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From the Carolingian Penny to the Classical Gold Standard

For many economists the history of money begins with the classical gold standard and travels the century-long road to today's fiat money world. Questions of monetary regime focus on the contrast between the nominal anchor provided by the gold standard and the instability of the fiat money standard. In this view, under a gold standard the quantity of money, and hence the price level, is fixed by the quantity of gold or, more moderately, constrained by the rising cost of mining gold. In contrast, under a fiat money standard the monetary authorities can arbitrarily print money and may have an incentive to generate high rates of inflation.

But this simple dichotomy leaves important questions unanswered. The classical gold standard is typically dated from 1879 to 1914, and while numerous scholars have addressed why it was so short-lived by asking why it ended so soon, far fewer have questioned the initial date: why didn't the desire for a nominal anchor lead to a much earlier emergence of the gold standard?

An easy answer would be that the bimetallic standards that characterized Western economies for several centuries before the gold standard also provided a nominal anchor, because they too were commodity money regimes.[1] But this raises more questions than it answers, since bimetallic standards were not as stable as the short-lived gold standard, so the commodity nature of the gold standard may not have been the source of its stability. What then *was* the source of the stability? Why did the bimetallic standard evolve into the gold standard in the nineteenth century?

[1] See, for example, Bordo and Kydland (1995). In this book I use the term "commodity money" but essentially limit the discussion to the commodities of gold, silver and copper.

This study answers those questions and provides a framework for an integrated history of Western monetary regimes. I argue that prior to the nineteenth century two forces determined the characteristics of the monetary regime: the fiscal needs of the monetary authority and the need for a medium of exchange suitable for a wide range of transactions. The former imperative meant that debasement and depreciation were used when fiscal needs were urgent or alternative sources of financing were unavailable. As taxation methods and capital markets developed, the monetary authorities reduced their reliance on seignorage revenue.

The need for a medium of exchange led to the use of bimetallic standards – monetary regimes in which gold and silver coins were legal tender in a common unit of account – and the use of units of account. But as shown in Chapter 2, bimetallic standards exacerbated the inherent tendency for commodity money standards to depreciate over time. In the nineteenth century, technological change made possible the use of fiduciary monies such as token subsidiary coins and paper bank notes. Fiduciary money removed the necessity for bimetallism, and gradually the gold standard replaced bimetallic standards. The elimination of that source of currency instability coupled with the lack of a fiscal motive for depreciation led to the stability we now associate with the gold standard. The "nominal anchor" provided by the gold standard was not merely ordained by nature's endowment but required a social contract that governments would not use their power to generate seignorage revenue and a technology that made fiduciary monies feasible.

To set the stage for the study, I briefly review the evo-

lution of European monetary standards from the penny standard of Charlemagne to the bimetallic standards of late medieval Europe. Charlemagne's monetary reform of 794 A.D. provides a natural starting point for the history of Western monetary standards. Charlemagne decreed that the money of the Holy Roman Empire should be the silver denarius, containing 1.7 grams of pure silver and weighing 1.9 grams.[2] While there were mints throughout the Empire, the dies from which the coins were stamped were all made centrally. Particularly at the fringes of the Empire where trade with the South and East were common, foreign gold coins were used in trade, including some gold coins minted under the late Roman Empire.

A system of counting emerged from two different sources: 12 denari were rated equal to 1 gold solidus – a Roman coin that had not been minted for two centuries but which still circulated; and, since 240 denari were cut from one pound weight of silver, 240 denari equalled one pound (£).[3] Thus arose the system where 240 denari (d) equalled 20 solidi (s) equalled £1. The important thing

[2] The weight of Charlemagne's denier is still disputed. Miskimin (1967) concludes that Charlemagne's reformed pound weight equalled 489 gms. and that the denier had 10% seignorage so that 264 were cut from 489 gms. of pure silver and each contained 1.85 gms. silver. Spufford (1988) bases his statement that the denier contained 1.7 gms. of silver on Grierson (1965). Bisson (1979: 5) states that the Carolingian seignorage rate was 4.5%. Note that when the medium of exchange and unit of account were identical, the rate of seignorage had to be the same as the alloy rate of the coin. This identity was not necessary once the unit of account and medium of exchange were separate.

[3] Although the name for the pound varied across states – *livre*, *libra* – the symbol £ was universal.

to note is that this was a system of counting (in dozens and scores of dozens) not a way of valuing alternative monies, and there were no coins representing either the pound or (for most of the period) the solidus. The quantity of money could be determined by counting ("telling") coins rather than by weighing silver. This distinction was critical but, at the time moot, since all coins had the same silver content.

However, this monetary regime did not remain in equilibrium. Two forces ended the "universal" money over the next four centuries. Firstly, and most simply, a significant portion of the coins wore away after decades of circulation and therefore newly minted pennies weighed more than older pennies. Secondly, the uniformity of the coinage declined with the waning power of the Holy Roman Empire. Coinage rights were gradually delegated to local abbots and counts who exploited the fact that coins were told rather than weighed, and profited by reducing the weight or fineness of the coins. By the end of the twelfth century the fineness of many of the deniers had been reduced to much less than 50 percent and the weight to about 1 gram. As a result, international and large-value transactions typically specified the type of the coin in which payments were to be made, implicitly generating a set of (flexible) exchange rates between coins or currencies.

Debasement and wear reduced the size and fineness of the pennies, but there were natural and social limits to this process. The social limits were incorporated in a series of contracts between citizens and monetary authorities and reflected the inefficiency of debasement as a tax. Citizens facilitated Pareto improvements whereby they agreed to

pay alternative taxes in return for a commitment from the monetary authorities not to debase the money.

In a stagnant world, a return to Charlemagne's coinage might have been predicted, but political and economic systems had changed. The hegemony of the Holy Roman Empire had disappeared, so that responses to the monetary problems were at the state or city level and the gradual expansion of trade meant that the silver penny was not a convenient medium of exchange for all transactions. First in the Italian city states and then throughout Europe states introduced large silver coins and gold coins to complement the pennies and make a medium of exchange for high-value transactions.

The origin and nature of the "unit of account" – sometimes termed "ghost money" or "imaginary money" – was the subject of heated debate in the early twentieth century.[4] The synthesis of that debate by Marc Bloch (1954) suggested that the use of units of account evolved over the millennium.[5] He identifies three stages in the use of units of account. In the Carolingian era, as we have noted above, units of account were simply a system of counting and there were no coins representing the larger units. In the thirteenth to sixteenth centuries when the number of coins issued by a single monetary authority multiplied, the unit of account gradually became used to link the values of the various coins. The unit of account typically started out tied to a particular coin, say the denier, but over time, the denier might no longer be

[4] See Van Werveke (1934) and Einaudi (1953).

[5] Lane and Mueller (1985) apply this model in their masterful study of the early days of bimetallism in Venice.

minted, and the livre or pound became simply an abstract unit in which accounts were kept without any ties to a particular coin. For example, in France, the silver denier was last minted in 1519, but all coins were made legal tender in *livres tournois*, a unit based on the denier. This separation between the unit of account and the medium of exchange is Bloch's third stage in the evolution of units of account, which he dates roughly in the seventeenth century.

The separation of the unit of account and medium of exchange facilitated the depreciation of the currency. Depreciation is defined carefully below but essentially refers to a reduction in the specie (gold or silver) definition of the unit of account. With some very prominent exceptions, depreciation in England and France after the midfourteenth century occurred primarily in response to the physical limitations of bimetallic commodity standards and was not used expediently to generate revenue for the monetary authorities.

The book begins with an analysis of the constraints on commodity money standards. Examination of the methods by which commodity money standards could issue a range of denominations shows that each method had increasing costs as its range widened. Monetary authorities therefore adopted a combination of methods simultaneously, including bimetallism, trimetallism and the issue of low-fineness coins. I then argue that a variety of physical limitations of commodity money generated varying values of coins and precluded the "fixity" of value (1 unit of account = 1 unit of goods) that is touted as a principal advantage of commodity money. Finally, I argue that the stability of commodity money was not a time consistent policy. If agents

expected stable money, the monetary authorities could gain, at least in the short run, by debasing or depreciating the currency.[6] Thus commodity money did not inherently provide the nominal anchor that is attributed to it.

Chapters 3 and 4 examine the monetary history of England and France in the context of the constraints on commodity money standards. Chapter 3 shows that in both countries the unit of account depreciated, so that bimetallic standards were not characterized by the stability associated with the classical gold standard. However, with the exception of a few spectacular episodes of debasement, the depreciation was not driven by fiscal objectives but by the objective of maintaining a circulation of coins trading at their legal tender value in the unit of account.

The problem of providing larger denomination coins was addressed throughout Western Europe by issuing large silver and gold coins; the problem of issuing smaller coins was not so easily resolved, and by the sixteenth century had become a major difficulty for monetary regimes. As noted above, no solution was perfect – coins of low fineness, trimetalllic (copper) coins and very small coins were all attempted, and Chapter 4 illustrates the experiments in England and France to resolve this.

Chapters 5–7 examine the transition from bimetallism to the gold standard in England, France and the United States. The transition occurred first in England and

[6] The term "monetary authorities" is used in discussions of contemporary monetary policy as it covers the gamut of government and semi-autonomous (e.g., central banks) organizations that determine policy. Here it is used similarly as an all-encompassing term for those who determine monetary policy, primarily kings, queens and parliaments.

involved a transition to a gold standard supplemented with fiduciary bank notes and small-denomination coins. The gold standard was a side-effect of the Industrial Revolution and emerged when technologies developed that could produce coins and notes that were not counterfeitable or at least were very costly to counterfeit.

The gold standard did create greater stability as changes in the relative price of gold to silver no longer induced responses of depreciation, but it is important to note that the "anchoring" of the monetary standard had emerged much earlier, and so in that sense the emergence of the gold standard was not a critical step in the creation of a nominal anchor.

Once the problem of issuing multiple denominations had been resolved, the focus of the debate about monetary standards became not how to provide a medium of exchange, but how to provide a stable price level.[7] This transition is clear in the history of choices over monetary regimes in France. In the late eighteenth century the revolutionary French government debated for fifteen years how to provide multiple denominations of currency and concluded by halfheartedly reverting to the bimetallic standard. Yet when the price of gold fell in the 1850s, the debate over the appropriate monetary standard

[7] Fetter (1965: 3) suggests similar timing: "I find practically no mention in any literature before 1797 of the idea that figured in discussions for a few years before and after the resumption of 1821, and was so prominent in the bimetallic controversy in the last quarter of the nineteenth century: that one metal would give more stable prices than would the other, or that the use of two metals as a standard would give greater price stability than would a single gold or silver standard".

contrasted a gold standard with fiduciary tokens with a renewed bimetallic standard, now promoted because it would enhance price stability. The de facto conclusion was in favour of the former, supported by the Latin Monetary Union, which created a currency union for fiduciary coins.

The histories of monetary standards of the United States and France are remarkably parallel. Both countries had revolutionary governments at the end of the eighteenth century that decimalized the monetary standard but retained bimetallism, and both countries abandoned bimetallism de facto in the 1850s following the gold discoveries. Finally both ended the free (i.e., unlimited) coinage of silver in the 1870s in ways that reflected their recent wartime experiences. That said, there were differences: the United States adopted a bimetallic standard after the American Revolution with very little debate, in contrast to the long and deep debate in France; the Americans responded to the de facto silver standard of the 1830s by decreasing the gold content of the dollar in 1834, while the French did not respond; finally, while both the Franco-Prussian War and the U.S. Civil War affected the transition to the gold standard, they did so in very different ways. The Civil War had led to a paper money standard under which the end of free silver coinage in the United States, the so-called Crime of 1873, was not so noticeable; the Franco-Prussian war had enriched Germany, and as Germany used its wealth to join the gold standard, the French government acted to prevent being the recipient of Germany's unwanted silver.

The technology of producing coins in a variety of denominations is an important explanatory variable for