Pillars of Globalization:

A history of monetary policy targets, 1797-1997

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> "To determine the pressure of steam, we do not take a popular vote: we consult a gauge. Concerning a patient's temperature, we do not ask for opinions: we read a thermometer. In economics, however, […] though the need for measurement is as great as in physics or in medicine, we have been guided in the past largely by opinions. In the future, we must substitute measurement. Toward this end, we must agree upon instruments of measurement",
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> William T. Foster, Foreword to *The Making of Index Numbers*, by Irving Fisher, 1927.

The success met by central banks in bringing down inflation during the past quarter of a century is nearly universal, and in developed countries, it is absolute. This constitutes one of the greatest transformations the global economy has experienced in the recent past. What are the forces that brought about this change? According to some, theoretical advances in modern macroeconomics explain it: First, the identification of structural credibility problems in the conduct of monetary policy, known as the "time inconsistency problem". Second, the design of new tools to address this problem, namely independent statutes for the central bank and inflation targets. According to others, the opening up of domestic markets to the forces of international competition – "globalization" -- is the invisible hand that subdued inflation. In the words of economist Ken Rogoff (2006b):

> "The advent of modern independent and anti-inflation-oriented central banks is one of the great success stories of modern economic science. But this story has been exaggerated. We should consider the possibility that the unprecedented pace of modern globalization, recently emphasized by Ben Bernanke, the Federal Reserve chairman, might also have played a role. If so, what will happen if the winds of globalization ever reverse course?"

Within this grand debate, an admittedly more focused controversy has developed on the operational design of anti-inflationary rules. First, there is the issue of whether the inflation rate is a sufficiently comprehensive indicator for monitoring monetary developments, or whether central banks should also rely on other sources of information and criteria, such as variations of the money supply. Second, there is the related issue of whether central banks should be concerned with asset prices or whether they should ignore them altogether. Third, there is the issue of determining the adequate measure of inflation, "headline inflation" vs. "core inflation", the inclusion or exclusion of fuel prices, and the adequate measure of

monetary contributions to price changes, given the structural changes brought about by globalization.

This paper intends to argue that such debates have a long history, which it may be useful to bear in mind in order to clarify some of the ongoing discussion. Specifically, we discuss the evolution of monetary policy in the long run, focusing on the history of monetary targets. This perspective highlights major resemblances and differences between the late 19th century and today. These two periods, generally described as displaying a high degree of commodity and capital markets integration, have been both characterized by the adoption of transparent policy rules assigned to independent central banks. On the other hand, the actual rule has changed dramatically over time. During the globalization of the 19th century central banks were assigned exchange rate targets. They were supposed to peg the value of the currency to a certain amount of specie (Eichengreen and Flandreau 1997). The ability to maintain the parity of the currency or to persuade market participants that there would be a reversal to the previous parity in case of deviation from this rule has often been described by later commentators as a hallmark of "good housekeeping" (Bordo and Rockoff 1996). Today by contrast, central banks are assigned inflation targets (Bernanke and Mishkin 1997). Observers often suggest that the capacity to keep the inflation rate within its assigned range (for instance, 0-2% in Europe) is as an indicator of the central bank's success.

In other words, the world has experienced a radical transformation in the definition of monetary targets between the two globalizations: External targets have given way to domestic ones. This paper intends to explain why by taking a careful look at the emergence of institutions aimed at monitoring the quality and performance of monetary policy making. To this end, the remainder of the paper is organized as follows: Section I reviews conventional views on the history of monetary policy. Section II provides a discussion of the epoch making bullion controversy of the early 18th century. Section III shows how concerns over

discretionary actions led to the emergence of the convertibility rules. Section IV follows suit showing how subsequent problems that emerged from the insufficiencies of the convertibility target led to the gradual take over of monetary policy by more or less automatic rules. Section V, finally suggest that these rules backfired in the interwar years leading to their eventual replacement by inflation target, although the basic framework of assigning a target to an independent agency, an invention of the 19th century, has been kept essentially intact.

Section I. Monetary management in the 19th century?

The conventional view is that monetary management is a recent invention, dating back to the interwar period at the earliest. Economists generally believe that in the 19th century, the existence of strict monetary rules ensured that little leeway was left to monetary policy. Central banks, the conventional wisdom goes, did not develop their operating procedures by focusing on the formulation of monetary policy, but instead, they gained their legitimacy by acting a lenders of last resort in the midst of financial crises. It is much later (following the massive deflation of the Great Depression) that Central Banks began conducting modern monetary management.

Thus the genitors of modern monetary policy were Keynesians and Monetarists, who disagreed on the role of monetary policy, but agreed on the existence and relevance of monetary policy making. Keynesians recognized what monetary policy could do. Monetarists emphasized what it could not. The reign of Keynesianism was undisputed until it began to give way under the blows of monetarist critique and a rampant stagflation. During the 1970s, modern theory identified a contradiction between a central bank's capacity to boost the economy transitorily and its inability to achieve this on a permanent basis. This contradiction (known as the time inconsistency problem) arises because monetary policy can do something about output over the short run, but nothing over the long run, the temptation to actually try

and promote employment will prove both irresistible and dangerous, for once they have recognized it, agents adjust the price and wage setting process so that the economy ends up with higher inflation. This eventually wipes out the central bank's ability to achieve anything useful, and leaves the economy worse off (Kydland & Prescott 1977, Barro & Gordon, 1983). One solution is to have an independent central bank that is run by a conservative central banker (Rogoff 1985, Cukierman 1995). This reasoning paved the way for the two institutional revolutions that occurred in the 1980s and 1990s, whereby independent central bankers were entrusted with an explicit mandate of price stability known as "inflation targeting".

As argued, the period before the advent of the Keynesian Revolution is usually portrayed as one where monetary policy making did not have the scope it has today. Authors recognize that there were anticipations of modern debates but argue that they were confined to the abstract domain of ideas (Rist 1938, Schumpeter 1952, Laidler 1991). The fact is that, in general, countries sought to peg their currency to the price of some precious metal: Initially gold, silver or a mix of the two called bimetallism (Flandreau 2003). Towards the end of the 19th century, gold became the only reference. This transformation brought a large fraction of the world on a common footing (Eichengreen and Flandreau 1996).

In practice, pegging to gold or silver was achieved through the agency of an institution known as convertibility: holders of banknotes could exchange them at the bullion window of the Central Bank against gold or silver coins and vice versa. But some countries whose finances were poorly run resorted to the seigniorage tax. In their inextinguishable thirst for funds, they devoured the resources of the central banks, which eventually found themselves unable to maintain convertibility. Excessive paper issues to finance government expenditure inevitably led to runs on the bullion reserves of the central bank (Lévy 1911). As a result,

sustained convertibility has come to be associated, in modern accounts, with sound monetary policy practice (e.g. Bordo and Rockoff 1996).

The practical implications of convertibility are far reaching. Once in place, convertibility becomes a *de facto* monetary target, akin to a fixed exchange rate defended by foreign exchange intervention. The only difference is that instead of the central bank buying and selling foreign exchange reserves against its own currency in the international foreign exchange market, it buys and sells gold or silver coins against its own notes in the domestic bullion market. But the discipline it induces is essentially the same: In practice, the central bank must adjust the money supply to the imperative of convertibility. Using the price of bullion as a nominal anchor in turn renders the money supply and the general price level endogenous (Bordo, Landon and Redish 2004). This explains the conventional view that pre-modern monetary policy making was essentially passive, being entirely subjected to the imperatives of convertibility.

This finding is related to an old fashioned interpretation of the pre-1914 of the international gold standard, which is surprisingly still very popular despite it having been proven wrong long ago. This view argues that monetary policy was dictated by unwritten "rules of the game". Supposedly, these "rules" specified that central banks facilitated the adjustment process by passing on, or even amplifying, the effect of gold reserves losses or gains (as opposed to sterilizing them). Gold losses led to more than proportional monetary contraction by central banks ensuring a swift adjustment of the international economy to the new conditions while gold gains led to more than proportional monetary expansion. That the gold standard collapsed in the interwar when it operated smoothly during the pre-1914 period is explained, according to this view, by the fact that central banks obeyed the rules in the pre-WWI period but not thereafter. However, Bloomfield (1959) demonstrated conclusively that such was not the case at all: In the pre-1914 period central banks sterilized much of the

variation in their gold reserves. Subsequent case studies have systematically confirmed Bloomfield's early findings (see e.g. Reis (2006) for a recent illustration for the Portuguese case).

Studies by Tullio and Wolters (2003a, 2003b, 2003c, 2004) identify the determinants of central bank discount rate changes relying on a homogenous German source that documents domestic and international variables at the date when central bank rate changes occurred. The countries considered are England, Germany, France, and Austria-Hungary and the period is 1876-1913. They find that variation of central bank reserves and the interest rates of the most important foreign central banks (in particular, the Bank of England) were important drivers of actual decisions in monetary policy, explaining much of their variance.

Table 1. Central Bank Reaction Functions:
Determinants of interest rate changes in four leading institutions (1876-1913)

	Reichsbank	*Banque de France*	*Öster.-Ung. Bank*	Bank of England
Variations of notes cover	-0.035 (13.0)	-0.060 (6.6)	-0.049 (5.5)	-0.039 (16.3)
Δ Reichsbank Rate	--	--	0.129 (1.9)	0.172 (3.4)
Δ BoF Rate	--	--	--	0.270 (1.9)
Δ ÖUB Rate		-0.469 (2.8)	--	
Δ BoE Rate	0.085 (1.8)	0.152 (2.8)	--	--
Exch. Rate Depreciation w.r.t. Parity	0.704 (4.6)	1.153 (6.2)	--	--
Constant	0.039 (1.0)	-0.150 (3.0)	0.028 (0.5)	0.086 (2.7)
Adj-R2	0.696	0.886	0.667	0.626
DW	2.35	1.80	2.44	1.82
N-obs	136	35	50	221

Source: Tullio and Wolters (2003a, 2003b, 2003c, 2004). The non-significant effects of other central banks interest rate changes are omitted by the authors and cannot be reported here.

In particular the large and significant effects of variations of notes cover on interest rate changes reported in the first line of Table 1 suggests that one important motivation behind the central banks policy action was the concern over convertibility. While Banks were prepared to

go to some length to avoid adjustments that might be painful for the economy, they eventually surrendered to a decline of their reserves, when convertibility was at risk, so that discount rate changes were always associated with increase/decreases in the cover ratio. This result is also supported by the significance of exchange rate variations. A loss of reserves when the exchange rate was strong for instance, was not always met by interest rate increases since this did not signal an external drain, but an internal one, with specie more likely to eventually flow back towards the Bank's coffers. Thus the only rule that central banks recognized was a convertibility, or fixed exchange rate, rule.

The notion that monetary policy was a non-issue, or a minor one, during the pre-modern period is further reinforced by the work of leading economic historians such as Goodhart (1988). Goodhart examines how private, profit making central banks transformed themselves into the public institutions they have become today, and he suggests that this was achieved during the 20th century. For the 19th century, he emphasizes the critical role of financial crises, information, and the need for a lender of last resort in promoting the role of central banks. According to Goodhart, central banks emerged when increasingly violent financial crises created the need for the emergency provision of liquidity. Institutions that had access to privileged information owing to their peculiar position within the financial system as a source of re-discount were well equipped to play that role. Moreover, the availability of government support through the granting of legal tender status for the notes of the bank of issue reinforced their capacity to deal with crises. Finally, a precondition for the transformation of central banks into their modern counterpart, was that they would move away from commercial banking and focus on their role as providers of liquidity, so as to neutralize potential conflicts of interest between the public interest and that of their shareholders. In the end, through an evolutionary process that saw the "public good" motive of financial stability taking precedence over the concern over "private" profits, modern central banks were born. More

importantly, concerns over how should monetary policy be conducted played a minor role in this evolution:

> "Until 1914 [monetary] management largely consisted of seeking to reconcile, as best as possible, the need to maintain the chosen metallic standard on the one hand with concern for the stability and well-being of the financial system, and beyond that of the economy more widely. Then, as various pressures of the twentieth century disrupted first the Gold Standard, and thereafter the Bretton Woods system of pegged exchange rates, the macro-economic objectives of monetary management were altered and adjusted. *Yet at all times, concern for the health of the financial system has remained paramount*" (our italics, Goodhart 1988, p. 5-6)

In this perspective it is the concern over financial stability that gives continuity to the history of central banks. It is beyond question that financial stability has been a chief concern among policy makers and designers of central banks statutes.[1] However, what remains to be understood is the reason why convertibility (as opposed to any other nominal anchor) emerged as a "first best" monetary policy rule, with inconvertible paper currency being a "second best", and why it has changed nowadays. Some authors have argued that the reason is that there was something special with gold adherence, in that it may have conferred credibility benefits to those who used it as a monetary target (Bordo and Rockoff 1995). This is doubtful from a contemporary perspective, since today's countries that target a fix exchange rate do not seem to display a higher degree of credibility than those with an inflation rule. In effect, empirical evidence for the late 19th century suggests that the gold standard convertibility rule did not improve borrowing terms once other factors are controlled for (Flandreau and Zumer 2004). Finally, case studies show that some countries, such as Chile, performed extremely well in terms of growth and yet never adopted a gold anchor (Briones 2004). There is therefore nothing obvious in the reasons why, before the mid-20th century, central banks

[1] . However, Goodhart's account relies heavily on case studies laid out for the US Congress' National Monetary Commission of 1908. The National Monetary Commission had been set up following the financial crisis of 1907, and its mandate was to decide whether a central bank would be able to reduce the occurrence or severity of financial crises, and it led to the creation of the Federal Reserve System in 1913 (). During those years, monetary policy as such was still in the US a very contentious issue. This was for both political and constitutional reasons: the emergence of a federal monetary authority would signal a decisive progress of centralization and required some constitutional adjustments (Timberlake 1993). It is natural therefore that the material from the US National Monetary Commission should display an exclusive focus on financial stability and downplay the relevance of concerns about how to conduct monetary policy.

generally adopted the price of bullion as target for the value of their notes and effective monetary policy rule.

Section II. Monitoring, Targets and the Gold Standard, 1797-1821

a) The Restriction period as a counterfactual

To understand why convertibility rules came to predominate, it is useful to think of plausible counterfactuals, and address the question: had specie convertibility not been adopted, what would have taken place? This question takes us to the heart of the problem of how monetary targets are defined and implemented, and how the problem of definition and implementation in turn makes a decisive contribution to the choice of what target is used.

So powerful is the reference to specie convertibility in the context of the 19th century that it may seem quite difficult to imagine a world without it. The strategy used in this paper to deal with this issue is to focus on one defining episode in monetary history when an alternative to the specie convertibility rule was seriously considered in a leading country. This was the era of inconvertibility of the pound between 1797 (when the Bank of England was granted by Parliament the right to suspended specie payments) and 1821 (when convertibility was resumed), known as the "Restriction Period".

Modern students of the Gold Standard portray the episode as a parenthesis (Bordo and Schwartz 1984). But a quarter of a century is not an interregnum. During those years, people borrowed, reimbursed, purchased, sold, wrote contracts, financial markets expanded, and in effect Britain was fully engaged in a major economic transformation, known as the Industrial Revolution, which saw its economic leadership durably established. Moreover, there were senior authorities and member of parliament who recommended that this regime should go on indefinitely. As argued by Frank Fetter (1965), the episode and the controversy it triggered

were critical for the making of "19th century monetary orthodoxy", by which is usually meant the adoption of convertibility as a key target for monetary policy.[2]

One key aspect of the episode of Restriction is that it had not been motivated by a credibility problem. The Directors of the Bank had secured it as a preemptive measure in a period of military conflict with France. As the economist David Ricardo (although a fierce critic of the policies of the Bank of England) emphasized, the monetary vicissitudes of the period did not derive from a "want of confidence in the Bank of England, or any doubts of their ability to fulfill their engagements" (Ricardo, 1810, 'Introduction'). For the first time in modern history, a developed nation – the *most* developed nation in the world – thus experienced the effects of inconvertibility without this being associated, unlike earlier episodes, with a major credibility crisis, such as when John Law infamously inflated away France's public debt.

Not surprisingly, people debated the merits of the new regime. Some, such as the Directors of the Bank of England supported a continuation of inconvertibility. Others (e.g. Ricardo 1810) called for a swift resumption of specie payments. In 1809, as the pound sterling experienced a serious depreciation in foreign exchange markets, a Parliamentary Committee was set. The Committee comprised influential figures of the banking community such as Alexander Baring and economists such as Henry Thornton, author of a famous pamphlet on the effects of inconvertible paper currency (Thornton 1802). After extensive interviews with merchants, bankers, economists, and policy makers the Committee produced the celebrated

[2] . "In 1797 there was in England no generally accepted theory of a monetary and banking system. There were only laws and institutions, inadequate and in some cases inconsistent. The two decades before 1797, despite the economic growth of the country and the expansion of banking, had been almost devoid of any fundamental analysis of the monetary standard, of banking theory, or of the position of the Bank of England. The suspension of specie payments by the Bank of England on February 27, 1797, and similar action by the Bank of Ireland a few days later, precipitated a controversy that continued for over three quarters if a century. Out of this controversy developed most of the principles of monetary and banking orthodoxy, not only of England, but of virtually the entire Western world in the forty years before 1914". (Fetter 1965: 1).

Bullion Report (Parliamentary Papers, 1810). The *Report* recommended a gradual return to specie convertibility.

Yet, even after the Report was published, there was much delay in actual implementation. The Parliament postponed publication of the report and when a vote eventually took place it led to a rejection of its key proposal, viz., return to convertibility, by a clear majority. Despite infuriated diatribes in the Parliament, a decision regarding convertibility was postponed until 1818 and convertibility itself had to wait until 1821. Thus the period of Restriction forced economists and authorities to confront the possibility of embracing a truly different monetary framework. It is therefore an excellent observation point to study policy making at the crossroad.

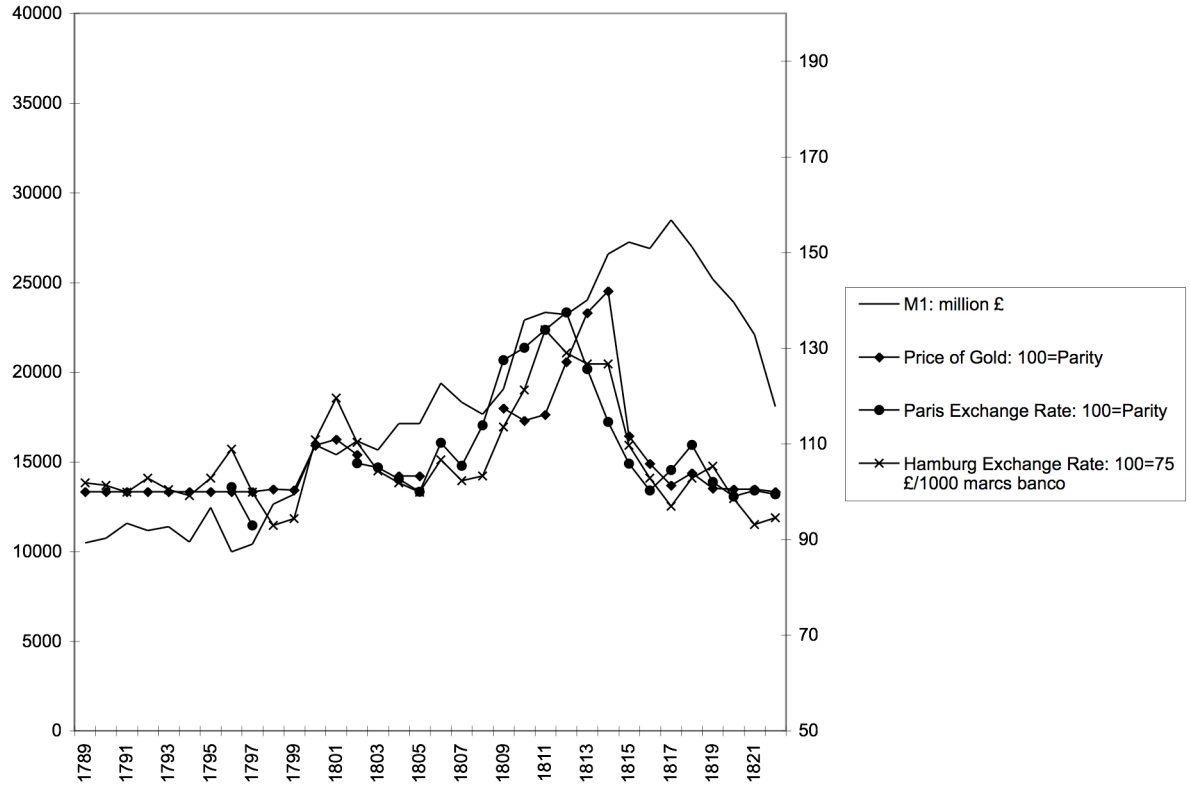
b) Tolerably accurate criteria

The controversy surrounding the Restriction is widely credited as epoch making for monetary theory (Schumpeter 1954, Fetter 1965). It is not our purpose to review here the fascinating debates that pitted against one another some of the best economic minds of the time. Historians of economic thought have focused on the underlying theoretical issues, identifying the view of the Bank's Directors as one version of the real bills doctrine, and that of Ricardo and Thornton, endorsed by the *Bullion Report*, as an anticipation of modern quantity theory (Fetter 1965). In what follows we extract some meaningful elements that will serve us to document institutional aspects of the debate.

On the surface, controversy revolved on the effects of the Restriction. People concurred that suspension of specie payment since 1797 had "enabled the conductors of [the Bank of England] to increase or decrease at pleasure the quantity and amount of their notes" (Ricardo, 1810), and available economic elements suggested that the restriction had increased rather than decreased the money supply. Technically, the question was to determine whether the

Bank circulated the right amount of money, or whether the suspension had led to "over issues".

Figure 1. Economic elements of the Bullion Controversy



Source: Exchange rates and the price of gold: Lloyd's list. M1 (note circulation): Clapham 1944.

Figure 1 documents the elements available to contemporaries.[3] As seen they observed a continuous increase of the money supply that had actually begun before the Restriction but accelerated markedly afterwards. A peak was reached when the debate erupted in 1809. Contemporaries also observed two further phenomena. First, the price of gold was going up. Second, foreign currencies were appreciating against sterling. After having hold up well

[3] . We take this series from Clapham (1944) but the *Bullion Report* and Ricardo (1910) show that these numbers were known to the public. A related series, also known to the contemporary public, is the average amount of commercial bills under discount provided by Cannan (1919). Note that the Bank was reluctant to be fully transparent and retained information on some important data such as bullion reserves. However, as described in Klein (2005) the bullion reserve of the Bank of England was communicated as an index from 1797 onwards and the relation between the index and absolute values was soon leaked. Moreover, directors of the Bank knew the true figures from the start and were also who were also shareholders so that stock prices must have reflected their private information.

despite the Restriction, the pound was now diving. This raised the possibility that the conductors of the Bank had misused their new monetary prerogatives.

The directors of the Bank insisted they were not "over-issuing" in any sense. They challenged the notion that an increase in the supply of banknotes would depreciate them, arguing that they "could not see how the amount of Bank notes issued can operate upon the price of Bullion, or the state of the Exchanges" (BR p. 34). On the empirical front, they emphasized that the course of the exchange and the amount of paper circulation "frequently have no connection" (BR, p. 33), a claim that was not entirely unfounded but certainly exaggerated. On the theoretical front, they argued that they could never "over-issue" because they would "never force a Note in circulation" (BR 47) and because they would only discount "legitimate mercantile paper" (BR 47). On the practical front, they claimed that, since they would never discount the bills of speculators concerned with shipping gold abroad, their monetary policy could not have any effect upon the exchanges (BR p. 32).

Both the authors of the *Bullion Report* and Ricardo (1810) disagreed. Building on the insights of the monetary approach to the balance of payments as developed by Hume (1726) and by then part of the conventional wisdom[4], they provided explicit predictions of what should be expected, *ceteris paribus*, from an increase in paper money in an inconvertible regime. Their conclusion was that "a general rise of all prices, a rise in the market price of gold, and a fall of the foreign exchanges, will be the effect of an excessive quantity of circulating medium in a country which has adopted a currency […] not convertible at will into a Coin which is exportable" (BR, 17). Because there was no consensus at the time on how to construct a price index, and because examining prices one after the other would turn out to be tedious, the value of the pound in terms of other currencies was taken by the authors to be a

[4] . Suggesting that Fetter's claim that there was no monetary doctrine available in 1797 is an exaggeration. As is obvious from both the *Bullion Report* and Ricardo (1810) who claim to be proceeding from first principles, here was a dominant view and this view was rooted on what is known today as the monetary approach to the balance of payments.

"tolerably accurate criterion by which we may judge of the debasement of the currency proceeding from […] a depreciated paper-money" (Ricardo, 1810 p. 12). In their hands, the evidence in Figure 1 of a depreciated exchange rate and high price of gold became the basis of "two unerring tests" (Ricardo 1810, p. 13) designed to reject the Bank of England's hypothesis that its paper issues had no effect on the value of the notes. Through Figure 1, the "evils" of a depreciating currency, as Ricardo called them, were traced to a monetary source. In the more prudent language of the authors of the *Bullion Report*:

> "Although, as Your Committee has already had the occasion to observe, no certain conclusion can be drawn from the numerical amount of paper in circulation, considered abstractly from all other circumstances, either as to such paper being in excess, or still less as to the proportion of such excess, yet they must remark, that the fact of any very great and rapid increase in that amount, when coupled and attended with all the indications of a depreciated circulation, does afford the strongest confirmatory evidence, that, from the want of some adequate check, the issues of such paper have not been restrained within their proper limits" (p. 64).

c) The problem of discretionary policy

Because the pound had depreciated in value and because one could not reject that this depreciation could be traced to monetary expansion, one had to reject the view that the supply of money by the Bank of England was always in proportion with the needs of the economy, as the directors maintained. However, there is a long way to go between this finding and the recommendation to return to gold convertibility. Strict monetarism does not mean a fixed exchange rate, but rather an explicit rule for monetary creation. But the Report explicitly objected to such rules (BR:). Moreover, several parts of the *Report*, which Fetter argues had been inspired by Henry Thornton, contained anticipations of the benefits of active monetary management. For instance there were references to the problem of downward wage rigidity (BR p. 67), and consequently, a discussion of the costs of deflationary adjustments that may result from monetary contraction (BR:). The acuteness of such concerns are quite perceptible when the authors of the Report recommend a gradual return to convertibility, with advance warning to the market so that prices could operate a swifter adjustment (BR:). In the same vein, Thornton (1802) is widely credited as having pioneered a statement of the short run

expansionary effects of monetary policy, as well as a discussion of its long run limitations. In such a background, an inconvertible currency might have provided a more adequate framework.

The reasons why the authors of the Bullion Report recommended a return to convertibility thus cannot be mixed up with the monetarist arguments the Report contains. This paper claims that the reasons for recommending convertibility have to do with institutional issues pertaining to mechanism design. In several parts, the Report expresses reservations towards discretionary monetary policy. The unavailability of rigorous, consensual, quantitative evidence that would relate prices and quantities and serve to measure the extent of the "excess issue". The alternative was to trust individuals. However, the authors of the *Report* were skeptical on the human ability to conduct discretionary monetary policy. Rules were better than discretion:

> "The suspension of Cash payments has had the effect of committing into the hands of the Directors of the Bank of England, to be exercised by *their sole discretion*, the important charge of supplying the Country with that quantity of circulating medium which is exactly proportioned to the wants and occasions of the Public. *In the judgment of the Committee, that is a trust, which it is unreasonable to expect that the Directors of the Bank of England should ever be able to discharge. The most detailed knowledge of the actual trade of the Country, combined with the profound science in all the principles of Money and Circulation, would not enable every man or set of men to adjust, and keep always adjusted the right proportion of circulating medium in a country to the wants of trade*" (Bullion Report, p. 52, our italics)

The main advantage of the gold standard rule, following this line of reasoning, was its legibility for the polity observing the actions of the Bank. Convertibility was a completely transparent principle whose maintenance could be tested at any time by looking at the price of gold in the newspapers.[5] From that respect, the convertibility advocated by the *Bullion Report* can be thought of as a second best arrangement. The Report acknowledged that other

[5] . In the words of Ricardo: "It will be a circumstance ever to be lamented, if this great country, having before its eyes the consequences of a forced paper circulation in America and France, should persevere in a system pregnant with so much disaster […] The only legitimate security which the public can possess against the indiscretion of the Bank is to oblige them to pay their notes on demand in specie; and this can only be effected by diminishing the amount of bank-notes in circulation till the nominal price of gold be lowered to the mint price [thus adopt convertibility]."

arrangements could exist and could in time be even superior. But none was as simple and verifiable as the commitment to pay gold for the notes.

From that respect, the real concern of the members of the Bullion Committee had been to find the official doctrine of the Bank at odds with the facts and its Directors adamant in their adherence to what Fullarton later called their "decried doctrine" (Fullarton 1845). This was a much more serious problem than the depreciation of the pound sterling per se. Ships may travel North or South just as well, but their captains must be able to read a compass.[6] Consequently, convertibility, a foreign exchange target, can be thought of as having really solved a monitoring problem. The emergence of the convertibility rule as a building block of "19th century monetary orthodoxy" did not result from theoretical considerations, but from governance problems. Apparently, the concerns of the policy makers of the 19th century were quite similar to the ones of their modern counterparts.

Section III. Private profit, collective ends, and policy rules: What Do Central Banks Maximize?

a) Inconvertibility and shareholders value

And thus much of the Bullionist controversy can be interpreted as a debate on the making of monetary policy, raising the interrelated problems of target selection and mechanism design. Modern theory derives monetary policy making from an optimization framework

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[6] . When the Directors of the Bank declared that the monetary policy was guided by the solidity of the borrowers, so that they "could not materially err" and always provided the circulation with the right amount of banknotes, the Committee confronted them with a thought experiment. The interest rate was 5% and they said they satisfied only legitimate needs. But, the Committee went on:

"Is it your opinion that the same security would exist against any excess in the issues of the Bank, if the rate of the discount were reduced from £5 to £4 per cent ?"

Answer. [by *Mr. Whitmore*]—"The security of an excess of issue would be, I conceive precisely the same." *Mr. Pearse*. – " I concur in that Answer."

"If it were reduced to £3 per cent.?" – *Mr. Whitmore*, "I conceive there would be no difference, if our practice remained the same as now, of not forcing a note into circulation." *Mr. Pearse*. – "I concur in that Answer." (quoted in Bullion Report, p. 48)

Members of the Bullion Committee were well aware that by these answers, the Directors had unknowingly given the fort away, since they contained an implicit recognition that the Directors' rule pointed to no single equilibrium. This is why they deemed the exchange a "very important part of the Evidence of these Gentlemen" (p. 48).

whereby authorities must set the inflation rate given preferences over price stability and output. The conflict between these two targets is at the origin of a sub-optimal equilibrium, which is solved by the creation of an independent central bank whose mandate is to focus exclusively on its anti-inflationary stance. Policy targets are then assigned in a fashion that is inspired from the theory of mechanism design. In one extreme form, the compensation central bank governors receive is a function of the success met in actually implementing their assigned goals (Walsh 1995a, 1995b, 2002). By the same token, an element of private interest is introduced in what is essentially the pursuit of collective ends.

In the late 18th century by contrast, when there were "only laws and institutions", but no "generally accepted theory of monetary policy" (Fetter 1965), elements of private and public interests intermingled with one another in a somewhat chaotic way. In particular, a central pillar of the more advanced monetary systems of the time, such as that of Holland and Britain, was that a private central bank was in charge of fulfilling the public task of producing hard powered money. In this context, a critical aspect of the Bullionist controversy (albeit one that is overlooked in conventional accounts) was the fact that the stock of the Bank of England rose sharply at the same time as its monetary issues expanded. There were, as a result, concerns that the suspension of convertibility had put a private concern in the position to collect a revenue from paper issues and thus induced an inflationary bias in the system. There can be no doubt, for instance, that Ricardo, a broker with intimate knowledge of fluctuations in the stock market, felt that way. Similar accusations must indeed be what prompted the former Governor of the Bank (Whitmore) and the current Vice Governor (Pearse) to claim that in setting the money supply they were "never induced, by a view to their own profit, to push their issues beyond what they deem consistent with the public interest" (Min. p. 19).

The issue therefore, is the extent to which interactions between the suspension of convertibility and the private motive created pressures for excessive paper issues. This

problem really has two facets, which must be dealt with separately. The first is straightforward: other things being equal, should a private central bank prefer convertibility of inconvertibility? The holding of specie reserves entails a deadweight loss. In the case of a 100% cover for instance, the asset side of the balance sheet of the Bank is exclusively made of non-interest bearing gold, which exactly offsets the note issues. The central bank derives no benefit from issuing notes. By contrast, if the central bank holds zero gold reserves, then the profitability is maximum since liabilities are non-interest bearing notes while assets are made of commercial loans at the ongoing interest rate. Therefore, the expansion of the real monetary base while it is wonderful news for shareholders in an inconvertible standard, leaves them unexcited in a 100% cover system. Formally, the derivative of the price of the central bank's stock with respect to an increase in the demand for real balances must be greater in a regime of inconvertibility than in a convertible regime:[7]

$$\frac{\partial P_{BoE}}{\partial (M/P)}\Big|_{inconvertible} > \frac{\partial P_{BoE}}{\partial (M/P)}\Big|_{convertible}$$

Before we report evidence of this, we must immediately remark that in real life things were slightly more complex. First the Bank of England also took deposits, which were then lent again so that the profits from note issuing were combined with regular banking intermediation. Second, even during the inconvertibility period, the Bank kept gold reserves, so that the return to convertibility in 1821 did not imply a complete shift in profitability.[8] Nonetheless, as illustrated on Figure 2, the association between the real money balances and the price of the Bank of England stock measured in constant terms was significantly altered by the return to convertibility, with the derivatives behaving as predicted in Equation (1). In other words, when the currency is non-convertible and the central bank privately owned, the

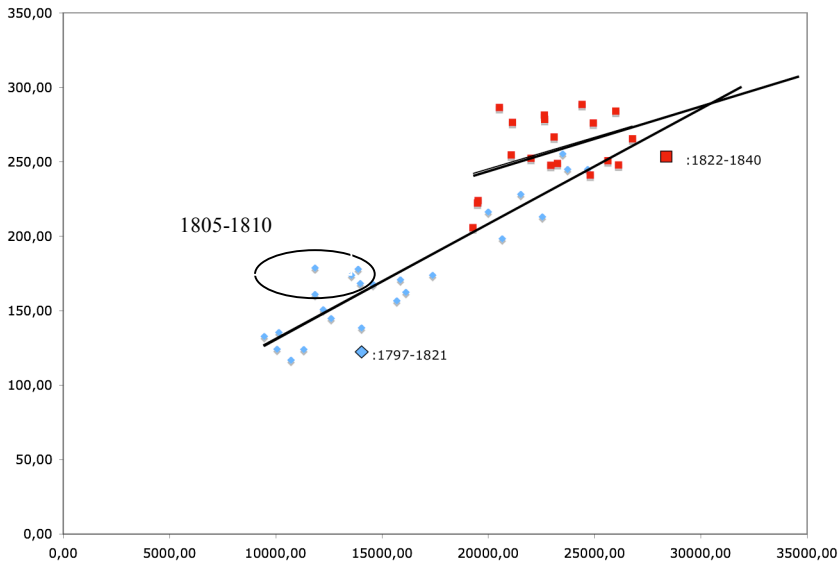
[7] . Horsefield reports evidence suggesting that this logic was familiar to contemporary investors who inferred the actual cover ratio (which was undisclosed to the public, see footnote 3) from knowledge of gross dividends and an assumption about returns (Horsefield 1940).

[8] . The computations in Horsefield (1940) show bullion as a proportion of Notes plus Deposit around 20% in the 1800s and 10% between 1810 and 1815. For details on implicit cover rules during the Restriction period see Horsefield 1940. For a discussion of Palmer's rule of 1832 prescribing a 1 to 3 cover ratio (between notes and bullion) and for the origins of the cover system prescribed in Peel's Act see Horsefield (1944).

shareholders of the Bank and the economy at large have aligned interests: economic growth increases the demand for real money balances, which drives up the profits of the central bank.

The Bullion Report recognized the situation. It emphasized that that it was "natural for the Bank Directors to believe, that nothing but benefit could accrue to the public at large [from the inconvertibility of the pound], *while they saw the growth of Bank profits go hand in hand with the accommodations granted to the Merchants*". (our italics, *Bullion Report*: p…). It explains the reason why the Bank of England was a fierce supporter of inconvertibility. The inference, in any case, is that privately owned central banks did not like the gold standard. This is interesting, especially because political scientists and historians often claim that the gold standard epitomized the age of *laissez faire* (e.g. Gallarotti 1995): we conclude that, had private interests got it the way they wanted, they would have rather floated.

Figure 2. Real Money Balances and the Bank of England Stock



Source: Bank Stock: Vitu 1867, M1: Clapham 1944

b) Profit motives and monetary rules

The second matter that deserves to be examined is whether, as some feared, a private central bank seeking to maximize profits would have adopted an inflationary stance. It was obvious that David Ricardo was primarily concerned by the fact that a central bank that would not follow convertibility rules would essentially behave like a seigniorage revenue maximizing government (Ricardo 1810). To discuss this matter, it is useful to develop a simple theoretical analysis of the difference between seigniorage collection by a government and an independent monetary monopoly respectively. Let:

M : nominal quantity of money

P : price level

M=M/P : real money balances

Y : nominal income

y=Y/P : real income

g_x=d(log x)/dt=(1/x)(dx/dt) : percentage rate of growth of variable x (e.g. g_P : inflation)

m^D=f(y,g_P) : demand for real money balances

i=r+g_P : the nominal interest rate equal to the sum of the exogenous real interest rate and the inflation rate.

Consider first the steady state revenue Φ^G collected by a government seeking to maximize seigniorage (see e.g. Friedman 1971) for a classic treatment. conventionally given by:

$$\Phi^G = \frac{1}{P}\frac{dM}{dt} = \frac{M}{P} \cdot g_M \qquad (1)$$

Along the steady state, inflation is constant, and since by assumption real income is also constant (positive growth could be handled without loss of generality) we have:

$$g_P = g_M \qquad (2)$$

Moreover, equilibrium between money demand and money supply requires:

$$m^D = m \qquad (3)$$

It is then possible to compute the derivative of the government revenue function with respect to g_P in order to obtain a first order condition for the revenue maximizing steady state inflation rate. Formally, substituting (2) and (3) into (1) and taking the derivative yields:

$$\begin{aligned} \frac{d\Phi^G}{dg_P} &= \frac{M}{P} + g_P \frac{df(y,g_P)}{dg_P} \\ &= \frac{M}{P} + \frac{M}{P} \cdot \frac{1}{f(y,g_P)} g_P \frac{df(y,g_P)}{dg_P} \\ &= \frac{M}{P}\left(1 + g_P \frac{d\log m^D}{dg_P}\right) = 0 \end{aligned} \qquad (4)$$

From where we get the usual solution:

$$g_P \frac{d\log m^D}{dg_P} = -1 \qquad (5)$$

Moreover to simplify things further we consider the following money demand function:

$$m^D = l(y)e^{-bg_P} \qquad (6)$$

In this case we have:

$$\frac{d\log m^D}{dg_P} = -b \qquad (7)$$

So that:

$$g_P^* = g_M^* = \frac{1}{b} \qquad (8)$$

Consider now the situation of a revenue maximizing central bank. The revenue function is not given by the real value of instantaneous monetary creation as in the government case, but by the purchasing power of the interest earned on lending against banknotes (i.e. zero cost resources). Formally this is:

$$\Phi^B = i \cdot \frac{M}{P} = (r + g_P)\frac{M}{P} \qquad (9)$$

Taking derivatives with respect to the inflation rate and setting equal to zero yields:

$$\begin{aligned}\frac{d\Phi^B}{dg_P} &= \frac{M}{P} + (r+g_P)\frac{df(y,g_P)}{dg_P} \\ &= \frac{M}{P} + \frac{M}{P}\cdot\frac{1}{f(y,g_P)}(r+g_P)\frac{df(y,g_P)}{dg_P} \qquad (10) \\ &= \frac{M}{P}\left(1+(r+g_P)\frac{d\log m^D}{dg_P}\right)=0\end{aligned}$$

From where we get:

$$(r+g_P)\frac{d\log m^D}{dg_P} = -1 \qquad (11)$$

Substituting (7) into (11) gives the formula for the steady state optimal inflation rate:

$$g_P^{**} = g_M^{**} = \frac{1}{b} - r \qquad (12)$$

Which is strictly smaller than the optimal inflation and money creation rate for the seigniorage maximizing government. Moreover, for reasonable parameters of interest rate elasticity of real money demand, which are typically set between 0.2 and 0.4 (Knell and Stix 2004), and a real interest rate of, say 3 per cent, we get a target inflation range of -0.5 to 2%.

To understand why this is arises it is convenient to look at what happens when the interest rate elasticity is very large ($b \to \infty$). Then we have:

$$g_P^{**} = -r \qquad (13)$$

Where we recognize Friedman's inflation rule, which is normally derived by assuming a benevolent central planner in charge of setting the money growth rate (see Woodford (1990) for a comprehensive discussion). The intuition why it arises naturally in a profit maximizing framework is the following: a private central bank is concerned with minimizing the opportunity cost of holding money because this ensures that real money balances are maximized. From a monetarist perspective, the interests of a profit maximizing central banker issuing fiat currency and those of the public at large are in this case aligned with one another.

The beauty of this result is its irony. The Bullionist controversy is conventionally remembered as having pitted against each other forerunners of monetarism (Ricardo and the authors of the *Bullion Report*) and supporters of the real bills doctrine (the Directors of the Bank of England, among others), the former warning against the inflationary bias that may have arisen from a bank abiding exclusively by the profit motive. The analysis developed here shows that from a strictly monetarist point of view, it is not clear at all why profit maximization should lead to excessive inflation. In fact if agents are sufficiently averse to inflation then the profit seeking central bank will implement Friedman's rule. Consequently, inconvertibility per se cannot be seen to entail an inflationary bias.

This result is robust to a number of variants of the model at hand. Consider for instance the situation of Keynesian unemployment where monetary expansion can boost output. Then a profit maximizing central banker has an incentive to be accommodating as long as the expansion is non inflationary. This is because, by boosting output, the banker can push the economy towards an equilibrium where output is bigger and thus the demand for real money balances is larger, which increases his/her profits. Beyond this point however, money creation becomes inflationary and fails to boost output, thus reducing real profits. The banker will thus be induced to create money exactly up to the point where inflationary pressures set in. This situation was explicitly discussed by Thornton (1802).

Alternatively, consider the case of inflation surprises.[9] They boost output transitorily leading to one-off real output gains. But these gains are offset by real losses suffered through

[9] . On inflation surprises and their effects, vide Ricardo (1810): "It is no dispute, that if the Bank were to bring a large additional sum of notes into the market, and offer them on loan, but that they would for a time affect the rate of interest. The same effects would follow from the discovery of a hidden treasure of gold and silver coin. If the amount were large, the Bank, or the owner of the Treasure, might not be able to lend the notes or the money at four, nor perhaps three per cent.; but having done so, neither the notes, nor the money, would be retained unemployed by the borrowers; they would be sent into every market, and would everywhere raise the price of commodities, till they were absorbed in the general circulation. It is only during the interval of the issues of the Bank, and their effect on prices, that we should be sensible of an abundance of money, interest would, during that interval, be under its natural level; but as soon as the additional sum of notes or of became absorbed in the general circulation, the rate of interest would be as high, and new loans would be demanded with as much eagerness as before the additional issues […] To suppose than any increased issues of the Bank can have the

the depreciation of the bank's assets, since the bank is a creditor. There are also the long run costs associated with loss of credibility and higher nominal interest rate (expected inflation) in the future, leading to reduced real money holdings. Finally, because the bank is a chartered monopoly, it must take into account the risk of losing its privilege in the future because of inadequate monetary policy.

The precise effect of these various factors on the conduct of monetary policy will depend on several variable and parameters and it is no place here to develop all the alternatives. But the basic element is that we cannot see any reason why a profit maximizing central bank should systematically over-issue. If, as monetarists believe, central banks have no influence over the long run on real values, and if a private central bank issuing an inconvertible currency maximizes its profit by ensuring that it produces a high quality asset, thus maximizing demand, there is in effect little scope for permanent expansion. Thus, while the directors of the Bank may have erred in motivating their policies with their theoretical reference to the real bills doctrine, their overarching concern over profits and retaining their charter must have acted as a powerful break on inflationary policies. From a historical point of view, we may remark that, past 1810, prices stopped rising and began actually a steady decline (Figure 1). And yet nothing had changed in the formal framework in which the Bank of England conducted policy.

To conclude, Figure 3 provides a last test of the views developed above by examining whether shareholders of the Bank reacted favorably to inflation. Figure 3 gives empirical evidence that during the Restriction period, if there was an association at all between inflation and Bank stock price changes, it was a negative one. Had the Directors "over-expanded", the

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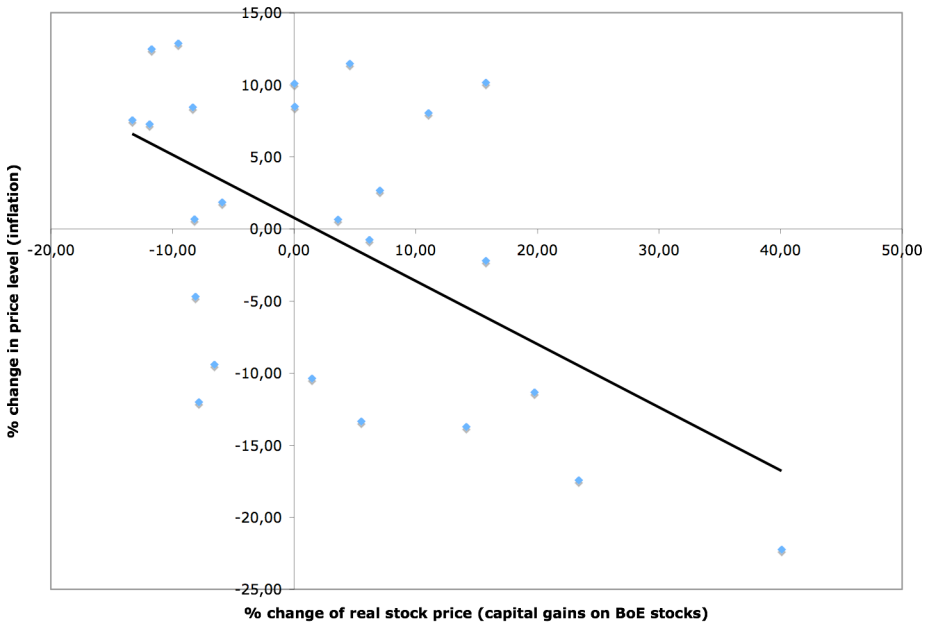
effects of permanently lowering the rate of interest, and satisfying the demands of all borrowers, so that there will be none to apply for new loans, or that a productive gold or silver mine can have such an effect, is to attribute a power to the circulating medium which it can never possess. Banks would, if this were possible, become powerful engines indeed. […] No nation, but by similar means, could enter into competition with us, we should engross the trade of the world. To what absurdities would not such a theory lead us!"

shareholders would have complained. The consequence of this may perhaps be the claim, quoted earlier, that the Directors were "never induced, by a view to their own profit, to push their issues beyond what they deem consistent with the public interest". This understatement could be the true rationale behind the real bills doctrine – that the interests of a profit maximizing monopolistic bank of issue are aligned with those of the economy at large, as the Bullion Report itself had recognized.[10]

Figure 3. Is inflation good for shareholders?



Source: Author's computations

c) Convertibility as the Invisible Hand of Monetary Policy

In the end we understand better the dilemma in which British policy makers found themselves in the early 19th century. On the one hand, they were uneasy with the notion that a private institution operating on the sole basis of shareholder value would always generate good monetary policy decisions. This was expecting a lot from a special interest. At the very least, they felt there was something inadequate in the private appropriation of the profits from

[10] . "And it was very natural for [the Bank Directors] to pursue as before […] the same liberal and prudent system of commercial advances from which the prosperity of their own establishment had resulted, as well as in a great degree the commercial prosperity of the whole country" (BR, p. 49).

circulating inconvertible notes. In one of the most articulate expressions of this concern, Ricardo (1819) claimed that the public was not getting a fair deal in the current regime and made suggestions for alternative rules to share in the profits. In a posthumously published tract (Ricardo 1824), he explained that he wanted the Bank of England to be split in two parts, a government run currency board, and a privately owned commercial bank without a note issue privilege. A similar, though less extreme view was spelt out in the *Bullion Report* recommending that, if Parliament were not to decide a return to convertibility, then "some mode ought to be devised of enabling the State to participate much more largely in the profits accruing from the present system [of inconvertibility]".[11]

On the other hand, if this logic were pushed to its conclusion, and a rule be designed to share the profits between the Bank and the State, there was a serious concern that Government would take over the business of printing money, assigning to the Bank targets that may be detrimental to the welfare of the economy, for the Leviathan could turn out to be primarily concerned with seigniorage collection. This explains why the authors of the *Report*, hastened to state that the nationalization of profits was "by no means the policy they wish to recommend" (p. 65) adding a few pages later that the "compulsory limitation […] of the rate of the Bank profits and dividends by carrying the surplus of profits above that rate to the public account […] would be objectionable as a most hurtful and *improper interference with the rights of commercial property*" (BR, p. 68: our italics).

And thus to the Smithian distrust of a merchant's ability to act willingly in the interest of the community at large responded the Smithian pessimism regarding a government ability to set adequate targets. The emergence of convertibility rules was a response to this institutional

[11] . "If Your Committee could be of opinion that the wisdom of Parliament would not be directed to apply a proper remedy to a state of things so unnatural and teeming, if not corrected in time, with ultimate consequences so prejudicial to the public welfare; they would not hesitate to declare an opinion, that some mode ought to be devised of enabling the State to participate much more largely in the profits accruing from the present system". (p. 65)

conundrum. As long as there is convertibility, supporters of this rule argued, a privately owned bank is under a set of constraints, which induce it to behave in the interest of the economy at large, while pursuing its own interest. Suppose it does over-issue. Then this is bound to lead to an increase of domestic prices. The resulting loss of competitiveness causes a trade deficit, and a drain of the bullion reserve. This threatens the solidity of the Bank, which consequently adjusts the circulation of notes (money supply) in order to defend its own credit. In the end, the Bank creates exactly the "right" amount of money, and convertibility emerges as the invisible hand of monetary policy. As it was argued in the Bullion Report:

> "So long as the paper of the Bank was convertible into specie at the will of the holder, it was enough, *both for the safety of the Bank and for the public interest in what regarded its circulating medium*, that the Directors attended only to the character and quality of the bills discounted as real ones and payable at fixed and short periods. They could not much exceed the proper bounds in respect of the quantity and amounts of Bills discounted, so as thereby to produce an excess of their paper in circulation, without quickly finding that the surplus returned upon to themselves in demand for specie. *The private interest of the Bank to guard themselves against a demand of that nature, was a sufficient protection for the public against any such excess of Bank paper*, as would occasion a material fall in the relative value of the circulating medium" (BR, pp. 48-9, our italics).

This conclusion is important. As already indicated, previous students of the history of central banks have emphasized the role of financial crises and the need for a separation between commercial lending and lending of last resort, in effect between private profit and collective ends, as a preliminary stage in their evolution, taking place in the 20th century (Goodhart 1988). This paper's exploration of the making of convertibility rules in the early 19th century suggests a different chronology and a different focus. The need to address the conflict of interest between the private profit of the central bank and the general welfare of the economy manifested itself quite early, and was chiefly concerned with monetary policy, not crisis management.

Section IV. Money and crises

But convertibility did not fix everything. First, it implied that under some plausible circumstances such as a reduced production of bullion or a collapse of international monetary

cooperation, the "right" amount of money would mean deflation. Combined with downward wage rigidity, this could turn out to be costly (Bordo, Landon, and Redish 2004). The problem would manifest itself in the most disastrous way during the interwar period when the gold standard became the "millstone around the neck of national economies, helping them to sink" (Eichengreen and Temin 2000). But there were difficulties over shorter horizons as well, and the "blind faith in convertibility as a panacea" (Horsefield 1944: p. 112) soon proved to be a delusion.

a) Monetary rules and asset price bubbles

By reference to the "right" amount of paper issues, contemporaries referred to both quantitative and prudential norms. The "right" amount of money was one that would neither encourage a depreciation of the currency nor generate asset price bubbles. The one instrument could meet two targets, because they coincided. This view is evidenced by the recurrent insistence on the need to discount "real" bills only, by which it was understood bills issued as part of a genuine commercial transaction, as opposed to purely financial operations. In this logic, the blame for the financial crisis of 1812-1814 was assigned to the excesses of paper money. The notion thus prevailed in some circles that a monetary supply subjected to the convertibility rule would render the currency more "elastic", a popular wording that was often used but rarely defined, and which in the early 19th century essentially meant "automatic". Technically, it was thought that the Bank's ability to set an adequate money supply would in turn work throughout the banking system via the operation of the multiplier, and would thus ensure that speculative manias would never be encouraged.

This was asking a lot, as it soon appeared. In 1848, only a few years after theses ideas had been eventually formalized in the Bank Act of 1844, after having been informally operative between 1821 and 1844, a massive crisis took place, triggering a run on the reserves of the Bank. Despite its quasi-currency board features (apart from a free circulation of £ 14 million

notes had to be backed one for one by reserves), the Bank was forced to seek the protection of inconvertibility from the Government. Technically, banking failures, triggered by commercial liquidations, had led to a scramble for gold. Depositors of the bank joined with holders of banknotes to get their balances paid into gold and, since deposits were not part of the formula that tied M1 to gold reserves, the bank was caught short.

The episode forced to recognized that the convertibility target was not a magic bullet ensuring that financial crises would be kept at bay.[12] It came to be recognized that financial emergencies created a need for central bank discretionary action over and beyond the automatic stipulations of a convertible currency. But then all governments faced the same dilemma that had been at the heart of the Bullionist controversy of the early 19th century. Again, there could be conflicts of interest in the exercise discretionary action, and boundaries had to be set to ensure the political acceptability emergency liquidity provision.

This became the center of a European wide debate when, in 1860, Juglar, a French economist, published a pioneering study of this problem (Juglar 1889). Juglar was interested in describing the features of what he called "periodical commercial crises", which he found to be recurrent, international, and always financial in nature. One of his major findings was the identification of early warning indicators in the behavior of macroeconomic banking series and in particular in the central bank balance-sheet. Three phases, he argued, were to be identified. During the first period, of expansion, credit was easy, the demand for liquidity declined and the bullion reserves of the central bank were reduced. A point was reached however when reserves were becoming too narrow and the central bank became more cautious in extending credit. But this was calling off the punch bowl when people were

[12] . Clapham (1944) reports that the Directors of the Bank had themselves agreed to the Act of 1844 and in effect contributed to drafting it. This suggests that the Bank understood before their opponents that the convertibility rule would not discourage crises, and that it was better to comply to an external, automatic, rule which would bear the brunt of the criticism in case of problem, than to adopt a discretionary policy and be the target of attacks in case of problems. This strategy also protected the privilege and indeed, Fetter reports that the price of the Bank stock rose when the Act was known.

already drunk. The actions of the bank only increased alarm causing more agents to seek support from the bank, and more to be turned down. The second phase – the crisis properly speaking -- was in full swell by then. Then began the third and last phase, of liquidation. Businesses went bankrupt. The demand for liquidity was raised, because borrowers now needed to have more cash in hand to persuade lenders of credit worthiness. Then, as the economy languished and the velocity of money declined, the central bank began rebuilding its bullion reserve. A low point was reached and the cycle could start again.

Did the central bank have a responsibility in the process? Shouldn't it have acted earlier? Wasn't the strict implementation of the convertibility rule pro-cyclical and thus detrimental? Juglar's analysis raised questions that are surprisingly modern. In implying that, along the business cycle, there were other targets that the Bank might want to consider, he really anticipated on the modern debate on monetary policy and asset price bubbles (see e.g. Detken and Adalid 2006 for a recent discussion).

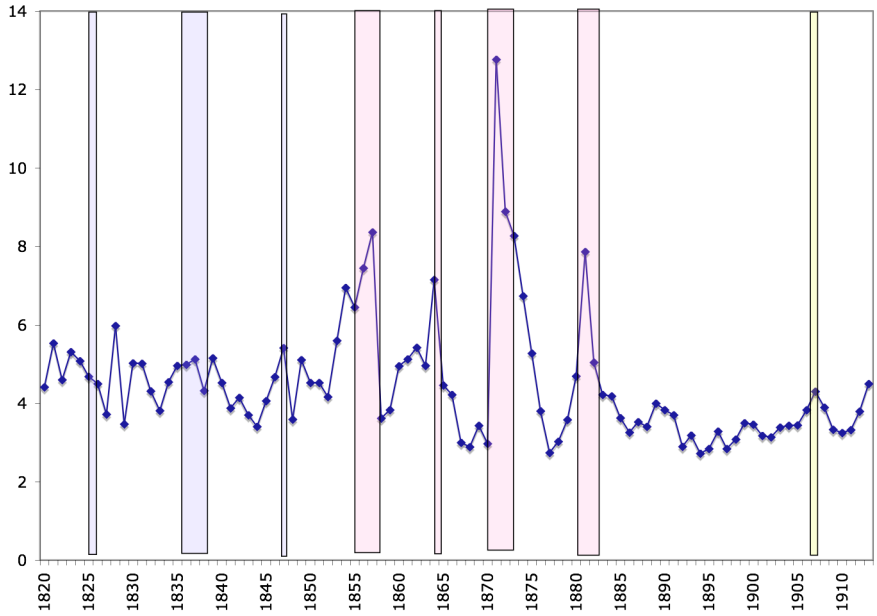
b) Like doctors in a plague: a case study

The result was, in the early 1860s, a fierce policy debate on the consequences of active interest rate management by the Bank of France. The reason was that the Bank had recently transformed itself into a genuine central bank. Following the Revolution of 1848, it had received the monopoly of issue over the entire country. Moreover, in 1857, the suppression of usury law that set an interest ceiling at 6% had enabled it to manage actively the interest rate, especially in periods of crises. This permitted the Bank to do away with older policies of credit rationing and become a genuine lender of last resort for the economy at large.

The extension of the powers of the Bank was politically contentious. The Bank was being criticized as being owned by a banking establishment that used it against new entrants. When Savoie was annexed to France in 1860, the Pereire brothers took advantage of the existence of a bank of issue to try and set up a competing bank. A major commission, reminiscent of the

Bullion Committee of 1809-10, was created to discuss the conduct of monetary policy.[13] A recurrent theme was that the central bank was setting a policy that maximized its profits at the expenses of the welfare of the economy. The concern consistent with the theoretical elements sketched earlier was that the Bank of France was too restrictive. This feeling was motivated by the observation that the Bank distributed record dividends in years of crises. Evidence of this is provided in Figure 4. As can be seen, there was a perfect overlap between years of crisis and years of high dividends, when the Bank of France was both a genuine central bank and a private company too (1848-1897).

Figure 4. The Bank of France Dividend and Financial Crises



Source: author's computations. Dividend calculated from data in Bouvier et al. (1965). Chronology of crises from Juglar (1889). We added the crisis of 1907.

Such an outcome as shown in Figure 4 is perfectly normal. A crisis implies, following Bagehot's rule of lending of last resort, that the central banks discounts record volumes (because there is a need for liquidity) at record rates (Bagehot's expression was "penal" interest rates): both prices and quantities are maximized, thus revenues peak while costs are

[13] . See Flandreau 2003.

essentially identical from one year to the other. From a political point of view, however, the matter is more complex, just as the setting of monetary targets by a private company had been at the time of the Bullion controversy. The Bank, some observers remarked, was very much like a doctor who becomes rich in the midst of a plague. The situation opened the door to conspiracy theories, and the Bank was accused to fuel speculation in order to generate a profitable crisis. The Bank was caught in a quandary. It got blamed for what it was doing but would have been blamed just as well if it weren't. Had it sought instead to fine-tune the economy, tightening credit before "excessive expansion" occurred, it would have met just as much criticism.[14] Given the set of constraints in which the Bank found itself, there was little else to do, than to passively follow the cycle. Any deviation from this course, any attempt at active monetary management, would fatally be criticized as self-serving.

The same causes producing the same effects, the eventual solution to this dilemma was reminiscent of the Bullion Report recommendation that "some mode ought to be devised of enabling the State to participate much more largely in the profits" of the Bank. In 1897, when the Bank's charter was renewed, and after a nationalization of the Bank had been considered, several provisions ensured that a larger share of the Bank's profits would go to the State (Blancheton 2000), especially in emergencies. On this item, it was stated that any revenue arising from a discount rate hike above 5% could not be paid to the shareholders, but distributed equally between the government and a special reserve.[15] The Bank could no longer be blamed to be raising the interest rate for profit motives and indeed, as seen in Figure 4, the crisis of 1907 had a modest impact only on dividends.

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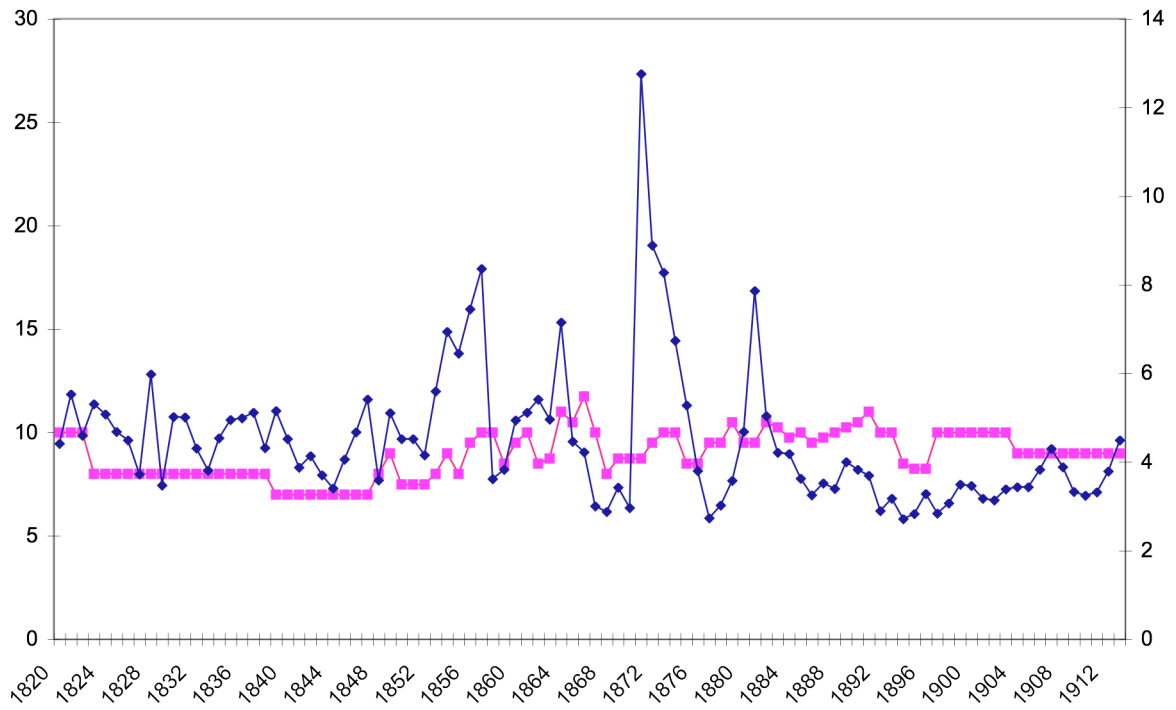
[14] . The Pereire brothers precisely motivated their campaign against the Bank by pre-Keynesian or more adequately, post-Lawian calls for easy credit that would help mobilize unused capacities.

[15] . The extension of the privilege of the Bank of France in 1857 had specified (art. 8) that the Bank of France would be enabled to increase its discount rate above 6%, but that profits above this level would be deducted from the amounts distributed annually to the shareholders and incorporated in a special account serving…. The privilege of 1897 lowered the ceiling to 5%, with this time three fourth of the surplus being paid to the government (art. 12). See Lois et Statuts, p. 141.

Further evidence of the effect of regulation on dividends can be got by comparing the evolution of the dividend paid by the Bank of France to that paid by the Bank of England where profits arising from suspending the Act of Peel were integrally paid to the government and where strict limits on the issue of notes ensured that credit expansion would immediately be checked (Lévy: p. 288). As can be seen, during the period 1848-1897 the volatility of the Bank of France's dividend is substantially higher, and the effect of crises much more substantial, although the incidence of the crises of 1848, 1866, 1873 and 1890 (but not 1907) on the Bank of England's dividend are visible on the chart.[16]

Figure 5. Dividend Bank of France (right axis) and Bank of England (left axis)



Source: Clapham (1944) and Bouvier et al. (1965)

France's evolution wasn't isolated (Canovai 1910). As in the case of France, everywhere it was found necessary to separate policy making from the profit motive. Towards the end of the

[16] . Of note is the fact that, prior to the Act of Peel, the Bank of England does not seem to have taken advantage of crises to distribute higher dividends, perhaps reflecting the fierce controversy that was surrounding its role then, a controversy that may have indeed led it to anticipate on the effect of subsequent legislation (see Clapham 1944 on the climate surrounding the adoption of Peel's act and Horsefield 1944 on the Bank's role in supporting it).

19th century, the charters of leading central banks were modified in a direction that effectively separated monetary policy decisions from profit motives.[17] This took a variety of regulatory forms with three main arrangements, not mutually exclusive, dominating. One was the introduction of a curb on the dividend that was paid to shareholders. For instance the renewal of the Charter of the Reichsbank in 1899 reduced substantially the part of profits that could be appropriated by shareholders, setting a de facto cap on dividends. This effectively transformed the Reichsbank's stock into a kind of bond since a minimal return was easily achieved thanks to the privilege of note issues, while at the same time it was quite implausible to go much beyond this level. Consequently, shareholders' votes no longer influenced profitability, although their role as an external supervisory body still had value for transparency and accountability, and the *Reichsbank* was a quasi-state bank. A second type of regulation was the introduction of a ceiling on non-backed issues with a stipulation that issues beyond this threshold would be entirely transferred to the State (United Kingdom), or heavily taxed (Germany, Austria). This ensured that emergency liquidity provision would be mainly guided by considerations over financial stability. Finally, there were also explicit formulas, such as the one described above in the case of France, whereby profits were confiscated if they originated from high interest rates (France, Belgium). Table 2 summarizes the evidence, for a selection of European banks.

The precise effects of such a complex set of regulations on central banks incentives regarding policy making remain to be fully understood and should be the topic of future research. The French example suggests that they may not have always created more room for cyclical management. The increased predation of central Bank's profits by the government led the Bank to seek profits where they were less heavily taxed. The result was a massive increase

[17] . Interestingly, the expression used to designate the property of the money supply that such institutional mechanism were supposed to bring, was "elasticity". This helps measuring the distance that had been traveled since the early 19th century when "elasticity" was thought to be the property that stood at the antipodes of discretionary action, a kind of miraculous effect of monetary policy rules which, if faithfully adhered to, would ensure that everything would work smoothly up.

of direct lending in regional centers where the Bank competed for customers against the local branches of leading commercial banks (Gonjo 2003). In so doing, it moved away from rediscounting and liquidity provision as a "bank of banks" is expected to behave, and "regressed" into straight credit to local customers. The evolution created pressures for a minimization of interest rate changes because local customers wanted to develop stable lending relations, or else threatened to switch to other lenders. This pushed the Bank of France away from modern monetary management. In effect, the Bank began adhering, as much as it could, to a 3% interest rate target. The connection between the removal of the profit motive and the emergence of modern monetary policy is loose and long.

Table 1. Central Banks Profits and Incentives Post 1848:
a Selection of Leading Institutions

	Reichsbank	*Banque de France*	*Öster.-Ung. Bank*	*Bank of England*	*Banque de Belgique*
Statutes	1875	1801	1816/1878	1696	1850
Rule	- Convertibility - Proportion - Contingent	- Convertibility - Ceiling on circulation	- Convertibility - Proportion - Contingent	- Convertibility - Million £14 un backed circulation - issues beyond this backed 1 for 1	- Convertibility - Ceiling on circulation
Excess or Emergency issues	- Yes	-Yes	- Yes	- Yes	- Yes
Taxes on profits from emergency issues	- 5% of excess issues	- No	- 5% of excess issues	- Entirely taxed	-Partly taxed (after 1872)
Tax on profits	1875: dividend between 4.5 and 8%, beyond 8%, 3/4th go to Government 1890: dividend between 3.5 and 6%, beyond 6%, 3/4th go to Government 1900: idem	1848: Tax on circulation (0.5%) 1878: Lower tax on un backed circulation 1897: Tax equal to 1/8th of revenue from un-backed circulation	1878: dividend between 5 and 7%, beyond 7% profits shared with government.	- Fixed annual fee	1850: 1/6th of profits when dividend>6% 1872: 1/4th of profits when dividend>6% 1900: 1/4th profits when dividend>4%
Tax on high discount rate	- No	- 1857: Tax on discount profits when interest beyond 6% - 1897: Tax on discount profits when interest beyond 5%	- No	- No	1872 : No discount profits when interest beyond >5% 1900: No discount profits when interest beyond >3.5%

Source: Constructed from information in Lévy (1911).

c) Why Central Bank Independence?

On the surface, this evolution runs counter another concomitant one. Between 1870 and 1914, leading economists (Conant 1895; Lévy 1911) achieved critical advances in central banking theory. Relying on extensive historical evidence on the effects of central bank independence on monetary performance and exchange rate stability, they concluded in favor of a strict separation between monetary policy and government action (Flandreau et al. 1998).[18] On the practical side, the period saw numerous institutional changes aimed at reinforcing the operational independence of central banks. Lévy recommended the creation of a European central bank, setting the monetary policy for a number of participating countries, and which he imagined located in Switzerland so as to fully escape governmental pressure. Independence had come to be a central element of institutional orthodoxy (Flandreau et al. 1998), later becoming a building block of the reconstruction programs implemented under the auspices of the Geneva-based League of Nations (Flandreau 2003).

The two seemingly conflicting evolutions -- of new regulations aimed at removing financial incentives from concerns over monetary policy management, and of the consolidation of operational independence within those regulations -- really operated on different levels. Everything happened as if there was a gradual replacement of the profit motive by a set of publicly set targets. With a reduced concern of shareholders over monetary policy as such (since the links between monetary policy decisions and dividends had been severed), there was a policy vacuum, which called for greater and more explicit prescriptions of monetary policy. On the other hand, this heightened the danger of government intervention in the actual conduct of monetary policy. With less interests in the behavior of the Bank,

[18] . Flandreau et al. (1998) provide evidence of a remarkably modern command of the time consistency problem. In one telling example that was to become a case in point (Conant 1895), the French premier Adolphe Thiers resisted parliamentary pressures to nationalize the Bank of France in the middle of the financial difficulties created by the Franco-Prussia war of 1870-1, by arguing that the Bank could only help the government "if it were not a government bank" (Flandreau et al. 1998).

shareholders may have failed to care about its mis-behavior. Consequently, it was necessary to consolidate both the theory and practice of central bank independence. The combination of these forces ensured that central banks were left with essentially one concern – retaining their charters and the accruing benefits – and a simple target which was the sine-qua non for the charter to be retained – specie convertibility. This transformed them into obedient servants of the convertibility rule.

Section V. Targets, monetary policy and globalization

This paper has explored the foundations of monetary policy targets in the 19th century. The resulting *tour d'horizon* would not be complete however, if we did not provide insights on how this better understanding of an earlier regime sheds light on the current system. There are three interesting issues to discuss. The first issue is the question of understanding the relation between the monetary policy rules that emerged from the late 19th century, and the collapse of globalization that occurred in the 1930s. The second issue is the question of understanding the differences and resemblances between 19th century monetary policy rules and modern ones, as they re-emerged in the past quarter of a century. The third issue is to speculate on the challenges that modern rules are likely to meet. Given space constraints, our discussion remains tentative, and yet a few salient points emerge.

Our study of the making of convertibility rules and of the gradual separation between monetary policy decisions and the profit motive, in the late 19th century may explain why historians are always struck by the very ideological tone of monetary authorities' defense of the gold standard in the 1920s. The fact was that, through a number of decisive institutional transformation, gold convertibility was now valued in and for itself, quite independently of welfare or growth considerations. Building on this insight, we may moreover speculate whether the different levels of commitment to the defense of convertibility that different

central banks displayed had to do with the value that retaining the charter had for their shareholders. From that respect, we remark that Figure 5 shows that for each stock whose nominal price was 100, the dividend of the Bank of England was on average 2.5-3 times larger than that paid by the Bank of France. Therefore, the privilege paid almost twice as well for every franc or pound invested in England than in France. It is doubtless that such situations must have had incidences on the determination displayed by alternative institutions towards the defense of the status quo ante. Whether or not similar incentives explain the Bank of England commitment during the 1920s to return to the older parity is still a long shot, but the subject is worth further exploration in future research.

In any case, there are reasons to believe that, through the agency of the convertibility principle, a certain conception of what monetary policy ought to be crystallized and became a holy principle, instead of the pragmatic criterion it had been in the past. Consequently, the discussion in the previous sections sheds light on the dynamics of the interwar period when central banks were found adhering frantically to convertibility even when this meant imposing major costs to the economy. They did so, until the costs of convertibility were too large and the gold became self-defeating. As a result, the resilience of monetary policy institutions became a major factor of de-globalization (Eichengreen 1992, James 2001). This suggests that the relations between institutions, monetary stability and globalization is more complex than what the current debate implies. History suggests that the forces that lead to the creation of monetary institutions capable of delivering a high quality output are the same that bring international integration. From that respect the question of determining whether low inflation results from globalization or inflation targeting by independent central banks is a rhetorical one. However, the extent to which specific institutions created at a given time in a given environment to address specific monitoring problems remain optimal when the environment does changes is obviously a quite different matter.

The second issue that is worth discussing is that of the relation between current practices and historical trends. The history that has been told in the previous sections can be understood as that of the serendipitous discovery of principles that foreshadow current practices. Just as today, monetary stability was seen as resulting from the pursuit of formal targets that had been assigned to the central bank. Just as today, the success in reaching these targets was associated with central bank independence. Just as today, central bankers were faithfully committed to reaching these targets because they derived benefits from fulfilling their mandate.

A natural interpretation of the reasons why the history of central banks repeats itself may be found in their agency nature. As agents in charge of implementing monetary policy for the benefit of society, central banks are expected to produce a currency with certain attributes deemed useful, using a number of instruments considered as legitimate. To determine whether they are successful or not, it is simpler to ask them to achieve certain goals which can be used to monitor their performance. In this context, targeting (the exchange rate as in the 19th century or the inflation rate as today) is a particularly relevant framework. The legitimacy of the central bank is tightly related to its ability to achieve the objective it has been assigned and, because this objective is simple and transparent, the legitimacy is itself simple and transparent.

As a result, changes in the targets assigned to monetary policy can be traced to changes in the way society defines and measures the "quality" of money. From that respect, two major factors explain the shift that has occurred in the definition of monetary targets between the periods under consideration. The first is the emergence of a large consensus over price indices as adequate tools for tracking inflation. As we showed when we discussed the Bullionist controversy of the early 19th century, such instruments were entirely lacking then, leading the authors of the *Bullion Report* to focus on the exchange rate and the price of gold. Ironically,

there was less correlation between exchange rate variations and the money supply than between the money supply and the price level as it has been reconstructed later. But there was just no consensus on how to measure prices and as a result there was too much discretion for monetary policy, which had thus to be subjected to strict convertibility rules. Following this line of analysis, it is no surprise that Irving Fisher, one of the founding fathers of modern macroeconomics, devoted an entire chapter of his early treaty and later a full book to the issue of measurement of price variations (Fisher 1907, 1930), before becoming a proponent of price stabilization schemes, as opposed to exchange stabilization (Fisher 1907 and 1930, Jonung 1978, Bordo Dittmar and Gavin 2003).

The second, perhaps less important factor, is a residual from the Keynesian view that inflation is good while deflation is bad. This once predominant notion, which emerged in the midst of the interwar collapse, survives today in the form of inflation targets that are low but above zero. Some economists have sought to motivate this number by emphasizing the existence of downward adjustment costs when inflation is close to or below zero. Reference to the work of Akerlof, Dickens and Perry (1996) establishing this theoretical result is now conventional (see e.g. the survey in Bernanke 1998). Yet in the perspective developed in this paper (that political acceptability is a crucial aspect of a successful delegation scheme) we may understand why a range that does not displease monetarists while not alienating moderate Keynesian either was eventually chosen. In the real world, societies must sometimes agree on things they do not understand.

Finally, before concluding, we should like to say a word on current discussions. A bird's eye view of the evolution of central bank institutions suggests that there has been a definite trend towards a greater contribution of "scientific" ingredients in the conduct of monetary policy. This grew naturally from the dilemma of discretionary monetary policy, which early 19th century British monetary authorities were the first to meet. The more monetary policy

becomes a science – as opposed to being an "art" – the greater the leeway that society will be able to grant to policy makers, because the monitoring problem will be reduced. The availability of objective, agreed upon measures of inflation for instance, permitted the emergence of inflation targeting when 19th century monetary authorities were instructed to peg their currency to gold. To the extent that this rules out deflation and to the extent that deflation is a bad thing, this is an improvement.

This explains the current debates over alternative ways to measure inflation since these different measures correspond to alternative assessments of the outcome of monetary policy. This also explains the concerns over the information content of evolution of the money supply, a debate that really began with the bullion controversy when observers suggested that the increase in the supply of banknotes, even when it was not met with exchange rate depreciation was only a debasement time bomb. Finally, this explains the concerns of modern policy makers regarding whether or not they should respond to asset price bubbles or not. While some have argued that monetary policy is turning into a "science" (Clarida et al. 1999), it is to be feared that these issues will remain pending for the time to come.

Conclusions

This paper has provided an overview of the making of modern monetary policy rules. It argued that the reason why exchange rate targets emerged in the 19th century as criteria for sound policy is not that there was no alternative. The possibility of a managed currency had been effectively considered. Nor is it because the management of this currency by a private institution would have been necessarily inflationary, although this is what Ricardo and others feared. We saw that there was no necessary conflict of interest between the pursuit of private ends by a profit seeking bank of issue and the fulfilling of collective goals normally associated with the conduct of monetary policy. The reason why convertibility emerged, we

argued, was the concern that delegating monetary authority to a private concern might turn out to involve too much discretionary action. To rule it out, a strict target was thus assigned to central banks.

Moreover, as the century progressed, concerns about the effect of the profit motive on the way central banks dealt with crises led to increased regulation whereby exceptional profits, accruing from the fulfilling of the LLR function for instance, would automatically be confiscated by government authorities. As a result, the actions of central banks had to take place in the narrow space left between a convertibility target that would ensure that they would not expand too much and a profit appropriation rule that ensured that they would not contract too much. By then, central banks, though still nominally private companies, had really become monetary bureaucracies.

This evolution paved the way for subsequent transformations in the interwar. We argued that, because of earlier transformations, central banks could now take actions that were detrimental to the welfare of the economy without having to support the effects of such decisions, since the link between the prosperity of the economy and their own welfare had been severed. Central banks could keep targeting the exchange rate, protected as they were from government interference through a complex institutional coating. The existence and design of the convertibility targets may go a long way to explain the persistence of restrictive policies, despite worldwide deflation during the 1930s. Just as they may have promoted globalization before WWI, convertibility rules may have contributed to the collapse of globalization during the interwar. In this light, the terms of the ongoing debate on whether central bank independence and inflation targeting or globalization caused the recent disinflation seem to be ill stated.

Historians like to emphasize persistence. Economists have a soft spot for novelty. As an essay in economic history, this paper was about both. It was about persistence, because it

sought to show that the dilemmas modern monetary policy makers are facing today have counterparts in previous centuries. It is about novelty because current issues incorporate new elements in a way that makes them both distinctive and unique. By combining historical and contemporary insights, it is hoped that we have achieved two things. First, our historical perspective on the use of monetary policy targets found modern policy makers in the good company of their forerunners, facing pretty much the same structural objectives, challenges, and constraints. This may be cold comfort, but it is one kind of comfort. Second, and possibly more importantly, it has helped to identify which resources and constraints were available to modern policy makers that were not available to previous ones. As Schumpeter stated in his book on business cycles we learn economic history to know "why we are as far as we are" but also "why we are not further" (Schumpeter 1933).

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