# THE LONG-RUN BEHAVIOUR OF THE INCOME

# VELOCITY OF MONEY IN PORTUGAL: 1854-1992

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# Contents

## Abstract

This paper analyses the behaviour of the Portuguese income velocity of money from 1854, when Portugal precociously accepted the rules of the gold exchange standard and the eve of the European Economic Union.

The long run behaviour of income velocity of money in Portugal displays, throughout the entire period, a pattern in line with its relative economic and institutional backwardness. Only from the 1950s on, did a general process of modernization of the Portuguese economy take place. Economic growth was sustained and important institutional aspects related to monetary and financial factors were developed up to 1973.

Portuguese income velocity of money displays the U-shaped pattern, which is also apparent in several case-studies concerning developed economies. However, the inflexion point of the trend is delayed to 1973 as a consequence of Portuguese relative economic and institutional backwardness and in line with the Spanish case.

# 1. Introduction[1]

The present paper will analyze the behaviour of the Portuguese income velocity of money from a long-term perspective and assess the importance of macroeconomic and institutional factors as determinants of such behaviour. We discuss whether Portuguese income velocity of money displays the U-shaped pattern, which is apparent in several case-studies concerning developed economies, such as Canada, USA, United Kingdom, Norway, Sweden, Germany, Denmark, France and Italy. We look for particularities of the Portuguese case, in line, namely, with the Spanish case, as a consequence of the relative economic and institutional backwardness of the Iberian economies. On the other hand, as a by-product, the short-run fluctuations of the Portuguese income velocity of money will also be examined and used as an instrument to revisit and reinterpret from a different perspective some views on the Portuguese economic history, which have been under debate.

The choice of the period examined hardly requires justification for those acquainted with Portuguese economic history. 1854 is the year when Portugal implemented a global monetary reform, which included the relatively precocious acceptance of the rules of the gold standard. 1992 is the last year before the launch of the European Economic Union as a further, decisive step in the European integration process according to the Maastricht Treaty. From then on the aim of accomplishing a monetary union within a few years led member-countries, willing to become members of the European Monetary Union from the onset, as was the case of Portugal, to conform to a number of "convergence criteria" to ensure sustained nominal convergence. For that reason Portugal entered the exchange rate mechanism of the European Monetary System in 1992.

This paper is divided into four sections. Section 1 surveys the most relevant literature on the subject as well as the sources where data to estimate the Portuguese income velocity of money

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1 Paper presented at Iberometrics II — Second Iberian Cliometrics Workshop, Universidad Carlos III, Madrid, Spain – March 11-12, 2005.

from a long run perspective may be found. At the end, the computation of the historical Portuguese velocity series will be presented. Section 2 analyses this empirical evidence, namely the long-run behaviour of these series stressing the role of macroeconomic and institutional developments in a context of the relative backwardness of the Portuguese economy well into the 20th century. Short and medium-run fluctuations of the income velocity series in Portugal and its determinants will be also examined in some detail. Section 3 looks over the post-WWII period, when a meaningful U-shaped pattern of the Portuguese income velocity of money is displayed, in line with the institutionalist approach and in the context of the sustained economic growth and convergence to European standards of the Portuguese economy. The paper concludes with a summary and some questions to be answered in the next phase of our ongoing research.

## 2. The institutionalist approach and the empirical evidence

### 2.1. An overview

This research on the secular pattern of the Portuguese income velocity of money is largely induced by, and indebted to, the institutionalist approach and the empirical evidence produced in works, such as Jonung, 1978, Bordo; Jonung, 1981, Siklos, 1993, Bordo; Jonung; Siklos, 1997, Craig; Fisher, 2000, Carreras; Garcia-Iglesias, 2003.

Briefly, these studies suggest, in line with Wicksell's monetary theory on velocity[1] and according to Jonung's study inspired by the Swedish case (Jonung, 1978), the importance of taking institutional changes into consideration to explain the secular behaviour of the income velocity of money, beyond its traditional determinants[2]. They empirically demonstrate that common developments of the financial and economic modernization process, such as monetarisation, the spread of commercial banks, financial sophistication and economic stability, are relevant determinants in explaining what seems to be a common U-shaped pattern of the long run behaviour of the income velocity of money across the developed economies[3]. The two first developments explain the decreasing trend of velocity, while financial sophistication and economic stability explain the following increasing trend[4]. We will see more precisely how they are supposed to operate when

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1 For a synthetic summary of this theory see Jonung, 1978.
2 Income velocity of money has traditionally been explained as a function of real income and of nominal interest rate.
3 In some cases, according to econometric tests, the most relevant determinants (see Bordo; Jonung, 1981).
4 As referred in Bordo; Jonung, 1981, other explanations relying on the traditional explanations for the behaviour of the income velocity of money have been put forward. Friedman and Schwartz, 1982 studies of the USA and Great Britain monetary histories consider the steady declining trend in velocity ($V_2$) to be the consequence of the steady increase in real GDP per capita while $M_2$ is a luxury good.

we examine the Portuguese case below. Note that the U-shaped pattern seems to be particularly appealing when a relatively broad definition of money is considered, namely $M_2$ as a consequence of the prevalence of the long run perspective. On the other hand, the empirical evidence, covering a relatively large number of case studies, shows that the turning point of the U curve lies in the aftermath of WWII, for the majority of the developed economies. However, some precocious cases, such as Scandinavian countries and France underwent the inflection point earlier in the 1920s and 1930s, while for Spain 1973 seems to be the corresponding point (see Carreras; Garcia-Iglesias, 2003).

## 2.2. Portuguese empirical evidence: the computation of the historical Portuguese velocity series

During the last two decades, Portuguese modern economic growth and Portuguese monetary and financial history have been the target of important research and debate. Analytical and overall studies on those subjects have been published, while quantitative groundwork, including different estimates of historical series of the relevant aggregate variables for our present task, has been produced. As the income velocity of money is generally defined as a measure of nominal income over a measure of money stock, we will now concentrate on the available long-run estimates of nominal gross domestic product (GDP), real GDP and price indices, as potential deflators, on one hand, and of money supply on the other. Most of this quantitative groundwork is now gathered in Valério (coord), 2001, ch. 2, 6, 7 and 8, a two volume work of Portuguese historical statistics. Some statistical appendices including these variables can also be found in Lains, 2003 and in Mata; Valério, 2003, where some of them were updated.

The only relatively consistent time series of nominal GDP embracing the whole period is available in Mata; Valério, 2003: 254-257 and presented in the appendix. Critical and detailed presentation of the sources and methodology used to compute this series is available in Valério, 1998, updating a seminal work on Portuguese economic growth and retrospective national accounts in a very long-run perspective, which used similar methodology (see Nunes; Mata; Valério, 1989). That methodology, using macroeconomic proxy variables, took into account the latest revised series of Portuguese national accounts produced by the Portuguese National Statistical Office (INE) and by the Portuguese Central Bank (BP), namely Pinheiro (org), 1997 for the period 1953-1993 and Baptista et allii, 1997 for the period 1910-1958. However, this methodology as well as the empirical evidence it produced has been under debate (see Lains; Reis, 1991; Nunes; Mata; Valério, 1991, Esteves, 1993; Marques; Esteves, 1994). Meanwhile important efforts to re-examine long-term Portuguese economic growth led to new retrospective estimates of GDP at constant prices and GDP deflator computed from sector output values from 1850 to 1913 (see Reis, 1986; Lains, 1990,

Lains, 1995; Lains; Sousa, 1998), in line with the series produced by the Bank of Portugal research teams, namely those computed in Baptista et allii, 1997 for the period 1910-1958. Unfortunately, these alternative time series, which were linked in Lains, 2003 cannot be tied to the related series produced in Pinheiro (org), 1997, for the period 1953-1992, as acknowledged by the author[1]. We will not at this stage use the latter except to discuss some details of our empirical findings.

In relation to estimates of money supply Valério (coord), 2001, ch. 7 and Mata; Valério, 2003 gather all the relevant data. In reference to the former a detailed presentation of sources and methodologies used to compute the time series available on Portuguese money supply are to be found. Again, there is only one relative consistent time series of $M_0$, $M_1$ and $M_2$ for the whole time span of our analysis (see Mata; Valério, 2003: 257-270) and the methodology as well as the empirical evidence it produced have also been under debate[2] (see Reis, 1990, Valério, 1991). The appendix reproduces the series computed in Mata; Valério, 2003. Notwithstanding, we use the alternative time series in Reis, 1990, to elaborate upon theoretical aspects, test empirical findings and discuss its plausibility against historical evidence.

The table in the appendix and charts 1 and 2 below show the GDP and money stock series and the annual values of the income velocity of money in Portugal computed from these aggregate variables. It also includes figures for the overall balance of payments and exchange rate, which will be used in the following analysis. The next step will be the detailed analysis of its long run behaviour and its main fluctuations.

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1 Actually, the author linked the two first sets of series, computing GDP at constant prices (1953=100) for the period 1848-1958, but, in spite of his suggestion, he did not link this series to the one covering 1953-1992 (see Lains, 2003: 248, 256).

2 The relevant aspect of the debate focus on the effect of the suspension of the gold standard on the composition and level of money supply between 1891 and World War I, namely whether gold coins were hoarded (and exported) as supported by N. Valério, or remained in circulation, at least till the war, as supported by J. Reis.

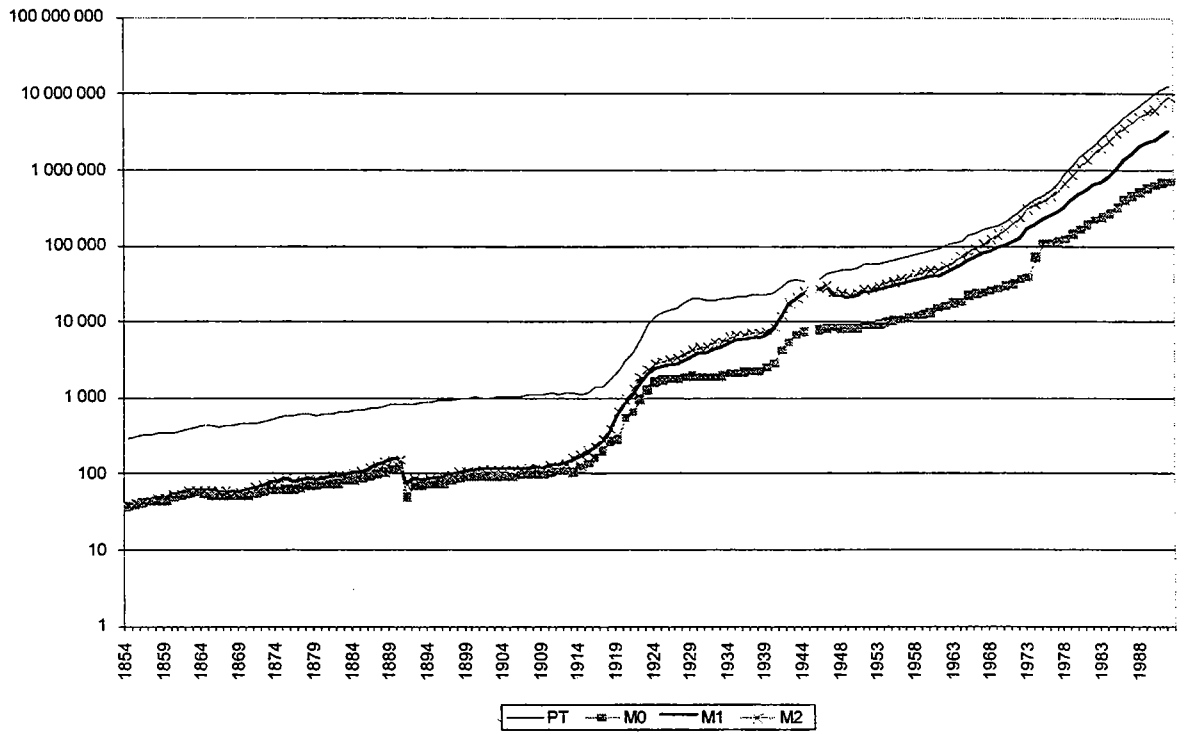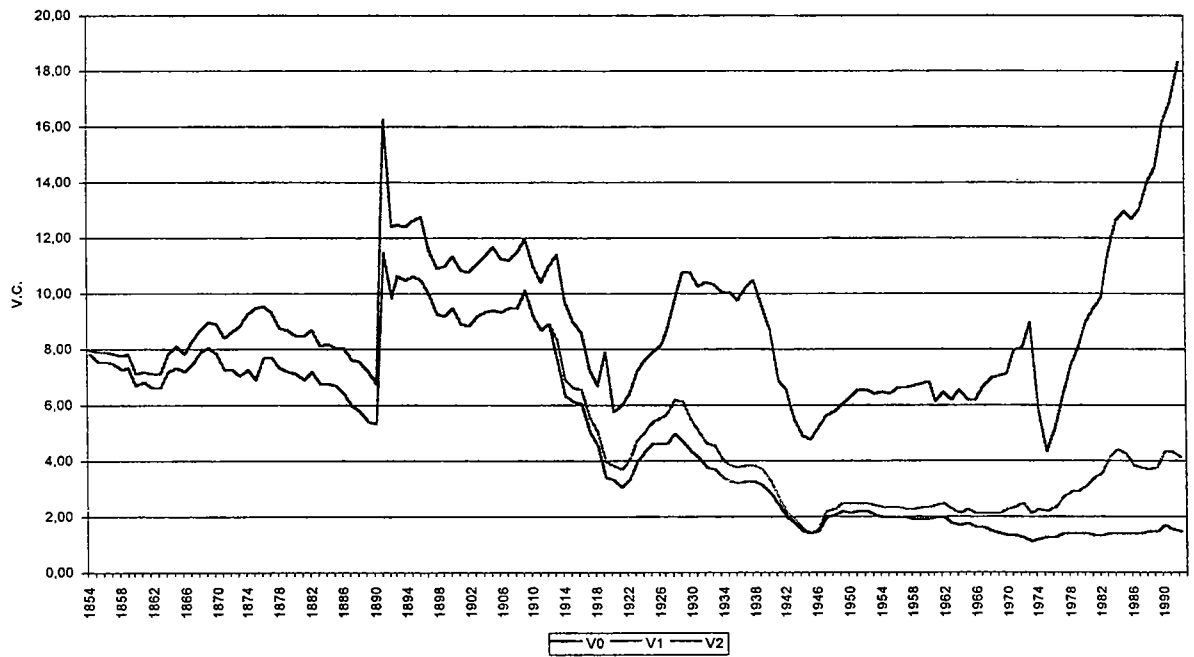## Chart 1 - Nominal GDP and M0, M1, M2 (1854-1992)



Legend: PT — M0 — M1 — M2

## Chart 2 - V0, V1, V2 (1854-1992)



Legend: V0 — V1 — V2

## 3. The long run behaviour of the income velocity of money in Portugal

The large majority of the analyses on the long run behaviour of the income velocity of money have relied on case studies concerning economies whose process of modern economic growth took off during the 19th century. Portugal, actually, remained a relative backward economy until WWII and in spite of having experienced periods of economic growth and some institutional changes conditional to growth, it failed to perform according to earlier modern economic growth. Thus, only after 1945 may Portuguese behaviour of the income velocity of money be expected to display a pattern similar to the case studies referred to above, which deal with newcomers to sustained growth. As such, the period after WWII will be analyzed in section 3 below, in line with the institutional approach.

However, the behaviour of the income velocity of money before 1945 is of particular interest when looking over some relevant facts of the Portuguese economic, monetary and institutional history. A relatively detailed study of this period will follow.

### 3.1. The behaviour of the income velocity of money in Portugal before 1945

From the very first perspective, the period under consideration may be broken into different phases according to a single, meaningful institutional criterion: the exchange rate regime. We will consider the period 1854-1891, when Portugal stood in the gold standard[1], which proved to be a decisive instrument of exchange and monetary stability after more than a half century of the severe effects of monetary instability. A second phase to take into consideration lies between 1891 and 1931, when Portugal was under a floating exchange rate regime and had to both face and overcome the most severe financial and monetary instability period of its history in the aftermath of WWI. From 1931 the consolidation of financial and monetary stability, which had been achieved in 1924, allowed the Portuguese monetary authorities to make the Portuguese currency conform to a fixed exchange rate regime. Formally Portugal adopted the gold-exchange standard system in July 1, 1931, fixing an escudo-sterling parity of 110$. Though the Portuguese monetary authorities decided to follow the British abandonment of the gold standard only 82 days after, they kept the Portuguese currency pegged to the sterling (or to the dollar or the French franc, whenever significant depreciation of the pound or the dollar took place), to ensure the desired stability of the Portuguese currency (see Santos, 1996: 194-7).

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1 Portugal was an early comer and a early gone to the gold standard. It was adopted by the law of July 29, 1854, and suspended (never to be restored for all practical matters, by the decree of July, 9, 1981 (see, Reis 1996a; Santos, 1996).

### 3.1.1. The behaviour of the income velocity of money in Portugal during the gold standard regime: 1854-1890

The dates of this period coincide with the monetary regime of the gold standard in Portugal[1]. This period was characterized by exchange and price stability (Duarte, Andrade, 2003)[2], as well as GDP increase. Institutional reforms and investments in infrastructure, namely in transport and communications, explain GDP behaviour. The state financed a large percentage of this investment which, alongside current expenditures, would drive up public debt, once public revenue increased at a lower rate. The weight of public debt on GDP significantly increased, from 38% between 1854-59 to 81% between 1880-89 (Esteves, 2003). This public debt was mainly financed by external loans and emigrants' remittances, especially from Brazil. As the trade balance showed permanent deficits, this put the financial situation of the country in a very fragile position. The crises of 1876 and 1890-92 would demonstrate this fragility, as will be analyzed below.

In this period the banking system diversified[3]. However, despite the appearance of new issuing banks and commercial banks, the formation of a mortgage bank (*Companhia Geral do Crédito Predial Português*), the continued existence of saving banks, such as the *Montepio Geral*, and banking houses and bankers, there were no investment banks. This lack of some specific sectors led to the opening of short and mid-term operations by commercial banks. Thus, we may conclude that the banking system was backward in relation to the continental system regarding investment banks (Gerschenkron, 1966). At the same time, the banking system was unevenly spread from a regional point of view, and the main banks had few or no branches outside Lisbon and Oporto.

The absence of investment banks and the weak development of the stock market (Justino, 1994) put the Portuguese financial system at a level, compatible with its retarded economic and cultural position.

When analyzing the behaviour of income velocity of money (see chart 2) three periods are conspicuous: 1854-1861, 1861-1876 and 1876-1891.

Between 1854 and 1861 the income velocity of money decreased. This behaviour may be explained by the relative stagnation of real GDP, in a period of moderate growth of money stock. In turn, the relative stagnation of real GDP finds justification in the crisis occurring in the mid-1850s, a

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1 For the discussion and presentation of the reasons for adopting this monetary regime see, Reis (1996a), Mendonça (1996).

2 According to Duarte, Andrade, 2003, a comparison in terms of nominal stability, when we have a gold standard should be made using prices and not an inflation rate. Considering this, the authors verified that the gold standard period was, as expected, of great stability in terms of prices.

3 The *Banco de Lisboa*, created by law of December 31, 1821, was the first bank to be founded in Portugal. In the first half of the 19th century, apart from the *Banco de Lisboa* other organizations, such as saving banks, banking houses and bankers were founded (Nunes, Valério, 2005a).

crisis which had an agricultural dimension, the oidium plague that affected most of the national vineyards, coupled with bad harvests, and the demographic dimension, epidemics of cholera and yellow fever (Justino, 1989, II: 74-78).

Money stock had a moderate growth, and this increase was essentially explained by the rise in circulation of foreign gold coins - sovereigns and half-sovereigns that had been legal tender since 1834. As legal tender, the English coinage circulated without needing to be taken by economic agents to the Mint for re-coining. The little data available on the overall balance of payments suggest that the balance was favourable between the mid-1850s and the mid-1860s, which explains the import of sovereigns. The positive balance of payments may in turn be explained by emigrant's remittances and capital inflows, especially from Brazil as a consequence of the abolition of the slave trade.

These factors contributed to the decrease of income velocity of money which fell from a level of about 8.0 (V0=7.97 e V1=7.76) to a value closer to 7.0 (V0=7.18 e V1=6.78). It is also important to underline that V0 and V1 still presented very similar values showing a monetary structure with much liquid currency.

From 1861 on, there was a new short-term period culminating in 1876. During this period, while V0 increased, V1 increased only until 1869, when it began to fall. It was a period in which nominal GDP increased and M0 and M1 also went up, but in which M1 registered a growth rate above nominal GDP after 1869, causing a fall of V1.

The rise of M0 may be justified by the positive balance of payments, explained in turn by the emigrant remittances and capital inflows now coming mainly from Britain to buy public loans.

The changing behaviour of M1 may be explained by a change in the behaviour of economic agents. Until 1869, it may be said that they kept their monetary assets out of the banking system, as a rule. Then the situation changed. This may be partly explained by an increased inflow of emigrants' remittances (which had been reduced during the previous years by the Brazilian difficulties linked to the Paraguay war), and partly a consequence of the banking boom triggered by the improvement of the financial situation[1]. By the mid-1870s, the banking boom would degenerate into a speculative bubble, which led to 1876 crisis.

The 1876 crisis was in essence a banking crisis. The speculative behaviour adopted between 1873 and 1876 consisted of, namely, buying Spanish and Peruvian bonds below par, causing great difficulties to the banks in the North of Portugal, as a result of the subsequent Spanish and Peruvian bankruptcies (Esteves, 2003). However, this crisis was short lived because the Bank of Portugal played the role of 'lender of last resort' (Nunes, Valério: 2005a). Despite this intervention short and

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1 The link between the two facts may be established because the regional pattern of bank formation coincided with the regional pattern of emigrants' origins, both being mainly concentrated in the north-west of the country (Entre-Douro-e-Minho). In 1870, there were 15 banks. In 1876, this number had increased to 52 (of which 27 in the north of the country).

mid-term repercussions were unavoidable. In the short-term, mistrust by economic agents translated into a significant drop in demand deposits, from 24102 *contos* in 1875 to 14824 in 1876, reaching 13588 *contos* in 1879, which implied an increase of V1. In the mid-term, the positive overall balance of payments increased the monetary base to a level higher than nominal GDP, implying a fall of income velocity of money. The banking system also saw a reduction in the number of establishments that went down to 41 in 1890.

Nominal GDP continued to rise, even in spite of the 1876 crisis, which was purely a banking crisis and not an economic crisis. In fact, the features of the Portuguese banking system, with the absence of investment banks, and with an economic activity little dependent on banking credits, avoided the repercussions of this crisis in the productive sector. The fluctuations on the stock exchange were also insignificant (Justino, 1994; Lains, 2002).

The last short-term period took place between the two crises – 1876 and 1890-91. During this period V1 and the V0 values fell together and the gap between them shortened. This behaviour may be explained by three factors: the continuation of GDP growth; the continuation of the balancing of the overall balance of payments by emigrants' remittances and foreign capital inflows, despite trade deficits; and the slow recovery of confidence in the banking system after the 1876 upheaval.

### 3.1.2. The behaviour of the income velocity of money in Portugal during a floating exchange rate regime: 1891-1931

In 1891, a new period began that would last until 1931 and was characterized by the suspension of the gold standard and consequently an era of floating exchange regimes and unconvertible paper-money. The suspension of convertibility pushed the rate of exchange away from the par (1 pound sterling = 4500 réis) (see appendix).

The crisis of 1891 was caused by the reduction of Brazilian remittances due to problems in Brazilian society – the abolition of slavery (1888), the fall of the Monarchy (1889) and the prolonged political instability until 1891, on a level with the Baring Brothers crisis. This led to a bank run, and to the suspension of the gold-standard (decree of 9 July, 1891)[1]. At the same time, Northern issuing

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[1] According to Flandreau, Zumer, 2004, the Argentina bankruptcy in 1890 led to the official recognition of the relevance of the fiscal criterium — equilibrium between the budget evolution and economic growth — in the concession of international loans. At the beginning, international financial markets in the 19th century rewarded trade openness, but, as time went by, they became more demanding and loan concession became more dependent on the national financial policies. The authors present a global interpretation of the 19th century financial crises, including the one that occurred in Portugal in 1891, according to this theory. This is why Esteves 2003 writes: "If there is something surprising in this story it is the prolonged access that Portugal had to the main financial markets of the time (...), notwithstanding its previous reputation of being a bad debtor (...)" (Esteves, 2003: 243).

banks, on the verge of bankruptcy, had to surrender their issuing rights to the Bank of Portugal, which became the only issuing bank[1].

The abandonment of the gold-standard closed foreign markets to the Portuguese government[2]. Internal payments were maintained by means of credit from the Bank of Portugal and the payment of the service of foreign public debt had to be suspended, ruining Portuguese credibility in foreign capital markets.

There are two quite different versions regarding what happened during the next period (1891-1914).

From our point of view the suspension of convertibility led to an immediate hoarding (and exporting) of gold. Gold coins can no longer be considered to be in circulation, and were partially replaced by banknotes[3]. As changes in nominal GDP were mild (and there was no significant impact on prices), money stock plummeted and velocity soared. Returning to traditional levels took as long as until WWI. By then, new huge exogenous shocks would make restoration of gold-standard at the pre-1891 par an impossible dream (more on the 1891-1914 period is included below).

According to other authors (Reis, 1990: 22-23), gold coins remained in circulation until WWI, despite the suspension of convertibility. Thus, money stock and velocity do not show any dramatic movements in the aftermath of the crisis, and remain quite stable (with a gentle decreasing trend) until WW I.

Besides the seemingly unavoidable implementation of the Gresham law (paying with depreciated money, hoarding appreciated currency), we have based our opinion on the academic testimony of contemporary witnesses such as Freitas, 1898: 30, "gold disappeared from circulation quickly".

Comparing the two series of money supply (M0) and the respective behaviour of income velocity of money between 1890 and 1895:

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1 This had already been enacted by the law of July 29, 1887, but had been made conditional on an agreement between the Bank of Portugal and the Northern issuing banks. Negotiations dragged on until necessity forced their conclusion.

2 The long run cumulative increase in the public debt, which resulted from the economic and financial blueprint implemented in Portugal between the 1850s and the 1880s, was a major determinant of the severity of the 1890-92 crisis (Mata, 1988).

3 This effect may be overstated, because part of the gold coins already served mainly as a store of value before 1891.

| Year | Nominal GDP | M0 | M0* | V0 | V0* |
|------|-------------|-----|------|------|------|
| 1890 | 810 | 121 | 125,8 | 6,69 | 6,44 |
| 1891 | 811 | 50 | 138,6 | 16,22 | 5,85 |
| 1892 | 841 | 68 | 147,5 | 12,37 | 5,70 |
| 1893 | 860 | 69 | 142,1 | 12,46 | 6,05 |
| 1894 | 880 | 71 | 140,6 | 12,39 | 6,26 |
| 1895 | 931 | 74 | 140,8 | 12,58 | 6,6 |

*Sources*: For GDP and M0 see appendix. In relation to M0*, see Reis, 1990. V0* = Nominal GDP/M0*

Chart 3 presents the behaviour of the income velocity of money, comparing the two hypotheses about the evolution of M0:

**Chart 3 - Comparing income velocity of money (1890-1895)**
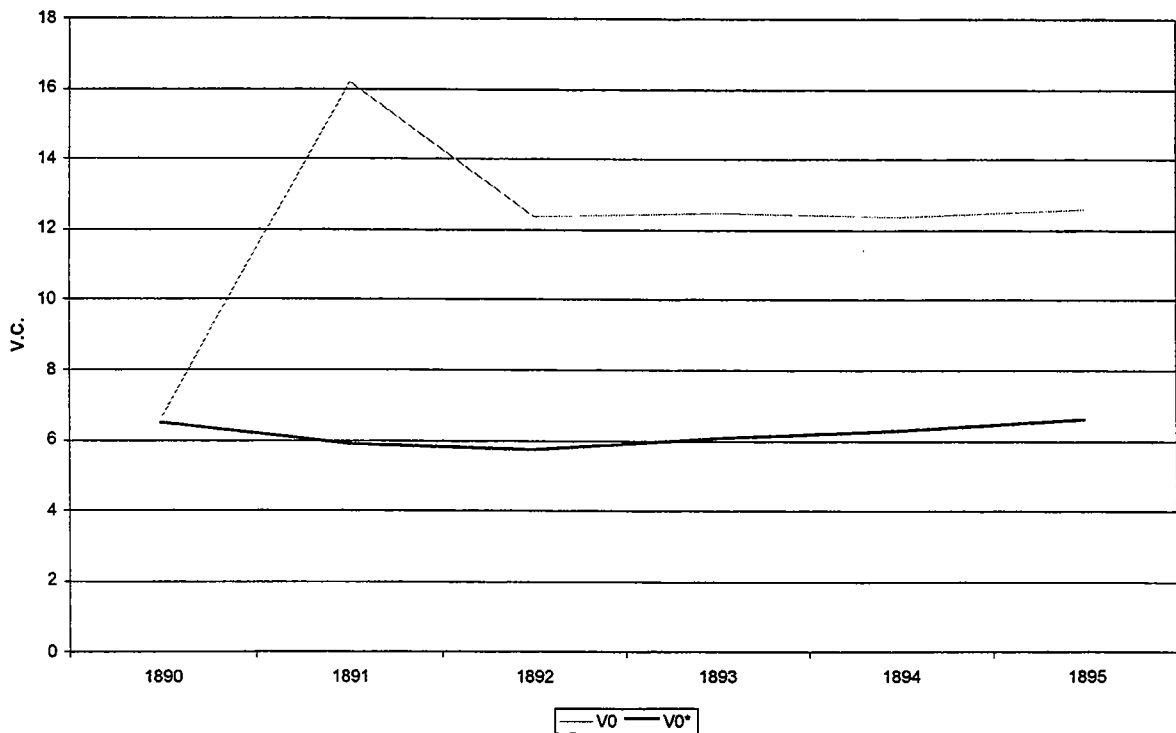
Between 1891 and 1931, three periods must be distinguished: the first up until the start of the WWI, the second between 1914 and 1922, and the third between 1922 and 1931.

The first period, between 1891 and 1914, may in turn be divided into three shorter sub-periods: the first, between 1891 and 1903, characterized by a fall in velocity; the second, between 1903 and 1909, characterized by a rise in velocity; the last between 1909 and 1914, characterized again by a fall in velocity.

It is far from easy to explain these (quite gentle) short-term fluctuations. They seem to follow, with some delay, the evolution of the exchange rate, which depreciated until 1898, appreciated between 1898 and 1907, and depreciated again between 1907 and WWI. It is believed that these short-term fluctuations of the exchange rate reflect the evolution of the overall balance of payments (data after 1900 are not good enough to undoubted confirmation). It is, however, necessary to suppose that the movements of nominal GDP tended to be more pronounced than the movements of the money stock induced by the evolution of the balance of payments to account for the above mentioned evolution of velocity. This is a period that certainly warrants (and demands) deeper scrutiny (see chart 4).

**Chart 4 - Income velocity and exchange rate (1891-1914)**
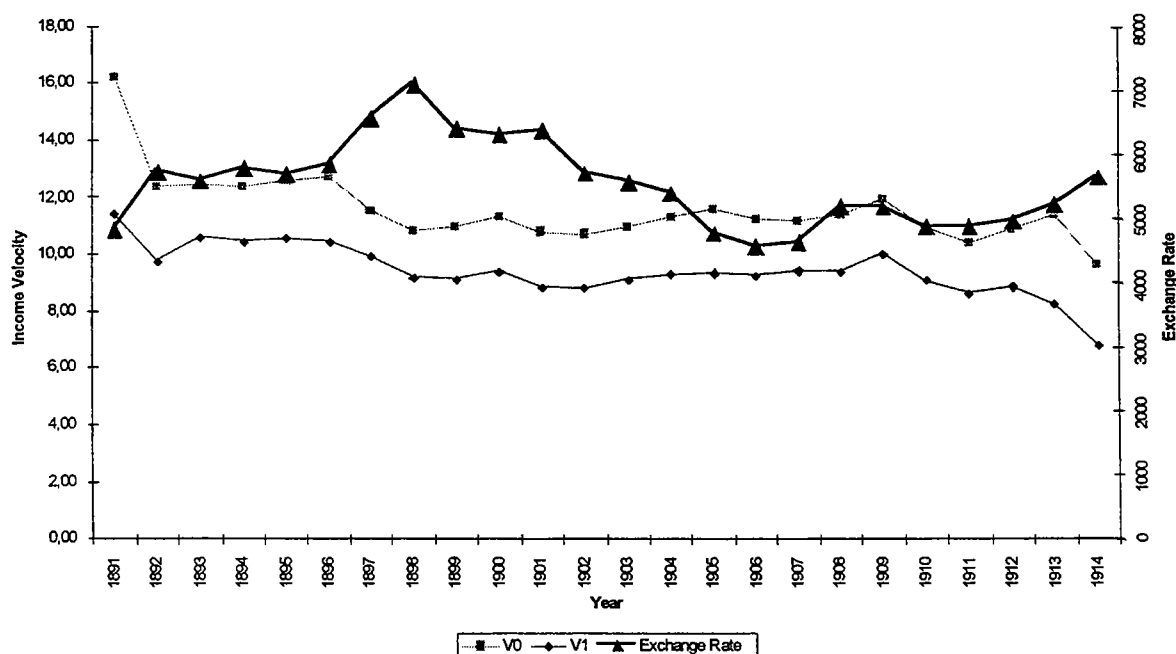


The second period occurred between 1914 and 1921 and corresponds to a period of significant fall in the income velocity of money to V0=5,91 and V1=3,66. Real GDP fell and inflation soared – prices multiplied nine-fold, consequently nominal GDP went up, but moderately. Therefore,

it was an exceptional increase of money stock that explains the falling behaviour of income velocity of money.

The financing of public debt by the Bank of Portugal, which had begun in 1891, soared between 1914 and 1921 creating an increase in the issuing of bank notes. The rise in public debt resulting from the WWI was driven up, because fiscal income and internal and external loans did not cover expenses. The solution was the issuing of notes and in 1921 the amounts reached 737 thousand *contos* nearly 7 times the amount registered in 1914. Simultaneously, demand deposits rose from 358 thousand *contos* at the end of the war to 1083 thousand *contos*, in 1921. This rise was part of the great turbulence felt by the banking market between 1918 and 1921. This movement profited of the post-war speculative environment created by a large number of newly-opened banks which were later to cease their activity quickly (Valério, 1984). It is within this context that M0 and M1 registered significant increases affecting the income velocity of money.

The third period occurred between 1922 and 1931. Both income velocities of money, V0 and V1, increased. However, while V0 continued to rise until 1930, V1 changed direction in 1928. It was a period of economic recovery that would reflect in the accentuated growth of nominal GDP, in a period of relative price stability.

The policies of monetary and financial stabilization adopted between 1922 and 1931 led to exchange stability and to public accounts breaking even. One of the political measures of stabilization included the end of financing the state by the Bank of Portugal in 1924. This policy would explain the moderate rise of M0 with the consequent rise of V0. The situation of economic recovery acted positively on the economic agent's expectations and influenced the banking system, in spite of some important banks being liquidated in the period 1930-31[1] (Nunes, Valério, 2005b). Meanwhile this crisis did not affect the growth of demand deposits that registered a continued increase from 460 thousand *contos* in 1922 to 1743 thousand *contos* in 1931. That crisis reflected above all on the time and savings deposits that fell from 1023 thousand *contos* in 1929 to 876 thousand *contos* in 1931. So, the fall seen from 1928 in V1, may be explained by the rate of increase of M1 being higher than the growth of nominal GDP. This period also marked the beginning of the large gap between V0 and V1 values, reflecting the changes in the composition of money stock – the decrease of currency in relation to the growth of deposits.

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1 Among these the *Banco Comercial do Porto* and the *Banco do Minho*, two old-issuing banks in the north of Portugal.

### 3.1.3. The behaviour of the income velocity of money in Portugal after the return to a relatively stable escudo: 1931-1945

As a result of the financial and monetary stabilization policy initiated in the previous period, the macroeconomic variables, namely, GDP, prices, public accounts, and exchange rates, reflected a better performance by the Portuguese economy, from 1928 on. This justified the adoption of the gold-exchange standard on July 1, 1931. As seen before gold-exchange standard was ephemerous, but exchange stability would remain for decades (Santos, 1996).

The change in the mentality of the economic agents in relation to money was reinforced in this period. The increased weight of banking deposits reflected this. The economic agents preferred to have deposits, namely demand deposits, to currency, with the consequent general use of cheques (Santos, 1994) and a major increase of M1 and M2 in relation to M0. In 1943 the acceptance of cheques on payments to the state would be legally consecrated as part of the monetary framework (decree-law 32677 of February 20). The change in status of the Bank of Portugal from the only issuing bank to a central bank in 1931 would be another institutional modification to underline (Mata, Valério, 1982; Valério, 1996).

The performance of the income velocity of money during the period was characterized by a continued fall which saw its lowest point in 1945, with a V1 value equal to 1.38. GDP and money stock showed an increasing trend, and the elasticity of money stock in relation to GDP was greater than one. The evolution of money stock may be mainly explained by the surpluses of the balance of payments, which remained positive during the whole period.

Despite this continued behaviour, considering the short-term period of the WWII, the period should be further subdivided into two: 1931-1939 and 1939-1945.

Between 1931 and 1939 nominal GDP showed a moderate growth while money stock saw a sharp increase. The strong increase of money stock is explained by a growth of demand deposits reflecting the trust of economic agents. During a phase of relative economic prosperity, in comparison to the previous decade, the economic agents would opt to use the banking system as a location for their monetary assets. A period of relative stability of real short-term interest rates would be positive and influence decisions.

During WWII, Portugal's neutrality led to a situation of prosperity translated into nominal GDP growth and a positive balance of payments. The increased demand for Portuguese products abroad, as well as the arrival of thousands of refugees explained the positive commercial and capital balances. This short-term period generated a growth of international assets in the banking sector, especially in the Bank of Portugal, and an increase of liquidity of banking institutions in general. The evolution of the monetary base was determined by the balance of payments (Santos, 1994), and explains the rise of M and the fall of the income velocity of money.

## 4. The U-shaped pattern in the context of the Portuguese Modern Economic Growth: 1945-1992

As mentioned above, the post-WWII was a decisive turning point towards modern economic growth in Portugal. Sustained high level of GDP and GDP per capita, a rapid change of productive structures and an increasing level of international economic integration led Portugal to an apparent catching up process to the most developed economies. Meanwhile, institutional changes, which proved to be decisive for the relative success of the Portuguese economy, were implemented at different levels. Some of them influenced directly the modernization of the banking, credit and financial systems, as well as economic security and stability, the relevant aspects of the theoretical model to be applied below.

In this context, it is appealing to depict in chart 5 an apparent, albeit mild, U-shaped pattern in the behaviour of the income velocity of money in Portugal in this period. V shows a downward trend till 1973 (V2 falls from 1,33 to 1,11) when a gentle inflection takes place, and reaches a maximum value in 1990 (V2 = 1,62). As such, we will look over the institutional approach during two shorter periods: 1945-1973 and 1974-1992. Note that these two phases also correspond to different exchange rate regimes. During 1945-1973 exchange stability was an accomplished aim of economic policy, even if Portugal only adhered formally to the Bretton Woods Agreements and to the IMF in 1962[1]. From 1974 to 1992 the Portuguese currency unit floated. A detailed evolution of these phases will be considered in the following analysis:

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1 The Portuguese currency had pegged to the dollar since 1949, and it was previously pegged to the sterling as explained above.

Chart 5 - Income velocity of money (1945-1992)
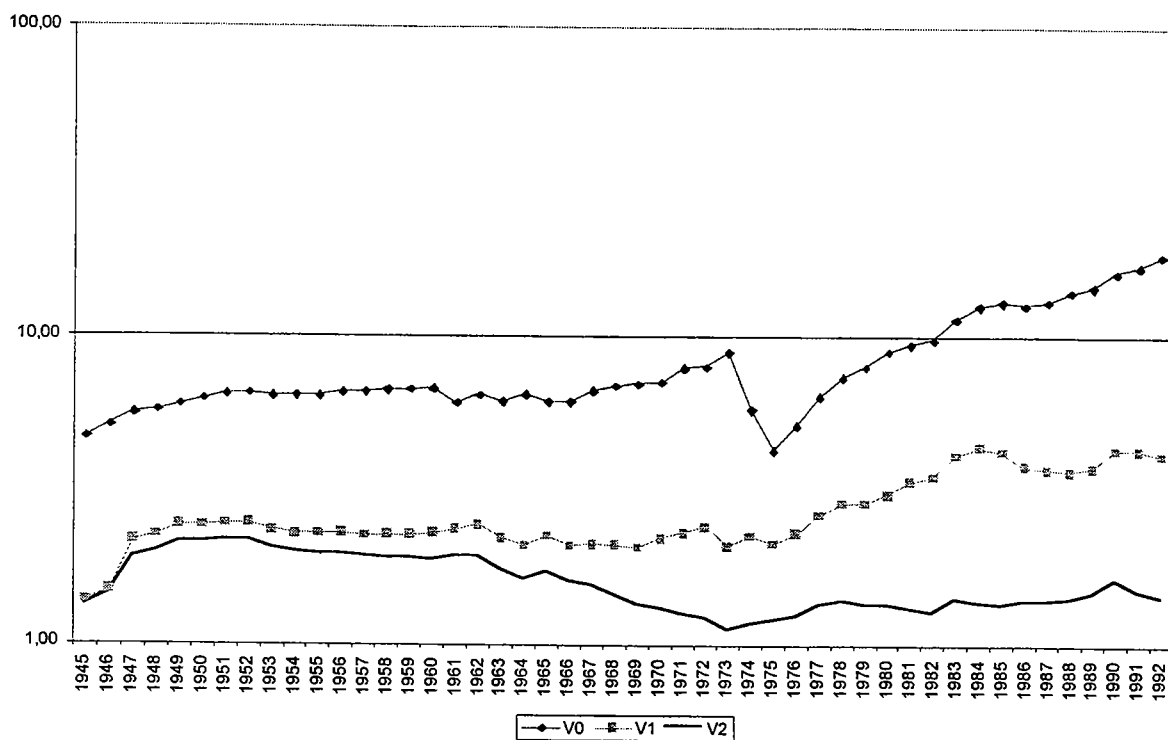


Notwithstanding, it is worth emphasizing that the most conspicuous observation of chart 2 clearly shows that the income velocity of money (V1 and V2) maintains a long run declining trend as would be expected as a consequence of the steady increase in real GDP per capita and due to the fact that, in this context, the public prefers ever larger holdings of real cash balances (in other words $M_2$ is a luxury good) (Friedman; Schwartz, 1963).

## 4.1. The "monetarization" period and the downward trend of velocity: 1945-1973

As previously mentioned, Portugal's income velocity of money shows a downward trend between 1945 and 1973. According to the standard institutionalist approach to the long-run behaviour of income velocity of money, this fall of V characterizes the first period of economic and monetary development and is determined by the process of "monetarization".

This process is normally composed of two inter-related developments: an increased use of currency and bank-produced means of payment (notes and deposits), and the spread of the banking system, especially commercial banks, and their modern credit facilities. However, the retardation of modern economic growth introduces some specific factors in the Portuguese case (very likely common to other latecomers). The spread of banknote use had already occurred in the

late 19th century and early 20th century and the spread of the banking system had already made some progress. However, it is without doubt that this period witnessed a further and significant spread of the banking system and the significant introduction of the use of demand deposits as means of payment.

Actually if we take V2 as the most relevant aggregate for this study, it is very apparent that the decisive increase of M2 (currency circulation plus demand deposits plus time deposits) took place during this period and particularly after the mid-1960s. The rate of growth of M2 was clearly above the rate of growth of nominal GDP, determining a downward trend of V2.

However, demand deposits, which began to grow significantly only during WW II, still raised their share in M2 till the end of the 1950s, though at a decreasing rate when compared to time deposits, and the ratio of currency circulation to GDP was, at the beginning of WW II, just 9.5%, when deposits were still a small share of money supply.

This "monetarization" process reflects the industrialization and modernization of the Portuguese economy and, as a natural outcome, a clear reduction in the share of the agriculture value added and of the workforce took place (see Nunes, 2001). These developments reduced the importance of the persisting weight of production for self consumption, which characterizes a traditional economy, and increased the demand for currency and other modern means of payment. The parallel increase in the urbanization rates (see Nunes, 1996), introduced radical changes in public preferences towards holding currency, notes and deposits while the densification of branches of commercial banks began to develop during the 1950s and exploded in the 1960s[1].

Some qualifications to this modernization process deserve to be underlined in order to add some relevant factors which also influenced the behaviour of money supply and consequently that of income velocity.

One of these factors is the financial and monetary environment of *Estado Novo*[2]. Broadly speaking, the monetary, banking and financial policy during this period maintained the essential principles which were defined in the 1930s. Monetary (price, interest rate and exchange rate) stability was a basic aim to be pursued. Strong regulation of the banking system, namely discretionary power over bank formation, severe restriction on credit concession to avoid banking crises, high levels of required reserve ratios, which reduced the habit of commercial banks to call for

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1 Actually, the Bank of Portugal, the Portuguese issuing bank, and the *Caixa Geral de Depósitos*, a savings bank, had spread some agencies through the interior areas of the country before the 1950s. However, according to Sérgio, 1990, the *Banco Nacional Ultramarino*, the issuing bank for some of the colonies, could be by then considered the only national commercial bank — in 1949 it had already 50 agencies out of Lisbon and Oporto. By 1959, these 2 towns concentrated almost 2/3 of 121 agencies authorized by the government. Among the commercial banks only the *Banco Pinto e Sotto Maior*, the *Banco Lisboa & Açores* and the *Banco Borges e Irmão* had spread significantly their agencies in the Continental area during the 1950s. In the early 1970s the most important banks began to create agencies abroad to capture emigrants' remittances.

2 The political authoritarian regime that ruled in Portugal, from the 1930s to April 1974.

central bank discounts, was also a relevant aspect. The success of the budget equilibrium policy avoided the government using the central bank to monetary financing of deficits; meanwhile it contributed in keeping prices growing at very moderate rates and in stabilizing the discount and interest rate[1]. Finally, no instruments of indirect control to influence money stock were used denoting a rather conservative and passive monetary policy.

So, in the context of a policy eager to accumulate gold and foreign assets, the balance of payments had a direct impact on the evolution of the stock of money. However, the fact that there were deficits did not inevitably imply a credit contraction, once the banking system had reached high levels of liquidity.

Though the essence of this environment remained unchanged throughout this period, it is classical to subdivide it into two periods, 1946-1959 and 1960-1973, as they show significant differences in terms of the rhythm of economic growth and international economic integration of the behaviour of the balance of payments as well as of public accounts[2], which influenced differently the behaviour of M and V.

### 4.1.1. The period 1946-1959

No significant internal or external shocks provoked any changes in the monetary policy of the government during this period. Actually, after the legislation passed in 1935 (law 1894 of April 11), only in the late 1950s would new general legislation on the banking system be drawn up (decree-law 41403 of November 27, 1957), confirming the basic principles and the strong regulation of the banking system. As such, the automatic effect of the balance of payment on the monetary base, mentioned above, worked with normalcy and produced the desired outcome.

Up until 1950 the deficits of the balance of payment were mainly the result of the increase in trade balance deficits, partly to regain pre-war consumer levels after 1945 and also of some capital outflows, which had come into being in Portugal during the war. Therefore, this period was characterized by deflation and strong credit restrictions[3]. These facts lie behind the behaviour of V: as M decreased and nominal GDP slightly increased, both V1 and V2, rose as chart 5 shows.

From 1950 to 1953 the balance of trade recovered normalcy (meaning smaller deficits) and the balance of payments either showed small surpluses or insignificant deficits. These deficits rose slightly from 1954 to 1959 but they did not prevent a reasonable credit expansion, as reserves and

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1 Prices and the discount rate would grow at relatively higher rates from 1965 on, as it will be referred bellow.
2 Public accounts deficits in the 1960s are related to the breaking out of the colonial wars in 1961.
3 Once saving banks endured less restrictions than commercial banks during this short period, they were to play a more active role in what concerns credit activity

liquidity of the banking system were huge, and a rather significant economic growth was experienced[1]. Under these circumstances, according to Santos: 1994: 995, there was a small increase in the monetary base (1.8% annual average), M1 and M2 grew by 4 and 4,6% respectively resulting mainly from reserve ratios. As nominal GDP grew more in line with M1, V2 shows a slight decrease while V1 shows a similar pattern but yet milder.

### 4.1.2. The period 1960-1973

As Portugal deepened its international economic integration, mainly after becoming a founding member of EFTA in 1960, and economic growth accelerated, the trade balance became increasingly unfavourable. However, no negative effects were felt on the balance of payments. On the other hand the balance of current accounts became very favourable as Portuguese emigrants' remittances and tourism expenditures rose permanently during this period. On the other hand the capital account became also rather favourable. The net inflows of capital, especially in the late 1960s were caused by positive expectations on Portuguese economic growth and by specific legislation produced to attract foreign capital (decree-law 46312 of April 18, 1965). Actually the balance of payments in this period shows significant surpluses though exchange rate stability was not under threat. Until the devaluation of the dollar that would put an end to the Bretton Wood gold-exchange regime in 1971 only negligible adjustments are registered. In 1971 Portuguese currency suffered a revaluation in relation to the most important international currencies (Mata; Valério, 1996). Notwithstanding, this credit situation on the balance of payments induced a significant and positive impact on the increase of the monetary base while the excessive liquidity of the banking system suffered a downward trend as the reserve ratios decreased in direct association to the increase of deposits and especially time deposits.

It is worth noting that the increasing relevance of time deposits was a result of the large increase of both emigrants' remittances and families' gross domestic savings, which were an important incentive in the development of a banking system more competitive in capturing and retaining those assets.

Relatively worrying inflationary pressures were felt in Portugal after 1965, partly as the result of this increase in money supply, and so the government tried at last to implement a more active, restrictive monetary policy.[2]The discount rate had remained fixed at 2% since the end of the war,

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1 According to Sérgio, 1990, from 1956 on, commercial banks raised a little their discounts from the central bank.

2 Notice that, during this period, neither the inflationary pressure nor the increase in the money supply were the effect of monetary financing of budgetary deficits. Actually, the latter remained at a very moderate level and they were financed by the issue of public debt. This fact denotes the return of the state credibility as a debtor at both the domestic and the external markets (Mata;Valério, 1996).

but after 1965 it began a slow but steady upward trend reaching 5% in 1973; in 1972 the reserve ratios were legally raised and quantitative restrictions to credit both for consumption and imports were implemented.[1]

Within this context, the 1960s brought about a strong increase in M1 and specifically in M2 to a rate above nominal GDP growth rate, though this period was the "golden age" of economic growth in Portuguese economic history. As a result, V1 and V2 fell.

*

Some aspects concerning the relatively poor financial sophistication of the period deserve to be emphasized. It was only in 1958 that an investment bank was created as a specialized institution to deal with middle and long run credit activities *Banco de Fomento Nacional* (decree-law 41557 of November 13, 1958)[2] and only in 1962 (decree-law 44432 of June 29) that the Bank of Portugal began formally developing all the modern functions of a central bank.

Other relevant aspects concern the lack of an inter-banking securities market and of a modern capital market and, as well as, for all practical reasons, the absence of mechanisms of monetary sophistication in terms of means of payment or methods of capturing deposits. The introduction of the first credit card in 1971 was followed by an extremely slow spread of its use during the final two years of this period.

In relation to economic security and stability, the other relevant determinant of the upward trend of V, two different situations are worth noting. The welfare state had not yet been implemented in this period, through some progress and spread of social security schemes was to be witnessed after 1968 (Carreira, 1996). As for economic stability, the situation is somewhat dubious. If stability is taken as the implementation of Keynesian anti-cycle policies, again we have to wait until the post-1974 period[3]. But as has been seen above, this period was characterized by high levels of growth, no problems of unemployment or of international payments and also by great economic stability, an environment not calling for short-term interventions (Nunes, 2002: 27-37).

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1 Notice that, according to Sousa, 1989 this restrictive policy was implemented with delay and was too soft specially when in 1973 real (four times increase of the price of oil) and monetary (the realignment of the exchange rates) external shocks led to a more serious inflation problem and brought a new problem: external payments debits.

2 Till 1958 the middle and long run credit activities were centralized in the *Caixa Geral de Depósitos* a public, universal banking institution.

3 This is the meaning of 'stability' behind the institutionalist approach (see Jonung, 1978: 222).

## 4.2. "Financial sophistication, growing stability and security" period and the upward trend of velocity: 1974-1992

Between 1973 and 1992 Portuguese income velocity of money shows a very mild upward trend. According to the institutionalist approach to the long-run behaviour of income velocity of money, this rise of V2 characterizes the second period of economic and monetary development and is determined by 'financial sophistication and growing economic stability and security', which overcame the downward effects on V2 of the "monetarization" process.

To discuss if these determinants are (the) relevant aspects behind the behaviour of Portugal income velocity after 1973, we have to look for several institutional developments: on one hand we have to find the introduction of "a large number of close substitutes for money such as bonds, stocks and other financial assets" as well as "the development of various methods of economizing on money balances, such as the use of credit cards, transfer of funds either electronically or by phone, and modern cash management techniques, within business and industry" (Jonung, 1978: 222). On the other hand we have to look for the implementation of the welfare state, as a fundamental element to ensure the individual a minimum standard of living in case of unemployment, illness, during retirement, to reduce the costs of child education, and the effective implementation of stabilization policies to minimize fluctuations throughout the business cycle.

We will not discuss here in detail the development in Portugal of all these aspects or assess the impact of associated transformations. We will however review the most relevant elements.

Concerning financial sophistication, the developments brought about after the revolution of April 1974 seem to have had an adverse effect on the anticipated sophistication: namely nationalization of the banking system and the closure of the stock market. The first situation was only to change significantly more than a decade later. If freedom in the banking market was reintroduced in 1983 (decree-law 406/83 of November 19), only in 1990 was the process of re-privatization regulated (decree law 11/90 of April 5). As for the stock market, institutional normalcy took less time. The inter-banking monetary market was created in 1977, the inter-banking securities market in 1978 and, according to Mateus, 1998, this was a relevant factor of accruing efficiency in the management of the banking system liquidity. Regular stock market activity dates from 1977 but only in the second half of the 1980s did it reach its full potential, leading, only by 1988, to the introduction of an operational electronic transaction system. A new securities code and the legal framework of credit institutions and financial societies date only from 1991 and 1992 respectively.[1]. Note that mistrust of both the banking system and inflation led to the hoarding of gold and to capital

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[1] For further details on the slow modernization of the financial system, whose process accelerated after the end of the 1980s, see Mateus, 1998.

escaping abroad until the middle of the 1980s. The impact of these facts on the behaviour of M and V will be seen below.

However, if we take the spread of more economizing mechanisms of payments and transfer of funds, Portugal was a newcomer, if not the pioneer in a European context, concerning the electronic transfer of funds. Again, Portugal was a relatively early and intensive user of credit cards. But, the use of modern cash management techniques within business and industry, or the use of the telephone to transfer funds was a rather slow and somewhat late process, the clear signs of which are only to be found in the 1990s.[1]

The effects of the social and economic transformation shortly after April 1974 had a huge impact on the quick, comprehensive implementation of a welfare state even at the expense of the rapid development of serious financial deficits, which would bring about severe short-run crises[2]. These crises led to the implementation of stabilization policies geared towards minimizing fluctuations. They proved to be efficient in maintaining a relatively small unemployment rate and in controlling excessive external payment deficits.

To summarize up to this point: of the two major determinants in the institutional standard approach on the upward trend of income velocity, as factors that reduce the demand for money, the latter (growing economic security and stability) seems to have worked in Portugal in reducing the propensity to hold money for precautionary reasons and as a store of value; the former seems to have had a less conspicuous effect until the beginning of the 1990s. The balance of these two forces may explain why the upward trend of V2 seems to have been so mild up until 1992, or, in a more realistic reading, why this phase is a relatively long period of transition, a prolonged bottoming of the U.

Again, some qualifications regarding these institutional determinants deserve to be underlined in order to add some relevant factors which also influenced the behaviour of money supply and consequently that of income velocity.

During this period, the behaviour of the economy according to both the real and the monetary aggregate variables was very different from that which had occurred during the previous period. Briefly, the economic growth rates decreased (in line with what was happening in the world economy at large), the instability of the monetary aggregates — exchange rate, interest rate and inflation rate — was the rule, though the degree of instability differed during the period. This situation is clearly observed in the table in the appendix and in chart 1.

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1 This aspect of slow modernization has to do with the characteristics of the Portuguese firms structure, namely a large number of ill-equipped small firms with no modern management and small adherence to technological innovation in a context of reduced competition, and the low level of education of the population at large.

2 The effects of neo-liberal policies in the dismantling of some of welfare state elements have been felt in Portugal only very recently, certainly after 1992.

In this context, there were periods of severe deficits of the external accounts and persistent high levels of budget deficits (though decreasing from the mid-1980s). This time, both aspects influenced the behaviour of money stock as well as income velocity. Actually, the deficits of public accounts began to be financed by central banking issues and not only by the issuing of public debt on the market, as had happened before, and the problems of the external payments were met through devaluations (isolated devaluations and crawling peg) (Mata; Valério, 1996).

As a result, a period of strong inflation came about (the level of prices increased 28 times between 1973 e 1992) while the rediscount rate kept pace peaking at a rate of 25% in 1984. Notice that real interest rates remained essentially negative till the late 1980s, influencing the behaviour of deposits and the demand for alternative assets.

As previously mentioned, the effects of these variables on the behaviour of income velocity was not at all similar throughout the entire period. It is usual to subdivide it into two periods: 1974-1984 and 1985-1992.

### 4.2.1. The period 1974-1984

In 1974 and 1975 Portuguese nominal growth was moderate taking into consideration the increase in the price index. Meanwhile, the monetary base rose significantly even if some restrictive factors on the expansion of monetary supply were in operation. Among them were the reduction in reserves of gold and foreign currency, resulting from deficits in the balance of payments, and the decrease in the multiplier of M2, resulting itself from the conversion of time deposits into notes and gold within the context of public mistrust in the banking system during a revolutionary period. This situation inverted the downward trend of M0 and M1 in relation to M2, during a very short period of time.[1] However, there were no longer limits to the concession of credits by the central bank to the state (who profited greatly) and to the banking system, while the monetary base was no longer dependent upon foreign currency and gold reserves. So, in spite of some controversy surrounding the true sign of the monetary policy among Keynesians and Monetarists in this short period of time[2], M (by decreasing order, M0, M1 and M2) rose significantly above nominal product, inducing the raise of V (by increasing order V0, V1 and V2), as chart 5 shows.

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1 A few months after November 1975, when the last attempt to establish a leftwing authoritarian regime failed, the normalcy of the structure of the monetary stock was reestablished.

2 According to the Keynesian perspective (Lopes, 1996: 222-223), the final outcome of these two years was not particularly expansionary (as would be the case in the years to come), on the contrary, this policy may have been the cause of the recession felt in 1975. According to a monetarist perspective the high rates of inflation and the severe problems of the balance of payments in 1974-1976 were more the result of the monetary expansionist policy of the Bank of Portugal than the effect of external (raise in the international oil price) and internal (explosion in wages and salaries) real shocks.

Between 1976 and 1984 economic growth in Portugal was moderate as a result of the international environment and the severe problems of external payments felt both in 1976-1977 and 1982-3. These problems led to the implementation of stabilizing policies in 1978-9 and again in 1983-1984. Furthermore, the rates of growth decelerated during the final years of the 1970s and in 1983 there was even a situation of economic depression. The stabilizing policies, that proved to be efficient in controlling the worrying problems of external solvability for which they were specifically designed, were much less useful in controlling the level of inflation. Actually, the limits enforced to the expansion of the bank credit[1] and the manipulation of interest rates did not prevent the rates of inflation from rising until attaining a 30% value[2].

On the other hand, the fact that the real interest rate remained negative during most of this period did not prevent a sharp increase in time deposits after the end of the 1970s, when the real interest rate began to grow from its 1974 value of −15%. This favourable situation in terms of time deposits was also a consequence of the absence of return on demand deposits, which saw their relative importance fall until 1985, in a context where there were no alternative applications yet available. So, as the chart shows, there was, throughout this period, a significant raise in M2/GDP and a corresponding fall in V2, while M1/GDP decreased causing a V1 increase.

### 4.2.2. The period 1985-1992

As far as economic growth is concerned the period 1985-1992 shows high rates of growth in the context of a significant decrease of inflation rates. A favourable international environment (devaluation of the dollar, decrease of interest rates and of oil price), the joining of the European Communities and a quick monetary (reduction in nominal interest and inflation rates), financial (reduction in the public account deficits and some reduction in the ratio of public debt to GDP) and exchange (reduction of the crawling peg and its suspension after 1990) stabilization process were the main determinants of such an economic performance.

Throughout this period, the monetary base grew very significantly as a result of important external payment surpluses. The inflow of European structural funds was a major determinant of this positive situation. However, "[...] from 1987 on, external debt began being refunded in large amounts and so an important part of the inflows of capital were sterilized [...]" and, on the other

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1 Part of this liquidity, which was not used to credit concession to the public, was channeled to the subscription of public debt, "[...] allowing to reduce the multiplier of the monetary base, enlarged by the monetary financing of the Bank of Portugal to the State, but also induced commercial banks to make credit concessions at low interest, to the State" (Lopes, 1996: 224).

2 According to some views inflation was even instrumental in solving foreign payments problems (see Valério 2001)

hand, "the explosion of certificated public debt [...] taken by the banking system became a new instrument in financing the deficit" (Mateus, 1998:200).

Another relevant aspect concerns the changes in the structure of the monetary stock in this period, especially in the latter years. These changes were the result of important institutional transformations which liberalized banking activity and capital movements, while the limits to credit concession and the administrative control of interest rates were banished[1]. Now, the relative importance of demand deposits stopped falling after 1985 (rising slightly up until 1987 to fall slightly again up to 1990) responding to the fall in the inflation rate, the inherent raise in the real interest rate and the increasing competition among banks[2]. Thus, slight fluctuations in the relative importance of M1 to GDP also led to insignificant changes (of the expected sign) in V1. Meanwhile, alternative applications to time deposits, apart from certificated public debt, gained momentum and stock market transactions exploded in a bubble in 1987. The decreasing interest rates led to a strong increase of credit concession to consumption, to acquisition of personal property, while domestic savings began decreasing[3]. So, the fall of the ratio M2/GDP produced an upward trend of V2 till 1990.

Between 1990 and 1992 both V1 and V2 fell, the main cause being the deceleration of nominal product growth. In turn, and to some extent this was the consequence of the implementation of economic and monetary policies aiming at guaranteeing nominal convergence, because there was a need to accomplish the government political target of making Portugal a member of the European Monetary System.


## 5. Conclusion


The long run behaviour of income velocity of money in Portugal displays, throughout the entire period, a pattern in line with its relative economic and institutional backwardness.

Actually, Portugal took almost a century, from the mid-1850s to the 1940s before being able to sustain its economic growth and to consolidate and attain some fundamental levels of modernization including both monetary and financial aspects. As explained in detail in section 2 relatively short periods of some growth and monetary institutional modernization were cut off by some economic stagnation, deceleration and mistrust of the positive effects of some of the institutional modernization steps, which had been accomplished before. In terms of the institutional

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1 Note that the cash reserves remained relatively high in the European context (Lopes, 1996: 225).
2 After 1984 the banking sector was liberalized.
3 These trends were to be pushed further along the 1990s.

standard approach the downward trend of velocity during this period may only be explained in Portugal by the first step of the "monetarization" process, namely development in the use of currency and notes. During the 1930s some development of demand deposits took place, but the spread of deposits, namely time deposits, would only take place after the WWII. As such, up until 1945 the main analytical variables used were V0 and V1.

From the 1950s on, a general process of modernization of the Portuguese economy took place. Economic growth was sustained and important institutional aspects related to monetary and financial factors were developed up to 1973 as explained in detail in section 3, inducing the continued downward trend of V2. However, during the early post WWII decades, the economic policy of the *Estado Novo*, mistrusting some market mechanisms, had some detrimental effects on further financial modernization and did not develop significant welfare state mechanisms. From 1974 on, economic security and financial sophistication occurred, though the latter was particularly felt only after the second half of the 1980s, when the liberalization of the banking and financial markets took place and an upward trend is somehow apparent. In this context, V2 became the relevant variable but the U shaped behaviour of income velocity is very mild. Probably, if we took the 1990s values of V2 a much clearer upward trend would be apparent.

Another relevant aspect worthy of note is that Portuguese economic and monetary history was always very conditional upon the external environment and more specifically upon the external account balances up until 1992, in spite of the institutional environment. In some periods the trade balance was decisive, in most periods emigrants' remittances had an important impact and in some other periods the capital balance had visible effects on the monetary base. The fact that Portugal has always been a small economy may be an important reason why it has remained very sensitive to external economic fluctuations and specifics impacts.

Further developments in this research will be produced in another paper, which will attempt to deepen statistical analysis into the relative importance of institutional factors in explaining the behaviour of the Portuguese income velocity of money, namely by including proxies of institutional variables in a simple velocity function.

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**Appendix**

| Year | Real per capita GDP index (base 2000=1000) | Price Index (base 1914=100) | Nominal GDP (10³contos) | M0 (10³ contos) | M1 (10³ contos) | M2 (10³ contos) | V0 | V1 | V2 | Overall balance of payments (10³ contos) | Exchange rate (10³ réis or escudos) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1854 | 41 | 76 | 295 | 37 | 38 | 38 | 7,97 | 7,76 | 7,76 | 3 | |
| 1855 | 44 | 74 | 308 | 39 | 41 | 41 | 7,90 | 7,51 | 7,51 | 3 | |
| 1856 | 38 | 93 | 324 | 41 | 43 | 43 | 7,90 | 7,53 | 7,53 | 1 | |
| 1857 | 46 | 77 | 335 | 43 | 45 | 45 | 7,79 | 7,44 | 7,44 | | |
| 1858 | 50 | 70 | 341 | 44 | 47 | 47 | 7,75 | 7,26 | 7,26 | | |
| 1859 | 45 | 78 | 344 | 44 | 47 | 47 | 7,82 | 7,32 | 7,32 | | |
| 1860 | 47 | 75 | 346 | 49 | 52 | 52 | 7,06 | 6,65 | 6,65 | | |
| 1861 | 46 | 80 | 366 | 51 | 54 | 54 | 7,18 | 6,78 | 6,78 | 2 | |
| 1862 | 48 | 81 | 388 | 55 | 59 | 59 | 7,05 | 6,58 | 6,58 | 4 | |
| 1863 | 51 | 77 | 402 | 57 | 61 | 61 | 7,05 | 6,59 | 6,59 | 2 | |
| 1864 | 53 | 80 | 428 | 55 | 60 | 60 | 7,78 | 7,13 | 7,13 | 0 | |
| 1865 | 54 | 77 | 429 | 53 | 59 | 59 | 8,09 | 7,27 | 7,27 | -3 | |
| 1866 | 51 | 80 | 415 | 53 | 58 | 58 | 7,83 | 7,16 | 7,16 | 0 | |
| 1867 | 49 | 86 | 430 | 52 | 58 | 58 | 8,27 | 7,41 | 7,41 | 1 | |
| 1868 | 53 | 80 | 441 | 51 | 56 | 56 | 8,65 | 7,88 | 7,88 | 1 | |
| 1869 | 55 | 79 | 455 | 51 | 57 | 57 | 8,92 | 7,98 | 7,98 | 0 | |
| 1870 | 60 | 74 | 470 | 53 | 60 | 60 | 8,87 | 7,83 | 7,83 | 1 | |
| 1871 | 61 | 72 | 469 | 56 | 65 | 65 | 8,38 | 7,22 | 7,22 | 4 | |
| 1872 | 64 | 72 | 497 | 58 | 69 | 69 | 8,57 | 7,20 | 7,20 | 2 | |
| 1873 | 54 | 95 | 528 | 60 | 75 | 75 | 8,80 | 7,04 | 7,04 | 4 | |
| 1874 | 67 | 78 | 563 | 61 | 78 | 78 | 9,23 | 7,22 | 7,22 | 1 | |
| 1875 | 70 | 79 | 595 | 63 | 87 | 87 | 9,44 | 6,84 | 6,84 | 2 | |
| 1876 | 69 | 80 | 599 | 63 | 78 | 78 | 9,51 | 7,68 | 7,68 | 3 | |
| 1877 | 63 | 91 | 613 | 66 | 80 | 80 | 9,29 | 7,66 | 7,66 | -1 | |
| 1878 | 63 | 90 | 612 | 70 | 84 | 84 | 8,74 | 7,29 | 7,29 | 2 | |

| Year | Real per capita GDP index (base 2000=1000) | Price Index (base 1914=100) | Nominal GDP (10³ contos) | M0 (10³ contos) | M1 (10³ contos) | M2 (10³ contos) | V0 | V1 | V2 | Overall balance of payments (10³ contos) | Exchange rate (10³ réis or escudos) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1879 | 63 | 86 | 596 | 69 | 83 | 83 | 8,64 | 7,18 | 7,18 | -1 | |
| 1880 | 68 | 80 | 608 | 72 | 86 | 86 | 8,44 | 7,07 | 7,07 | 3 | |
| 1881 | 69 | 82 | 634 | 75 | 92 | 92 | 8,45 | 6,89 | 6,89 | 3 | |
| 1882 | 69 | 83 | 650 | 75 | 91 | 91 | 8,67 | 7,14 | 7,14 | 1 | |
| 1883 | 71 | 79 | 649 | 80 | 96 | 96 | 8,11 | 6,76 | 6,76 | 3 | |
| 1884 | 79 | 73 | 678 | 83 | 101 | 101 | 8,17 | 6,71 | 6,71 | 3 | |
| 1885 | 83 | 70 | 700 | 87 | 105 | 105 | 8,05 | 6,67 | 6,67 | 3 | |
| 1886 | 85 | 72 | 737 | 92 | 116 | 116 | 8,01 | 6,35 | 6,35 | 9 | |
| 1887 | 88 | 70 | 754 | 99 | 127 | 127 | 7,62 | 5,94 | 5,94 | 4 | |
| 1888 | 92 | 70 | 798 | 106 | 140 | 140 | 7,53 | 5,70 | 5,70 | 6 | |
| 1889 | 87 | 76 | 813 | 114 | 151 | 151 | 7,13 | 5,38 | 5,38 | 8 | |
| 1890 | 78 | 86 | 810 | 121 | 152 | 152 | 6,69 | 5,33 | 5,33 | 4 | |
| 1891 | 80 | 83 | 811 | 50 | 71 | 71 | 16,22 | 11,42 | 11,42 | -26 | 4832 |
| 1892 | 80 | 85 | 841 | 68 | 86 | 86 | 12,37 | 9,78 | 9,78 | -4 | 5735 |
| 1893 | 80 | 87 | 860 | 69 | 81 | 81 | 12,46 | 10,62 | 10,62 | -6 | 5600 |
| 1894 | 80 | 89 | 880 | 71 | 84 | 84 | 12,39 | 10,48 | 10,48 | -3 | 5790 |
| 1895 | 88 | 84 | 931 | 74 | 88 | 88 | 12,58 | 10,58 | 10,58 | 0 | 5698 |
| 1896 | 89 | 85 | 953 | 75 | 91 | 91 | 12,71 | 10,47 | 10,47 | -4 | 5853 |
| 1897 | 83 | 92 | 946 | 82 | 95 | 95 | 11,54 | 9,96 | 9,96 | -2 | 6575 |
| 1898 | 81 | 96 | 967 | 89 | 105 | 105 | 10,87 | 9,21 | 9,21 | 1 | 7108 |
| 1899 | 83 | 94 | 988 | 90 | 108 | 108 | 10,98 | 9,15 | 9,15 | -2 | 6416 |
| 1900 | 87 | 91 | 1 019 | 90 | 108 | 108 | 11,32 | 9,44 | 9,44 | -2 | 6320 |
| 1901 | 85 | 90 | 994 | 92 | 112 | 112 | 10,80 | 8,88 | 8,88 | -1 | 6382 |
| 1902 | 88 | 87 | 998 | 93 | 113 | 113 | 10,73 | 8,83 | 8,83 | 0 | 5722 |
| 1903 | 87 | 90 | 1 033 | 94 | 113 | 113 | 10,99 | 9,14 | 9,14 | 0 | 5581 |
| 1904 | 83 | 96 | 1 053 | 93 | 113 | 113 | 11,32 | 9,32 | 9,32 | -2 | 5413 |

| Year | Real per capita GDP index (base 2000=1000) | Price Index (base 1914=100) | Nominal GDP (10³ contos) | M0 (10³ contos) | M1 (10³ contos) | M2 (10³ contos) | V0 | V1 | V2 | Overall balance of payments (10³ contos) | Exchange rate (10³ réis or escudos) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1905 | 84 | 95 | 1 059 | 91 | 113 | 113 | 11,64 | 9,37 | 9,37 | 2 | 4793 |
| 1906 | 84 | 95 | 1 068 | 95 | 115 | 115 | 11,24 | 9,29 | 9,29 | -2 | 4582 |
| 1907 | 85 | 95 | 1 096 | 98 | 116 | 116 | 11,18 | 9,45 | 9,45 | 0 | 4642 |
| 1908 | 86 | 96 | 1 120 | 98 | 119 | 119 | 11,43 | 9,41 | 9,41 | -1 | 5199 |
| 1909 | 85 | 97 | 1 137 | 95 | 113 | 113 | 11,97 | 10,06 | 10,06 | 4 | 5185 |
| 1910 | 89 | 93 | 1 150 | 105 | 126 | 126 | 10,95 | 9,13 | 9,13 | -4 | 4895 |
| 1911 | 83 | 99 | 1 133 | 109 | 131 | 131 | 10,39 | 8,65 | 8,65 | 4 | 4889 |
| 1912 | 88 | 98 | 1 191 | 109 | 134 | 134 | 10,93 | 8,89 | 8,89 | 2 | 4974 |
| 1913 | 86 | 101 | 1 209 | 106 | 146 | 160 | 11,41 | 8,28 | 7,56 | -3 | 5235 |
| 1914 | 81 | 100 | 1 129 | 117 | 165 | 179 | 9,65 | 6,84 | 6,31 | 1 | 5663 |
| 1915 | 78 | 112 | 1 208 | 135 | 183 | 199 | 8,95 | 6,60 | 6,07 | 2 | 6746 |
| 1916 | 75 | 137 | 1 383 | 161 | 213 | 231 | 8,59 | 6,49 | 5,99 | 0 | 7032 |
| 1917 | 67 | 162 | 1 431 | 198 | 261 | 285 | 7,23 | 5,48 | 5,02 | 1 | 7726 |
| 1918 | 51 | 293 | 1 737 | 262 | 348 | 386 | 6,63 | 4,99 | 4,50 | 2 | 7901 |
| 1919 | 59 | 335 | 2 227 | 284 | 570 | 660 | 7,84 | 3,91 | 3,37 | -1 | 8196 |
| 1920 | 52 | 580 | 3 119 | 547 | 820 | 951 | 5,70 | 3,80 | 3,28 | 1 | 18329 |
| 1921 | 44 | 909 | 3 870 | 655 | 1056 | 1286 | 5,91 | 3,66 | 3,01 | 1 | 39384 |
| 1922 | 59 | 1099 | 6 131 | 965 | 1521 | 1866 | 6,35 | 4,03 | 3,29 | 0 | 65084 |
| 1923 | 61 | 1726 | 9 299 | 1298 | 1963 | 2354 | 7,16 | 4,74 | 3,95 | 0 | 109714 |
| 1924 | 60 | 2399 | 12 133 | 1599 | 2420 | 2822 | 7,59 | 5,01 | 4,30 | 28 | 133950 |
| 1925 | 68 | 2306 | 13 450 | 1709 | 2500 | 2921 | 7,87 | 5,38 | 4,60 | 8 | 99210 |
| 1926 | 74 | 2208 | 14 203 | 1761 | 2583 | 3116 | 8,07 | 5,50 | 4,56 | 2 | 94770 |
| 1927 | 74 | 2371 | 15 344 | 1780 | 2711 | 3360 | 8,62 | 5,66 | 4,57 | -7 | 108360 |
| 1928 | 90 | 2269 | 18 249 | 1870 | 2974 | 3715 | 9,76 | 6,14 | 4,91 | -5 | 108250 |
| 1929 | 96 | 2361 | 20 304 | 1898 | 3335 | 4340 | 10,70 | 6,09 | 4,68 | -1 | 108250 |
| 1930 | 97 | 2243 | 19 877 | 1857 | 3674 | 4600 | 10,70 | 5,41 | 4,32 | 1 | 108250 |

| Year | Real per capita GDP index (base 2000=1000) | Price Index (base 1914=100) | Nominal GDP (10³ contos) | M0 (10³ contos) | M1 (10³ contos) | M2 (10³ contos) | V0 | V1 | V2 | Overall balance of payments (10³ contos) | Exchange rate (10³ réis or escudos) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1931 | 102 | 1990 | 19 191 | 1875 | 3846 | 4723 | 10,24 | 4,99 | 4,06 | 988 | 109369 |
| 1932 | 104 | 1949 | 19 508 | 1885 | 4252 | 5221 | 10,35 | 4,59 | 3,74 | 265 | 110061 |
| 1933 | 105 | 1948 | 19 892 | 1925 | 4417 | 5408 | 10,33 | 4,50 | 3,68 | 106 | 109103 |
| 1934 | 106 | 1968 | 20 668 | 2069 | 5121 | 6150 | 9,99 | 4,04 | 3,36 | -15 | 110453 |
| 1935 | 106 | 1972 | 20 890 | 2090 | 5526 | 6549 | 10,00 | 3,78 | 3,19 | -69 | 110363 |
| 1936 | 105 | 2022 | 21 322 | 2188 | 5777 | 6757 | 9,74 | 3,69 | 3,16 | -210 | 110377 |
| 1937 | 105 | 2102 | 22 288 | 2192 | 5839 | 6920 | 10,17 | 3,82 | 3,22 | 231 | 110375 |
| 1938 | 110 | 2037 | 23 149 | 2212 | 6081 | 7150 | 10,47 | 3,81 | 3,24 | -165 | 110385 |
| 1939 | 115 | 1918 | 23 414 | 2468 | 6447 | 7607 | 9,49 | 3,63 | 3,08 | 391 | 110270 |
| 1940 | 115 | 2009 | 24 454 | 2815 | 7617 | 8726 | 8,69 | 3,21 | 2,80 | 659 | 27564 |
| 1941 | 123 | 2258 | 29 039 | 4244 | 10985 | 12109 | 6,84 | 2,64 | 2,40 | 3718 | 25198 |
| 1942 | 122 | 2758 | 34 111 | 5267 | 16192 | 17497 | 6,48 | 2,11 | 1,95 | 4528 | 25054 |
| 1943 | 116 | 3118 | 36 282 | 6656 | 19425 | 20770 | 5,45 | 1,87 | 1,75 | 1705 | 25050 |
| 1944 | 109 | 3208 | 35 228 | 7230 | 23265 | 24444 | 4,87 | 1,51 | 1,44 | 2675 | 24977 |
| 1945 | 105 | 3497 | 36 351 | 7734 | 26314 | 27380 | 4,70 | 1,38 | 1,33 | 1856 | 24920 |
| 1946 | 107 | 3980 | 42 294 | 8253 | 28307 | 29347 | 5,12 | 1,49 | 1,44 | 502 | 24940 |
| 1947 | 115 | 4103 | 46 930 | 8371 | 21646 | 24654 | 5,61 | 2,17 | 1,90 | -2799 | 25014 |
| 1948 | 135 | 3381 | 47 693 | 8323 | 21194 | 24029 | 5,73 | 2,25 | 1,98 | -3,262 | 25065 |
| 1949 | 121 | 3920 | 48 599 | 8104 | 20049 | 22954 | 6,00 | 2,42 | 2,12 | -85 | 26150 |
| 1950 | 128 | 3819 | 50 664 | 8096 | 20988 | 24029 | 6,26 | 2,41 | 2,11 | 1186 | 28900 |
| 1951 | 142 | 3872 | 57 360 | 8849 | 23474 | 26775 | 6,48 | 2,44 | 2,14 | 2343 | 28900 |
| 1952 | 145 | 3878 | 58 678 | 8994 | 23879 | 27278 | 6,52 | 2,46 | 2,15 | 495 | 28900 |
| 1953 | 144 | 3913 | 58 993 | 9236 | 25290 | 29183 | 6,39 | 2,33 | 2,02 | 1975 | 28900 |
| 1954 | 152 | 3944 | 62 564 | 9747 | 27615 | 31767 | 6,42 | 2,27 | 1,97 | 1425 | 28900 |
| 1955 | 155 | 4077 | 65 447 | 10274 | 28716 | 33558 | 6,37 | 2,28 | 1,95 | 434 | 28900 |
| 1956 | 160 | 4256 | 69 943 | 10677 | 30546 | 35820 | 6,55 | 2,29 | 1,95 | 1008 | 28900 |

| Year | Real per capita GDP index (base 2000=1000) | Price Index (base 1914=100) | Nominal GDP (10³contos) | M0 (10³ contos) | M1 (10³ contos) | M2 (10³ contos) | V0 | V1 | V2 | Overall balance of payments (10³ contos) | Exchange rate (10³ réis or escudos) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1957 | 167 | 4257 | 74 250 | 11267 | 32958 | 38787 | 6,59 | 2,25 | 1,91 | 92 | 28900 |
| 1958 | 176 | 4318 | 79 191 | 11842 | 35113 | 41764 | 6,69 | 2,26 | 1,90 | 195 | 28900 |
| 1959 | 182 | 4375 | 84 042 | 12507 | 37135 | 44628 | 6,72 | 2,26 | 1,88 | 375 | 28780 |
| 1960 | 189 | 4472 | 88 994 | 13151 | 38877 | 47378 | 6,77 | 2,29 | 1,88 | -122 | 28790 |
| 1961 | 195 | 4461 | 92 648 | 15246 | 39212 | 48418 | 6,08 | 2,36 | 1,91 | -2377 | 28860 |
| 1962 | 214 | 4459 | 103 987 | 16119 | 42710 | 54480 | 6,45 | 2,43 | 1,91 | 5041 | 28800 |
| 1963 | 222 | 4575 | 107 438 | 17505 | 48746 | 61888 | 6,14 | 2,20 | 1,74 | 1867 | 28870 |
| 1964 | 235 | 4799 | 116 626 | 17994 | 55837 | 72287 | 6,48 | 2,09 | 1,61 | 3138 | 28940 |
| 1965 | 259 | 4955 | 135 681 | 22126 | 60311 | 79681 | 6,13 | 2,25 | 1,70 | 2226 | 28900 |
| 1966 | 274 | 5081 | 144 812 | 23577 | 69202 | 90649 | 6,14 | 2,09 | 1,60 | 4028 | 28940 |
| 1967 | 288 | 5293 | 162 217 | 24363 | 76924 | 104643 | 6,66 | 2,11 | 1,55 | 4589 | 28960 |
| 1968 | 305 | 5398 | 175 432 | 25402 | 83589 | 121076 | 6,91 | 2,10 | 1,45 | 4416 | 28850 |
| 1969 | 314 | 5543 | 188 229 | 26772 | 91349 | 139887 | 7,03 | 2,06 | 1,35 | 2490 | 28680 |
| 1970 | 343 | 5822 | 212 358 | 29848 | 96464 | 163017 | 7,11 | 2,20 | 1,30 | 2225 | 28740 |
| 1971 | 377 | 6253 | 245 768 | 31061 | 106663 | 195601 | 7,91 | 2,30 | 1,26 | 9244 | 28310 |
| 1972 | 415 | 6778 | 289 955 | 36269 | 120532 | 239568 | 7,99 | 2,41 | 1,21 | 7665 | 27170 |
| 1973 | 436 | 7299 | 342 817 | 38418 | 164696 | 308520 | 8,92 | 2,08 | 1,11 | 9834 | 24650 |
| 1974 | 436 | 10064 | 405 744 | 69881 | 181062 | 350495 | 5,81 | 2,24 | 1,16 | -13125 | 25520 |
| 1975 | 395 | 11929 | 469 776 | 109994 | 221363 | 390217 | 4,27 | 2,12 | 1,20 | -24952 | 25670 |
| 1976 | 397 | 14391 | 561 947 | 109107 | 245666 | 459163 | 5,15 | 2,29 | 1,22 | -33283 | 30340 |
| 1977 | 420 | 19136 | 722 257 | 113208 | 274123 | 534817 | 6,38 | 2,63 | 1,35 | -59475 | 38410 |
| 1978 | 445 | 24257 | 893 364 | 121280 | 312374 | 645888 | 7,37 | 2,86 | 1,38 | 9356 | 44090 |
| 1979 | 476 | 30103 | 1 135 905 | 142119 | 396557 | 851779 | 7,99 | 2,86 | 1,33 | 38357 | 49080 |
| 1980 | 498 | 35641 | 1 476 316 | 165162 | 481426 | 1093506 | 8,94 | 3,07 | 1,35 | 35000 | 50220 |
| 1981 | 511 | 41372 | 1 773 726 | 188372 | 524514 | 1356367 | 9,42 | 3,38 | 1,31 | -11220 | 61710 |
| 1982 | 524 | 50639 | 2 144 820 | 219457 | 610479 | 1683896 | 9,77 | 3,51 | 1,27 | 7222 | 79300 |

| Year | Real per capita GDP index (base 2000=1000) | Price Index (base 1914=100) | Nominal GDP (10³ contos) | M0 (10³ contos) | M1 (10³ contos) | M2 (10³ contos) | V0 | V1 | V2 | Overall balance of payments (10³ contos) | Exchange rate (10³ réis or escudos) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983 | 533 | 63552 | 2 740 339 | 240051 | 666197 | 1969213 | 11,42 | 4,11 | 1,39 | -87316 | 110950 |
| 1984 | 529 | 81855 | 3 365 099 | 267349 | 772320 | 2458328 | 12,59 | 4,36 | 1,37 | 59321 | 146560 |
| 1985 | 541 | 97899 | 4 131 014 | 318982 | 980559 | 3056227 | 12,95 | 4,21 | 1,35 | 167852 | 170580 |
| 1986 | 560 | 109451 | 5 048 501 | 399256 | 1334154 | 3656960 | 12,64 | 3,78 | 1,38 | -33061 | 149800 |
| 1987 | 604 | 119470 | 5 948 432 | 457686 | 1611614 | 4280151 | 13,00 | 3,69 | 1,39 | 266584 | 141090 |
| 1988 | 639 | 131354 | 7 100 357 | 509544 | 1951198 | 5059103 | 13,93 | 3,64 | 1,40 | 192275 | 144240 |
| 1989 | 686 | 147905 | 8 388 429 | 577349 | 2242559 | 5717246 | 14,53 | 3,74 | 1,47 | 549115 | 157770 |
| 1990 | 746 | 167724 | 10 072 063 | 623876 | 2352222 | 6229915 | 16,14 | 4,28 | 1,62 | 493060 | 142555 |
| 1991 | 776 | 186845 | 11 534 190 | 683079 | 2704682 | 7801571 | 16,89 | 4,26 | 1,48 | 585263 | 144482 |
| 1992 | 802 | 203474 | 12 951 001 | 708190 | 3163733 | 9106545 | 18,29 | 4,09 | 1,42 | 245209 | 134998 |

**Remark:**

Until 1891 exchange rate at par was £ 1=4500 réis. There are no data on fluctuations of effective exchange rate similar to those available for post-1891 years. Ferramosca; Esteves, 1999, made an analysis of gold point violations (concluding for rather few events), but did not published the series used, relying in graphic presentation.

Between 1891 and 1939, pound sterling exchange rate.

Between 1940 on, U.S. dollar exchange rate