

Abstract

This paper constructs *nominal* and *real* multilateral effective exchange rates for Japan during the period 1879-1938. Existing studies of Japanese quantitative economic history have tended to use the dollar-yen bilateral exchange rate. A comparison of different indices suggests that the new data offer new insights into Japanese's economic history.

JEL Classifications: F31, N11, N43

Key Words: Gold standard, Effective exchange rates, Business cycles

Effective Exchange Rates in Japan

1879-1938

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Introduction

Between 1879 and 1938 Japan switched exchange rate regimes on a number of occasions. A paper currency operated during the period 1879-86; from 1886 the silver standard prevailed¹; in 1897 Japan adopted the gold standard; the imposition of a gold embargo in 1917 was followed by a period of flexible exchange rates in the 1920s, although the policy intention of returning to the gold standard influenced macroeconomic policy. The return to the 1913 gold parity was achieved early in 1930, but by December 1931 depressed economic conditions forced Japan to make an early exit from the gold standard, resulting in a large nominal and real yen depreciation. In 1934 the yen was linked to sterling, effectively resulting in a period of managed exchange rates.

The aim of this paper is to provide a new data set of *nominal* and *real* effective exchange rates for Japan during the period 1879-1938. Existing research has so far focused on the behaviour of real *bilateral* rates with the major industrial

¹ The silver standard and paper currencies prevailed in many of the non-core industrial countries during the last three decades of the 19th Century (Ford, 1962; Nugent, 1973; Eichengreen, 1989; Bordo and Rockoff, 1996).

countries or has constructed effective exchange rates using only a very small sample of countries (Minami, 1986; Okura and Teranishi, 1994; Iwami *et al.*, 1998). Section I describes trends in the *nominal* effective exchange rate for Japan. Section II describes the trends in the *real* effective exchange rates. Section III illustrates the relevance of the new data by using cointegration and error correction models to evaluate the determinants of Japanese exports during the period 1879-1938. The data appendix provides the data series for nominal and real effective exchange rates.

1 Nominal Effective Exchange Rates

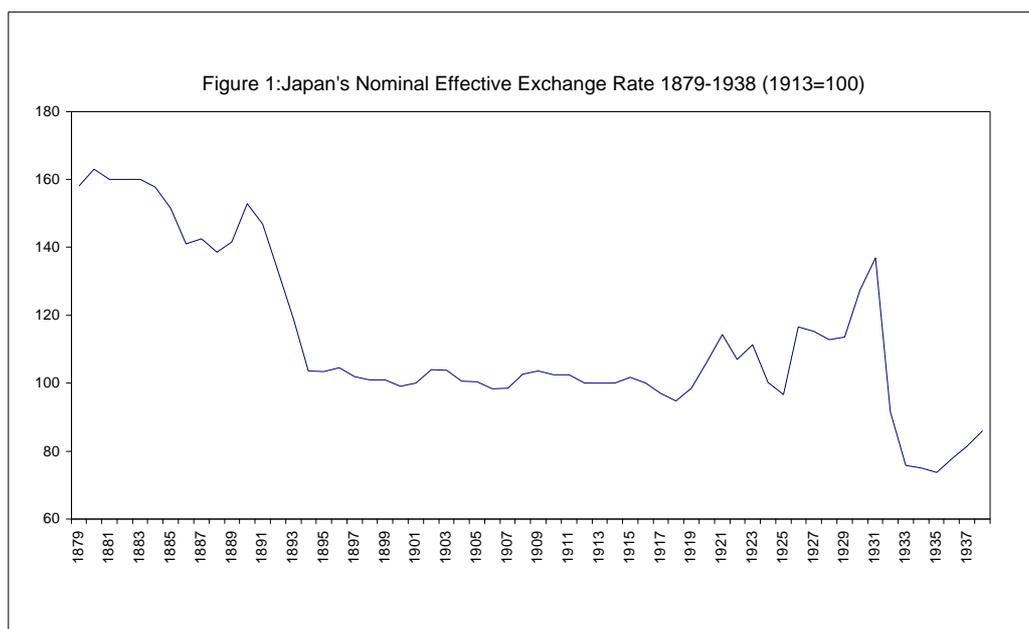
Nominal Effective exchange rates have been calculated using bilateral trade weights. Whilst it is recognised that other weighting systems, such as output weights, will also provide useful information (Edwards, 1989; Lipschitz and McDonald, 1991), for this period only trade weights are feasible, given the extremely limited availability of output data for most of Japan's trading partners during this period.

For the period 1879-1913 the nominal effective exchange rate (EER) is calculated as the weighted average for 16 of Japan's main trading partners², accounting for over 80 per cent of Japan's visible trade. Exchange rates are expressed as the foreign price of domestic currency with 1913=100. Laspeyres and Paasche exchange rate indices were constructed using bilateral trade weights for 1879 and 1913 respectively³. A geometric mean was then used to derive the Fisher ideal index over this period. For the period 1913-1938 Laspeyres and Paasche exchange rate indices were constructed using bilateral trade weights for 1913 and 1938 respectively. A geometric mean was then used to derive the Fisher ideal

² The countries included are Australia, Belgium, Canada, China, Dutch India, Egypt, France, Germany, Hong Kong, India, Italy, Netherlands, Russia, Switzerland, UK, and USA. The number of countries covered by this exercise is comparable to modern practice.

³ A number of weighting systems were investigated. As would be expected the level of the index

index. In 1913 both indices take the value of 100. Given the degree of structural change in Japan's trade over this period, relative to the pre-1913 period, and the available exchange rate data, it was necessary to change the coverage of countries.⁴ This index is presented in Figure 1 covering the whole period 1879-1938 (the data series are presented in Appendix 2).



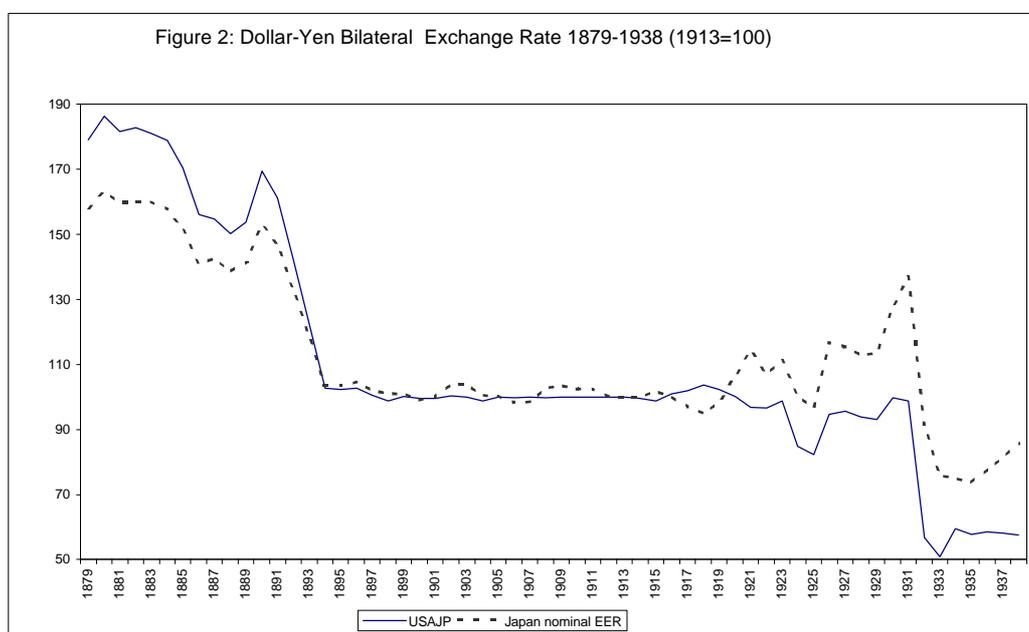
Nominal EER movements follow a stochastic trend,⁵ with the rate depreciating by 17 per cent over the period 1879-1892 and a further 20 per cent depreciation during 1892-4. This was followed by a phase of relative stability during the period 1894-1913. During 1913-1931 the EER appreciated by 35 per cent. The exit from the gold standard resulted in 45 per cent depreciation during 1931-3. In discussions of Japanese economic performance, the existing historical literature often uses the dollar-yen rate instead of using a measure of effective exchange rate variations. For example, Minami (1986) uses the dollar-yen rate as an

is affected but the movements over time are similar for the different weighting schemes.

⁴ The countries included in this sample period are Australia, Canada, China, Dutch India, Egypt, France, Hong Kong, India, Italy, Korea, Manchuria, Netherlands, Singapore, Switzerland, Taiwan, Thailand, UK and the USA. The coverage ratio amounts to 80-85 per cent of Japan's trade.

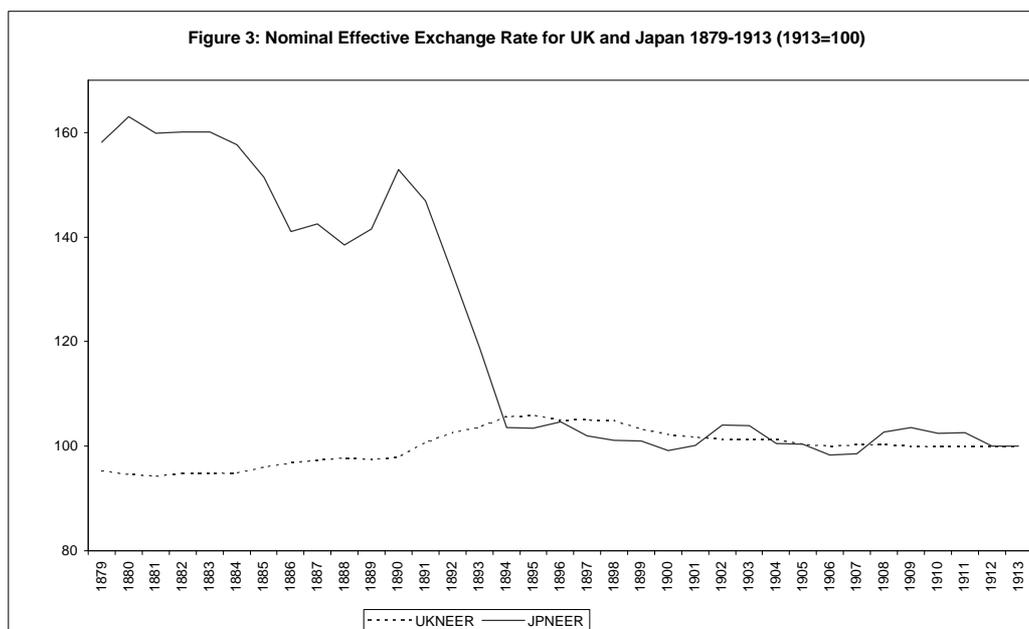
⁵ Augmented Dick-Fuller (ADF) for trend-stationarity fail to reject the unit root hypothesis.

indicator of exchange rate influences on Japanese export performance. Comparing the movements of the dollar-yen rate with Japan's nominal EER (see Figure 2) highlights a number of important differences. First, the magnitudes of exchange rate changes over the period 1879-94 are smaller for the effective rate than the bilateral rate with America. The second major difference arises in the 1920s. Whilst the bilateral rate with the US remains non-trended during 1913-30, the EER appreciates by 36 per cent. Such major differences imply that the bilateral US rate provides a misleading indicator of nominal exchange rate influences on the Japanese economy over much of the period.



In order to gain a comparative perspective, Figure 3 compares the behaviour of the EER of Japan and Britain in the period 1879-1913 drawing on the data of Solomou and Catao (1998). The British rate appreciated by 10 per cent over the period 1879-1895 followed by a phase of mild depreciation during 1895-1913. Thus, during the period when Japan was on the Silver standard an inverse movement is observed; during the period 1897-1913 when Japan was on the gold standard, a relative stability is observed while for Britain a mild depreciation is observed. Over the period 1913-1930/1 the EER of the Yen and Sterling appreciated by 35 per cent and 49 per cent respectively (Broadberry, 1986).

Estimates of Britain's nominal depreciation in the 1930s vary between 15 per cent (Redmond, 1984) and 25 per cent (Dimsdale, 1981). The depreciation of the Yen in the early 1930s was clearly much larger than the depreciation of sterling and other currencies.



2 Real Effective Exchange Rates

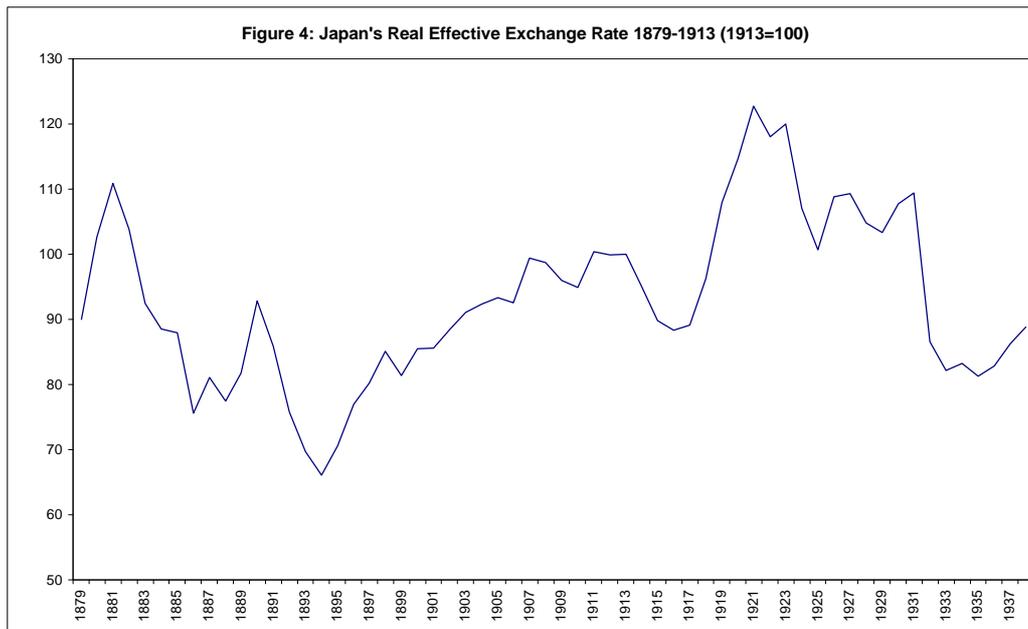
Real effective exchange rate (EER) indices for Japan have been calculated as weighted averages of nominal bilateral rates adjusted for relative price changes. Where possible we have used consumer prices as deflators. The main exception to this is China where we have had to use wholesale prices. Given the weight of China in Japan's trade (which averaged about 14 per cent during this period) this data constraint has an effect on the magnitude of the annual movements, but does not distort the direction of the short-run or long-run movements of the calculated real EERs.

For the period 1879-1913 Laspeyres and Paasche exchange rate indices were constructed using bilateral trade weights for 1879 and 1913 respectively. A geometric mean was then used to derive the Fisher ideal index over this period. Given the available price data for Japan and its main trading partners we produced a real EER series using an 11-country selection.⁶ The weights used are the same trade weights as were used in the nominal EER calculations adjusted for variations in the number of countries covered. For the period 1913-1938 Laspeyres and Paasche exchange rate indices were constructed using bilateral trade weights for 1913 and 1938 respectively. A geometric mean was then used to derive the Fisher ideal index. Given the degree of change in the regional distribution of Japans trade over this period, relative to the pre-1913 period, and the available price data, it was necessary to change the coverage of countries slightly.⁷

Figure 4 plots Japans real EER for the period 1879-1938. During 1879-1894 the real rate depreciates by 36 per cent. The rate appreciates by 51 per cent over the period 1894-1913. During 1913-21 the real EER appreciates by a further 23 per cent. For most of the 1920s there is a correction with a 13 per cent depreciation of the real EER over the period 1921-30. With devaluation in December 1931 the real EER of the Yen depreciated by 25 per cent and remained at this low level over the period 1932-6, with a mild appreciation in 1937 and 1938.

⁶ The countries included are Australia, Belgium, Canada, China, France, Germany, India, Italy, Netherlands, UK and the USA. The coverage amounts to over 75 per cent of Japans trade over this period.

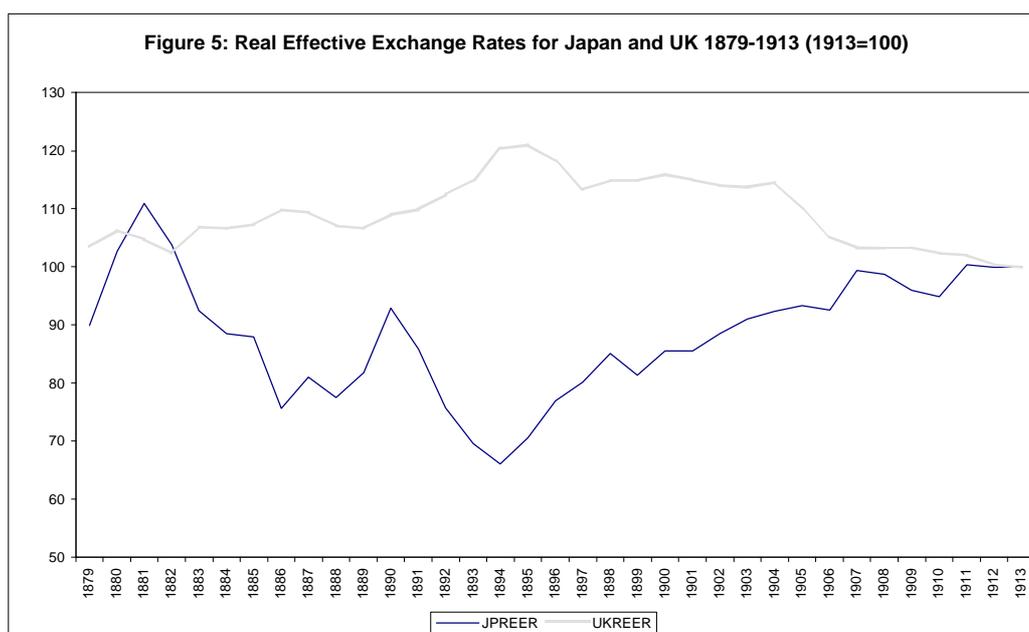
⁷ The countries included in this sample period are Australia, Canada, China, Egypt, France, India, Italy, Korea, Manchuria, Netherlands, Taiwan, UK and the USA. The coverage ratio amounts to over 75 per cent of Japan's trade.



Comparing the real EER index reported here with the real exchange rates reported in other studies illustrates significant differences. Ito (1997, p.510) reports the dollar-yen rate deflated by consumer prices. Comparing the real dollar-yen bilateral rate with our index for the real EER suggest that the two measures move together in the pre-1913 period, but show some significant differences in the inter-war period. Iwami *et al.* (1998, p. 40) calculate a real effective exchange rate during the period 1919-38 (with 1913=100). Their index overstates the swing of appreciation in the early 1920s and the degree of depreciation for most of the 1920s. Their index suggests that the degree of appreciation during 1913-21 was more than double the rate of our index. They also find that the rate for 1930 was comparable to the 1913 level. Our results suggest that the 1920s saw a *correction* but the Yen remained significantly overvalued on its return to gold in 1930. Whilst they find that the real EER depreciated fairly smoothly over the period 1925-32 we find that the exit from the gold standard in 1931 had a large *step effect* in creating an undervalued yen. The observed differences are arising from two sources: first, we use a larger selection of countries, giving a broader coverage of Japan's trading structure; secondly, we compare relative prices using consumer price indices instead of export and import price indices. For these reasons the real EER derived here is more relevant as a

measure for analysing Japan's macroeconomic conditions.

In order to gain a comparative perspective Figure 5 compares the behaviour of real effective rates of Japan and Britain in the period 1879-1913 drawing on the data of Solomou and Catao (1998). During 1879-1894 the British real EER appreciated by 20 per cent whilst the Japanese rate fell 36 per cent. During 1895-1913 the British rate depreciated by 17 per cent whilst the Japanese rate appreciated by over 50 per cent. During 1913-21 the British rate appreciated by about 26 per cent (Broadberry, 1986) whilst the Japanese rate appreciated by 23 per cent. The depreciation observed in both countries during the 1920s was a correction but was not sufficient to eliminate the overvaluation observed during 1913-21. During the early 1930s the devaluation of 1931 gave Britain a 13 per cent real depreciation (Redmond, 1984) whilst the Japanese rate fell by 25 per cent during 1931-33. Another important difference for the 1930s is that whilst the British real EER appreciated to the pre-devaluation level by 1937, the Japanese rate remained competitive throughout the 1930s. In many ways the experience of the two countries moves from a pattern of inverse long-run movements before 1913 to a pattern of co-movement in the period 1913-38.



3. Determinants of Japan's Exports

In this section, as a way of illustrating the usefulness of the new data, we use the real effective exchange rate data to model the determinants of Japan's commodity exports. The existing literature offers mixed results on the role of prices in the determination of exports. For the pre-1913 period, Shinohara (1962) argues that relative price effects were large, whilst Minami (1986) finds that the relative price effect was relatively unimportant. In order to account for these differences let us first compare our real effective exchange rate with Minami's measure of competitiveness. Minami uses Japan's terms of trade data (the ratio of the price of exports to the price of imports) adjusted for nominal exchange rate variations as a measure of the real exchange rate. Figure 6 compares the real EER calculated here with Minami's index. Major discrepancies are observed throughout the period. For example, whilst the data for the real EER shows that Japan witnessed a large real yen depreciation during 1879-94, Minami's index shows a stable, although cyclical, level. Whilst we find a trend of appreciation during 1894-1913, Minami's index shows appreciation in the late 1890s and depreciation during 1900-1913. Our data suggest that the 1920s witnessed a persistently high value for the real EER (despite the mild depreciation during 1921-30) whilst Minami's data suggest a larger depreciation. Given such marked differences, it is clear that existing inferences are not robust since they arise from using unrepresentative data. The real EER calculations presented here are general enough to provide a better measure of relative price effects than is found in the existing literature.

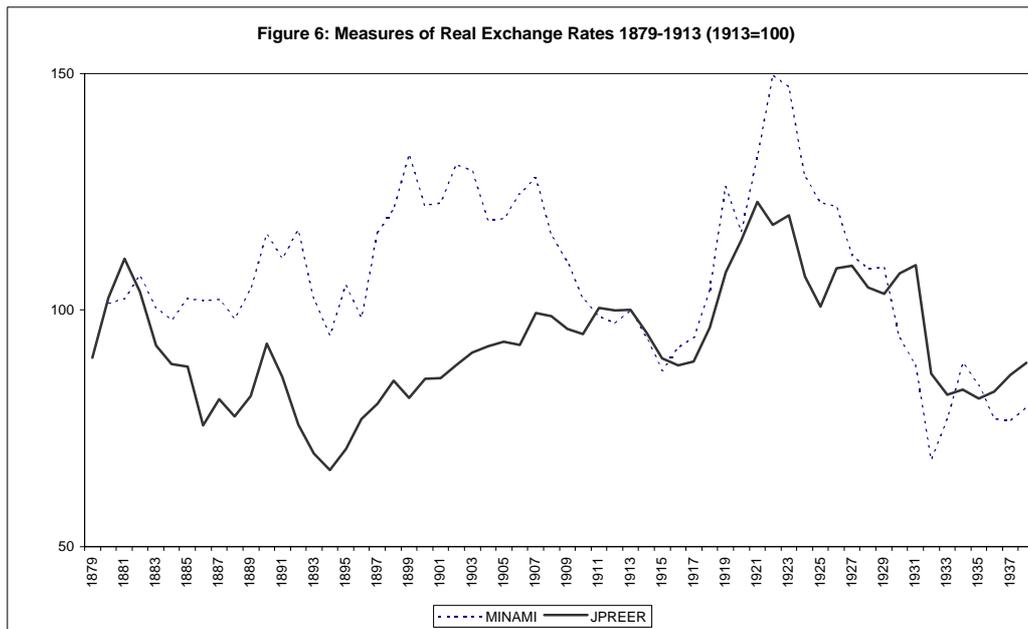


Table 1 describes the data for exports, Japan's real EER and trading partners income⁸ over the major episodes of real exchange rate variations. The pattern of long run movements that emerges from this suggests that income and real EER effects are both important over the period. During 1879-1913 a fairly stable and high export growth was achieved because the income and real EER effects operated inversely: during 1879-94 depreciation was correlated with relatively low world income growth, whilst during 1894-1913 a phase of appreciation was correlated with relatively high world income growth. During 1913-31 a major reduction in the growth of world income and an appreciation of the real EER resulted in a significant retardation of Japan's export growth. During the

⁸ For the period 1879-1902 we constructed an income index as the weighted average for 6 countries of Japan's main trading partners (US, UK, France, Germany, Italy, and Australia). Taiwan, India, and Dutch India were added for the period 1903-1913), accounting for 52- 76% of Japan's visible trade. Income of each country is expressed as 1903=100. Laspeyres and Paasche world income indices were constructed using bilateral export weights for 1879 and 1903 respectively. A geometric mean was then used to derive the Fisher ideal index over this period. For the period 1903-1913 Laspeyres and Paasche income indices were constructed using bilateral exports weights for 1903 and 1913 respectively. A geometric mean was then used to derive the Fisher ideal index. In 1903 both indices take the value of 100. For the period 1913-1938 a world income series is constructed as the weighted average for 10 of Japan's main trading partners (US, UK, France, Germany, Italy, Australia, Taiwan, Korea, India, and Dutch India), accounting for 56-62% of Japan's visible trade. Laspeyres and Paasche world income indices were constructed using bilateral exports weights for 1913 and 1938 respectively. A geometric mean was then used to derive the Fisher ideal index over this period.

economic recovery of the 1930s a large real yen depreciation and high world income growth resulted in a phase rapid export growth⁹.

Table 1: Japan's exports, Trading partners' income and REER

	Exports (% per year)	Partners' Income (% per year)	REER (total change)
1879-1894	7.9	2.4	-26.5%
1894-1913	7.0	3.1	51.3%
1913-1931	4.0	2.0	9.0%
1931-1938	10.0	4.0	-18.9%

In order to evaluate this relationship more formally we employ co-integration and error correction analysis to estimate the relationship between these variables. Over the whole sample period (1879-1938) time series analysis suggests that all the variables are integrated of order one. The Johansen co-integration methodology suggests that there exists one cointegrating vector between exports, the real EER and world income¹⁰. The long-run coefficients of both variables have the expected sign and are statistically significant (see Table 2). Using the error correction methodology to estimate the export function suggests that the income and real EER variables both have significant effects on export growth.

⁹ The income of Japan's trading partners grew rapidly (4.0 % annually) This is mainly due to the growth of colonial regions (Korea, 8.0% p.a. and Taiwan, 5.7% p. a.).

¹⁰ In the estimated models we assume weak exogeneity running from world income and real EER effects to Japan's exports. This is the most likely theoretical causal structure.

**Table 2: Estimates of Restricted Cointegrating Relations
(Standard Errors in Brackets)**

Cointegration with no intercepts or trends in the VAR : 1881 to 1938. Order of VAR = 2, chosen r =1.

Log exports	1.0000
Log world Income	-2.6236 (0.15836)
Log REER	1.1515 (0.17209)

The cointegration results suggest that world income movement and real EER variations influenced Japan's long-run export variations. The results from the error correction model suggest that world income and the real EER also have significant short run effects on variations in export growth (see Table 3).

Table 3: Error Correction model for explaining growth of Japan's commodity exports 1880 to 1938

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
Growth of REER	-0.9712	.16803	-5.7795[.000]
Growth of income	1.8118	.39596	4.5759[.000]
LAGECM	-0.28037	.09537	-2.9399[.005]
Constant	-0.07011	.03552	-1.9740[.053]

R-Squared .52432	R-Bar-Squared .49837	DW-statistic 2.1409
SE. of Regression .088375	F(3, 55) 20.2078[.000]	

Contrary to past studies the relative price variable, measured appropriately, is having a significant long-run and short-run effect on Japanese exports over the sample period 1879-1938. The analysis here illustrates some important aspects regarding the role of shocks to Japan's economic growth. In the pre-1913 period

the relative stability of export growth was an outcome of favourable and adverse shocks that counterbalanced each other. When the nature of shocks switched to a pattern co-movement Japan's export performance showed large long run and short run volatility. Thus, in the period of adjustment after the First World War Japan is faced with a high real EER and low world income growth, resulting in a halving of its export growth relative to the pre-1913 period. The favourable income and real EER conditions of the 1930s resulted in a period of exceptional export growth. Comparing these results with the existing literature, we can say that stochastic variation in Japan's real exchange rate had an important effect throughout the period 1879-1938

Conclusions

The new data suggest significant differences between the nominal EER and the yen-dollar bilateral rate. Since the latter has been used in quantitative analysis this is likely to result in biased interpretations. The magnitudes of the effective exchange rate changes were smaller over the period 1879-94 than the bilateral rate. A major difference is also observed during the period 1913-30: whilst the yen-dollar rate is non-trended, the Japanese effective rate appreciated by 36 per cent. The more representative information provided by the EER data has an important bearing on the determination of the national price level. So far, aggregate price movements have been explained in terms of a combination of real shocks and national monetary shocks (Faini and Toniolo, 1990). The importance of monetary shocks arising from international linkages across countries with different exchange rate regimes clearly warrants further attention. Given the growing openness of Japan's economy, long-term shifts in international exchange rates are likely to feed into domestic price changes.

The importance of the new data is also clear when we consider the behaviour of the real EER. The existing quantitative research on Japan has used inappropriate

measures of real EER, which has resulted in erroneous analysis of the real effects of exchange rate movements. The real EER movements show very large swings that had significant effects on competitiveness. As a result, the new data offer insights into the importance of relative price effects on Japan's trading performance. For example, the relative long-run stability of Japan's export growth during the pre-1913 period was the outcome of stochastic shocks to exchange rates and income working in opposite directions over the periods 1879-94 and 1894-1913. The conjunction of a real appreciation of the Yen during 1913-31 and an adverse world income effect resulted in a collapse of Japan's export growth during the 1920s. A reversal of exchange rate policy in the 1930s and favourable income growth amongst Japan's key trading partners resulted in exceptionally rapid export growth during the 1930s.

Finally, the new data will be of interest to business cycle research. The discussion of effective exchange rates (both nominal and real) will shed new light on the relative importance of real and nominal shocks in accounting for Japan's business cycles. For example, the evidence we have suggests that a marked long swing is observed over the period 1879-1938. Although variations in export growth do not account for the observed swings in economic growth over the whole period, the link between exchange rate variations and export growth had an effect that needs to be considered and helps us to understand the increased importance of export shocks in the inter-war period. During the pre-1913 period trade variations were stabilising for macroeconomic swings, whilst in the inter-war period they were a major generator of long-term fluctuation in the Japanese economy.

APPENDIX 1

DATA APPENDIX

International Trade Statistics

Japan Statistical Association (1988)
Toyo Keizai Shinposha (1935)
Ministry of Finance (1919)
LTES vol.14 (1979)

Nominal Exchange Rate Data ¹¹

China

1879-1892*: Foreign exchange section of *The Bankers' Gazette*, *The Economist*. An annual exchange rate against the British pound was calculated as an arithmetic average of 12 monthly observations, sampling over the first/second week for each month.

1893-1938: Japan Statistical Association (1988, pp.104-7).¹²

Manchuria

Up to 1932: this is treated as the same as China (because the trade with the Manchurian region was included in the trade with China in the trade statistics).

1933-1938: Yuan-Yen rates were used although both Yuan and the currency at par with Yen were circulated during some of the period.

1933-1934: Yuan-Yen rate from Japan Manchukuo Annual (1936, pp. 719-720).

1935-1938 The annual exchange rate was calculated using (1) monthly Manchukuo-Yen rate from January to August from Japan Manchukuo Annual (1936) and (2) 100 Yuan fixed at 100 Yen from September 1936.

¹¹* indicates the cross rates calculated using (1) the rate of the currency against the British pound and (2) the rates of British pound against the yen)

¹²(From 1933 Silver dollar against yen; 1 tael = 1.43 National Dollar)

Korea

1910-1938: Yen

Taiwan

1904-1938: Yen

Hong Kong

1879-1908*: Foreign exchange section of The Bankers' Gazette, *The Economist*. An annual exchange rate against British pound was calculated as an arithmetic average of 12 monthly observations, sampling over the first/second week for each month.

1909-1937: Ministry of Finance (1919, pp.144-5; 1925, pp.156-7; 1929, pp.194-5; 1938, pp.234-5).

1938*: Foreign exchange section of The Bankers' Gazette, *The Economist*

British India

1879-1908*: India, Department of Commercial Intelligence and Statistics, 1933, p.18.

1909-1938 Ministry of Finance (1919, pp.144-5; 1925, pp.156-7; 1929, pp.194-5; 1938, pp.234-5)

USA

1879-1913 and 1938: Japan Statistical Association (1988, pp.104-7), calculated as the average of the highest and the lowest rate of the year.

1914-1937: Ministry of Finance (1919, pp.144-5; 1925, pp.156-7; 1929, pp.194-5; 1938, pp.234-5).

Canada

1879-1913*: Fixed at the gold standard parity of \$4.86/£

1914-1915*: Urquhart (1965)

1916-1938: Foreign exchange section of The Bankers' Gazette, *The Economist*. An annual exchange rate against British pound was calculated as an arithmetic average of 12 monthly observations, sampling over the first/second week for each month.

UK

1879-1938: Japan Statistical Association (1988, pp.104-7). For the period 1880-1913 this was calculated as the average of the highest and the lowest rate of the year. For 1894 this procedure was not used because the highest and the lowest average was remarkably different, suggesting a reporting error in the data. For this year an annual exchange rate was calculated as an arithmetic average of 12 monthly observations using data from Ministry of Finance (1927).

France

1879-1938: Japan Statistical Association (1988, pp.104-107). During 1879-1913 this is calculated as the average of the highest and the lowest rate of the year.

Germany

1879-1913*: Mitchell (1988) pp. 703-704.

Belgium

1879-1913*: The same as the pound-franc rate, since Belgium was a member of the Latin Monetary Union and its exchange rate was kept fixed vis-à-vis the French franc.

Italy

1879-1937 (except 1919)*: Ciocca, PP. and Ulizze, I., (1990, pp. 354-5). For the years 1919 and 1938 exchange rates were derived from the foreign exchange section of The Bankers' Gazette, *The Economist*. An annual exchange rate against British pound was calculated as an arithmetic average of 12 monthly observations, sampling over the first/second week for each month.

Netherlands

1879-1938*: CEI (1980)

Switzerland

1879-1913*: The same as the pound-franc rate, since Switzerland was a member of the Latin Monetary Union and its exchange rate was kept fixed vis-à-vis the French franc.

1914-1938*: Foreign exchange section of The Bankers' Gazette, *The Economist*. An annual exchange rate against the British pound was calculated as an arithmetic average of 12 monthly observations, sampling over the first/second week for each month.

Australia

1879-1892*: Foreign exchange section of The Bankers' Gazette, *The Economist*. An annual exchange rate against British pound was calculated as an arithmetic average of 12 monthly observations, sampling over the first/second week for each month.

1893-1931*: Wilson (1933) pp.121-2.

1932-1938* League of Nations (1937, p.368; 1939, p.35)

Dutch India

1879-1912*: CEI (1980).

1913-1938: CEI (1980).

Straits Settlements

1913-1938: CEI (1980): Cross rates using the exchange rates between Dutch India and Straits Settlements and the exchange rates between Dutch India and Japan).

Thailand

1913-1938*: Wilson (1983 pp. 223-227).

Russia

1879-1913*: Foreign exchange section of The Bankers' Gazette, *The Economist*. An annual exchange rate against British pound was calculated as an arithmetic average of 12 monthly observations, sampling over the first/second week for each month.

Egypt

1879-1938*: Calculated as a cross exchange rate from using the pound-yen rate.

Prices

Japan

Wholesale Prices: 1879-1900 Mitchell (1995, p. 923 (Asahi Shinbun index)).
1901-1938 Mitchell (1995 p. 924 (Bank of Japan)).

Consumer Prices: 1879-1938 LTES vol.8 (1967, pp.134).

China

1893-1912 Wholesale Prices: Ho (1927, p.454).

1913-1935 Geometric Average of the Wholesale price indices in North China and in Canton by Nankai University Institute of Economics (1937, p.41).

1936-1938 Wholesale Prices in Shanghai by League of Nations (1939).

Manchuria

Wholesale Prices: 1932-38 Manshu Kaihatsu Yonjunenshi (1964, p. 707).

Korea

Consumer Prices 1912-1938: Mizoguchi *et al.* (1988, p.304).

Taiwan

Consumer Prices 1903-1938: Mizoguchi *et al.* (1988 p.303).

British India

Wholesale Prices: 1879-1913 India, Department of Commercial Intelligence and Statistics.

Wholesale Prices: 1914-1938, Mitchell (1995, pp. 924-925).

USA

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

Canada

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

UK

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

France

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

Germany

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

Belgium

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

Italy

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

Netherlands

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

Switzerland

Consumer Prices: Maddison (1991 pp. 296-303).

Egypt

Consumer Prices: 1914-1937 Mitchell (1995 pp. 930).

Australia

Consumer Prices: 1879-1938 Maddison (1991 pp. 296-303).

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Appendix 2:

Effective Exchange Rates 1879-1938 (1913=100)

	Nominal	Real
1879	158	90
1880	163	103
1881	160	111
1882	160	104
1883	160	92
1884	158	88
1885	151	88
1886	141	76
1887	143	81
1888	139	77
1889	141	82
1890	153	93
1891	147	86
1892	133	76
1893	119	70
1894	104	66
1895	103	71
1896	105	77
1897	102	80
1898	101	85
1899	101	81
1900	99	85
1901	100	86
1902	104	88
1903	104	91
1904	101	92
1905	100	93
1906	98	93
1907	99	99
1908	103	99
1909	104	96
1910	102	95
1911	102	100
1912	100	100
1913	100	100
1914	100	95
1915	102	90
1916	100	88
1917	97	89
1918	95	96
1919	98	108
1920	106	115
1921	114	123
1922	107	118
1923	111	120
1924	100	107
1925	97	101
1926	117	109
1927	115	109
1928	113	105
1929	114	103
1930	127	108
1931	137	109
1932	92	87
1933	76	82
1934	75	83
1935	74	81
1936	78	83
1937	81	86
1938	86	89