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Parallel Journeys:

Adam Smith and Milton Friedman on the Regulation of Banking

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Abstract

Adam Smith and Milton Friedman are famous for championing Laissez Faire, yet both supported government regulation of the banking system. In both cases their deviation from free market orthodoxy was based on a careful reading of financial history: especially Smith's reading of the Crisis of 1772 and Friedman's reading of the Crisis of 1929-33. In both cases they based their reading on a complex and nuanced account of human nature. This paper describes their parallel journeys to the conclusion that banking requires government regulation.

I must thank Simone Pollilo, Brad Pasanek, and the participants in the conference they organized, "After the Crash, Beyond Liquidity," which was held at the University of Virginia on October 30, 2009, for a number of comments that improved the paper. David Levy, Maria Pia Paganelli, Sandra Peart, George Selgin, and Eugene White read a related paper and saved me from making a number of mistakes in my interpretation of Smith. The remaining errors are solely my responsibility.

Parallel Journeys:

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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.

Adam Smith and Milton Friedman were two of the most important advocates of unfettered markets in the history of economics, yet both advocated government regulation of the banking system. Both came to their view of banking after an analysis of what had happened during an international financial crisis: for Smith it was the Crisis of 1772; for Friedman, the Crises of 1929-1932, although both also examined the record of earlier crises. Indeed, the failure of a single bank, and the consequences that flowed from that failure, had a major impact on both: for Smith it was the Ayr Bank; for Friedman, the Bank of United States. Both economists, moreover, departed from a strict interpretation of "rational economic man" as they developed their analyses of the crises, and instead relied on familiar metaphors to capture the irrational in human behavior. Here, I draw attention to the remarkable parallels in their intellectual journeys. I will begin at the beginning -- with Adam.

1. Smith and those Daedalian Wings of Paper Money¹

Rather than being a model builder in the modern mathematical style, Smith was a metaphor builder. The *invisible hand* is merely one of many metaphors that he used to convey and to construct his economic system. His most important metaphor for money was a highway,

¹ Sections one and two are based on a longer paper (Rockoff 2009b) that contains the empirical evidence summarized here.

and his most important metaphor for banking was a highway through the air supported on “Daedalian wings of paper money.”

It is worth examining Smith's use of these metaphors in detail because they provide a window into Smith's analysis of money and banking. Here is the crucial passage.

"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 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)."

Smith also likened money to a great (water) wheel that provided the motive force for commerce, but the wagon-road in the air was his most extraordinary metaphor and the most enlightening. 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. Smith's metaphor takes us away from rational economic man, or at least from the version that sees human beings as emotionless computers, mechanically weighing costs and benefits and the associated probabilities. Icarus knew the risks; His father Daedalus had explained them. But he became so enthralled by his ability to soar into the air, that he forgot the risks. Emotion triumphed logic. Smith was not the first to use the classical tale of Daedalus and Icarus to illustrate the dangers of a financial bubble. After all, the tale captures a familiar aspect

of human behavior. Levy and Peart (2010) note that there were two images of Icarus in *The Great Mirror of Folly*, an eighteenth century Dutch collection of cartoons illustrating the South Sea and Mississippi bubbles.

Smith's use of this metaphor can be traced in some detail because we have a preliminary fragment 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.

"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 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 breath without interrupting the communication, so as to be able to plow up ½ 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 ½ 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 of land currently in production.

The question 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 treatments of Smith's views are Checkland (1975b) and Gherity (1994).

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 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. 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 2006).

Smith was not content to simply note that paper money created a social savings. Like any modern economist, Smith attempted to take the next step and compute the amount of the social savings.² But here I think Smith ran into a problem: the social savings implied by a calculation based on 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 country in which the circulation consists of £1,000,000 sterling (gold or silver).³ 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.⁴ 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."

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 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;⁵ a good return in an economy where

² 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.

³ At 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).

⁴ 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.

⁵ 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).

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 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.

Smith, a calculation based on Smith's metaphor, to put it somewhat differently, does 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. That task still waits to be done.

2. Some Episodes in Scottish Banking History

The sanguine views of banking that Smith held at the time his lectures on jurisprudence were delivered 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.

2.1. The “Small Note Mania”

The timing of the small note mania 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, described the period narrowly as the early 1760s. Most of the small notes from this era in James Douglas’s (1975) catalogue of Scottish bank notes shows were issued in 1763 and 1764, confirming a narrow focus.

Many small notes were issued, not by banks, but rather by local merchants. Apparently notes for as little as one shilling Scots (one penny) were issued (Munro 1928, 122; Kerr 1902, 86-88). The legitimate small notes were mocked by the issue of bogus notes. One of the best of these, according to Munro (1928, 122) and other sources, 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.”

The forces producing the small note mania are 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 – like Icarus flying too close to the sun. 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.⁶ The two explanations, mania and scarcity of small denomination coins are not, of course, 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 small 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 nominal (face) 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 send funds abroad to support British military actions, and actions undertaken by 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 creating the regional deficit: a shift of investment toward London financial markets also undermined the Scottish balance of payments. The balance

⁶ White (1992, 163-164) summarizes the positions of the Scottish banking historians.

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." Still inflation tends to push up the price of silver and other coin metals to the point where coins are worth more as bullion for melting or for export than they are as coins circulation a face value in monetary transactions.

The phenomenon of wartime inflation producing a shortage of small coins is well known. This is what happened, for example, in the United States during the Civil War. The silver coinage disappeared from circulation in the United States, spent about fifteen years on a working vacation in Canada, Central and South America, and the West Indies, and then returned to the United States and reentered circulation (Carothers 1967 [1930], 259)! There was also a shortage of small coins during the Napoleonic Wars, when a ban on small notes, discussed below, was temporarily lifted. 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. The shortage of small change during the Napoleonic era, incidentally, 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 and Watt and their innovative technologies are the most dominant historical memory from the era, the solution to the problem of small coins, as Selgin

shows, was more prosaic: the selling of coins at cost plus and the offer by issuers to redeem quantities of them on demand in banknotes.

Consistent with the idea that the small note mania was the product of wartime inflation, the price of silver in Britain reaches its highest point in the period 1730-1790 in 1760 just at the onset of the most intense phase of the small note mania (Officer 2009b). There is some dissent from the view that the inflation contributed to the small note mania. Clapham (1945, vol. 1, 240-41) suggests that there was little connection between the Bank's efforts to finance the war and the small note mania, perhaps because of the absence of massive inflation. 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 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 did not propose a policy for solving it directly (Checkland 1975b, 515). However, as we will see below, he did propose measures that would have barred the small paper notes that substituted for small denomination coins.

2.2. The Crisis of 1772

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 1772.⁷ 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 of 1772 in the *Wealth of Nations* (II.ii.66-77). His analysis breaks the speculative period leading up to the Crisis into three stages.⁸ 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

⁷ 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).

⁸ Hamilton (1956) provides a modern treatment of the failure of the Ayr Bank; it provides more detail, but agrees with Smith.

long-term investments by rolling over short-term debt. Smith does not name the projectors he had in mind.⁹ 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 he 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 Bank or its principals.¹⁰ 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. It was founded in 1769. By 1772 the bank supplied 25 percent of the notes

⁹ 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.

¹⁰ Smith, famously, does not mention his rival Sir James Steuart, or Steuart's treatise, *An Inquiry into the Principles of Political Oeconomy* (1767) by name.

circulated by Scottish banks, 25 percent of total deposits, and 40 percent of total 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 that had been followed by the 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 on the open market, the bank had lent money to its shareholders, so it was more 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 headed for a fall.

The failure of the Ayr Bank was the spark that ignited the Crisis of 1772. Alexander Fordyce, a London speculator, was the key figure. 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 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?” (Smith, *Correspondence* 1987 [1740-1790], 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 quickly spread to other financial centers. 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; William Alexander and Sons, a Scottish firm, received £160,000 (Kindleberger 1978, 184). 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 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 many subsequent crises including 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, find anyone connected with the Bank that the owners could sue (*The Precipitation and Fall 1778*). The report was issued in November 1778, and even when one discounts some of the claims to allow for 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.”¹¹

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 rapid; it appears to have been a V-shaped recession, to use the modern jargon. Bankruptcies rose abruptly in 1772, peaked in 1773, but then fell to the pre-Crisis norm in 1774. Imports 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 crises.

While the Crisis of 1772 accounts for much of Smith’s analysis of banking, it was not the sole source of his views. Smith’s thinking was also shaped by a wide reading in banking and monetary history. 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:

¹¹ The student of metaphors will notice another parallel between the myth of Daedalus and Smith’s affairs. Daedalus used his wings wisely, but his son Icarus soared too close to the sun. Was Smith wise Daedalus and his protégé, the Duke of Buccleuch, the impetuous Icarus?

an unsuccessful war "in which the enemy got possession of the capital" (*Wealth of Nations* II.ii.87).

2.3. 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 or banks in the country, and these banks 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 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 (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, but 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. We will meet the idea of 100% reserve banks again when we turn to Milton Friedman's proposals for bank regulation. Smith chose the example of an enemy capturing the capital, to sum up, because it was a clear example of a plausible exogenous shock.

3. Smith's Proposals for Regulating the Banking System

Smith's reading of financial history, particularly the Crisis of 1772, led him to recommend a number of constraints on the banking system: (1) restriction of lending to "real bills," (2) usury laws, (3) elimination of the "option clause" in Scottish bank notes, (4) and limitation of the maximum note to 5£s. We will consider each of them in turn.

3.1. The Real Bills Doctrine

Bankers had an understanding of the rules of prudent banking, of course, long 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). The point that Smith was making underlays the demand of modern advocates of banking reform that investment banking and commercial banking be separated completely not just by a Chinese Wall within a single institution, but rather in separate institutions. 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 offered two

practical rules, one for discounting bills of exchange,¹² and one for the cash accounts¹³ 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 is 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 would 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, however, given the close-knit structure of Scottish society, that prudent rules, clearly 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 by commercial

¹² 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, although it is not generally thought of in these terms, is an example.

¹³ A cash account was similar to an overdraft privilege. The borrower would make use of the facility when they chose to do so.

banks, to take a simple example, 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 does not 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.¹⁴ 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.

3.2. 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

¹⁴ 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."¹⁵ 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," and has attracted the attention of many scholars attempting to understand Smith's views (Jadlow 1977, Levy 1987, Paganelli 2003, Rockoff 2009a). There are many aspects of usury laws that made them relatively attractive to Smith as a form of regulation. Paganelli (2003) a through 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 was then at 5 percent – a level which Smith thought reasonable – 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 wiling 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).

The usury laws, moreover, 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. This self-administering feature of the usury laws, one would think, would have made them more attractive to Smith as a way of limiting speculation.

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,

¹⁵ Most analysts do not discuss the usury laws as part of Smith's regulatory architecture for banking. Checkland (1975b, 517) is an exception.

and his use of the term in making his case for the usury laws. Even if the Ayr Bank had succeeded in its 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), a recipe for disaster. 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 the dangers of excessive lending to projectors during the boom of 1769-1771 and the Crisis of 1772.

3.3. 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* [my italics] 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*." If the note holder went to the office of the bank and demanded hard money, the teller will (most likely) 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 the 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 that had occurred in Scotland 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. Time deposit accounts which allowed banks to delay repayment if they choose to do so are a modern version of the same idea.

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 put £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. 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, 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, it was easy to blame the 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.

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 proposal that they be made 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 duopoly. 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, Smith never mentions the option clause, as Gherity (1995, 720) point out, in his detailed discussions of the banking problems of the 1760s and 1770s in the *Wealth of Nations*. The explanation, I believe, is that 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.

3.4. 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 £10 Bank of England notes. These notes 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 a 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 could refer mainly to the small notes issued in the early 1760s. These notes, however, were usually for less than £1, and had been prohibited by legislation in 1766. So I suspect that Smith also 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.¹⁶

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 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

¹⁶ There were repeated attempts to suppress the issue of small notes in antebellum America, based partly on Smith's authority (Bodenhorn 1993; White 1995).

\$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. 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).

5. 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 while they might make the system more resistant to crisis, they obviously could not prevent severe crises. The usury law had been unchanged for many years and its presence had failed to discourage imprudence at the Ayr Bank.

Some blame for the Crisis, one could argue, could 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 cannot 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;¹⁷ indeed, when the bank may have (Smith is cautious) advanced £1,600,000 in bullion in a week.¹⁸ 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 complex than they are usually portrayed.¹⁹ 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

¹⁷ 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.

¹⁸ 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.

¹⁹ 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.

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.

6. Milton Friedman and those "Contagions of Fear"

Like Smith, Friedman searched for striking metaphors to convey, and I would argue, to construct his understanding of the economy. He introduces his collection of essays entitled the *Optimum Quantity of Money* (1996), for example, by explaining that the theory of money is like a Japanese garden: simple on the surface, but filled with subtleties that emerge after prolonged contemplation. And, more importantly, the first essay in that volume, on the optimum quantity of money, begins by asking what would happen if a helicopter flew over an economy and dropped a \$1,000 on it, a figure of speech made famous later by Ben, "Helicopter Ben," Bernanke. Indeed, the recent popularity of the mysterious term, "quantitative easing," may be the result of the term's ability to conceal the fact that a simple monetarist policy was being adopted. Consider the scorn that would have been heaped on the Federal Reserve or some other central bank if it announced

in the midst of the financial crisis that it was adopting the Milton Friedman's policy of dropping money from a helicopter.

In the analysis of the Great Depression in *A Monetary History of the United States* (1963, 308) written with Anna J. Schwartz, we encounter the following figure of in the section of the chapter on the Great Depression entitled the "Onset of the First Banking Crisis, October 1930."

A contagion of fear spread among depositors, starting from the agricultural areas, which had experienced the heaviest impact of bank failures in the twenties. But such contagion knows no geographic limits.

Elsewhere in their discussion of the banking crises and in their discussion of earlier crises they used the more familiar term "panic." For example, in discussing the Crisis of 1893 they (1963, 108) described the beginning of the crisis as follows.

The commercial failure of a stock market favorite in May 1893, after months of depressed stock market prices, touched off the panic for which the stage had been set by the general uneasiness about the currency.²⁰

Does the use of these figures of speech mean that Friedman and Schwartz have abandoned "rational economic man" in favor of some more complex economic actor? To some extent they have. Imagine, to help clarify their analysis, the classic panic in which someone yells fire in a crowded auditorium. There is a rush for the exits and in the process elderly people and children are trampled. Many people die in the fire.²¹ Clearly, reason has not been completely abandoned. People run for the exits, they do not charge about randomly. Just as clearly, there may be a cooperative solution that works better in the aggregate, if not for each individual separately. If each individual simply waited their turn and filed out in order, the social outcome would have been better. Nevertheless, there may well be an element of irrationality in a

²⁰ There were fears that the gold standard might be abandoned in favor of a bimetallic standard.

²¹ Of course, this is not always the outcome. Sometimes the audience files out in good order. I witnessed this myself at a university production in which the stage set caught fire. I am not familiar with the academic literature on behavior in fires, I should add, and merely use the classic story to clarify some ideas about banking panics.

"contagion of fear." The fact that our neighbor is afraid and running for the exit may have a powerful effect on our own calculations. Perhaps if all the facts were analyzed dispassionately the conclusion would be "wait your turn" because the risks of being injured in a melee caused by a false cry of fire outweighed the benefits of pushing to the front of the line in a genuine fire. But fear may lead to a conclusion that exaggerates the current dangers: We may be subject to a "contagion of fear."

7. The Bank of United States

Friedman was a young man, a student at Rutgers University, when Great Depression struck. Although he must have been aware of the banking and economic crisis that was enveloping the nation, his views on economic issues were just forming. In this respect his story differs from Adam Smith's. Smith was already a distinguished academic, the author of the *Theory of Moral Sentiments*, when the Crisis of 1772 forced him to revise his views on banking. It was two of Friedman's teachers at the University of Chicago, where he went for his graduate studies in economics, Henry Simons and Lloyd Mints, who did the initial work of formulating a plan for regulating the banking system. Their idea, the 100% reserve plan, was later taken up by Friedman. Simon and Mints are, in this respect, a more exact parallel for Smith: economists with a strong preference for free markets trying to respond to a devastating banking crisis by formulating a set of regulations that would prevent future crises. Simons was the originator of the "Chicago Plan," as it came to be called, Simons (1948 [1934], 62-64). He was ably seconded by Mints, who taught banking and monetary economics at Chicago. Mints's case for 100% reserves appears in his *Monetary Policy for a Competitive Society* (1950, 186-87).

Friedman (1992 [1960], 65) acknowledged his debt to Simons and Mints for the idea of 100% reserves. But here the trail grows cold. Both Simons and Mints, as far as I have been able to learn, never described how they arrived at the idea. Albert G. Hart (1935) explored the cost of the transition to a system of 100% reserves in "The Chicago Plan of Banking Reform." He noted that similar proposals had been made by a number of economists in the early 1930s and went on to write that "From conversations with various American economists I am convinced that the same notion occurred to economists at several other centres of economics at the same time, although their findings have not happened to be published" (Hart 1935, 104). Perhaps it was simply an obvious idea at the time.

While the collapse of the banking system as a whole during the depression is sufficient to explain Friedman's support for government regulation of banking, Friedman, like Smith found the failure of one bank in particular especially important. Smith had the Ayr Bank; Friedman, the Bank of United States. The latter bank failed on December 11, 1930. For Friedman and Schwartz (1963, 309-311) this was a crucial moment in the unfolding drama. The Bank of United States was, measured by deposits, the largest failure in American banking history to that point. It was, moreover, a New York bank. Up to that time most bank failures had occurred in rural areas. It also had a distinctive name that might have led some people to believe that it had a special relationship with the government, although in fact it was an ordinary commercial bank that had been chartered by the state of New York. Had the bank been bailed out by the New York Clearing House or by the Federal Reserve the harm to the system might have been prevented, but there was no bailout. Although the bank asked for help, none was forthcoming, and the bank was forced to close. For Friedman and Schwartz the crucial piece of evidence that the failure of the Bank of United States altered the course of the banking crisis was that the ratio of currency to

deposits which had been falling began to rise. Depositors were afraid and were withdrawing cash; not just in isolated locations, but nationwide.

In a long footnote Friedman and Schwartz (1963, 309-310) gave some intriguing details of the meeting in which the decision of whether to bail out the Bank of United States was debated. The Bank, although large, was not a Wall Street bank. Like the Ayr Bank it was an outsider. It was based on the Lower East Side of New York and dealt mainly with Jewish businesses and depositors. Inevitably, this fact gave rise to the notion that the failure to bail out the bank may have been influenced by ethnic prejudice. A number of economic historians then explored this issue (Temin 1976, White 1984, Lucia 1985, Friedman and Schwartz 1986, O'Brien 1992, and Trescott 1992). One of the key questions in the debate was whether the Bank of United States was insolvent when it closed, or only illiquid. It would be presumptuous for me to pronounce a final verdict on this controversy, but I think I am safe in concluding the following. The Bank of the United States was not a hopeless bankrupt like the Ayr Bank. The Bank of United States eventually paid off more than 80 cents on the dollar, and that was during the 1930s when most asset values were depressed. But the Bank of United States suffered from problems similar to those of the Ayr Bank: it had expanded rapidly and had made risky investments in the stock market and real estate. Its role in the banking crisis was not as clear as the failure of the Ayr Bank, but the failure of the Bank of the United States must have alarmed a many ordinary depositors, and must have added to the growing distrust of the banking system that produced the increase in the currency-deposit ratio.

8. 100% Reserve Banking

What is required to reduce the probability of a financial panics -- which tend to be associated as Friedman and Schwartz show with the most severe economic contractions -- are government controls that can prevent a "contagion of fear" from taking hold. In *A Monetary History* Friedman and Schwartz they (1963, 434-42) provide a justly famous endorsement of federal deposit insurance.

As we have seen in earlier chapters, banking panics have occurred only during severe contractions and have greatly intensified such contractions, if indeed they have not been the primary factor converting what would otherwise have been mild contractions into severe ones. That is why we regard federal deposit insurance as so important a change in our banking structure and as contributing so greatly to monetary stability -- in practice far more than the establishment of the Federal Reserve System. (Friedman and Schwartz 1963, 441-442).

As they point out there might be other forms of government intervention that would achieve stability of the financial system. In *A Program for Monetary Stability* (1965, 1960) Friedman made the case for the even more radical form of regulation known as 100% reserve banking championed by his teachers Henry Simons and Lloyd Mints. It is worth spelling out the idea because it is a forerunner of later plans for "narrow banking."

In essence the idea is very simple. Banks would be required by law to hold one dollar in "high-powered money" (currency or deposits at the Federal Reserve) for every dollar in deposits they issued to the general public. Normally, of course, banks hold fractional reserves, for example \$10.00 in cash for every \$100.00 in deposits held by the public. The bank holding fractional reserves counts on the fact that in most circumstances not everyone will want their cash at once. Meanwhile, the bank can lend out the remainder of the deposits, \$90.00 in our example, at interest. If there is a demand for cash the bank can normally meet the demand from its fractional reserves of cash and then rebuild its reserves by hanging on to interest payments as they are made, hanging on to new deposits, or liquidating earning assets.

The main benefit of a 100% reserve system would be that demands by individuals to convert deposits into cash could always be satisfied. With fractional reserves there is always the danger, however remote, that so many depositors will demand cash at once that the bank's reserves will be exhausted. In that case, the bank would be forced to close its doors and legal processes would be set in motion that might lead to the liquidation of the bank. Although a "run" on a bank could occur at any time for idiosyncratic reasons, say a rumor that the bank had invested excessively in businesses that were in trouble and could not repay their loans, historically runs occurred mainly during banking panics. Sometimes a panic would start, or at least would accelerate, when a major financial institution with a good reputation failed. Suddenly all banks would be under suspicion and runs would become widespread. The panic would grow exponentially feeding on the fear that as others rushed to get their money out of the banks, the total reserves of the banking system would decline. Faced with a panic, banks would cease making new loans and begin demanding repayment of old ones. Asset values would plummet, and the public would cut its expenditures. Severe banking panics, at least at the time that the idea of 100% reserves was first advanced, had produced the most severe contractions in economic activity. One hundred percent reserves would prevent these crises.

Nonbank financial intermediaries, or financial intermediaries with only limited banking activities, that have played such a large role in the current crisis, were present in earlier crises, and on occasion played important supporting roles. But in the main the crises that Friedman and Schwartz studied in detail -- the crises of 1873, 1893, 1907, 1929-1933 and so on -- were banking crises, and could plausibly be prevented by a reform designed for commercial banks.

Under 100% reserve banking banks could not lend part of their deposits at interest as they do now. So how would they make any money? One way would be by charging fees for keeping

money on deposit and for other services -- no more interest on deposits. Just as one pays a bank for a safety deposit box in which to store valuables, one would pay the 100% reserve bank for storing deposits and making them available for transfer or conversion into cash. One hundred percent reserve banks could also raise funds by issuing stock and long-term debt, and these funds could be invested in the same way that fractional reserve banks invest their funds.

Friedman advocated another change in the banking system, one that has been adopted recently, which would create another stream of income for 100% reserve banks: he would have the Federal Reserve pay interest on deposits. Indeed, as Friedman acknowledged, having the Federal Reserve pay interest on deposits was the only change he called for in earlier proposals for 100% reserves (Friedman 1992 [1960], 71-75). Competition among banks would then, most likely, produce positive interest payments on deposits. The idea of paying interest on funds held by banks at the Federal Reserve, as least as far as Friedman was concerned, was derived from a well-known paper by George S. Tolley, "Providing for Growth of the Money Supply" (1957). The reason, as Tolley explained, for creating an environment in which banks paid interest on deposit was to increase the use of deposits by the general public, a desirable outcome because the social cost of producing additional deposits is low or negligible.²² The Federal Reserve in turn would have to get the money to pay interest from the seigniorage it receives from creating money, or from revenues supplied by the Treasury from taxes or the issue of debt.

As I noted above, Friedman and Schwartz gave an enthusiastic endorsement to deposit insurance in *A Monetary History*. Given their belief that deposit insurance was effective, what would be the gain from moving to an even more radical change, 100% reserves? One advantage would be macroeconomic. Once 100% reserves was in place changes in the stock of money

²² Tolley taught at the University of Chicago where he and Friedman were colleagues for a few years in the late 1960s.

would be determined solely by the Federal Reserve. Decisions by the public to convert deposits into cash would not alter the total stock of money and changes in the reserve ratios of banks would be impossible. If the Federal Reserve decided to keep the amount of high-powered money constant or decided to increase it at a fixed rate, the total stock of money would be constant or would grow at the same fixed rate. A second reason for preferring 100% reserves that Friedman offered was that the government could then separate itself completely from the investment decisions made by banks. Under 100% reserves banks would be investing either their own capital or funds lent to them long-term. Friedman was well aware of the point that has surfaced in recent discussions of banking reform that a system of government deposit insurance virtually requires that the government exercise some sort of control over the investments banks make, otherwise banks have a strong incentive to take risks. They can invest in high-earning risky assets, but face no loss of deposits as a result because depositors are insured by the Federal government.

In the wake of Friedman's support for 100% reserves in *A Program for Monetary Stability* (1960) a considerable literature developed that supported a more Laissez Faire approach to banking. Most important were Friedrich Hayek's (1976) plan for the *Denationalization of Money* and studies by a number of economic historians of various systems of "free banking." The latter studies argued that on the whole these systems had worked reasonably well and that in any cases, stories about "wildcat banking" under free banking were exaggerated. Friedman addressed this literature in paper written jointly with Anna Schwartz (1986), provocatively titled "Does Government Have Any Role in Money."²³ Friedman and Schwartz acknowledged many of the historical claims in this literature, but they remained unpersuaded that Laissez Faire could be applied to banking. Although they make many theoretical and historical arguments to support

²³ Full disclosure: I was one of the revisionists cited by Friedman and Schwartz; (Rockoff 1975).

the case against Laissez Faire, they clinch the argument with a then recent example of a banking crisis. The failure of the Home State Savings Bank of Cincinnati in March 1985 set off a run on savings banks in Ohio and some other states. Friedman and Schwartz (1986) draw the relevant conclusion: "These episodes show that what used to be called "the inherent instability" of a fractional reserve banking system is, unfortunately, still alive and well" (Friedman and Schwartz 1987 [1986], 305).

As with Smith, we can ask whether Friedman's recommendations would be sufficient to prevent financial crises.

9. Was Friedman's Regulatory Framework Sufficient?

Friedman's proposals like Smith's were never adopted. Scottish banks were allowed to issue the small notes that Smith thought should be banned; and American banks were allowed to invest a fraction of their deposits in a wide range of longer-term, non-governmental assets that Friedman would have replaced with interest bearing deposits at the Federal Reserve.²⁴ It is therefore impossible to say how much additional stability 100% reserves would have brought, if it had been adopted.

Remarkably something similar to Friedman's proposal, indeed something similar to Adam Smith's, has surfaced once again in the reforms being pushed by Paul Volcker, the chairman of President Obama's Economic Recovery Advisory Board, and the Obama

²⁴ At a lecture delivered in Stockholm in April 1954 Friedman listed deposit insurance as one of the reasons the American Economy was Depression-Proof (Friedman 1968 [1954], 75). He also pointed out that the absorption of Federal debt by the banking system had taken it "half way" to 100% reserves, showing the feasibility of the 100% reserve reform. This was the result, however, of the monetary expansion during World War II, and the ratio of Federal debt to deposit liabilities declined in subsequent years.

administration (Volcker 2010).²⁵ Volcker's proposal, as I understand it, would separate investment banking and securities trading from commercial banking. Commercial banks would be required to invest deposits (net of reserves) in traditional bank loans: They would be barred from using those funds for proprietary trading or other speculative purposes. This proposal does not go as far as Friedman's, which would require these funds to be invested in interest bearing deposits at the Federal Reserve; but is essentially the same as Adam Smith's proposal that these funds be invested in "real bills."

For the investment and trading side of the market, Volcker proposes a new "resolution authority" that would close down non-bank financial institutions that were deemed too-big-too-fail. Essentially, he proposes a special form of bankruptcy that would impose the burdens of bankruptcy in a somewhat different and more populist way than current bankruptcy procedures – managers would pay a high price – and would have access to government supplied funds made available for the purpose of smoothing the liquidation of the institution. Presumably smaller non-bank financial institutions would go through a conventional bankruptcy; that is without access to government funds.

A full analysis of this proposal is beyond the scope of the paper. It may be appropriate, however, to make a few points based on a comparison with Smith and Friedman. First, Volcker, like Smith and Friedman, has crafted a plan for reform that is eminently suited to dealing with the crisis through which we have just passed. What if the next crisis is different? Suppose that the Volcker proposals were adopted, but that the next crisis began with the failure of hundreds of small hedge funds instead of being concentrated in a few large banks and non-bank financial

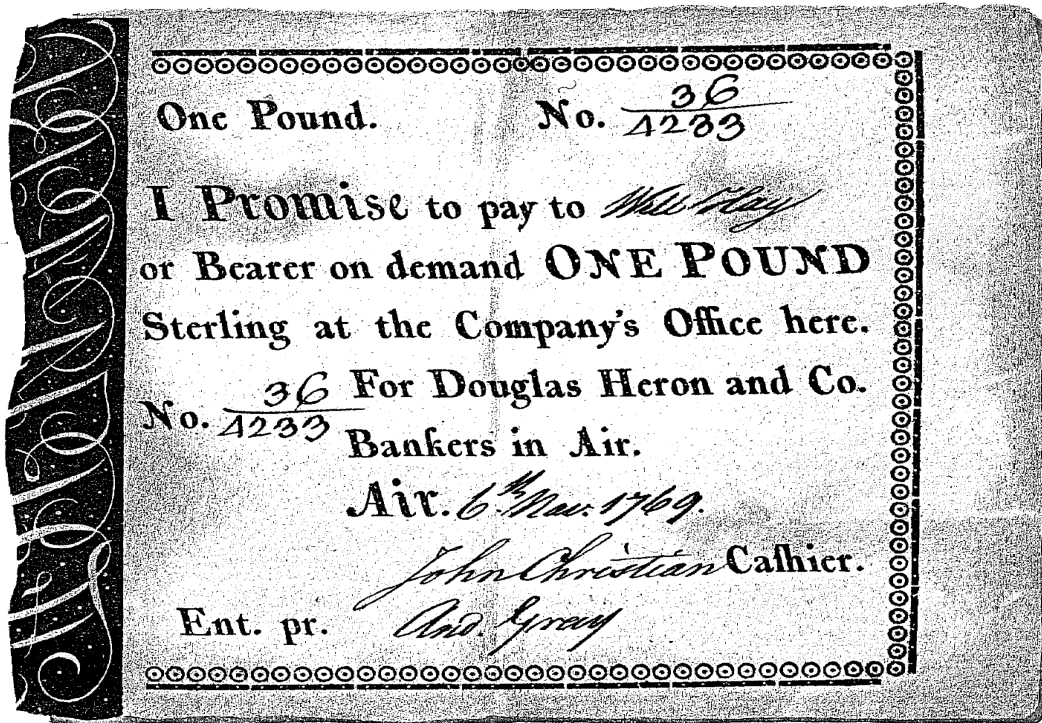
²⁵ In his *New York Times* op ed (2010) Volcker refers to Adam Smith's idea of "keeping banks small" in order to avoid the problems of too big to fail. While Smith favored competition in banking, I don't believe he would have favored "keeping banks small" if it took government restrictions on the growth of financial institutions to achieve it. Instead, as I tried to show above, Smith favored other kinds of legislation, such as establishing a minimum size of bank note, to protect the system against losses.

institutions? Then, it seems to me, the Federal Reserve and Treasury would be back to inventing remedies on the fly. My second observation is that Volcker's plan; Like Smith's and like Friedman's is unlikely to be adopted: too radical, too opposed to the interests of many bankers.

10. Conclusion

There is a remarkable parallel between the evolution of Adam Smith's views on banking and Milton Friedman's. Both economists were staunch defenders of Laissez Faire, yet both saw banking as an exception to the general rule that markets should be left free from government controls. Banks, both economists agreed, needed regulation by government in order to maintain macroeconomic stability. In both cases their deviation from Laissez Faire was the result of a financial crisis: for Smith it was the Crisis of 1772 and for Friedman it was the Crisis of 1929-33. Indeed, both seem to have been influenced by the failure of a particular bank: for Smith the Ayr Bank and for Friedman, the Bank of United States. Of course, these episodes did not stand alone: both tested their views against a broad array of historical evidence. Both, moreover, were led by their study of financial crises to employ assumptions about human nature that deviated from strict rationality. To incorporate elements of irrationality both used familiar metaphors: for Smith, the classic tale of Daedalus and Icarus; for Friedman, the notion of "a contagion of fear." The willingness of Smith and Friedman to modify their deeply held views in the light of experience sets a good example. Time will tell whether today's advocates of minimal financial regulation will learn similar lessons from today's meltdown.

A Note Issued by the Air (Ayr) Bank



Source: Graham (1911).

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