

EXCHANGE RATE AND EXCHANGE POLICY IN PORTUGAL 1891-1931 REVISITED (*)

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Introduction

Portugal adopted the gold-standard in 1854 and abandoned it in 1891 in the wake of the so-called Baring financial crisis. Gold-standard lasted for nearly four decades, because structural deficits of the trade balance were usually covered by emigrants remittances, mainly from Brazil, the most important outlet for Portuguese emigration, and by foreign loans in the London financial market. It broke down in 1891, for two reasons. Firstly, Brazilian political problems, related to the abrogation of slavery in 1888 and to the new republican regime implemented in 1889, made emigrants remittances to plummet. Secondly, the main lender of the Portuguese government in London, the Baring Brothers, was facing very difficult problems, because of the bankruptcy of its South-American debtors. A bank rush in May forced the Portuguese government to declare the inconvertibility of bank notes, first for a two month period, then *sine die*.

Gold convertibility was never restored. Floating exchange rates prevailed during four decades, until July 1931. Then, the Portuguese monetary unit was pegged to the sterling in an attempt to adopt the gold-exchange standard. The attempt lasted only eighty-one days, because of the declaration of the inconvertibility of the pound in September 1931, but Portugal remained in the sterling zone until World War II.

Some years ago, I studied the behaviour of the exchange rate and the evolution of the exchange policy in Portugal between 1891 and 1931 (that is to say, during the four decades of floating exchanges rates) in my M. A. dissertation (Mata, 1984) and in a small book (Mata, 1987). The analysis proceeded almost exclusively in terms of the Lisbon-London exchange rate, not only because of the part played by the British currency in international affairs, London being the

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most important financial market all over the world, but also because Great Britain was the main economic and financial partner of Portugal. This paper is an attempt to review the subject in the light of improved estimates of some macroeconomic variables for the Portuguese and the British economies.

1 — The behaviour of the exchange rate

The behaviour of the exchange rate during the four decades that elapsed between 1891 and 1931 is presented in figure 1. It immediately leads to the division of the evolution into three periods:

- a) 1891-1914 — during this period, Portuguese currency suffered only a mild depreciation (specially when this depreciation is compared with the one that followed during the war and post-war years);
- b) 1914-1924 — during this period, Portuguese currency suffered a very important depreciation; the exchange rate was multiplied by almost 30;
- c) 1924-1931 — during this period, Portuguese currency experienced a stabilization, that allowed it to be pegged to the pound in 1931.

2 — The exchange policy

The periods detected in the behaviour of the exchange rates correspond to significant changes in the policy of Portuguese monetary authorities:

- a) From 1891 to 1914, there was an absence of intervention in the exchange market;
- b) From 1914 to 1924, there occurred several attempts to control the exchange market by enacting a compulsory exchange rate (September-December 1914, September-October 1918, January-May 1920). All these attempts failed, because black market schemes absorbing the majority of the relevant transactions soon emerged;
- c) From 1924 to 1931, an attempt to influence the exchange market by means of buying and selling foreign exchange was successfully implemented. The financial basis for starting such an intervention was obtained through a massive sale of Portuguese silver coin in the London market, and it was sustained by implementing a system of compulsory sale of foreign exchange to monetary authorities by exporters, by means of repayable export duties.

3 — Explanation of exchange rate behaviour

To seek an explanation for the exchange rate behaviour in terms of the macro-economic evolution of Portuguese and British economies, I used a model based in the one presented in Hodrick, 1978.

The model leads to the estimation of the following regression:

$$e = a + b_1 \cdot p_P + b_2 \cdot p_B + b_3 \cdot m_P + b_4 \cdot m_B + b_5 \cdot (1+i_P) + b_6 \cdot (1+i_B) + b_7 \cdot y_P + b_8 \cdot y_B$$

where:

- a) e is the logarithm of the exchange rate;
- b) p_P is the logarithm of the price index for Portugal;
- c) p_B is the logarithm of the price index for Great Britain;
- d) m_P is the logarithm of the real money supply in Portugal;
- e) m_B is the logarithm of the real money supply in Great Britain;
- f) i_P is the logarithm of the interest rate in Portugal;
- g) i_B is the logarithm of the interest rate in Great Britain;
- h) y_P is the logarithm of the national income of Portugal;
- i) y_B is the logarithm of the national income of Great Britain.

Data used in estimations is presented in the statistical appendix.

It is pointless to try to estimate a single regression for the whole period, because the results are completely different when the period before World War I and the war and post-war years are considered. Accordingly, we shall consider the two regressions separately.

3.1 — The 1891-1914 period

The regression leads to the following results:

Degrees of freedom	23
Correlation coefficient	0.920
Determination coefficient	0.847
Adjusted determination coefficient	0.765
F-statistic	10.350
Durbin-Watson statistic	2.006
Intercept	5.478

Elasticities	Value	t-statistic
Portuguese price index	- 0.257	0.408
British price index	2.334	2.223
Portuguese money supply	0.272	1.268
British money supply	0.432	1.661
Portuguese interest rate	12.396	4.292
British interest rate	- 31.872	3.045
Portuguese real gdp	- 0.588	1.691
British real gdp	- 0.329	0.696

The global adherence of the model is quite good, but the results are rather puzzling. As a matter of fact, none of the statistically significant coefficients have the sign foreseen by economic theory: increases in British prices lead to depreciations of Portuguese currency; increases in the Portuguese rate of interest also lead to the depreciation of Portuguese currency; and increases in the British rate of interest lead to an appreciation of Portuguese currency. To be sure, all coefficients have the unexpected signs, with the exception of the (not significantly different from zero) coefficients of Portuguese money supply and of Portuguese gross domestic product.

We must seek for an explanation for these results. I believe it may be found in the influence of another variable on the Lisbon-London exchange rate — I am thinking of emigrants remittances. As a matter of fact, an increase in emigrants remittances (unrelated to the variables so far considered) improves the situation of the balance of payments, and implies an appreciation of the Portuguese currency. At the same time, the increase of emigrants remittances implies an increase in Portuguese nominal money supply, and indirectly an increase in Portuguese prices and a decrease in Portuguese interest rates, making for the relation detected in the regression stated above. A decrease in emigrants remittances has, of course, opposite effects.

Unfortunately, it is impossible to test directly such an hypothesis, because there is no data available about emigrants remittances. However, some authors of the epoch (see for all Salazar, 1916) suggested the Rio-London exchange rate as an explanatory variable for the Lisbon-London exchange rate. The explanation presented for such a relationship was that the Rio-London exchange rate was an indicator of the Brazilian economic situation, which was the main explanatory variable for remittances from Portuguese emigrants. (Let us recall that the great majority of Portuguese emigrants lived in Brazil.)

This means we may take the Rio-London exchange rate as a proxy variable for the amount of emigrants remittances received in Portugal. To make an indirect test to the hypothesis that the Lisbon-London exchange rate is influenced by the amount of emigrants remittances received by Portugal, the following regression was estimated:

$$e_{L/L} = a + b e_{R/L}$$

where:

- a) $e_{L/L}$ is the Lisbon-London exchange rate;
- b) $e_{R/L}$ is the Rio-London exchange rate.

The results with auto-correlation duly corrected were as follows:

Degrees of freedom	22
Correlation coefficient	0.805
Determination coefficient	0.649

Adjusted determination coefficient	0.632
F-statistic	38.793
Durbin-Watson statistic	1.662
Rho parameter	0.368
Intercept	2.046
Slope	0.097
t-statistic	6.228

This seems to confirm our hypothesis, though we must not forget we are dealing with an indirect test.

3.2 — The 1914-1931 period

The regression leads to the following results:

Degrees of freedom	17
Correlation coefficient	0.998
Determination coefficient	0.997
Adjusted determination coefficient	0.994
F-statistic	329
Durbin-Watson statistic	1.669
Intercept	— 1.715

Elasticities	Value	t-statistic
Portuguese price index	1.863	12.593
British price index	— 4.352	4.980
Portuguese money supply	3.697	2.894
British money supply	— 0.070	0.334
Portuguese interest rate	— 28.993	3.416
British interest rate	78.459	3.799
Portuguese real gdp	— 2.343	2.237
British real gdp	0.081	0.098

The global adherence of the model is quite good again, and all the statistically significant coefficients (those of Portuguese prices, British prices, Portuguese money supply, Portuguese interest rate, British interest rate, and Portuguese gross domestic product) do now have the sign foreseen by economic theory, pointing to the validation of the purchasing power parity theory, of the interest parity theory, and of the balance of payments theory of exchange rate determination (British money supply and British gross domestic product have coefficients not significantly different from zero, but also of the expected sign).

At the same time, the influence of emigrants remittances on the Lisbon-London exchange rate seems to vanish, as was pointed out by contemporary authors (see for all Caetano, 1931). The indirect test using again the Rio-London exchange rate as a proxy variable supports this view, because the results of the estimation of the regression with auto-correlation duly corrected are as follows:

Degrees of freedom	16
Correlation coefficient	0.434
Determination coefficient	0.188
Adjusted determination coefficient	0.134
F-statistic	3.473
Durbin-Watson statistic	1.474
Rho parameter	0.900
Intercept	0.573
Slope	0.123
t-statistic	1.864

As a matter of fact, the global adherence of the model is unsatisfactory, and the slope is not significantly different from zero.

4 — Economic consequences for Portuguese economy of flexible exchange rates regime

We have been concerned so far with the causes of exchange rate fluctuation, but it is interesting to address, however briefly, to the question of the economic consequences for Portuguese economy of flexible exchange rates regime.

The gold standard period had been a very satisfactory one in what concerns economic growth in Portugal. As a matter of fact, between 1860 and 1890, Portuguese real gross domestic product grew at a rate of about 2.8 % per year, and Portuguese *per capita* gross domestic product grew at a rate of about 2.1 % per year. By contrast, the flexible exchange rate period was quite disappointing: between 1891 and the First World War, the growth of real gross domestic product dropped to 0.9 % per year, a rate which was almost totally absorbed by population growth; during the years of the First World War, the Portuguese economy suffered a serious setback and it only recovered the pre-war output levels in the mid-1920's. Curiously enough, growth resumed after the currency stabilization in spite of the unfavourable international environment of the 1930's. This suggests flexible exchange rates were detrimental for Portuguese economic performance.

Of course, time coincidence is not a proof of causal relationship, and it is possible to point out explanations for Portuguese economic performance not directly related to the exchange rate regime: institutional reforms and intensive road and railway building were vital to the growth of the 1860's, 1870's and 1880's; state bankruptcy and protectionism helped to shelter the Portuguese

economy from the influence of the «belle époque» international growth; monetary questions were not the cause of the supply shortages and resource allocation for the army of the First World War years; and recovery and further growth in the inter-war years was based on much more than currency stabilization. However, the idea that a small open economy like Portugal has more to gain than to loose from a stabilized currency seems to be an interesting starting point to comparative research on the subject.

STATISTICAL APPENDIX

Sources:

Exchange rates — Mata, 1987;
 Portuguese prices — Mata, Nunes and Valério, 1989;
 Portuguese money supply — Mata, 1987;
 Portuguese interest rate — Mata, 1987;
 Portuguese real national income — Mata, Nunes and Valério, 1989;
 British data — Mitchell, 1990.

Symbols and units:

$E_{L/L}$ — Lisbon-London exchange rate in thousands of *réis* per pound until 1910 and in *escudos* per pound after 1911;
 $E_{R/L}$ — Rio-London exchange rate in thousands of *réis* per pound;
 P_P — price index for Portugal 1914 basis;
 P_B — price index for Great Britain 1914 basis;
 M_P — money supply in Portugal in thousands of *contos*;
 M_B — money supply in Great Britain in millions of pounds;
 i_P — interest rate in Portugal in percentage;
 i_B — interest rate in Great Britain in percentage;
 Y_P — national income of Portugal in thousands of *contos*;
 Y_B — national income of Great Britain in millions of pounds.

Year	$E_{L/L}$	$E_{R/L}$	P_P	P_B	M_P	M_B	i_P	i_B	Y_P	Y_B
1891	4.832	14.817	.86	.897	54	48	5.7	2.9	792	1481
1892	5.735	20.149	.88	.895	74	50	5.7	2.8	794	1445
1893	5.600	20.237	.89	.894	75	50	6.9	2.8	790	1443
1894	5.790	23.534	.91	.889	74	57	6.1	2.7	788	1557
1895	5.698	23.963	.87	.874	77	62	5.8	2.6	877	1603
1896	5.853	26.485	.88	.880	79	68	5.8	2.5	894	1659
1897	6.575	30.471	.93	.885	85	60	6.3	2.5	841	1670
1898	7.108	32.462	.97	.895	94	59	6.9	2.5	816	1759
1899	6.416	32.652	.95	.918	94	58	6.5	2.6	848	1839
1900	6.320	25.143	.93	.969	94	61	5.9	2.8	891	1813
1901	6.382	21.135	.92	.961	96	63	5.4	2.9	882	1833
1902	5.722	19.974	.89	.943	98	63	5.4	2.9	917	1866
1903	5.581	19.796	.92	.947	99	61	5.9	2.8	916	1837
1904	5.413	19.550	.97	.942	97	61	5.5	2.8	886	1857
1905	4.793	15.374	.96	.941	98	63	4.1	2.8	900	1928
1906	4.582	15.138	.96	.949	97	61	4.7	2.8	910	1975

Year	E_{UL}	E_{RL}	P_P	P_B	M_P	M_B	I_P	I_B	Y_P	Y_B
1907	4.642	15.685	.96	.961	101	62	4.8	3.0	941	2017
1908	5.199	15.250	.97	.969	101	65	5.0	2.9	957	1940
1909	5.185	15.736	.98	.958	102	65	5.1	3.0	960	1993
1910	4.895	14.713	.94	.963	108	64	5.0	3.1	1007	2042
1911	4.889	14.814	.99	.976	115	66	5.1	3.2	915	2113
1912	4.974	15.314	.98	.998	117	66	5.0	3.3	955	2140
1913	5.235	14.831	1.01	1.008	116	65	5.4	3.4	941	2227
1914	5.663	16.063	1.00	1.000	128	78	5.3	3.3	862	2278
1915	6.748	19.039	1.10	1.133	149	92	5.3	3.8	887	2423
1916	7.032	19.875	1.29	1.303	175	90	5.5	4.3	909	2470
1917	7.726	18.686	1.48	1.641	222	93	5.2	4.6	843	2487
1918	7.901	18.447	2.40	1.936	292	120	4.8	4.4	620	2541
1919	8.196	16.519	2.68	2.272	389	163	4.8	4.6	689	2289
1920	18.329	16.301	4.20	2.792	626	219	4.8	5.3	626	2033
1921	39.384	28.475	6.06	2.450	752	234	4.8	5.2	555	1868
1922	65.084	33.403	7.07	2.034	1071	229	4.7	4.4	764	1964
1923	109.714	43.446	10.22	1.872	1439	228	5.3	4.3	788	2026
1924	133.950	40.183	13.38	1.837	1777	229	6.7	4.4	767	2111
1925	99.210	38.890	12.95	1.858	1844	237	6.6	4.4	878	2213
1926	94.770	33.638	12.50	1.816	1891	233	6.9	4.6	966	2131
1927	108.360	41.129	13.25	1.772	1898	231	6.7	4.6	957	2302
1928	108.250	40.926	12.78	1.760	2031	241	7.0	4.5	1158	2331
1929	108.250	41.028	13.20	1.755	2088	509	6.1	4.6	1260	2400
1930	108.250	44.281	12.66	1.756	2036	514	5.5	4.5	1288	2383
1931	109.369	62.991	11.48	1.700	2103	494	6.4	4.4	1376	2260

FIGURE 1



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