the Ayr Bank (Douglas, Heron, and Company) and more generally what became known as the Crisis of 1772.⁹

Andreadēs (1966, 157) describes this crisis as the first modern banking panic to be faced by the Bank of England. It was international in scope, effecting London, Edinburgh, Europe, and the Americas. Even so, Edinburgh and the Ayr Bank were at the heart of the story. Smith presents his history of the Crisis in the *Wealth of Nations* (II.ii.66-77). His analysis breaks the speculative

⁹ Although Ayr is the current spelling, the contemporary spelling, as the facsimile below shows, was Air. Inevitably, the “Bankers in Air” were the victims of many puns (Rait 1930, 167).

period leading up to the Crisis into three stages.¹⁰ First, Smith describes a wave of investment by projectors (entrepreneurs trying to carry out ambitious schemes) which they financed by drawing and redrawing bills of exchange, that is financing long-term investments by rolling over short-term debt. Smith does not name the projectors he had in mind.¹¹ He simply notes that

“Many vast and extensive projects, however, were undertaken and for several years carried on without any other fund to support them besides what was raised at this enormous expense. The projectors, no doubt, had in their golden dreams the most distinct vision of this great profit. Upon their awaking, however, either at the end of their projects, or when they were no longer able to carry them on, they very seldom, I believe, had the good fortune to find it” (*Wealth of Nations* II.ii.69)

In the second stage of the boom, the banks were drawn in. They were discounting these “fictitious” bills of exchange, but not realizing that they were advancing long-term capital to projectors rather than short-term capital to merchants. Smith acknowledges that the banks may initially have had trouble distinguishing between real and fictitious bills, but argues that they eventually realized the danger. By the time they began to understand how deeply they were involved, however, it was not easy for them to cut back. Suddenly cutting off credit to the projectors might have ruined the banks along with their borrowers. The banks did, however, attempt to gradually cut back on their discounting, a process that raised howls of protest from the projectors.

The third stage of the boom was marked by the entry of the Ayr Bank. Smith, following his usual policy of not identifying the objects of his criticism by name, does not name the Ayr

¹⁰ Hamilton (1956) provides a modern treatment of the failure of the Ayr Bank; it provides more detail, but agrees with Smith.

¹¹ Rait (1930, 165) lists agricultural improvements, land in the West Indies, and Edinburgh's New Town. Hume, in a letter to Smith cited below, expresses concern about the Adelphi project in London, an ambitious London development undertaken by the Scottish architects Robert, James, and John Adam, and expresses special concern for Robert who has a "projecting turn." This may be one of the "projects" Smith had in mind.

Bank or its principals.¹² He says merely “in the midst of this clamour and distress a new bank was established in Scotland for the express purpose of relieving the distress of the country” (*Wealth of Nations* II.ii.73), but it is clear which bank he was describing. The rise of the Ayr Bank was remarkable. Founded in 1769, by 1772 the bank supplied 25 percent of the notes in circulation by Scottish banks, 25 percent of total deposits, and 40 percent of total Scottish bank assets. The public banks, a category that includes the Bank of Scotland and the Royal Bank of Scotland, accounted for only 21 percent of total assets. In three years the Ayr Bank had become a colossus (Checkland 1975a, 237).

Smith then describes the imprudent policies Ayr Bank (*Wealth of Nations* II.ii.73-77). (1) The Bank had advanced loans for long-term capital investments, violating the key principle of the real bills doctrine, described below. (2) Instead of raising the full amount of its capital, the bank lent money to its investors, so it was more highly leveraged than its books would suggest. (3) The Bank had made unwise acquisitions of other banking firms. (4) The bank had tried to force its notes into circulation, only to find them returning and depleting its reserves. And finally (5) the Bank had tried to replenish its reserves by drawing on London, and then redrawing when its drafts came due, thus piling up a large short-term debt in London. The Bank had expanded at a remarkable pace, but it was clearly heading for a fall.

The failure of the Ayr Bank proved to be the crucial spark that ignited the Crisis of 1772. Alexander Fordyce, a London speculator, was one of the key figures. Fordyce had financed a large short position in English East India stock with loans from his bank, Neale, James, Fordyce, and Downe, which in turn was heavily indebted to the Ayr Bank. Early in 1772 the Bank of England tried to limit over-trading by selective limiting credit. Fordyce, for example, was denied

¹² Smith, famously, does not mention his rival Sir James Steuart, or Steuart’s treatise, *An Inquiry into the Principles of Political Oeconomy* by name.

accommodation on a bill drawn on Amsterdam. Conceivably, he could have made it through the squeeze on his credit if his speculations had worked out. However, when the price of East India shares failed to fall as he had expected, Fordyce went bankrupt and fled to France on June 9, 1772. This event set off a financial panic in London; a number of firms would close by the end of the month. On June 12 a horseman reached Edinburgh with news of Fordyce's bankruptcy and the alarm in London. A run on the Ayr Bank began, and on June 22 it was forced to stop payment on its notes. A genuine banking panic in Edinburgh ensued. Fifteen private bankers in Edinburgh went bankrupt during the Crisis (Saville 1996, 162). On June 27, 1772 David Hume wrote to Smith.

“We are here in a very melancholy Situation: Continual Bankruptcies, universal Loss of Credit, and endless Suspicions...even the Bank of England is not entirely free from Suspicion. Those of Newcastle, Norwich, and Bristol are said to be stopp'd: The Thistle Bank has been reported to be in the same Condition: The Carron Company [an iron works, and pioneer of the industrial revolution] is reeling, which is one of the greatest Calamities of the whole; as they gave Employment to near 10,000 people. Do these Events any-wise affect your Theory?” (*Correspondence* 131).

Soon after, a related crisis gripped Amsterdam. The story was similar: excessive speculation in British East India Stock had left speculators and their financiers in a precarious position. This time, however, a number of Dutch firms were betting on a rise in the stock of the East India company when discouraging news arrived from India (Wilson, 1939). In the first week of January 1773, trade and finance between London and Amsterdam came to a halt. Although the Crisis was centered in London and Amsterdam, it spread to the continent. Hamburg, Stockholm, and St. Petersburg all felt the effects of the Crisis. The colonies, including the future United States, were also hit (Sheridan 1960).

The Bank of England came to the rescue. On 10 January 1773, a Sunday, the Bank allowed gold and silver to be drawn against notes and government bonds. One Dutch banker, it is

said, received £500,000 (Kindleberger 1978, 184); William Alexander and Sons, a Scottish firm, received £160,000. The Bank, however, discriminated among its borrowers. The Ayr Bank – the Lehman Brothers of the day – approached the Bank of England for a loan, and the Bank offered £300,000 but the terms were so stiff that the deal was never completed. The Bank of England was not the only lender of last resort in the Crisis. In Scotland the Bank of Scotland discounted bills of Carron and Company (the object of concern in Hume's letter to Smith) to help it get through the crisis (Saville 1996, 164). In Amsterdam in January of 1773 the city opened a loan office backed up by the Bank of Amsterdam (Clapham 1945, vol. 1, 248). In Sweden the Bank of Stockholm intervened, and in St. Petersburg, Catherine the Great secured the British merchants (Andreadēs 1966, 157). These banks, all of which enjoyed privileged relations with the state, may not have been lenders of last resort by way of formal legislation, but they all understood their role in a financial crisis.

The financial crisis was accompanied by a real decline in economic activity and high unemployment. It sounds, of course, a lot like the crisis of 2008. As Hamilton (1956) showed, the decline in real activity had a number of sources, but it seems probable that the financial crisis intensified the downturn. The history of the business cycle suggests that recessions are worse when they are accompanied by a financial crisis.

Smith was intimately involved with the Ayr Bank in the aftermath of the failure. The young Duke of Buccleuch, who Smith traveled with as advisor and tutor, was one of the principals of the bank. The Duke was probably one of the people that Smith strove to extricate from the mess (Ross 1995, 242). The behavior of the principals of the Ayr Bank would clearly fit Smith's reference to "accidents to which they [users of paper money] are exposed from the unskillfulness of the conductors." In July 1776 a committee of Inquiry was established to

determine to examine the affairs of the Ayr Bank, and I think it is fair to say, see if there was anyone connected with the Bank that the owners could sue (*The Precipitation and Fall 1778*). The report was issued in November 1778, and even given the obvious interest of the inquirers, it is damning. In case after case the report uses phrases like “clearly illegal,” “cash advances made without proper authority,” and so on. The principals were clearly “unskillful conductors,” to use the term Smith used in his metaphor, and it is to prevent this sort of thing from happening that Smith advocated what has come to be called the “real bills doctrine.”¹³

Unfortunately, there appears to be little quantitative data, at least by modern standards, with which to trace the course of the Crisis of 1772. Nevertheless, what little we have suggests that the recovery was relatively quick; it appears to have been a V-shaped recession, to use the modern jargon. Figure 5 shows British bankruptcies from 1755 to 1780. Evidently, bankruptcies rose abruptly in 1772, peaked in 1773, but then fell to the pre-Crisis norm in 1774. Figure 6 shows British imports from 1766 to 1776. Imports are likely to be a function of national income, and are probably the best available proxy for national income that we have for this era. Imports fall abruptly between 1772 and 1773, but then recover their pre-crisis level in 1774. Part of the explanation for the rapid recovery may have been that the speculative mania was confined mainly to the Ayr bank and its partners; at least this appears to have been the case in Scotland (Kerr 110). In this respect the Crisis of 1772 may have been a limited success for the Scottish system. The Ayr Bank was an upstart. The more experienced Scottish bankers recognized the danger and avoided entanglements with the Ayr bank. As a result the system as a whole was able to recover rather quickly. The V-shaped recovery may have influenced Smith. Had a long depression ensued he might have recommended more draconian measures to prevent banking

¹³ The student of metaphors will notice another parallel. Daedalus used his wings wisely, but his son Icarus soared too close to the sun, the wax holding his feathers together melted, and he fell into the sea. If we continue the metaphor Smith is wise Daedalus and his protégé, the Duke of Buccleuch, is the impetuous Icarus.

crises. While the measures that Smith recommended, discussed below, would have ameliorated the effects of future crises none of them was likely to prevent crises.

While the Crisis of 1772 accounts for much of Smith's views on money, it cannot do so completely. Smith's thinking was shaped by his understanding of banking and monetary history as well as by the events that were in the news, and with which he was intimately involved, while he was composing the *Wealth of Nations*. In his metaphor, a wagon road in the air, Smith explains that they [the holders of paper money] are liable to several other accidents, from which "no prudence or skill of those conductors can guard them." Smith, however, gives only one example of these other accidents: an unsuccessful war "in which the enemy got possession of the capital" (*Wealth of Nations* II.ii.87).

4. The Enemy Captures the Financial Center

If an enemy got control of the capital, the danger to the monetary system of the nation as a whole is easy to understand. The capital was normally the home to the main bank in the country. It would supply most of the bank notes used in the countryside. Bank notes that were payable in the capital might become irredeemable if the enemy captured the capital and its banks, and the countryside that relied on those notes would be reduced to barter. Gherity (1994, 439) wondered why Smith chose "a rather far-fetched hypothetical illustration instead of using an actual and recent historical event." It was as Gherity says, only an example, but it was not far-fetched or hypothetical. Something like this happened during the "Forty-Five" when the Jacobite army of Prince Charles Edward Stuart took control of Edinburgh.

When Prince Charles and his army made the fateful decision to leave the Highlands, and cross the "Forth at the Fords of Frew," the banks in Edinburgh immediately moved to protect their reserves (Graham 1911, 99-100; Munro 1927, 91-107; Checkland 1975a, 71-74). As the rebels approached the city, the Bank of Scotland and the Royal Bank stopped payment on their notes and moved their gold and silver coins, bank notes, and other items of value to Edinburgh's formidable castle for safekeeping. Although Prince Charles and his army captured the city, they never took the castle. The Banks, and especially the Royal Bank, with its Whig sympathies, however, were still vulnerable. By taxing the citizens of Edinburgh the rebels acquired notes issued by the Royal Bank. The officials of the Royal Bank were then given access to the castle where they acquired the gold needed to pay the notes. They also took the occasion while in the castle to burn or tear into pieces most of the Royal Bank notes stored there so that they could not fall into rebel hands. Thus, according to Munro, the historian of the Royal Bank, it was gold and silver from the Royal Bank that financed the remainder of the rebellion. After occupying Edinburgh and refitting, Prince Charles's army of mountaineers (to use Munro's term) headed South on its ill-fated invasion of England igniting new fears and another incipient banking panic. The Bank of England paid in six pences to slow withdrawals (Andreadēs 1966, 150-1; Clapham 1945, vol. 1, 71).

Smith, of course, was intimately familiar with the history of the "forty-five" as any Scotsmen of the era would be; he also discussed another case that he would know only from history: the French invasion of the Dutch Republic in 1672 (*Wealth of Nations* IV.iii.b.13). Smith notes that although the French were at Utrecht, the Bank of Amsterdam was able to pay out so regularly "as left no doubt of the fidelity with which it had observed its engagements." The point for Smith was that the Bank of Amsterdam was founded on, and very likely was maintained on,

the principle of 100% reserve backing for its notes: one guilder in coin for each guilder in notes circulating. Presumably, high or 100% reserves prevented a disaster that might have occurred had the French been at Utrecht, and the Bank of Amsterdam had been a fractional reserve bank. Then a run, like the one that hit the Bank of England when Prince Charles entered England, might have forced the Bank of Amsterdam to stop payment on its notes, and trade would have been disrupted. Smith chose the example of an enemy capturing the capital because it was a clear example of an exogenous shock, but it was not a fanciful example.

5. The Real Bills Doctrine

Adam Smith is usually considered the founder of the real bills doctrine. Bankers, of course, had an understanding of the rules of prudent banking before Smith. But it seems to be Smith who was the first to write down a set of rules of prudent banking and relate them to larger issues in monetary policy. Lloyd Mints (1945, 25) identified Smith as “the first thoroughgoing exponent of the “real bills” doctrine.”

Smith’s exposition of the real bills doctrine begins with the assertion that a banker can prudently lend to a borrower only the amount that the borrower would otherwise keep in a cash reserve. Long-term capital investments were out as far as banks were concerned. The capital that “the undertaker of a mine employs in sinking his shafts” cannot rightly be supplied by a bank because the returns would come after a period of many years, “a period far too distant to suit the conveniency of a bank” (*Wealth of Nations* II.ii.64). But how was a bank to know that it was lending an amount that the firm would otherwise keep in a cash reserve and not supplying long-

term capital? Smith offers two practical rules, one for discounting bills of exchange,¹⁴ and one for the cash accounts¹⁵ typically used by Scottish banks for lending.

For bills of exchange the rule was: discount only “a real bill of exchange drawn by a real creditor upon a real debtor, and which, as soon as it becomes due, is really paid by that debtor...” (*Wealth of Nations* II,ii, 59). It’s hard to miss the origin of the term “real bills.” One can imagine how this would work in practice. The names on the paper could be examined and checked to see that the bill was genuine, associated documents such as bills of lading could be examined, and the bank, of course, would know if it received payment as scheduled. For cash accounts the rule was simply to follow the activity in the account. If the borrower regularly paid the amounts borrowed, there was no problem. If the debts were rolled over, and if they mounted over time, the bank should not provide more accommodation.

Real bills was not intended by Smith to be part of the regulatory structure erected by the state. These rules were advice for bankers. If only Smith's protégé, the Duke of Buccleuch, had insisted on these rules at the Ayr Bank, much of the troubles at the Bank, including those of the Duke, might have been avoided. It was not implausible, moreover, given the close-knit structure of Scottish society, that prudent rules, brilliantly formulated by one of the leading Scottish philosophers would have an impact. Indeed, there is some evidence that the Scottish banks did come around to real bills (Munn 1981, 122-126). Although Smith seems to have viewed these rules as "advice to young gentlemen" they could be incorporated to some degree in bank charters, and could even be the basis for legislation. A prohibition on mortgage loans for banks, to take a

¹⁴ A bill of exchange is simply an order to a debtor to pay a certain sum of money to a third party on a certain date. A bank check is an example.

¹⁵ A cash account was similar to an overdraft privilege. The borrower would make use of the facility when they chose to do so.

simple example, would be a way of trying to implement real bills, which could be written into bank charters by the owners of the bank or written into banking laws.

Real bills has been criticized frequently because it doesn't provide a rule for monetary policy. As Mints (1945) pointed out, in an inflationary economy the nominal value of the bills being offered to banks would rise with the price level, hence inflation could continue even though every bank, including the central bank was following real bills.¹⁶ It is true, as Mints shows, that subsequent theorists and policy makers made the mistake of thinking of real bills as a rule for the conduct of monetary policy. But as Laidler (1981) argues, Smith never made this mistake. In Smith's model the price level is anchored by adherence to the specie standard; real bills is designed to prevent imprudent banking. In the short-run imprudent banking could lead to the over issue of notes by one bank or even the over issue of notes by the entire banking system. However, this would lead to return of notes by the overissuing bank or banks for redemption in specie, which would check the initial overissue (Selgin 2001). Even in the unlikely case that a general over-issue persisted for some time, the price level could not permanently diverge from the limits set by Hume's price-specie-flow mechanism. Smith might have been clearer about the limits of the real bills doctrine, but it is unfair to place much of the blame on him for the future misuse of his idea.

6. The Usury Laws

Smith was an advocate of usury laws: maximum legal interest rates. The usury laws applied to banks as well as other lenders, although Smith did not discuss them in his chapter on

¹⁶ When I was a graduate student at Chicago in the 1960s the doctrine was always referred to as the "fallacious real bills doctrine."

banking, but rather in the chapter on "Stock lent at interest."¹⁷ The belief that maximum interest rates should be set by the government, of course, was a major exception to Smith's defense of "natural liberty," a free market, and has attracted the attention of many scholars attempting to understand Smith's views (Jadlow 1977, Levy 1987, Paganelli 2003, Rockoff 2009). There are many aspects of usury laws that made them relatively attractive to Smith as a form of regulation. For one thing, the usury laws did not require a government bureaucracy to enforce them. The usury law created a legal defense that could be raised by a borrower who was being sued for nonpayment. Paganelli (2003) provides recent guide to the literature along with her own explanation of how usury laws fit into Smith's system.

Smith's argument was subtle, and closely related to the issues of concern here. The legal maximum (a level which Smith thought reasonable) was then at 5 percent, where it had been for most of the century. Smith thought that substantially increasing the maximum rate, or eliminating it, would encourage investors to channel funds to the wrong sort of person.

"The legal rate, it is to be observed, although it ought to be somewhat above, ought not to be much above the lowest market rate. If the legal rate of interest in Great Britain, for example was fixed so high as eight or ten per cent., the greater part of the money which was to be lent, would be lent to prodigals and projectors, who alone would be willing to give this high interest. Sober people, who will give for the use of money no more than a part of what they are likely to make by the use of it, would not venture into competition" (*Wealth of Nations* II.iv.15).

Smith's belief in the efficacy of usury laws, I suspect, was strengthened by his analysis of the boom leading up to the crisis of 1772, although there is no direct evidence. One bit of suggestive evidence is his repeated use of the term projectors in his discussion of the Ayr Bank, and his use of the term in making his case for the usury laws. Even if the Ayr Bank had succeeded in its

¹⁷ Most analysts do not discuss the usury laws as part of Smith's regulatory architecture for banking. Checkland (1975b, 517) is an exception.

wildest dreams of becoming the dominant bank in Scotland, it would have been likely, Smith thought, that its borrowers would be mere "chimerical projectors" (*Wealth of Nations* II.ii.77). Another suggestive bit of evidence is that the *Lectures on Jurisprudence*, which provides a remarkably broad and deep survey of British and Scottish law, including commercial law, rather surprisingly, does not include discussions of the usury laws, even though Smith incorporated a rather lengthy history and discussion of the usury laws in the *Wealth of Nations*. There could be many explanations for this difference between the *Lectures* and the *Wealth of Nations*, but I have a hunch that Smith's attention was drawn to negative consequences of excessive lending to projectors during the boom of 1769 to 1771 and the Crisis of 1772.

7. The Option Clause

One of the intriguing features of the Scottish banking system in the eighteenth century is that many Scottish Bank Notes bore what was called the "option clause." The option clause is best explained with an example. A Bank of Scotland note issued in 1750 read as follows.

The Governor and Company of the Bank of Scotland constituted by Act of Parliament do hereby oblige themselves to pay to Bearer One Pound Sterling on Demand ***or*** in the Option of the Directors One pound Six pence at the end of six months after of the demand and for ascertaining the demand and option of the directors the accomplant and one of the tellers of the bank are hereby ordered to mark and sign this note on the back thereof (Douglas 1975, 25)

The conventional part of the note is the part before the "***or***" [my bold italics]. If the note holder went to the office of the bank and demanded hard money, the teller will pay it on demand. The option clause, the part after the ***or***, however, allows the bank to delay payment, if it chooses to do so. If it chooses to delay payment, however, the bank agrees to pay interest at an annual rate of about 5 percent (the legal maximum). The option clause has attracted the attention of

monetary historians because it might be a device for reducing the threat of runs on a bank: Instead of being forced to close by a run, a bank could exercise its option and would then have up to 6 months to raise cash (Rockoff 1986). Perhaps the mere presence of option clauses could prevent runs on individual banks from turning into panics. Gherity (1995) showed that the runs were the result of specific attacks from other banks that had accumulated the notes of a rival. In other words, they were the result of a commercial tactic, rather than a panic. A comment by Selgin and White (1997) establishes that earlier writers had noted the origin of the option clause in raids by competing banks rather than panics by bank note holders, and stresses that whatever the origin of the option clause it might have reduced the potential for panics.

Contemporaries, perhaps including Smith, had a very different concern. The option clause might encourage banks to issue too many notes. For example, a bank that held £10 in reserve and had issued, say, £100 in demand notes, might believe that it could safely keep £150 in circulation when it issued notes bearing the option clause, thus adding £50 to its loan portfolio, while it held the same £10 in reserve.

Figure 7, based on Douglas's catalog of new issues, shows the progress of the option clause. Although the option was never universal, and although the use of the option clause was not as concentrated in time as the issue of small notes, it is clear that the use of the option clause became pronounced in the early 1760s, about the same time that the flood of small notes was hitting. Given the timing of the widespread adoption of the option clause, and the apparent incentive for banks that issued notes with option clauses to expand their circulation option clause for the small note mania (Rait 1930, 34-35). Since Smith supported the prohibition of the option clause, he may have shared this concern.

In any case the option clause was prohibited well before the Crisis of 1772 (Checkland 1975a, 253-55). In 1764 London received requests from Scotland to do something about the Scottish banking system. The local banking companies wanted to end competition from the informal note issuers. The Bank of Scotland and the Royal Bank, on learning about the pressure to limit the issue of small notes, countered with a different proposal: they be the sole issuers of notes in exchange, possibly, for an agreed annual sum to be used for public purposes. The Privy Council, which included friends of Smith, received detailed notes on Scottish banking from Sir James Steuart, and, it has been conjectured, may have consulted Smith, who was in London at the time (Checkland 1975a, 529). In the end the Privy Council rejected the push by the Bank of Scotland and the Royal Bank for a monopoly of the note issue. But it did recommend elimination of the option clause and of notes below £5 (Smith's idea?). The legislation, which took effect in 1766, eliminated the option clause.

Although Smith favored banning the option clause, as Gherity (1995, 720) point out, Smith never mentions the option clause in his detailed discussions of the banking problems of the 1760s and 1770s in the *Wealth of Nations*. Smith's main concern was with preventing or ameliorating the effect of crises like the Crisis of 1772, and that was to be addressed with another restriction on banking, one that had not yet been adopted: the £5 Note.

8. The £5 Note

Smith's main recommendation for preventing falls from the wagon road in the air, or at least for ameliorating their consequences, was to limit the minimum bank note to £5. Smith chose the sum of £5 carefully. In London, Smith tells us, the use of bank notes was limited to the

£10 Bank of England notes. These circulated mainly among businesses (say between wholesalers and retailers) and gold and silver were used in transactions between retailers and the public.

Smith thought that this was desirable state of affairs and that a limit of £5 would accomplish the same task elsewhere. Smith tells us that when the issue of very small notes is allowed, many "beggarly bankers" enter the field, and their frequent failures may be the source of a great "calamity to many poor people" (*Wealth of Nations* II.ii.90). This passage seems to refer to the small notes issued in the early 1760s. These notes, notes for less than £1, had been prohibited by legislation in 1766. But I suspect that Smith had other targets in mind when he called for raising the limit from £1 to £5: The Ayr bank had issued £1 and one guinea (£1.05) notes. It would have had more trouble expanding its circulation, and may not have failed, or at least would have done less damage when it did fail, if it had been forced to issue notes in denominations of £5 or higher.¹⁸

Attempts to put such sums into today's money are always bedeviled by index number problems. If we use a retail price index to inflate £5, we get a figure of £540 in 2007 (Officer 2009a), a denomination that would not be in general circulation. Indeed, the denominations common in Smith's day are still in common use today. The reason may be that the role of the bank note has changed drastically from the business-to-business role it played in Smith's day (where the checkable deposit has supplanted it) to the business-to-consumer role filled by coins in Smith's day.

Smith's idea addresses the problem of asymmetric information. If the notes are large denomination, the knowledgeable merchants will put in the time and effort to ensure that the banks whose notes they use are in good shape. Banking will be safe. However, if there are small

¹⁸ There were repeated attempts to suppress the issue of small notes in antebellum America, based partly on Smith's authority (Bodenhorn 1993; White 1995).

denominations, less informed people will use them and fewer people will have incentive to check up.

Smith's proposal, at least in intention, bears some resemblance to traditional bank deposit insurance. Traditionally, deposit insurance was limited to some particular amount, say the first \$100,000. One purpose of the limit was to minimize the government's exposure in the event of a failure. The main idea, however, was to protect the poor while trusting the rich to watch the affairs of the bank and get their money out in time, and even to impose, thereby, some discipline on the bank. Smith's idea was similar. The poor would be protected in the case of a banking crisis because they would have been forced to use coins in their everyday transactions. The rich would be vulnerable, but they could watch out for themselves, and they would impose some discipline on the banks, because they would convert their notes into gold or silver when they had information that the bank was in trouble. In effect, to go back to Smith's wagon-road-in-the-air metaphor, Smith was proposing to dismantle some of the wagon roads and force the poor, for their own good, to use the safer wagon roads on the ground.

The prohibition of the option clause and the prohibition of notes below £5 were, Smith acknowledged, a violation of "natural liberty." He argued, however, in another celebrated metaphor, that the restrictions on banking he was recommending could be compared to the requirement that builders install firewalls between apartments (*Wealth of Nations* II.ii.94).

Despite Smith's advocacy, the £5 minimum was never adopted in Scotland either in law or practice. Figure 3 shows all new issues of Scottish bank notes, and new issues of one pound or one guinea notes, from 1750 to 1810. Even after the publication of the *Wealth of Nations* most of the new issues, were one pound or one guinea notes. Indeed, the Scots became rather proud of

their £1 notes. Later when an attempt was made to ban the £1 note, Sir Walter Scott came to their defense (Munn 1981, 80-81).

9. Was Smith's Regulatory Framework Sufficient?

Would adopting Smith's regulatory framework have reduced the likelihood of, or at least ameliorated the effects of a repetition of the Ayr Bank Crisis? Smith advocated, let us recall, four restrictions on banking: (1) adoption of a reasonable usury law, (2) prohibition of the option clause in bank notes, (3) adoption of the real bills doctrine as part of the culture of banking, and (4) prohibition of notes in denominations below £5. Let us take them in turn. The first two were already in place when the Crisis of 1772 hit. They didn't prevent the Ayr Bank failure and it is unclear that they could contribute much to preventing recurrences. The usury law had been unchanged for many years and its presence had failed to discourage imprudence at the Ayr Bank. Perhaps some blame for the Crisis, however, could still be attached to the option clause. The prohibition of the option clause did not go into effect until May 1766 and the ill effects on the banking system from the use of the option clause may have lingered. In Smith's story of the Crisis he emphasizes that the older banks (which had made use of the option clause) were able to extricate themselves from their overextended positions in part because of the rise of the Ayr Bank. So it is conceivable that if the option clause had been banned earlier, the Scottish system would not have been as overextended as it was in 1772. Still, neither the usury laws nor the prohibition of the option clause had prevented the Crisis of 1772, so they could not be counted upon to prevent or reduce the impact of future crises of the same sort.

The adoption of the real bills doctrine would, undoubtedly, have helped prevent individual failures, and perhaps as a result reduced the likelihood of another banking panic, or the damage caused by one. However, the rules of prudent banking were well understood before Smith. The failure of the Ayr Bank was not caused by a failure to understand the rules of prudent banking, but rather by a determination to ignore them. After the failure of the bank, as I noted, a detailed investigation was carried out at the request of the owners of the bank. Admittedly the investigators were under pressure to find a particular result: The proprietors wanted to find cases in which the managers had broken rules of conduct laid down in the bank's charter in order to lay the basis for lawsuits. Nevertheless, one can't read the report without being impressed by the sheer quantity of detailed misbehaviors that they uncovered. Either the authors were very imaginative, or there were a lot of problems at the Ayr Bank. There were three branches – at Ayr, Edinburgh, and Dumfries – and the problems were worst Ayr. At one point the managers at Edinburgh wrote to the managers at Ayr complaining about the latter's lax standards; but the committee found abuses at all three branches. The main problem was not sophisticated mistakes, but rather excessive insider lending. Given the nature of the failure of the Ayr Bank it is hard to see how the adoption of Smith's rules of prudence, as helpful as they would often be, could have prevented the failure of the bank, although it is conceivable that they might have done so. Most of the charter regulations violated by the managers of the Ayr bank were procedural rules, such as number people required to make a quorum for decisions. It is just conceivable that had real bills restrictions been written into the charter, the managers would have been less likely to violate them.

Finally, we come to (4) the limitation on the size of notes to £5 or more. This might have had a substantial effect, if it had been in effect before 1769, because it would have forced the

Ayr Bank to rely on a more limited and sophisticated class of note holder for some of its funds. The Ayr bank issued, as I noted, one pound and one guinea (£1.05) notes. It had trouble keeping these notes circulating; it would have had more trouble keeping £5 notes circulating. Without the one-pound note, it may never have expanded to the extent that it did, although the Ayr Bank did manage to expand its portfolio to an even greater extent by drawing bills on London. Expansion of portfolios by short-term borrowing, of course, is familiar to students of the Crisis of 2008. By inhibiting repetitions of the rise and fall of Ayr Bank the £5 note limit might have lessened the likelihood of repetitions of the Crisis of 1772.

Smith's framework, evidently, was intended to lessen the likelihood of banking crises, and more importantly to minimize the suffering of the poor when they did happen. The real end to banking crises in Britain (until now) was the assumption by the Bank of England of the role of lender of last resort. What did Smith think about this? Smith discussed the Bank of England which he claimed "...acts, not only as an ordinary bank, but as a great engine of state" (*Wealth of Nations* II.ii.85) in several places in the *Wealth of Nations*. In particular he noted one occasion in Crisis of 1763 when the Bank acted as lender of last resort;¹⁹ indeed, when the bank may have (Smith is cautious) advanced £1,600,000 in bullion in a week.²⁰ However, while Smith describes the special powers and role of the Bank of England – Edwin G. West (1997, 127) describes Smith as appearing deferential – Smith does not explicitly endorse the use of these powers as a means of ameliorating or preventing crises. This idea came later and is usually associated with Bagehot (1873), although Bagehot's views on the role of the lender of last resort were more

¹⁹ Although the Bank of England acted as a lender of last resort in the Crisis of 1763, the Crisis was centered in Amsterdam, and does not appear to have had a major impact on Smith's thinking about banking.

²⁰ Clapham (1945, vol. 1, 240), addresses this passage in the *Wealth of Nations* and concludes that Smith is right not to put too much weight on the story, but to quote it as the sort of thing that might have happened.

complex than they are usually portrayed.²¹ As Anna J. Schwartz (1987, 276-77) pointed out, as a result of the adoption of the policy of acting as lender of last resort by the Bank of England there were no banking crises in England after 1866. The answer to the problem of Daedalion wings it seems was a central bank helicopter that could swoop in and keep the wagon way through the air afloat while Daedalus and Icarus cooled off and got their wings working again. (I know, but I did my best).

Speculative booms followed by financial crises and recessions are an old story. Adam Smith, the founding father of economics, wrestled with just such a crisis, the Crisis of 1772, when he wrote the *Wealth of Nations*. Some students of Smith, for example West (1997), have been troubled by the apparent contradiction between Smith's willingness to trust the market in most sectors of the economy while advocating restrictions on banks. The answer appears to be that Smith was an empiricist, willing to modify his views on the basis of contemporary and historical experience. Smith's willingness to examine the Crisis of 1772 in detail and to modify his views based on his understanding of it can be a model for economists trying to respond to the Crisis of 2008.

²¹ Bagehot's demand that the Bank of England formally adopt the mantle of the lender of last resort was, as Bagehot pointed out, based on the then current institutional structure of the British banking system in which the Bank of England enjoyed privileged position of long standing. Bagehot's preference if one could start de novo was for a free banking system along Scottish lines.

A Chronology of Scottish Banking in Adam Smith's Time	
1730	
November 19	The Bank of Scotland begins issuing £5 notes bearing the option clause.
1745	
July 23	Prince Charles Edward Stuart lands in Scotland.
September 13	Prince Charles and his army cross the Forth at the Fords of Frew.
" "	The Bank of Scotland and Royal Bank store their assets at Edinburgh Castle.
September 17	Prince Charles and his army enter Edinburgh.
October 31	Prince Charles and his army leave Edinburgh and heads South.
1750	
	The Bank of Scotland adds the option clause on the full range of its notes.
1763	
February 10	The Treaty of Paris ends Seven Years' War.
April 8	Adam Smith delivers a lecture on banking to his class in Jurisprudence.
1766	
May 15	Prohibition of the option clause in Scottish bank notes.
June 1	Prohibition of bank notes in denominations below £1.
1769	
November 6	Douglas Heron & Company (Ayr Bank) opens
1772	
	Alexander Fordyce finances a short position in East India stock with loans from the Ayr Bank
June 8	Fordyce's bank, which has extensive dealings with Ayr Bank, fails.
June 9	Fordyce flees England.
June 12	News of Fordyce's failure reaches Edinburgh
June 25	The Ayr bank suspends payment of gold and silver for notes.
June 27	Hume to Smith: How do these events affect your theory?
September 28	The Ayr bank reopens with a promise to pay notes in full.
1773	
January	Lines of credit between Amsterdam and London snap. Trade halted.
January 10	Bank of England comes to the rescue; bullion may be withdrawn on the presentation of notes and government bonds.
January	City of Amsterdam backed up by the Bank of Amsterdam opens a loan office to provide emergency aid.
August 12	Proprietors resolve to wind up the Ayr Bank
1776	
July 10	A committee is appointed to investigate the affairs of the Ayr Bank
1778	
November 23	Report of the Committee of Inquiry of the Ayr Bank Printed

Table 1. The Bank of Scotland, Key Features of the Balance Sheet, Selected Years, 1747-1810.

	Notes	Deposits	Paid up Capital	Surplus	Reserve ratio (Notes)	Leverage
	1000£	1000£	1000£	1000£	Percent	Ratio
1747	26	39	50	5	3.85	1.18
1750	58	41	50	11	5.17	1.62
1753	64	31	50	17	4.69	1.43
1756	83	43	60	11	4.82	1.77
1759	58	40	60	15	5.17	1.65
1762	138	42	60	23	3.62	2.27
1764	163	102	60	23	4.29	3.24
1766	87	116	60	23	4.60	2.45
1768	79	111	60	22	3.80	2.99
1771	60	108	70	16	3.33	2.19
1775	25	240	177	7	8.00	1.49
1780	289	92	200	32	4.84	1.87
1792	80	191	300	77	33.75	0.81
1797	852	293	803	144	4.69	1.21
1800	937	242	989	110	4.80	1.11
1802	867	430	1000	124	4.84	1.15
1805	650	334	1000	148	4.77	0.90
1810	730	388	1000	174	5.07	1.04

Source: Checkland (1975a, Tables 34 and 36)

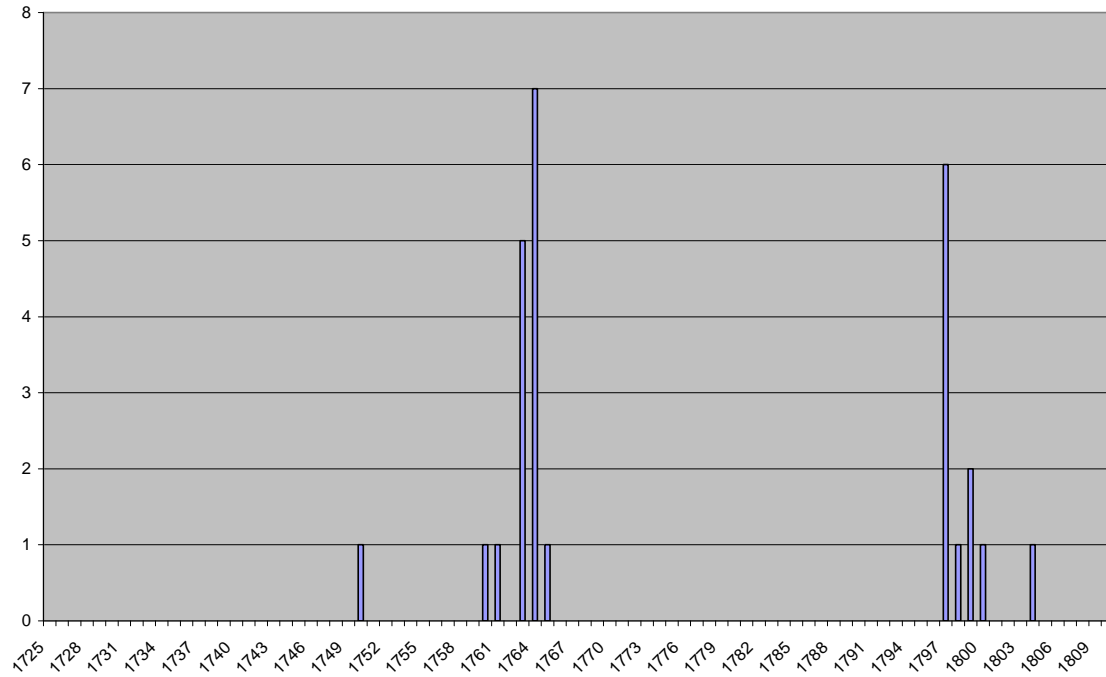


Figure 1. New Issues of Scottish Bank Notes with Face Values under £1, 1725-1810.

Source: Compiled from Douglas (1975).

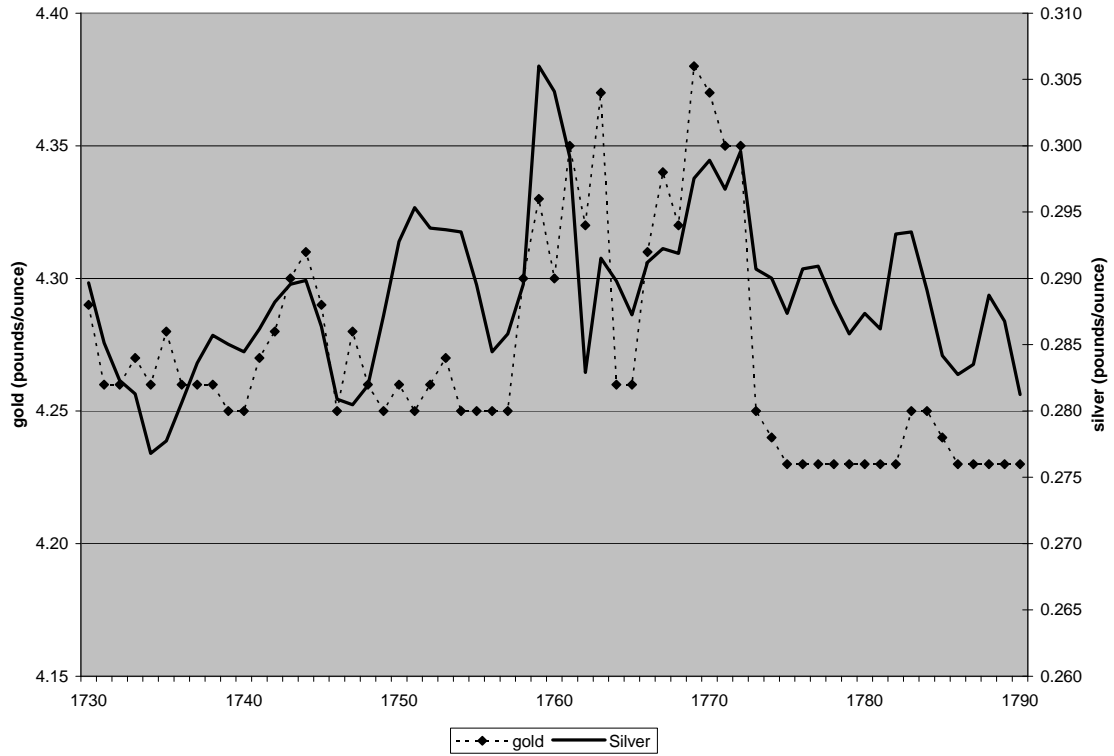


Figure 2. Market Prices of Gold and Silver in London, 1730-1790.

Source. Officer (2009b).

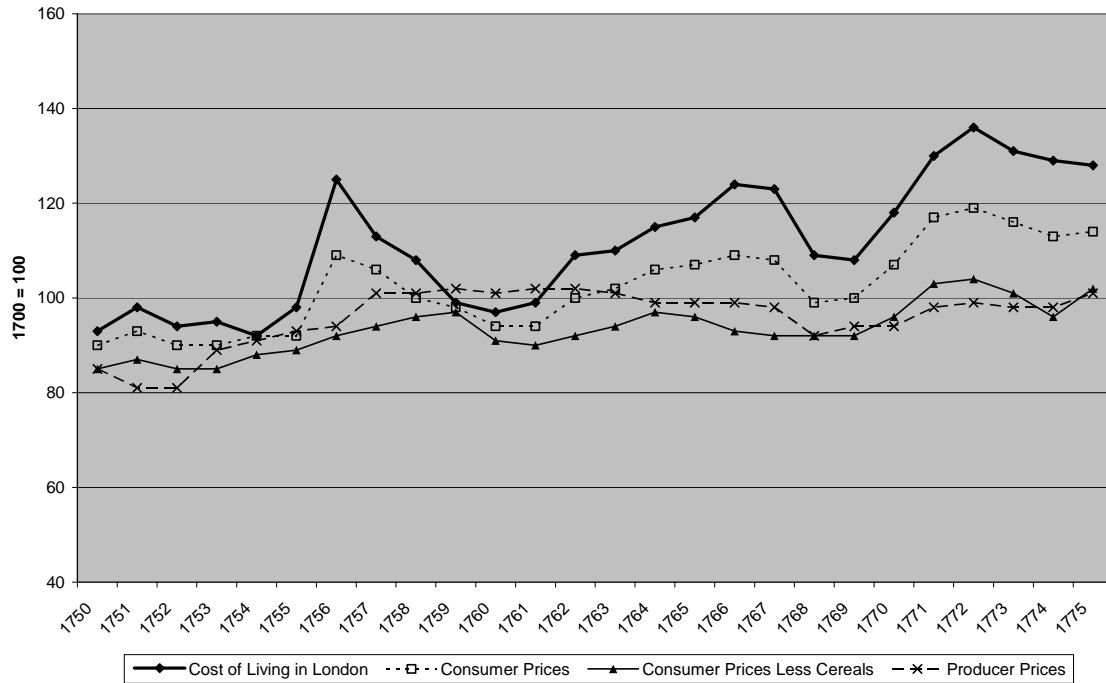


Figure 3. Prices in Britain, 1750-1775.

Sources. Cost of Living in London: Gilboy (1936, 137). Consumer Prices, Consumer Prices less Cereals, and Producer Prices: Schumpeter (1938, 35).

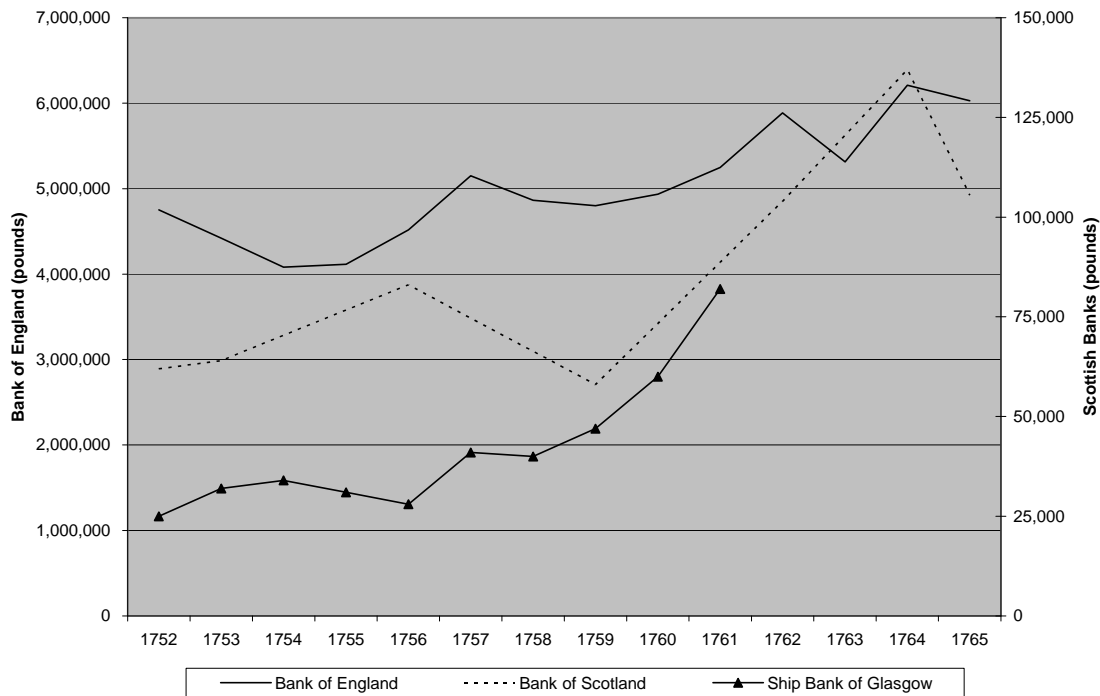


Figure 4. The Stock of Bank Notes in Circulation during the Era of the Seven Years' War.

Sources: Bank of England: Clapham (1945, vol. 1, Appendix C); Bank of Scotland: Checkland (1975a, Table 34); Ship Bank of Glasgow: Munn (1981, Appendix A).

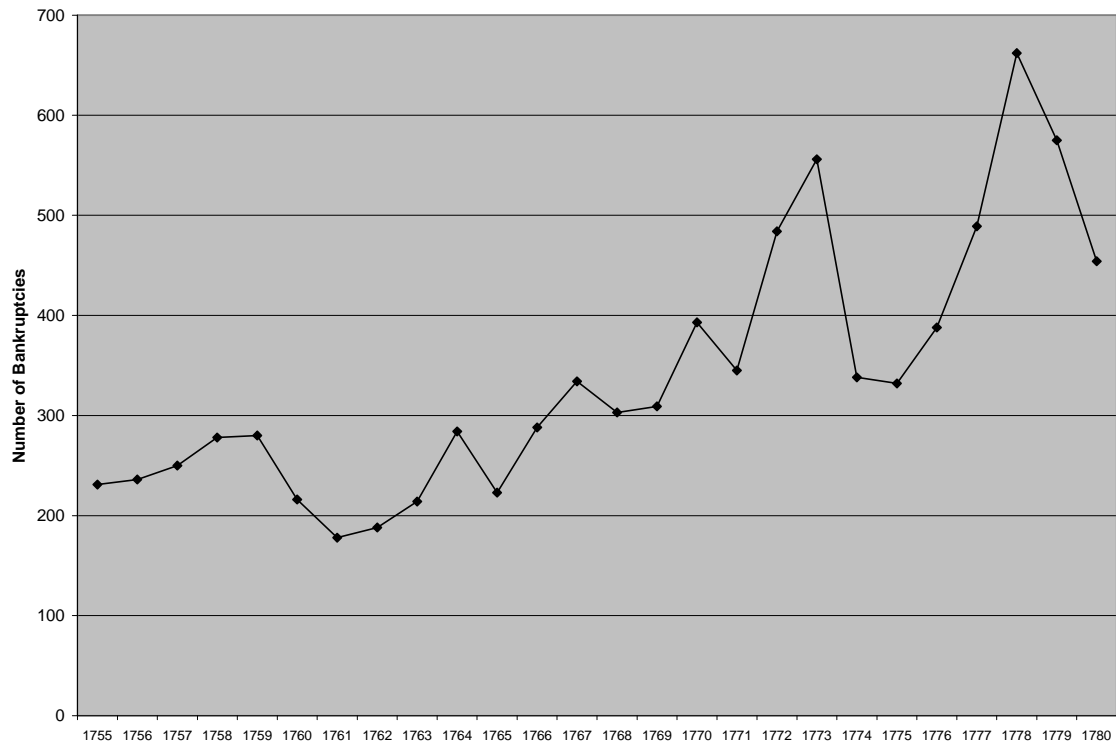


Figure 5. British Bankruptcies, 1755-1780.

Source: Mitchell (1988, 694).

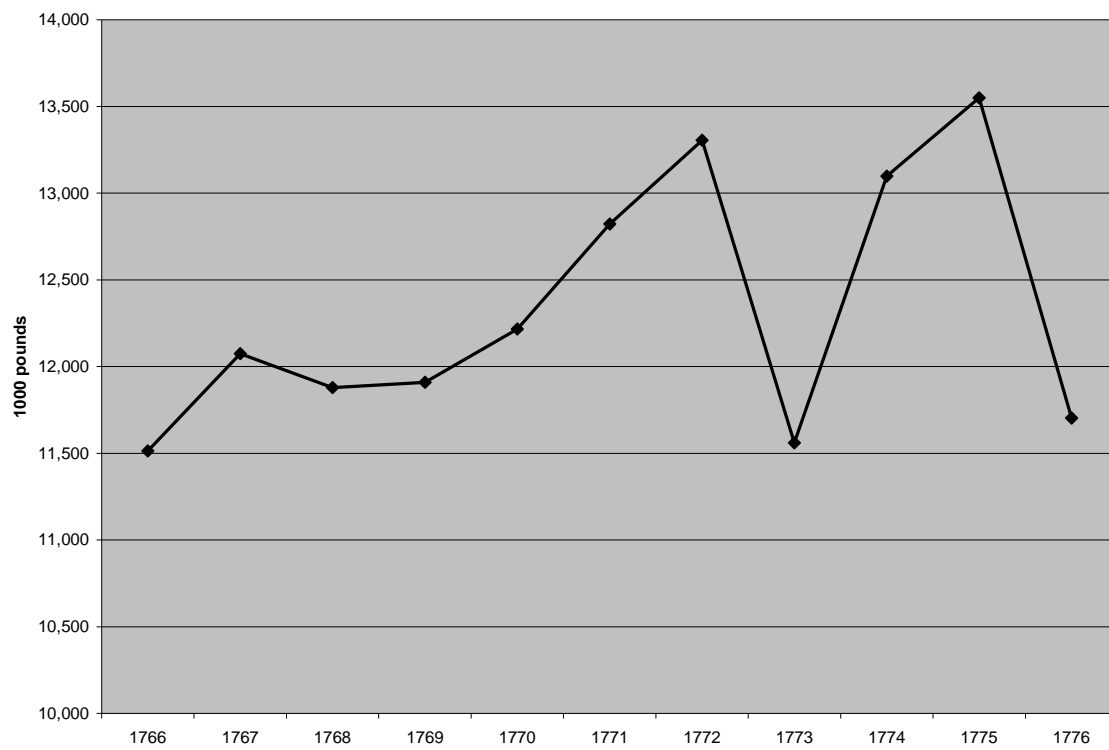


Figure 6. The Value of British Imports, 1766-1776.

Source: Mitchell (1988, 449).

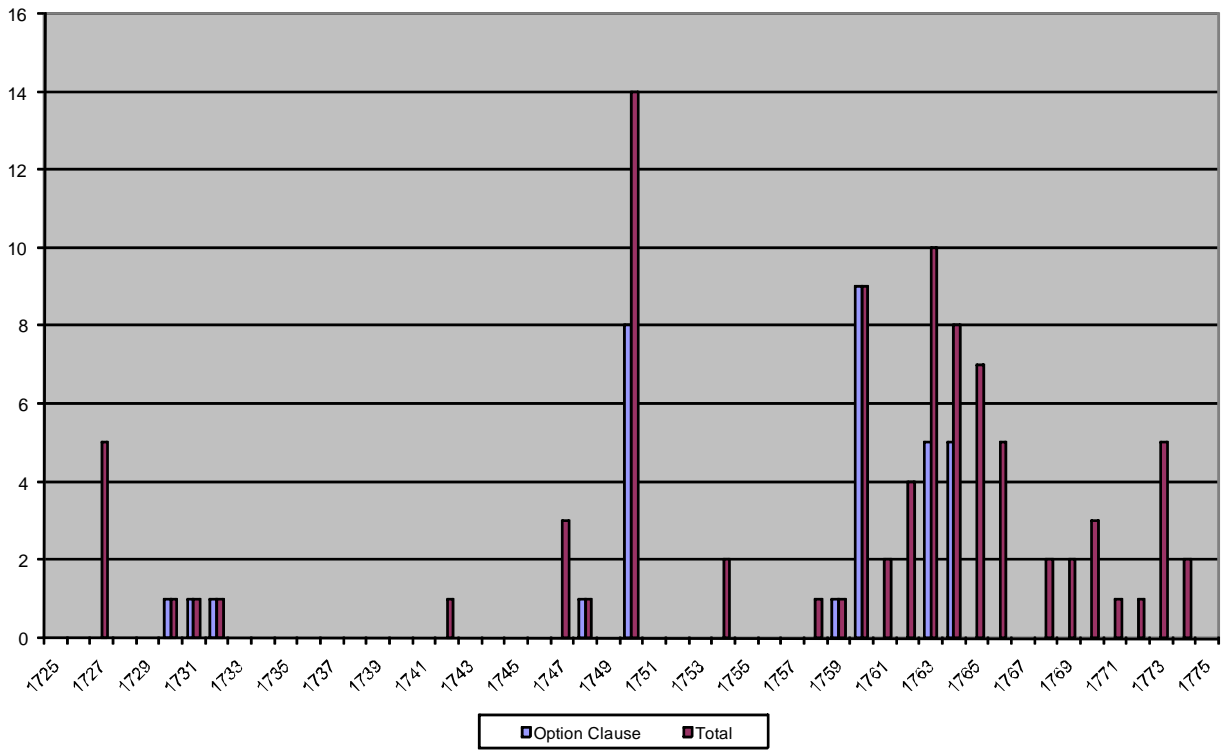


Figure 7. All New Issues of Scottish Bank Notes and New Issues Bearing the Option Clause, 1725-1775.

Source: Compiled from Douglas (1975).

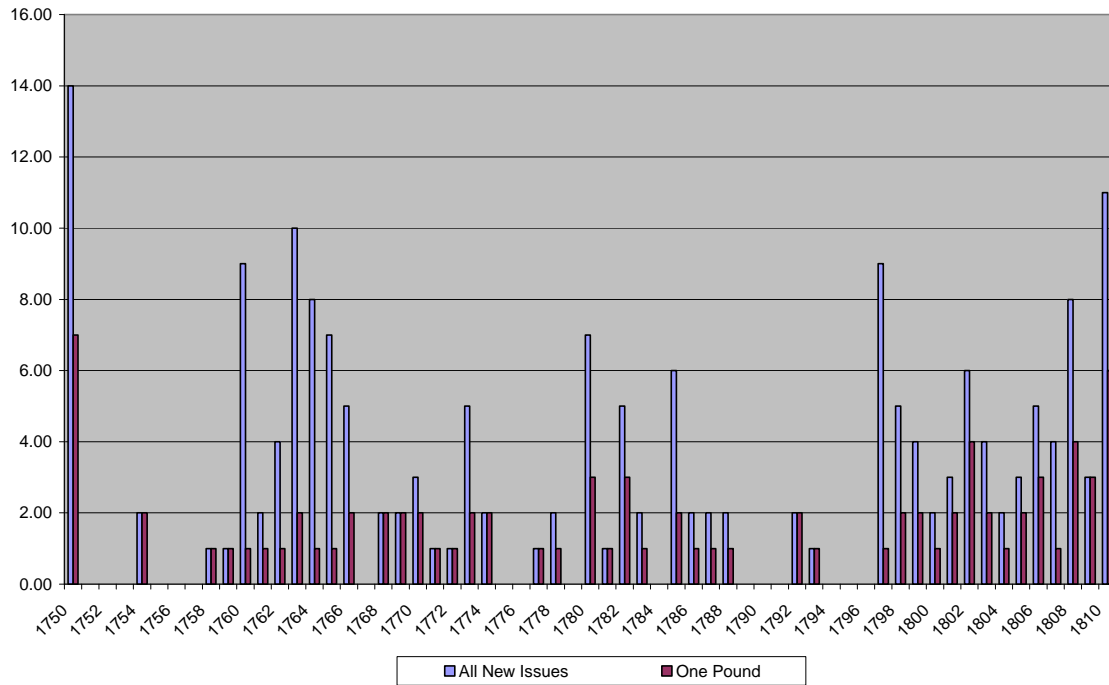
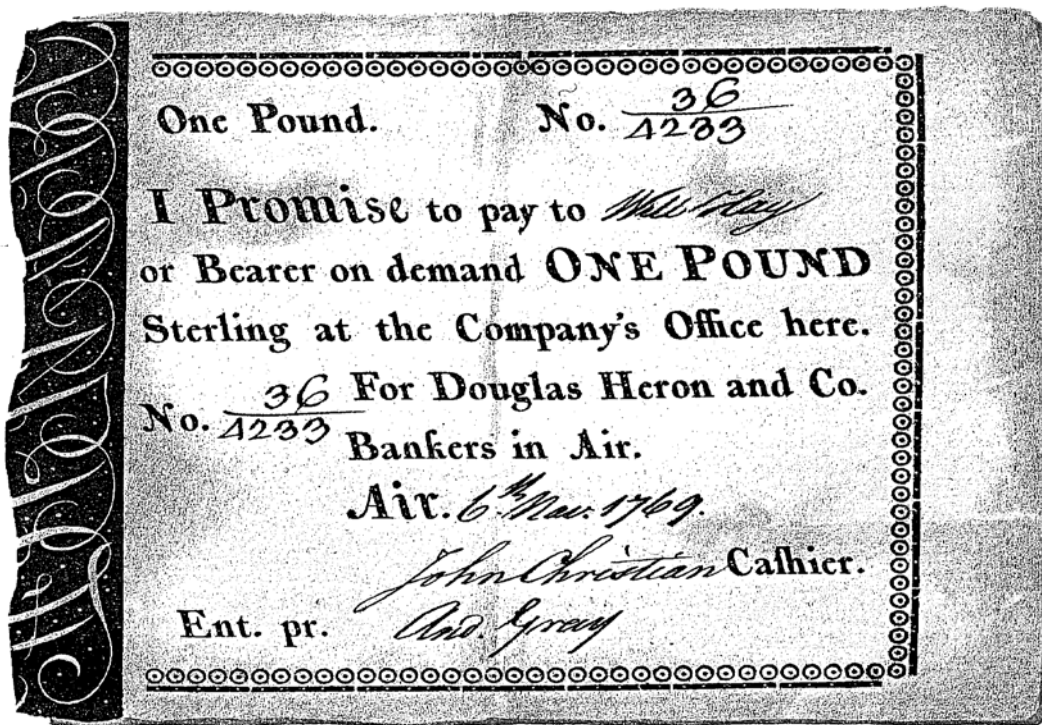


Figure 8. All New Issues of Scottish Bank Notes and All New Issues for One Pound or One Guinea, 1750-1810.

Source: Compiled from Douglas (1975).

A Note Issued by the Air (Ayr) Bank



Source: Graham (1911).

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