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An 'art', not a 'science'? Central bank management in Portugal under the gold standard, 1863–87[1]

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As long as Portugal was on the gold standard, the Bank of Portugal sought to help stabilize the currency at the exchange rate to which the country was committed. Because it was subject to political and other non-economic constraints, the bank carried out discount rate interventions sparingly, although in accordance with what could be termed the contemporary 'science' of central banking. Consequently, it had to intervene frequently in the currency markets, usually in covert fashion, in order to conciliate the needs of convertibility with this less than orthodox stance towards the gold standard. This article also shows how the bank was able to keep on repeatedly infringing the 'rules of the game' with success for almost 30 years, and raises the question of the sustainability of such a state of affairs.

I

> The management of an international standard is an art and not a science and no one would suggest that it is possible to draw up a formal code of actions admitting of no exceptions and qualifications, adherence to which is obligatory, on peril of wrecking the whole structure.[2]

The attempts to recreate the prewar gold standard system, during the 1920s and 1930s, led to a certain idealization of its past and to a reconstruction of its history. The account that emerged from these efforts—the 'textbook abstract', as Triffin called it[3]—proved to be highly resistant to historical critique, but in recent years it has finally begun to give way. Among the myths it perpetrated, the central one was that of the gold standard as an automatic, self-adjusting monetary regime in which central banks played a major, beneficent adjusting role.

Revisionism has upset several items of the conventional wisdom regarding the pre-1914 gold standard. It has shown that in many aspects the pre- and

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[2] Committee on Finance, *Report*, also known as the Macmillan Committee Report, 1931.

[3] Triffin, *International monetary system*.

post-First World War systems were after all quite similar, the holding by central banks of large foreign exchange reserves, besides gold, being a case in point.[4] It has revealed that before 1914 central banks often violated the 'rules of the game' and that they were less alike in their behaviour than was presumed.[5] This behaviour also varied over time, as happened with the Bank of England's observance of the 'rules of the game', which was flexible in normal times, but serious during critical periods.[6] Quantitative tests have revealed that they did not target just convertibility, but in fact combined this with profit seeking and with a politically grounded concern ('tenderness') for the economy's wellbeing.[7] Even personalities could shape the pattern of operations, as has been shown with regard to the influence of the governors of the Bank of England before 1914.[8] The result is that the gold standard was 'not a single monetary rule but a wide assortment of rules'.[9]

The ample disregard of central banks for the 'rules of the game' has come to be accepted as a fact of life of the classical gold standard. Yet it poses troubling questions about how, at the same time, it could be so easy to avoid crises and enjoy uninterrupted convertibility. In a path-breaking study, Bloomfield found the coexistence of these two situations perplexing and admitted he 'had no ready answers' for this.[10] And all the subsequent research has come to the somewhat puzzling conclusion that in the short run it was possible to deviate from the basic tenets of the classical gold standard, so long as they were observed in the long run.[11] The resolution of this paradox has recently been sought in a re-conceptualization of the gold standard system that brings its reputational aspects to the fore and stresses its nature as a 'contingent rule'.[12] According to this approach, it mattered little which monetary policies were followed in the short run, providing that over the long run a country was fully committed to this regime and that the financial community believed this to be the case.[13]

For this commitment mechanism to generate the desired responses, two conditions had to be satisfied, however. One was a readiness on the part of governments and central banks alike to do anything to maintain the monetary system at par. In normal times, this meant keeping exchange rates within the target bands defined by the gold export and import points. Deviation was only allowed under exceptional circumstances, such as war, and for as short a time as possible. The second condition was to bolster this

[4] Lindert, *Key currencies*.
[5] Capie et al., *Future of central banking*, ch. 1.
[6] Jeanne, 'Monetary policy'.
[7] Davutyan and Parke, 'Operations of the Bank of England'.
[8] Ogden, 'Bank of England discount'.
[9] Flanders, 'Gold standard', p. 218.
[10] Bloomfield, *Monetary policy*, p. 50.
[11] Dutton, 'Bank of England'; McGouldrick, 'Operations'; Giovannini, 'Rules of the game'.
[12] Bordo and Kydland, 'Gold standard'.
[13] Some of the literature has argued that the smooth working of the gold standard also required a dose of international cooperation in order to ride out financial storms. This has been questioned by Flandreau, 'Central bank cooperation'.

by following an orthodox line in relevant economic policies. This entailed fiscal responsibility and monetary restraint, ensuring that factor and product markets operated freely enough to make prices flexible, and allowing full freedom of factor movements and of trade.[14] The rigorous acceptance of these conditions was not simply a matter of ideology. It was also driven by self-interest, since countries on the gold standard enjoyed more favourable borrowing terms and easier access to international capital markets.[15]

The case depicted in this article fits well with the revisionist perspectives outlined above, but also poses some questions. Between the early 1860s, when it began to have an active monetary policy, and the end of convertibility in 1891, the Bank of Portugal frequently violated the 'rules of the game', yet the country was able to remain steadily on the gold standard. One of the issues this raises is how this monetary stability was possible when Portugal's policy commitment to the standard was weak, as will be shown below. A second area that calls for clarification concerns the duration of the time spans during which the system was able to tolerate departures from what should be the proper course of monetary policy under a fixed parity regime. The current literature makes much of the analytic distinction between the 'short' and the 'long run', that is, flexibility versus commitment, but has rarely specified the length of these periods.[16] For how long and by how much could the Bank of Portugal deviate from the rules and how was its convertibility assured in the interim? Lastly, there is the question of the determinants of the Bank's monetary policy and, in particular, whether its use of the discount rate was guided by rules or by discretion.

This article begins by trying to establish whether the Bank of Portugal observed the 'rules of the game' and concludes that breaches were frequent and extensive. This is followed by a section on the use of 'gold devices'. These were devices that a central bank could deploy as alternatives to the rules of the game in order to avoid sliding into inconvertibility. An explanation is proposed for how 'gold devices' made it possible to get round the problem posed by persistent deviations from the 'rules of the game'. When this was insufficient to keep the currency close enough to parity, the resort was to the discount rate, the 'classic' instrument of central bank intervention. The third part of the article models use of the discount rate by the Bank of Portugal. The aim here is to ascertain the extent to which there were systematic elements of central banking in Portuguese monetary policy at this time. The degree to which discount rate variation cannot be accounted for by a stable and rational body of rules would thus indicate the presence in central bank management of what one might call an 'art', as opposed to a rule-based, 'scientific' approach. A conclusion pulls together

[14] Eichengreen, and Flandreau, *Gold standard*, ch. 2.

[15] Bordo and Rockoff, 'Gold standard'.

[16] A rare case of specification is in Eichengreen and Flandreau, *Gold standard*, who state: 'Although it was possible to find repeated violations of rules over periods as short as a year, over longer intervals central banks' domestic and foreign assets moved together', p. 17.

these various strands and highlights the fact that only a small and unimportant economy such as Portugal could operate on the gold standard with such a degree of heterodoxy.

II

Portugal's experience with the gold standard is of interest for different reasons. To begin with, it offers significant contrasts with the three cases—Britain, France, and Germany—on which arguments regarding this international system nearly always rest. Although small, backward and poor, it was the first country in Europe, after Britain, to join this monetary regime, in 1854, an adherence that lasted for 37 years.[17] It had a 'full' gold standard, in which most of the monetary circulation was made up of gold coin—it represented 93 per cent of M1 in 1865—and the money multiplier was low as a result of a weak demand for notes and deposits.[18] Most of this circulation consisted of gold sovereigns which, along with Portuguese coin, were declared legal tender in 1851. Gold bars therefore were rarely found in the country and were sought after almost entirely for industrial purposes. If cash was needed, it was cheaper to import sovereigns from England than gold bars, which would have to be melted down and converted into legal Portuguese coin, by the Mint and at a price.[19]

On the other hand, Portugal was not exactly a well-behaved member of the 'club'. It failed two crucial criteria. It had persistent deficits on its budget and on its balance of trade. Thanks to vigorous borrowing in the market, the first one did not have to be monetized, though relative to GDP the long-term debt almost doubled between the early 1860s and the late 1880s.[20] The solution to the second deficit on its balance of trade relied on capital inflows and a growing stream of remittances to the homeland by emigrants residing in Brazil. The combined effect of all this was that monetary growth kept pace with the economy but did not generate inflationary pressure on the exchange rate, and intense external gold drains were infrequent.[21] Thus, outwardly the country satisfied the prerequisites for claiming the international 'seal of approval' conferred by gold standard adherence, whilst in fact

[17] This background account is based on Reis, 'Gold standard in Portugal'.

[18] In the case of most countries, total coin as a share of M1 was then around 70 per cent and dropped to about 20 per cent in the cases of the US and Britain. Flandreau, *L'or du monde*.

[19] Reis, *A evolução*.

[20] Mata, *Finanças públicas*, p. 255. At around 80 per cent in the late 1880s, this ratio places Portugal, along with Spain, Greece, and Italy, but also with France and the Netherlands, among the larger relative debtors of Europe. See Flandreau and Le Cacheux, 'Dettes publiques'.

[21] For a breakdown of the Portuguese balance of payments between 1865 and 1890, see Reis, 'Gold standard in Portugal', p. 76. In the aggregate, remittances, over this period, were 1.47 times the balance of trade deficit (not including gold) and 1.77 times gross government borrowing abroad (not including the service of this debt). Data for gold drains is available yearly. These occurred in 1865, 1866, 1867, 1868, 1869, and 1877, and the total outflow was equal to 4 per cent of the aggregate balance of trade deficit for these years. The data in Mata, 'As crises', are different but the orders of magnitude for the above estimates are the same.

it deviated significantly from the basic norms followed by the majority of countries that earned this distinction.[22] Portugal was not, however, a case of 'deficit without tears', as Lindert has put it.[23] The market went behind appearances, to look at the fundamentals, and, as a result, the yield on Portuguese bonds was usually considerably higher than that on consols.[24] On the other hand, as long as it was on the gold standard Portugal was able to borrow abroad consistently, a possibility which ceased following the advent of inconvertibility, in 1891, and the partial suspension by the state of its foreign payments, in 1892.

In comparative terms, during the period that we are studying the Bank of Portugal displays some interesting features. By contemporary standards, it enjoyed a considerable degree of autonomy. Its management was wholly entrusted to a board of directors, elected by its largest shareholders, and acted without dependence on the government. The latter, moreover, had no representative on this body, unlike common practice elsewhere on the continent, nor any say in the election of the institution's presiding officer. There was no limit on the bank's issue of notes, which were a monopoly in the Lisbon district but not elsewhere. Its statutes merely enjoined prudence in this respect, and, unusually, left the level of the reserve cover, which had to guarantee sight deposits as well, completely unspecified.[25] Notes were payable on demand, on pain, under general commercial law, of a declaration of insolvency, as almost happened in 1846 to its predecessor, the Bank of Lisbon. Convertibility was thus an objective of paramount importance, on which the very existence of the corporation was utterly dependent. Having said this, it is obvious that, as any joint stock company, the Bank of Portugal considered that its first duty was to its shareholders, and this meant that its second most important goal was affording them the highest rate of return compatible with long-term sustainability.[26]

In other ways, the actions of the Bank of Portugal were far more restricted. It could take sight deposits from the public but it was not allowed to pay interest on them. This severely curtailed the amount of liquid resources that it could attract in this way. It was permitted to supply short and long-term credit to the state and act as its receiver of taxes. During the period considered, however, it never undertook the latter and, by its own will, it kept the former, potentially a profitable business, at a relatively low

[22] Bordo and Rockoff, 'Gold standard'.

[23] Lindert, *Key currencies*, p. 74.

[24] The spread was usually around 3 percentage points. Bordo and Rockoff, 'Gold standard', are thus correct in that the 'seal' enabled Portugal to have access to capital from core countries, but incorrect in claiming that faithful adherence to gold, for more than 30 years in this case, would bring the price down almost to consol level.

[25] Few central banks enjoyed such latitude, as is revealed by a comparison with the international data in Flandreau, Le Cacheux and Zumer, 'Stability without a pact?'. For example, out of 13 banks, only the Portuguese one had its president chosen solely by the shareholders, while its flexible cover ratio was peculiar only to itself and another.

[26] Reis, *Banco de Portugal*; Banco de Portugal, *Diplomas orgânicos*.

level out of fear of too much involvement in the public debt. The use of its most important policy instrument, the discount rate, was severely limited, both in law and in practice. The bank was not permitted to raise it above 5 per cent unless authorized by a government decree, an extraordinary event that would normally require public discussion and justification. On the other hand, it was statutorily free to charge less than this, although it rarely chose to do so.[27] Lastly, there was one non-institutional way that gave it considerable freedom to act. Because of its relatively small size, its behaviour was unlikely to have any effect on international markets or on other central banks, unlike those of the core countries, the study of which has often been bedevilled by problems of 'feedback'.[28]

In order to ensure that the period covered by our analysis is homogeneous in all relevant aspects, we have restricted our observation to the years between 1863 and 1887, rather than the entire duration of the Portuguese gold standard era (1854–91). There are several reasons for this choice. The early 1860s were marked by a change in the management of the bank's reserves. After the turbulence suffered during the 1850s,[29] it was apparently felt, starting around 1861, that the reserve ratio could now be reduced from the customary 40–50 per cent level to the more profitable level of 20–30 per cent, a level that would be characteristic of the following decades. In 1864, a modern monetary policy was inaugurated when the discount rate was used for the first of many times, in order to 'influence the metallic circulation in our markets'.[30] Meanwhile, the bank had started to import gold occasionally to strengthen its reserves, a practice that was to become a central tool of its monetary strategy. The other end of this sub-period corresponds to the signing of a contract with the state, in 1888, which altered substantially the parameters under which the bank had previously operated. Under these new rules, limits were specified for the note issue (a maximum of twice the paid-up capital) and for the reserve ratio (a minimum of one-third). The bank was now given the freedom to vary its discount rate at will but had to share with the state the extra profits arising. On the other hand, it was obliged to open branches all over the country and to pay its notes on sight at any one of them, which compelled it, out of prudence, to keep a much higher reserve ratio than hitherto.

To assess the degree of conformity to the requirements of operating a central bank under a metallic standard, the usual procedure, in the literature, has been to quantify the observance by these institutions of the so-called 'rules of the game'. These were common-sense guidelines, founded

[27] One of these occasions was between February 1889 and the beginning of 1890, when the rate for commercial paper was allowed to vary between 4 and 5 per cent, depending on the quality of the bill. See *Relatório do conselho*, p. 11.

[28] During the 1860s, the country's share of international monetary reserves was 2.6 per cent, as compared with 44.6 for France, 5.9 for Italy, 18.4 for Britain, and 13.4 for Germany. Flandreau, *L'or du monde*.

[29] Reis, *Banco de Portugal*.

[30] Decree of 9 September, 1864 in Banco de Portugal, *Legislação Própria*, vol. II, p. 414.

Table 1. *Breaches of the 'rules of the game', 1863–87: Nurkse-Bloomfield criterion*

	Number of breaches	*Number of breaches relative to total months (%)*	
1) *Contemporaneous monthly data*			N = 300
a) Serious	34	11	
b) Moderate	94	31	
c) All	164	55	
2) *Six-month moving average*			N = 295
a) Serious	26	9	
b) Moderate	84	28	
c) All	178	60	
3) *Twelve-month moving average*			N = 289
a) Serious	22	8	
b) Moderate	75	26	
c) All	175	61	
4) *Yearly averages*			N = 25
a) Serious	4	16	
b) Moderate	8	32	
c) All	12	48	
5) *End-of-year data*			N = 25
a) Serious	7	28	
b) Moderate	11	44	
c) All	13	52	

Notes: For definition of 'breach', see text. 'Serious breaches' concern occasions when the percentage variations in the two variables add up to 20% or more of their absolute values; 'moderate' when they add up to between 10 and 20%; 'all' covers all breaches, no matter how small.
Sources: Monthly balance sheets of the Bank of Portugal published in *Diário do Governo*.

on banking and market experience, which were probably not known at the time under this designation, but were considered effective in ensuring convertibility, particularly when under the strain of a gold drain. The oldest version is the Bloomfield-Nurkse criterion, which states that a central bank behaved in accordance with these rules whenever it hastened adjustment to shocks, and avoided sterilizing gold flows. In practice, reserves (non-earning international assets) should vary directly with domestic income-generating assets and therefore a simple indicator of observance is given by multiplying the first differences of these two variables. A negative result tells us that there is a breach; a positive one tells us that there was 'good behaviour'.[31]

The results obtained from the Portuguese data are summarized in table 1 and is in line with the generality of other cases studied.[32] Whatever the measurement used, it is clear that, between 1863 and 1887, the Bank of Portugal not only deviated often from this 'rule', but did so at times on a

[31] It was first stated in Nurkse, *International currency experience*.

[32] Using yearly data from a sample of 12 central banks between 1880 and 1914, Bloomfield, *Monetary policy*, found that breaches of the 'rule' occurred about 60 per cent of the time. The Portuguese experience ranges from 48 to 61 per cent, depending on the time unit employed. Given the disagreements on how 'reserves' should be defined, we have adopted Bloomfield's recommendation to follow the procedure adopted by the bank in question in each case.

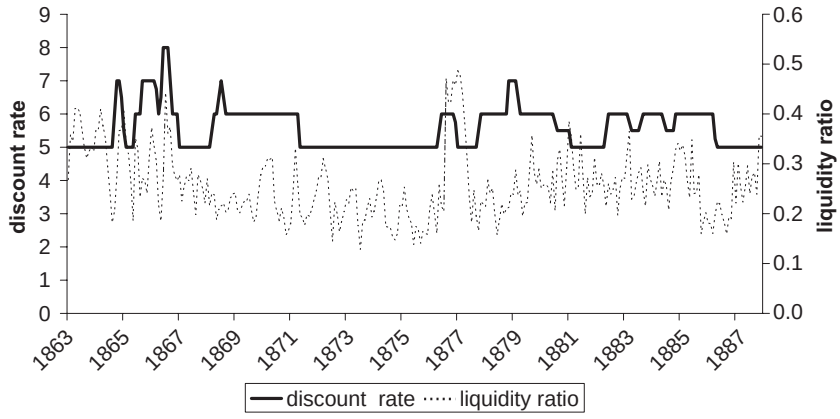

Figure 1. *Discount rate and liquidity ratio*

Sources: The liquidity ratio is estimated from the data on 'official' reserves and sight obligations (bank notes and deposits) in the monthly balance sheets of the Bank of Portugal published in *Diário do Governo*; the discount rate comes from the minutes of the board meetings of the Bank in Arquivo Histórico do Banco de Portugal (hereafter AHBP), Actas da Direcção, BP.Dir-2.

considerable scale. Between 8 and 28 per cent of the time, these breaches were 'serious'—variations of more than 20 per cent in both variables combined—and between two-fifths and a quarter of the time, they were 'moderate'—variations of more than 10 per cent in both variables combined. If we add minor violations, then the time of infraction comes to around half or more of the period considered.[33] Several authors have claimed that Bloomfield's demonstration of 'bad' central bank behaviour was biased by his use of yearly figures, it being supposed that with monthly data the picture would have been less negative.[34] It is interesting to note therefore that, in the present case, the conclusion does not diverge much whether we use monthly or average yearly data, and, in the case of monthly figures, whether we use contemporaneous observations, or six- or twelve-month moving averages.

A second criterion, also suggested by Bloomfield, requires that the discount rate of central banks, their principal instrument of intervention in the market, varies inversely with their reserve ratio (reserves divided by sight liabilities, that is, notes plus deposits). This did not happen in the case of the Bank of Portugal during the period under consideration. The two variables are represented in figure 1, the coefficient of correlation between them being 0.167. This is not only small but has the wrong sign, and strongly suggests that the Bank did not respond systematically to losses of reserves by raising its discount rate and conversely. For a central bank, this was inappropriate behaviour and a breach of the 'rules of the game' that

[33] Bloomfield did not categorize violations according to their magnitude, as we have done here, and his criterion has therefore been considered insufficient by Dam, in *Rules of the game*, p. 31.

[34] Dutton, 'Bank of England'; Pippenger, 'Bank of England operations'.

endangered the metallic standard, even if on many other occasions it did act in conformity with these rules.

A third version of the 'rules of the game' stipulated that metallic reserves must be kept at a 'safe' level at all times. A central bank that failed to do so was not only running risks in terms of its convertibility, but also giving the market a sign that made it hard to believe in its commitment to the monetary standard. What constituted 'safety' for contemporaries is open to interpretation, but, in the case of the Bank of Portugal, which was under no formal constraint in this respect, it could never have been less than the one-third specified by the famous Palmer rule.[35] A further look at figure 1 reveals how frequently—about three-quarters of the time—this widely acknowledged prudential norm went unobserved by the Bank of Portugal. Particularly striking is the fact that on one-third of these occasions its liquidity ratio breached the 25 per cent level, and in one month out of twelve it fell below the 20 per cent mark.

A final approach is based on the argument that the liquidity ratio can only be evaluated properly if the discount rate policy of the central bank in question is also borne in mind.[36] Central banks holding relatively higher reserves enjoyed a larger cushion of liquidity against adverse movements, and this enabled them to use their discount rate more sparingly. Others, for whom this cushion was thin, were obliged to protect their reserves by means of a far more active discount policy. At one extreme of the spectrum, it has been argued, was the Bank of England, with very low reserves and frequent changes in its rate to ensure that, despite gold drains, they were always sufficient. At the other was the Banque de France, with very large reserves and a preference for an immobile discount rate. The Bank of Portugal was rather an outlier. Although by international standards it had a low reserve ratio—30 per cent on average during 1863–87—it was not a frequent user of its discount rate as a means of protecting its reserves. In other words, it was 'English' in terms of its reserve position and 'French' in terms of its discount rate policy, a contradiction that seems to indicate yet another way in which the 'rules of the game' were breached.[37]

Underlying this propensity to disregard the 'rules of the game' was the considerable rigidity with which the Bank of Portugal had to implement its monetary and credit policies. This situation merits further enquiry since it was at the root of the numerous short-term difficulties that this institution constantly struggled to circumvent during convertibility, as will be shown in the following section. In the case of the breaches under the second and fourth of the criteria examined above, the problem lay in its apparent

[35] Fetter, *British monetary orthodoxy*, p. 32. The first ever liquidity rule, introduced in 1888 by the bank, stipulated that gold reserves had to equal at least one-third of notes in circulation plus deposits.

[36] Capie et al., *Future of central banking*, ch. 1; Contamin and Denise, 'Politiques monétaires'.

[37] The Bank of Portugal changed its discount rate 1.3 times a year on average during the years 1870–90, compared to the Banque de France's 1.4 times, and the Bank of England's 8.8. See Ford, 'International financial policy'.

difficulty in adjusting its discount rate to changing conditions. The first thing to note is that this was not a question of a lack of awareness of the usefulness of the instrument in this respect. On the contrary, by the start of the 1860s the board of directors had come to understand fully the theory and practice of this policy tool for central bank management and the need to discard the old law on usury. It was familiar with the success with which it was being used by other central banks and regarded it as 'the only effective measure known to foreign banks for defending metallic reserves and combating a tendency for the export of coin'.[38] It was also conscious of the fact that in a monetary crisis it was better for business 'to obtain some credit with an additional sacrifice than no credit at all'.[39] At the same time, the bank's practical capacity to impose discount rate changes on the domestic financial market was undisputed. On the 28 occasions on which we have been able to track the market after a bank rate change, we have found that it was the commercial banks who followed in every case, and this within one or two days of the event.[40] In the Bank of Portugal's own view, there was no doubt that by the mid 1860s it had become informally 'the regulator of the price of capital in Portugal'.[41]

Clearly, the most important reason for the rigidity of the discount rate was political. Governments normally opposed increases above the 5 per cent norm and when the discount rate was above this level, they tended to pressurize the bank to lower it. First and foremost this was out of concern over the cost of financing the public debt, a particularly important consideration in a political system that was prone to budget deficits. In 1884, for example, the authorities showed hostility to a higher discount rate on the grounds that it would depress the launch price of a planned loan. In addition, higher interest rates were unpopular because they were likely to depress business, reduce trade and production, and provoke urban unemployment and possibly unrest. These were worries that stimulated a politically inspired 'tenderness' towards the market that could not be ignored by an institution which depended to such a large extent on political goodwill for the renewal of its privileges.[42]

[38] *Parecer ácerca das exigências*, p. 14. This important publication summarizes the thinking of the Bank of Portugal regarding its monetary policies in the mid-1860s. Its main tenets are illustrated by many of the decisions taken by the board of directors in subsequent years, which for reasons of space are not referred to here explicitly.

[39] Ibid., p. 20.

[40] This contrasts with the 15 per cent of occasions on which the Bank of England led the market in the course of discount rate turning points. See Gallarotti, *Anatomy*, p. 120. For the Portuguese experience, we have used the reports of the *Comércio de Portugal*, a financial fortnightly published during almost the entire period we are studying.

[41] *Parecer ácerca das exigências*, p. 8.

[42] The minutes of the board of directors display the frequency of these pressures. A detailed analysis of the years 1877–84 shows that they could happen several times in a year. In November 1877, for example, the board wrote twice to the government and some of its members met with ministers to ask for a discount rise four times. It was not granted until a year later. Elsewhere, Sayers, *Bank of England* and Eichengreen, *Globalizing capital*, provide ample evidence for the universality of this concern among central banks.

In the case of the breaches detected in accordance with the first and third criteria for 'rules of the game' observance, once more the Bank of Portugal reveals a clear understanding of what it was doing. 'If the Bank is obliged to defend its reserve [and cannot raise the discount rate], it must restrict its operations', in other words, reduce its earning assets.[43] The problem was that this could not be done readily given the nature of the business of banking itself. How easy was it for the Bank of Portugal to cut back its commercial credits—a large part of its normal business—when this became advisable as a result of a drain in reserves? As a 'bank of circulation', which was supposed to hold only very liquid assets, this should not have been any trouble, since the credit tap could easily be opened or shut. In fact, as we learn from many discussions at board level, this was not the case. As a result of the pressure of competition and the less than commercial nature of some of its business, three-month bills often turned out to be many months longer in duration, and could not easily be discontinued.[44] Even in genuine cases of short-term commercial credit, based on 'real bills', many customers expected to be able to 'roll over' their liability as long as they did not exceed tacitly or explicitly agreed ceilings. Strong reactions were therefore encountered whenever the bank reduced its volume of credit, and this led to public outcry, as well to loss of custom. Not surprisingly, directors were inclined to resist the dictates of banking know-how for as long as possible and avoided reducing the level of domestic earning assets, even when reserves fell not only in one month, but successively over several months, as the data in table 1 implies.[45]

A third circumstance emerges from the archives as a deterrent to taking speedy action in consonance with the 'rules of the game'. This is the fact that it was not always easy to discern, day to day, whether the economy was enduring a small, passing shock that would soon be dispelled without any need for corrective action; or whether it was something more serious. Only time could tell and this led to waiting, sometimes for months, while directors debated the gravity of the situation—whether it was opportune to ask the government for a decree raising the discount rate, whether there were alternatives, and, if not, how strong a measure should be adopted—without reaching a decision. In 1881, for instance, the topic came up in May, and was subsequently discussed at 13 different board meetings before a letter was sent to the government, in February 1882, asking for the discount rate

[43] *Parecer ácerca das exigências*, p. 21.

[44] This is demonstrated in great detail by director Ramires in a speech to the board, on 24 September 1880, in which he lamented that so little paper in the Bank's portfolio was truly 'commercial' and blamed this on Portugal's lack of commercial development. See Arquivo Histórico do Banco de Portugal (hereafter AHBP), Actas da Direcção, BP/Dir-2/ Book 17.

[45] For example, on 1 June 1866, in the midst of a crisis, João Ferreira Roquete, a merchant and regular client, wrote indignantly to the board asking to have his bills rolled over, arguing that it was impossible to stop having them discounted suddenly, as the board wished. See AHBP, Correspondência diversa recebida, BP/CG/66.

to be raised to 6 per cent. The request was finally granted in April 1882, after another letter and five more board discussions.[46] Often directors could not agree and in the meantime the situation might improve—for example, as a result of the unexpected arrival from Brazil of a ship with remittances. For the actors in this drama, it was not always obvious whether a shock was 'structural' or not, and with the rudimentary statistics available, it was even hard to tell how large it might be. In the meantime, while this was discussed and decided upon, or not, as the case might be, the 'rules of the game' were ignored.

III

The picture drawn thus far is not exactly that of a central bank intent on ensuring convertibility and seeking to inspire confidence. Reserves were often sharply depleted, sometimes to inadmissibly low levels, proper defensive measures were delayed for long periods, and credit operations failed to reflect movements in the reserve. Yet Portugal remained on the gold standard without interruption for decades, and the Bank of Portugal was able to withstand all shocks without apparent threat to its convertibility. The explanation lies in the frequent use of 'gold devices', sometimes over quite long periods of time, and to this we now turn our attention.

'Gold devices' were generally covert, or at least discrete measures employed by central banks to solve short-term reserve problems when they found it undesirable to use the orthodox instruments of monetary control required by the situation.[47] The object was to influence the cost of dealing in gold, with a view to discouraging an unwanted depletion of reserves. Often, though not necessarily, this involved raising the transactions cost of redeeming notes or deposits for gold at their counters, in order to prevent the export of gold, if the exchange rate approached the gold export point.[48] Although described at some length in the literature, the extent of their use, their impact, and the reasons for preferring one type to another have received little systematic study.[49] In the core countries, they often included varying the rules for redemption, imposing geographic barriers on where gold could be bought and sold, but also encouraging imports of gold by means of subsidies and meting out pecuniary penalties to those who bought it to export. In some cases, a mixture of moral pressure and threats to elicit the desired response from clients was used.[50]

[46] Information drawn from board minutes. See AHBP, Actas da Direcção, BP/Dir-2/ Book 18.

[47] Contamin, 'Interdépendances financières', gives a strong reason why, in the case of the Banque de France, it was important, at the end of the nineteenth century, to be discrete: the concern over a loss of public confidence if the Banque de France was seen to be too committed to gold devices and not ready to use the discount rate to defend its reserve.

[48] Scammel, 'Working of the gold standard'; Dam, *Rules of the game*.

[49] An exception is Contamin, 'Interdépendances financières'.

[50] Gallarotti, *Anatomy*; Contamin and Denise, 'Politiques monétaires'.

The Bank of Portugal tried out several 'gold devices'. Rationing credit restricted economic activity and thus helped improve the country's external position and reduce the demand for gold. Refusing credit to customers who were believed to be speculating in the exchanges was another approach, when the rate for bills on London began to get close to the gold export point. Neither was used on any scale since they were difficult to hide, ineffective, and politically unpopular. A third possibility—paying out notes and deposits in copper and silver—to deter clients from seeking gold for sending abroad was even illegal given the restricted legal tender of such coins. Instead, the bank preferred two other 'devices'. The first consisted in replenishing its coffers with gold obtained from various sources, when the reserve became too low. Most commonly, this was done by importing sovereigns from London, either on credit or by paying for them from the various types of liquid assets that the Bank of Portugal held there, at its bankers.[51] The purpose was to have enough gold to face the current drain while it lasted, but it also served for 'window dressing', when needed in order to impress the public and assuage fears of inconvertibility.[52]

Such operations relied for their success on the speed and frequency of the Southampton steamers, and their number was large, as was the amount involved, which totalled £10.6 million over the 24 years under observation. Relative to reserves, on average this was not an enormous sum—slightly less than 10 per cent—but if we consider only the months in which these imports took place, then the importance of this device becomes more apparent. The data represented in figure 2 reveals how common these episodes were—gold shipments arrived in 41 per cent of the months considered. The amounts involved were also very significant in terms of 'improving' the balance sheet. For example, there were seven months when gold imports by the bank raised reserves by more than 50 per cent. In another nine months reserves were raised by more than 40 per cent. The data also allow us to intuit, *ceteris paribus,* the consequences for the liquidity ratio, had these gold imports not occurred.[53] The result is that the number of months in which the liquidity ratio was below the 30 per cent mark would increase from 170 to 193. Those in which it would have fallen below 25 per cent would rise from 83 to 123,

[51] This device started to be used in 1857. It had already been employed by the Banque de France in the 1830s, under the designation of *politique d'éspèce*. See Flandreau, *L'or du monde*. The aim was the same in both cases: to smooth shocks without having to use the discount rate. They were abandoned by the Banque de France in the 1860s as it was discovered that they had adverse feedback effects because of the large scale, in international terms, of these operations. In the case of a small and poor country, this scale problem was nonexistent. In the 1880s, at their peak, yearly gold imports by the Bank of Portugal were around £1 million, at a time when the aggregate gold reserves of all central banks were about £300 million. See Haupt, *Arbitrages et parités.*

[52] The Bank of Portugal was under a legal obligation to publish a monthly summary of its balance sheet, including all the elements for calculating its cover ratio. This was a strong motivation for the practice of 'window dressing'.

[53] This is a static analysis, which neglects the fact that in the event of a non-replenishment of reserves, a loss of confidence and a run on the Bank might well have taken place. This could have led to an even steeper decline in the reserve ratio, or, alternatively, to an unavoidable need to raise the discount rate.

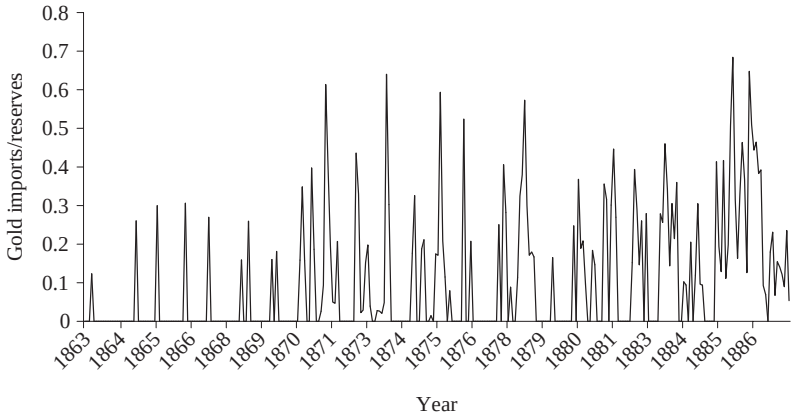

Figure 2. *Gold imports/reserves*

Sources: gold imports are in the rubric 'operações cambiais' in AHBP, Mestre Auxiliar, BP. CG7; reserves are from the monthly balance sheets of the Bank of Portugal published in *Diário do Governo*.

while those below 20 per cent would have risen from 26 to 62. Lastly, there is a new category, of nine months, in which the liquidity ratio would now have been lower than 10 per cent, had external gold not become available. Naturally, it was at the 'dangerous' end of the spectrum that this device had its greatest impact.

Gold imports were especially suitable for facing internal drains. These happened very occasionally, such as in 1876, when the public sought to increase its gold holdings because of a loss of confidence. More often, however, they were the result of increasing needs of cash for transactions, as the economy grew and became increasingly monetized, and also because there were shifts in preference for coin over other instruments. Over these years, this second group of causes was the driving force behind the Bank of Portugal's introduction into the market, at its own expense, of a large amount of gold coin from abroad, as revealed by the increase in the stock of monetary gold of 80 per cent between 1863 and 1887.[54] Not to have done so, on the other hand, would have exposed it to frequent runs by note and deposit holders, which, as a 'fractional' bank, it would have found hard to contain.

A different predicament arose when, for balance of payments reasons, the exchange rate for bills on London neared the gold export point, making it cheaper for economic agents to export this metal rather than remit paper for external payments. Such a situation encouraged holders of claims on

[54] For an example of an internal drain of the second type, in the late 1880s, as a result of expanding wine exports, see Reis, 'Gold standard in Portugal'. The rapidly growing appetite of the Portuguese public for monetary balances in gold coin is documented in Reis, *A evolução*.

Table 2. *Bank of Portugal: gold imports and bankers' drafts on London, 1880–87* (*contos*)

	Gold imports	*Bankers' drafts*	*Profits on foreign operations*	*Gross profits*
	(1)	*(2)*	*(3)*	*(4)*
1880	3,015	2,890	19.3	766.6
1881	2,925	5,377	–14.5	807.0
1882	3,150	13,085	–62.3	907.5
1883	4,500	12,647	–79.0	757.7
1884	2,250	21,269	–57.1	822.1
1885	4,185	35,336	–134.8	852.3
1886	8,280	21,066	–38.9	847.2
1887	4,410	12,881	–44.6	801.5

Source: Annual report and accounts of the Bank of Portugal (several years).

the Bank of Portugal to exchange their notes or liquidate their deposits in return for gold coin, which could then be exported. To dissuade this behaviour, the Bank of Portugal had another 'device', in effect an intervention to manipulate the exchange rate by offering paper on London at a better rate than that of the market. This made it less desirable to export gold and caused the exchange rate for bills to move away from the gold point.[55] To achieve this, the bank would either offer commercial bills that it already held in its portfolio, or sell its own drafts on its correspondents in London. These operations tended to carry a loss, since the bills had been acquired at a better price and the drafts had to be covered subsequently by remittances that had to be bought in the local market, possibly at a higher price.[56] Nevertheless, as table 2 shows, they were preferred over gold imports. This was probably because they were more discrete, but possibly cheaper too, because the cost of packaging, insuring, and transporting sovereigns from England was significant.[57] Table 2 also brings to light that these flows were substantial, if we bear in mind that during the 1880s metallic reserves averaged about 2,000 *contos*. It would seem that Portugal was hardly a case where 'the effect [of gold devices] can be exaggerated'.[58]

[55] Esteves, Reis and Ferramosca, in 'Market integration', put the gold export point at 52.5 pence for a parity rate of 53.33 pence to the *mil reis*, during 1861–82, and 52.82 during 1882–91. The Portuguese currency unit was the *real* (plural *reis*), of which 1 million = 1 *conto*. A *conto*, a unit of account, was roughly equivalent to £222.

[56] Already in September 1864, Knowles and Foster, then the Bank of Portugal's London bankers, advised the bank to follow this course of action in order to stem a gold drain. See, AHBP, Correspondência externa recebida, BP/Est-1. According to Sayers, *Bank of England*, the Bank of England only seriously developed gold devices 20 years later, in the 1880s.

[57] It varied between 0.2 and 0.4 per cent of the value of the gold, according to material in the Bank of Portugal's archives. The bank's accounts do not allow us to compare this with the losses from issuing drafts on London at 'artificial' prices, which were also not trivial. The latter were probably lower because, except when it faced internal drains, the Bank of Portugal seems to have preferred drawing on London rather than importing coin.

[58] Dam, *Rules of the game*, p. 35.

The fundamental aim of the Bank of Portugal in using these mechanisms when dealing with liquidity shocks was to keep banking conditions steady, and above all to avoid recourse to discount rate changes.[59] The latter were politically onerous and unpopular with the market, and had to be kept for major difficulties. Gold devices served for short and not very intense disturbances, but they had two important limitations. The lesser one was cost, as obtaining additional reserves in this way had a price. The shocks that we are considering here, however, although frequent, were short term and followed by as many reversals, and this allowed the Bank of Portugal to recoup some of its preceding losses on foreign exchange operations. Even on the occasions when this was not possible, particularly during the 1880s, the bank's gross profits were large enough to absorb such losses, as can be seen in table 2.

The second limitation was that reserve problems could only be countered in the manner described to the extent that the Bank of Portugal had access to sufficient external assets in order to meet the debits arising. Whenever it drew on London in order to drive up the exchange rate or ordered the remittance of a few boxes of sovereigns, the corresponding amounts had to be paid out of the liquid assets held by its correspondents abroad. Consequently, the restriction was the aggregate worth of its portfolio of foreign bills, 'easily negotiable' shares and bonds, and the cash balances held in accounts abroad, and which served to secure the acquisition of reserves in London. An additional and exceptional source of liquidity, of which more below, consisted of unsecured credits that the Bank of Portugal's foreign bankers from time to time allowed for this purpose. The longer a liquidity problem lasted, the more these resources were needed, in order to maintain confidence and convertibility through the use of its two favourite gold devices. As the directors wrote to the government on one of these occasions, the use of gold devices 'comes to an end as soon as the Bank's credits abroad or its portfolio of paper on foreign places are exhausted'.[60]

The implication of all this is that to understand how the Bank of Portugal managed its reserves and correlated this with other monetary instruments, we must abandon the bank's 'official' concept of reserves, that includes only 'cash in hand'. Instead, it is better to resort to a notion of 'global reserves', which comprises both 'official' and external reserves net of short-term obligations contracted in foreign markets. The latter provides a more realistic view of where the limits to a policy of gold devices lay and, as we shall

[59] Borrowing reserves internally was hardly a viable alternative. To do so by attracting more deposits, it would have had to pay interest on them, which was forbidden by its bylaws. If, instead, it issued more notes, it would be faced by their speedy return, unless public preferences to hold notes were to increase, an unlikely event during a reserve drain. On this 'reflux mechanism', see White, *Free banking*. The possibility of buying de-monetized gold locally for minting would have been expensive and slow compared with shipping monetized gold from England. See Bastien, 'Para a história'.

[60] Letter of 25 July 1877 in AHBP, Registo de papeis oficiais n° 17, BP.CG/48.

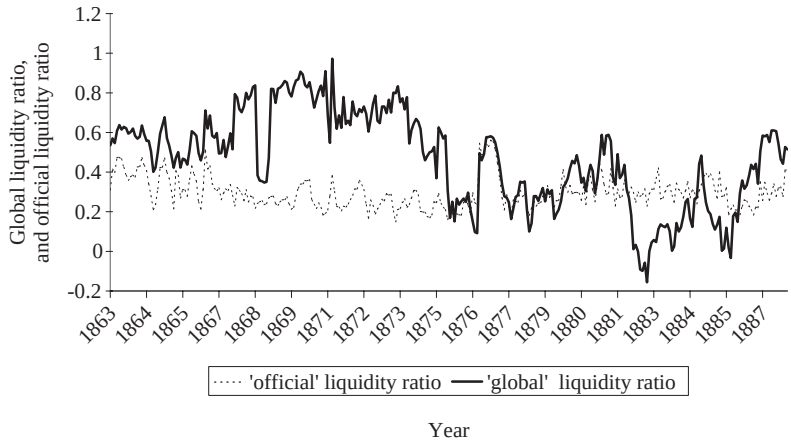

Figure 3. *'Global' and 'official' liquidity ratios*

Sources: for the 'official' liquidity ratio, same as fig. 1; for the external reserves used to estimate the 'global' liquidity ratio, AHBP, Mestre Auxiliar, BP.CG7 and AHBP, Situações Periódicas, BP.CG18.

see in the next section, was indeed what the board monitored when it formulated its monetary policy.[61]

The adoption of this approach to reserves considerably alters some of our earlier conclusions, as becomes apparent from figure 3. Between 1863 and 1876, external reserves did indeed act as a cushion to the 'official' ones, since the ratio of 'global' to 'official' reserves was consistently greater than unity. Our earlier impression of a declining and often dangerously low liquidity ratio during these years is replaced by a far rosier picture, which allows us to make better sense of the puzzle regarding the bank's passive use of the discount rate. With a 'global' liquidity ratio often in excess of 60 per cent, the Bank of Portugal had little cause for worry and, like the Banque de France, every reason to follow a highly stable monetary policy. On the other hand, between 1877 and 1887, a major sea change took place. Net external reserves now often dwindled to insignificance or were even negative, in which case, the ratio between 'global' and 'official' reserves fell lower than unity. This means that part of the Bank of Portugal's metallic reserves in Lisbon had been acquired in London for 'window dressing' but was in fact owed to foreign bankers. Still more remarkable, during a total of ten months spread out over 1882, 1883, and 1885, this ratio was either negative or nil, the implication being that in this case the entire official reserve was financed by short-term credit from abroad. Meanwhile, the

[61] Under its bylaws, the concept of 'reserves' was this broader notion, encompassing both cash and external resources with different but short degrees of liquidity. See Banco de Portugal, *Diplomas*. It preferred, however, not to publicize the 'true' reserve position, so that only 'cash in hand' was shown under 'reserves' in the published monthly summary, the net external position being dispersed among other accounts and therefore impossible for outsiders to trace.

Bank of Portugal outwardly displayed a modest, though stable, liquidity ratio of around 25 per cent, which concealed a potentially dangerous situation in serious need of corrective monetary action.[62]

The record of internal discussion does not reveal the reasons for this change in the Bank of Portugal's behaviour explicitly but one may speculate on them. Some may belong to the field of entrepreneurship and involved efforts at profit maximizing. In this perspective, it is striking that the average spread between London and Lisbon interest rates increased by one percentage point, from the first to the second period. This made it more profitable, after 1876, to run down external balances and borrow abroad in order to lend at home, which is effectively what the Bank of Portugal was doing, whereas earlier it had been accumulating in London with assets exported there from Lisbon. A second motive of this kind was the increasing reputation and network of banking connections that the Bank of Portugal had built up since the 1860s. It was by far the largest and oldest bank in Portugal, and clearly the most solid. Its capital represented a considerable proportion of total assets, while its sight liabilities were of moderate size. It had an excellent record of paying punctually, a strong international business orientation and easy access to bills from the important Brazilian market. The desirability of such a customer was further enhanced by the perception of the close support it enjoyed from the Portuguese government. The market doubtless remembered that the latter had entrusted the Bank of Portugal with more than half a million pounds sterling, in cash, during the 1876 banking crisis, to enable it to bail out the beleaguered Portuguese banking system.

At the same time, factors of a broader systemic nature may also have obliged the bank to intervene more often and to assume the costly role of managing the national currency. For technical and institutional reasons, the target zone defined by the gold points became narrower in 1876–87, by half a percentage point compared to 1854–69. This meant that smaller and more frequent external shocks than before were apt now to trigger off flows that had to be neutralized, and required a more vigorous use of 'gold devices'.[63] This may have been reinforced, from the mid-1870s until the early 1890s, by the rapid spread of the gold standard to a number of countries, unaccompanied by a commensurate increase in world gold production, making international competition for gold balances more severe.[64] The consequent international deflationary trend also made itself felt in Portugal—prices fell by 16 per cent between 1878 and 1889—and presumably encouraged economic agents to accumulate a greater proportion of savings in gold coin,

[62] The Portuguese case contradicts Gallarotti's claim, in *Anatomy*, p. 81, that central banks would rather raise the discount rate, use gold devices, or control capital movements than borrow from another bank in order to replenish reserves.

[63] See Esteves, Reis, and Ferramosca, 'Market integration', the only study that provides details on gold points in Portugal.

[64] Eichengreen and Flandreau, 'Geography of the gold standard'.

which could be a factor in increasing the propensity to drain reserves from the Bank of Portugal.

The kind of external financial assistance that this small and peripheral national bank of issue could aspire to at this time typically did not come from other central banks.[65] It came from ordinary banking institutions that were familiar with the particular environment, had profit as their main object, and did not enter into these operations for the sake of the international monetary system's stability. They proliferated and competed intensely in huge markets such as London, and the Bank of Portugal apparently had relatively little difficulty in establishing fruitful relations with several of them who were keen to have such a customer. Besides engaging in normal commercial operations with them, it had managed to obtain considerable secured, but also unsecured, credits, initially of about £100,000, in the 1860s but which had risen to more than £1 million sterling by the end of the period. These could be drawn upon freely for periods of between three to six months, to be covered by remittances of bills later. During good times, the Bank of Portugal accumulated external liquidity in London. In difficult times, of internal or external drain, it might run up deficits for several months on end, and use these resources, by means of 'gold devices', to sustain convertibility and public confidence. It is important in this connection to mention the fact that the Bank of Portugal was small enough that its credit demands on the international market were minuscule, tended to pass unobserved, and generated no effects for other players.[66] For these bankers, all that mattered was that it be creditworthy when it sought to indebt itself.

Informational asymmetry has been a much studied feature of financial systems. The situation we are examining is a striking example of this problem. For many years Portugal's central bank was able to hold an apparently adequate gold reserve and thereby present itself to the world with a credible commitment to the gold standard, which to some extent the true facts belied. It is not clear to what extent the market was deceived by appearances or what significance it attached to the available negative signs. The question this raises is: how asymmetric was this information and why did speculators not take greater advantage of Portugal's weak currency?

[65] Foreign borrowing by central banks in trouble is mentioned by several authors but the details are scant and usually focus exclusively on inter-central bank operations. See Bloomfield, *Monetary policy*; de Cecco, 'European monetary and financial cooperation'; Gallarotti, *Anatomy*; Bayoumi and Eichengreen, 'Stability of the gold standard'. Ford, in 'International financial policy', claims that gold for replenishing reserves came either from 'other monetary authorities or from the mines' (p. 201), completely ignoring the possibility that private bankers might have rendered this service. On the other hand, Johansen, 'Banking and finance', refers to the Danish central bank 'borrowing from foreign correspondents, mainly in Hamburg, Berlin and London' (p. 165) and Flandreau, *L'or du monde,* shows that the Banque de France borrowed from both types of institution during the 1850s and 1860s.

[66] *The Economist* of 26 August 1876 commented that the £1 million pounds in gold that the Portuguese government had just borrowed in London to shore up the local banks was 'of too small a magnitude to make any impression on the vast accumulation of gold here'.

In our present state of knowledge, a concrete and precise answer is not possible, but it may be helpful to consider the two following points. One of them is that the Bank of Portugal thought it worthwhile to make sustained efforts, of various kinds, to limit the information that was accessible to the market. As noted earlier, not all of the data that would have been of interest to exchange dealers was placed on the published monthly balance sheets. The true liquidity position of the Bank of Portugal was therefore not easily ascertainable, a practice that is known to have been followed later by at least one other peripheral central bank.[67] As regards the import of sovereigns, the same concern to cover traces is also evident, particularly as the size of the flow increased. In 1872, the Bank of Portugal stopped using a single supplier and started dispersing its orders among three different and unrelated correspondents. After 1877, it processed all gold coin remittances via the Portuguese Treasury's Financial Agent in London, to make it even more difficult for the market to determine who their recipient was. A similar change happened in the bank's choice of London correspondents. In the 1860s there was only one, but by the 1880s the business was being distributed among several bankers, who naturally knew little about each others' dealings with the Bank of Portugal, as was normal business practice. As one of its London bankers advised, apropos a loan of £300,000 sought by the Bank of Portugal when it was facing a drain in 1865, 'it is better not to let others here know the contingency that requires you to have to prepare yourselves in this manner'.[68]

The second point regards the impact that these and other efforts may have had on operators seeking potential windfall profits from the Portuguese currency business. The Bank of Portugal was surprisingly candid with its principal correspondents on these matters during occasions of difficulty and often discussed its strategy in the London market with them.[69] This was safe not only because total discretion was the rule in such relationships, but also because it was clearly in the interest of these correspondents not to speculate against long-standing clients with whom they had considerable funds tied up. What is more striking, however, is that these banks, which had privileged access to the affairs of the Bank of Portugal and were regarded as 'specialists' in Iberian and Latin American business, do not appear to have entertained doubts concerning the sustainability of the Bank of Portugal's liquidity position in the medium term. According to the internal ratings of the Crédit Lyonnais, Portugal would have been a 'third order' sovereign risk during the 1880s, and yet this bank held Portuguese bonds and was a major

[67] This was the Bank of Austria-Hungary between 1901 and 1913. See Morys, 'Classical gold standard'.

[68] Knowles and Foster to Bank of Portugal, 9 June 1865, Foreign correspondence, AHBP, BP-Est.1.

[69] The Bank of Portugal's correspondence with Knowles and Foster, in the 1860s, and with F. Youle, a director of the London and County Banking Co., during the 1870s and 1880s, is illustrative.

discounter, in London, of the Bank of Portugal's drafts.[70] Likewise, the London and County Banking Co. allowed the Bank of Portugal very significant short-term credits, for uncovered drafts and for the import of sovereigns, all through the 1870s and 1880s—their limit was £700,000 in the early 1880s—despite being regularly informed of this client's liquidity needs and of the difficulties it faced in Lisbon and in London. In 1885, at the peak of its external difficulties, the Bank of Portugal enjoyed total credits, from six bankers in London, of £1.1 million, of which it was using at most a third.[71] Thus, although every so often market operators may have had reasons to be suspicious, there was apparently enough strength in the Bank of Portugal's position to discourage important speculative attacks. Besides this, reassuringly, the Bank of Portugal did intervene, from time to time, with its strongest weapon, the discount rate, to safeguard convertibility. Even though this was used perhaps too infrequently and too inflexibly, the result was a discount rate that was certainly not low by international standards.[72] The remaining question is therefore whether it was used well and consistently. In what follows, we try to establish the extent to which the Bank of Portugal's discount rate policy accorded with sound banking and monetary principles, and whether it was rules or discretion that prevailed in its exercise.

IV

The previous section showed that the central bank of a small and peripheral gold standard country could frequently elude with impunity the rules of conduct that revealed its commitment to this regime. It also demonstrated that there were limits to how far this could be taken. When these limits were reached, there was no option but to turn to the discount rate. Given its history of weak adherence to 'the rules of the game', the question is whether it also varied its discount rate in the same discretionary manner. The answer to this has two parts. One is to establish the factors that the Bank of Portugal and the specialized public deemed the proper ones for shaping such a policy. The bank claimed from early on that in such matters 'experience' and 'good authority' governed its actions.[73] The second part aims at determining

[70] Flandreau, 'Caveat emptor'. This rating refers to the 1890s, when the Crédit Lyonnais considered as 'third order' international debtors that had a ratio of debt service to normal revenues above 40 per cent. For Portugal this indicator averaged 56 per cent during the period 1881–7. See Mata, *Finanças públicas*. Correspondingly, the implicit rate of return on Portuguese external bonds during the 1880s, at an average of 5.8 per cent according to *The Economist*, was 3 points above the rate on consols. In 1892, Portugal had the second highest debt per capita in Europe, a situation that originated in the 1880s, since no loans were contracted after 1888.

[71] The six banks involved were the London and County Banking Co., the Mercantile Bank, the Hanseatic Bank, Brown Shipley, the Union Bank of Spain and England, and the Crédit Lyonnais, London. See the board minute for 27 March 1885, in AHBP, Actas da Direcção, BP/Dir-2/ Book 21.

[72] The average discount rate of the Bank of Portugal for 1863–87 was close to 6 per cent.

[73] *Parecer ácerca das exigências*, p. 28.

whether these factors actually played their presumed role and this is revealed by the Bank of Portugal's reaction function relative to its discount rate.

Exercises of this kind have long been carried out for different countries, mainly Britain and Germany, and the literature on the subject is plentiful.[74] Like most of these, we assume here that the Bank of Portugal did not optimize a target, but followed a rule of thumb and possibly aimed at several targets at the same time.[75] The discount rate considered here is both a categorical and an ordered variable, that is, it only assumed precise values of 5.0, 5.5, 6.0, 6.5 per cent and so on. A better procedure to follow in these cases, instead of the usual OLSQ, is ordered probit, which takes this feature into consideration.[76] In the case of both the dependent and the independent variables, we focus on levels rather than the first differences, and this for two reasons. One is that there is no need for differencing because they are stationary.[77] The other is that our qualitative sources indicate that the Bank of Portugal monitored levels, not variations, and made efforts to shift those levels, not to influence rates of change. In designing the model, instantaneous reaction to explanatory variables was ruled out, given that this appeared ahistorical, because of delays and imperfections in the flow of information and the time required for decisions by the board. Based on our reading of the archival material, this seemed to come closest to reflecting the Bank of Portugal's slow, cautious, and often vacillating decision-making process, and appropriate lags were therefore selected for each variable using a VAR model.

The most important of the independent variables should be the liquidity ratio, either in its 'official' version (metallic reserves/notes and deposits), or the 'global' version (metallic + net external reserves/notes + deposits). The expected sign in the estimation is negative, in accordance with the 'rules of the game'. Much use has been made in other studies of related targets, such as international gold inflows and outflows, or the level of bank reserves. The latter does not seem apposite because it only makes banking sense when compared to the obligations that it was supposed to guarantee. The former cannot be used here because the information is lacking on anything but a monthly basis. In any case, although the directors of the Bank of Portugal were concerned about the balance of payments and its components, for them the liquidity ratio was undoubtedly the crucial indicator. Moreover, in a country

[74] For numerous references, see Bordo and MacDonald, 'Violations'.

[75] A rare exception is Giovannini, 'Rules of the game', who attempts to estimate a specific target for both the Bank of England and the Reichsbank.

[76] This procedure has not been adopted in the majority of historical studies but a comparable one—dynamic probit—was originally proposed for the same problem by Eichengreen, Watson and Grossman, 'Bank rate policy' and has recently been tried again by Davutyan and Parke, 'Operations of the Bank of England'. On the reasons for preferring a probit to a logit alternative in this case, see Feinstein and Thomas, *Making history count*, p. 423. Several recent studies on the reaction function of the European Central Bank's short-term interest rate using ordered probit techniques are listed in Gerlach, 'Interest rate setting'.

[77] The railway receipts variable, which is discussed below, is the exception to this and is transformed by first differencing.

where the hoarding of gold was significant, foreign gold movements by themselves could be deceptive in assessing the reserve position of the bank.[78]

The highly integrated nature of the international gold standard has drawn attention to the impact on a given central bank's reaction function of the actions of its major counterparts, and this also happened in the case of the Bank of Portugal. The directors' view was that 'owing to the mobility of circulating capital, by a natural impulse, the rate of interest tends to find the same level in all markets which entertain easy commercial relations, a tendency which has been compared to that of a liquid in a system of communicating vases'.[79] In view of Portugal's strong commercial and financial links with Britain, the obvious choice was the latter country's discount rate, that of the Bank of England having been preferred as it is the one the board usually mentioned. The expected sign of the coefficient is positive.

International financial relations suggest two further explanatory variables—the Brazilian exchange rate being one of them. In this case, the Portuguese specifity lay in the importance of emigrant remittances in its balance of payments. When the Brazilian exchange weakened, these remittances diminished too, and this pressured the Portuguese exchange rate downwards, thereby encouraging defensive action by the Bank of Portugal.[80] The sign of the coefficient should therefore be negative. A second exogenous link was the price of Portuguese foreign bonds, which were payable in gold, and quoted on the London stock exchange. The idea here is that this price was an indicator of the country's credibility, and of the market' expectations regarding its solvability. A fall in value was a sign of deterioration for external investors, leading to a capital outflow. This would push the Bank of Portugal to have to defend the reserve, by raising the discount rate, so that again the sign of this coefficient ought to be negative. This inverse relationship was reinforced by the fact that these bonds were also present to quite an extent in Portuguese portfolios. A rise in prices would induce these investors to sell off and repay their debts to the banks. This would cause the Bank of Portugal's reserves to be replenished and thereby reduce the need to increase the discount rate.[81]

To render the model more realistic, certain non-financial and non-monetary variables have been added to it. To establish whether the Bank of Portugal's discount-rate policy was governed by concern over the level of activity in the economy—the much-vaunted 'tenderness' for the market—we have resorted to a proxy based on the first differences of monthly railway traffic receipts.[82] Internal discussion suggests that such worries indeed existed, but it is not certain that this proxy picks them up. The reason would be that railway receipts reflected mostly agricultural activity, certainly an

[78] Reis, 'Gold standard in Portugal'.
[79] *Parecer ácerca das exigências*, p. 16.
[80] Salazar, *Ágio do ouro*.
[81] *Relatório da direcção*.
[82] This was used for England in Goodhart, *Business of banking*.

important dimension of the Portuguese economy, but one that may not have been all that closely integrated with the formal financial system. Another variable that is related to this one is the seasonality of the economy, and is proxied here with dummies in the standard way. Since a role for politics in monetary affairs seems likely too, a dummy that reflects the political colour of the governments of the time seems fitting. Under the party system known as Rotativismo, from the 1850s onwards the Regenerador and Progressista parties alternated regularly in power[83] and, although lacking clearly distinct programmatic personalities, the Regeneradores appear to have been fiscally more responsible and to have enjoyed a better international financial reputation.[84] A final proxy seeks to take into account the likelihood of a change over time in the Bank of Portugal's perception both of the working of the money market and of its own role in the financial system, as a result of the accumulation of experience. A dummy dividing the period into two, at the December 1876 mark, has the further advantage of capturing the likely repercussion on this of that year's banking crisis and the protracted debate on the Portuguese financial system that followed.

The results of the estimation, using monthly data, are displayed in table 3. The first thing to note is that the independent variables have the correct signs, with one exception and all but one are significant at the 1 per cent level. The conclusion is that the Bank's discount policy was directly influenced by a set of rules that spelled out sound principles of central bank management, including the 'rules of the game'. The 'goodness of fit' of the estimation seems to confirm this despite the fact that, in the case of the ordered probit model, it must be recognized that, unlike with OLSQ models, the available statistics—the pseudo-R2 and the McFadden-R2—raise problems of interpretation.[85] On the other hand, the joint explanatory power of these variables is not high, suggesting that the element of 'discretion' in the decision-making process, as opposed to the application of 'rules', must have been considerable. This leads to the conclusion that central banking, as practised in Portugal, was very much an 'art', and the 'formal code of actions', referred to as a 'science' by the Macmillan Committee in 1931, apparently was not the prevailing element.[86]

On a more detailed level, an important finding is the confirmation that the 'global' liquidity ratio is better than its 'official' version, which had the right sign (not shown in table 3) but was not significant. The apparent

[83] Bonifácio, *Século XIX*.

[84] The subject has hardly been studied, but see Mata, 'Conjuntura económica' and Lains, *História da Caixa*. Fontes Pereira de Melo, the leader of the Regeneradores for 30 years, was responsible for first placing Portuguese finances on a sound footing in the 1850s, and for re-opening foreign stock exchanges to Portuguese bonds.

[85] Nevertheless it is encouraging that an expectation-prediction table confirms the 'goodness of fit' of the model. The aggregate of the differences between observed counts and the number of observations where those responses had the highest probability was 23 per cent of total observations.

[86] Martin Aceña, 'Spain', attributes an even less 'scientific' approach to the neighbouring Bank of Spain—'an ad hoc policy rather than a management consciously oriented to regulating the economic business cycle and the volume of credit', p. 151. The Bank of Spain was off the gold standard at this time.

Table 3. *Bank of Portugal discount rate function, 1863–87* (ordered probit estimation)

Dependent variable: Bank of Portugal Discount Rate	
Independent variables:	
'Global' liquidity ratio [5]	–0.031 (–6.13)
Bank of England discount rate [1]	0.340 (6.53)
Brazilian exchange rate [0]	–0.225 (–5.40)
Price of Portuguese foreign bonds [1]	–0.069 (–3.30)
Political dummy [0]	–0.362 (–2.25)
Dummy for 1876	–0.377 (–1.40)
Other variables (not significant)	
Summary statistics:	
Pseudo R2	0.206
McFadden R2	0.204
LR chi2	148
Log likelihood	–265
N	295

Notes: Z statistics are in round brackets; figures in square brackets represent the lag of each variable. Given their lack of significance, the following variables have been omitted: railway traffic receipts and seasonality.
Sources: For the dependent variable, same as figure 1; for the 'global' liquidity ratio, same as figure 3; for the Bank of England discount rate, Mitchell, *British historical statistics*; for the Brazilian exchange rate and the Portuguese bond price, *The Economist* (several years); for the political dummy, Mata, 'Conjuntura económica'.

absence of a seasonal influence is equally striking in view of the large weight of the agricultural sector, but may simply mean a low degree of integration of the economy and especially a weak link between formal financial institutions and the primary sector.[87] The same was already expected and is similarly confirmed for our index of economic activity, which also strongly reflects agricultural activity. Rather than implying a lack of concern by the Bank of Portugal for the state of the market, the reason may simply reside in the inappropriateness of the proxy. Lastly, the lags used to define the different variables differ, not surprisingly, from variable to variable. The effects of both the Brazilian exchange rate and the bond price on the discount rate were felt rapidly, a fact which is hard to explain during the 1860s, until the delays in communication with the former colony were lifted at the beginning of the 1870s thanks to the inauguration of the submarine cable. A high sensitivity to the discount rate of the Bank of England is also revealed, as might be expected. In contrast, the Bank of Portugal's reserve position clearly took a much longer time to be digested by the board of directors before decisions were taken, which is in keeping with our evidence from board meetings on such decisions.

Politics apparently mattered too. The periods when the financially 'more respectable' Regenerador party governed were characterized by a tendency for a lower discount rate, and the opposite happened when the Progressista

[87] It is possible that this result occurred because both the dependent and at least one of the explanatory variables were affected by seasonality, but this does not appear to have been the case. The Bank of Portugal discount rate was tested on its own using ordered probit and this revealed no seasonality. The same happened when ordinary least squares regressions were run separately for each one of the explanatory variables.

party or its predecessors were in charge. Differences of trust in Portuguese finance by the international community might be one explanation for this, via the effect of a 'country risk' factor associated with this. But the reason could simply be that Regenerador governments were stronger and longer lasting, and therefore better able to resist the Bank of Portugal's pressure to raise the discount rate. Some sort of learning curve also is apparent, judging by the sign and significance of the 1876 dummy (though $p = 0.16$ only). The later sub-period was characterized by a tendency to lower discount rates, other things being equal, but it seems unlikely that this was the direct effect of the 1876 bank crisis since this should have rendered bankers more, not less, cautious. A better explanation is that a perception was spreading that the state was now readier than before to bail the Bank of Portugal out of difficulty, as it did on that occasion. There is no direct evidence on this, but it is tempting to believe that a stronger possibility of 'moral hazard' made it easier to live with a discount rate that was getting harder and harder to alter.

V

The point of departure of this study is the widely accepted notion that the stability of the gold standard mostly relied on the steadfast long-term commitment of various countries to this regime. This allowed a measure of policy flexibility that rendered adjustments to shocks relatively smooth and painless. The Bank of Portugal was the central bank of a country that did not provide a favourable financial and political environment for the continuous adherence to this monetary system. Nevertheless, it was able to breach the 'rules of the game' persistently, at times on a considerable scale, and without seriously threatening convertibility. Indeed, to the casual observer its commitment must have seemed quite adequate. Not only were there no suspensions of convertibility during several decades, but Portugal also managed to keep its exchange rate within the gold point band satisfactorily.[88]

The reality, in fact, was quite otherwise. To satisfy appearances, the Bank of Portugal increasingly had to use 'gold devices', to a point where it came to rely heavily on short-term credits from its foreign bankers in order to maintain sufficient liquidity to meet its sight obligations. Finally, during the 1880s, the *Economist* started issuing successive warnings that 'the country was living beyond its means'.[89] Interestingly, this was also the time when the Portuguese exchange rate had its best performance, with a ten-yearly average deviation from par that was less than either in the 1860s or the 1870s, as well as a clear trend towards 'good behaviour' throughout the 1880s themselves.[90] Does this mean that the Bank's intervention to support

[88] For the general picture, see Bordo and McDonald, 'Violations'; for details on the Portuguese case, see Esteves, Reis and Ferramosca, 'Market integration'.

[89] Cited by Esteves, 'Finanças públicas', p. 322.

[90] Esteves, Reis and Ferramosca, 'Market integration', p. 43.

the exchange was so successful that it enabled Portugal to prolong its link to gold beyond what should have been possible given the weakness of the country's commitment to this standard?

Clearly, the Bank of Portugal was quite effective in defending the peg, and therefore helped to maintain stability. There were at least two other circumstances, however, without which it was impossible that these arrangements could have lasted for long. One was the country's relative international insignificance, the other was the opportunity for profit it offered specialist bankers in core countries. Yet when Portugal was forced off the gold standard, in 1891, these advantages turned into disadvantages and all the system's fragility was revealed. The country was too small to justify a bail-out operation, as would have been carried out for core countries that were 'too large to fail'. And, in an international financial environment that was in retreat ever since the Barings crisis, it had become too risky to continue to offer the sort of short-term credit that had been the lifeblood of the Bank of Portugal's 'gold devices'.

At the same time, it would be wrong to infer, because convertibility collapsed at that moment, that the monetary regime described above had ceased to be sustainable. The reason is that the shocks that terminated it were not only exogenous but quite massive, and no amount of central bank intervention could have neutralized their impact. To begin with, political strife in Brazil and the Barings crisis of 1890 led to a plunge in the Rio/London exchange rate—a 61 per cent fall during 1890–91—and consequently to a dramatic drop in Brazilian remittances. Fears caused by this loss of foreign earnings were compounded by concerns relating to Portugal's involvement in a hopeless diplomatic wrangle with Britain over African colonial possessions, which worsened its foreign image and raised worries about an unbearable burden of military expenditure. With the service of the foreign debt becoming increasingly difficult, fresh Portuguese government borrowing abroad became practically impossible, thus upsetting the second pillar of the Portuguese external position. As Barings, the bankers of the government in London, refused to renew their short-term credits, there was nothing left but to force the Bank of Portugal to take on this role, a task that was beyond its strength. Inconvertibility thus became inescapable, as the Bank of Portugal's gold reserves were rapidly dissipated, a situation that could only have been staved off had the combination of circumstances not been so hugely adverse.[91]

Gold devices were not the only instrument used by the Bank of Portugal to even out the effect of external shocks while the gold standard existed. Like all central banks, it also had its discount rate policy, which, however, it employed with some reluctance and difficulty. Of special interest in terms of central bank history is the fact that it used this instrument in accordance with what would pass, at that time, for a 'scientific' set of rules. Moreover,

[91] Reis, 'Gold standard in Portugal'.

it did so consistently. It tracked the Bank of England's rate closely, and did the same for its own reserve ratio, not the official, 'window-dressed' one, but the 'global' one, which included its net external liquid assets. It paid attention, sensibly, to less orthodox indicators too, such as the Brazilian exchange rate, the price of Portuguese bonds in London, and the political complexion of the government of the day. Yet, in the end, it was discretion that had the greatest influence in these decisions. Discretion here does not simply mean the 'art' of central banking, as extolled during the 1920s and 1930s—taking decisions on the basis of good sense, tradition and flair. No doubt it included these too, but it also encompassed all the undesired and unavoidable political and informational difficulties that surrounded any assessment by the Bank of Portugal's directors leading to a discount rate change. A reading of the board's minutes has brought to light how many of these imponderables it had to face and how weighty they were. Getting a government to agree to a rate-hike decree could take up to three or four months, and this depended on a variety of exogenous factors that were forever changing quite unpredictably. But this was only the second stage of the process. Before this, as noted earlier, a lot of time was spent discussing within the board whether the situation was ripe for an alteration, not only in terms of 'science', but also of other pertinent aspects, such as personal relationships with the current government. This could entail a further three to four months of delay.

Had the Bank of Portugal enjoyed real instead of only partial autonomy in monetary policy, such delays might have been shorter, and its use of the discount rate might have been more frequent and better adjusted to market conditions. We cannot be sure that this would have prolonged the life of the gold standard, however. The fact was that the Bank of Portugal was not the Bank of England. It could not attract gold flows, without using its discount rate, simply by dint of its reputation and the market expectations that this engendered. Indeed, the question is whether using this tool more often would not have set off adverse selection effects and frightened away corrective capital movements, rather than attracting them. The truth is that the mechanisms for managing the gold standard were not the same for everyone. Ford's warning against 'accepting too easily some of the facile stereotypes which have been applied to gold standard provisions regardless of individual circumstances' thus continues to stand.[92]

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[92] Ford, 'International financial policy', p. 202.

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