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Exchange Market Pressure on the Pound-Dollar Exchange Rate: 1925-1931

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Abstract

An investigation of exchange market pressure against the pound sterling during the inter-war period. The main findings are that a) the behavior of UK fundamentals relative to those of the USA help to explain exchange market pressure against the pound; b) during the run up to devaluation in September 1931 the monetary authorities in the UK were acting to reduce domestic credit; but that c) additional pressure was brought against the pound from speculative sources. These findings relate to current thinking on the choice of exchange rate regime as even well behaved fundamentals may not be sufficient to sustain a currency on its peg.

This paper offers an investigation of exchange market pressure against the pound sterling during the inter-war period, 1925-1931, when the pound was pegged to the US dollar through their links to gold. We believe that this investigation is relevant today for what it tells us about the viability of exchange rate pegging. In the "unholy trinity" of pegged exchange rate, open capital markets and independent monetary policy, the latter must be largely given up if the former two are to be viable. What we find is that, even though the Bank of England seemingly responsibly managed the money base within the confines of the latitude offered by the exchange rate band between the gold points, the pound was still subjected to speculative capital outflows – especially in the four months before it was knocked off of its peg on September 21st, 1931. If this interpretation of our findings is correct, the viability of open capital markets along with pegging is questionable even when the authorities behave responsibly.

At issue is whether the Bank of England played by the 'rules of the game', by which is usually meant that changes in the money base were strictly determined by the balance of payments? Eichengreen, Watson and Grossman (1985) from their econometric evidence argue that it did not play strictly by that rule as interest rates were sometimes managed to influence business conditions in the UK which for most of the period under consideration were depressed. The Bank of England would cut interest rates in order to stimulate the economy only to have to raise them again to protect the balance of payments and the pound's peg to gold. In fact, some latitude was afforded to the Bank of England by the pound's fluctuation band between the gold points. Lower interest rates could be

sustained so long as the exchange rate moved only within the band and did not threaten to breach it.

Figure 1 shows that the pound-dollar exchange rate did indeed fluctuate between estimates of the gold points.[1] What we find in our econometric estimate of the exchange market pressure model is that when the Bank of England increased the rate of domestic credit expansion, exchange market pressure on the pound-dollar exchange rate would also increase. That is, the exchange rate depreciated within the fluctuation band and foreign exchange reserves fell. However, we think that the Bank of England's monetary policy during 1925-1931 was in fact well behaved because the peg to gold and dollar was maintained for more than six years in very difficult world economic circumstances and with an open capital account. Indeed, the experience of the pound during this period was far superior to that of the members of the European Monetary System during the 1980s when currency realignments were very frequent even though exchange rate fluctuation bands were relatively wide and capital accounts were not necessarily fully open.

Another strand of evidence that supports the view the Bank of England was conservative in its management of the money base comes from our calculation of pound-dollar realignment expectations in the foreign exchange market. We show that between the pound's return to the gold standard in 1925 and June 1931 the market did not expect the pound to be devalued. Our empirical evidence here is based on the target zone model due

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[1] The estimated gold points shown in Figure 1 are those of Officer (1993). The gold points were determined by the cost of moving gold across the Atlantic Ocean, and as interest costs were incurred in doing so, the gold points were not constant but fluctuated with interest rates. According to Officer's calculations the gold points averaged about 0.6% either side of parity.

to Krugman (1988 and 1991) as extended by Svensson (1991, 1993) and Bertola and Svensson (1993) and is described in section 2 below. However, in the summer of 1931 devaluation expectations turned strongly against the pound, in the sense that they became statistically significant and larger than at any other time during the previous six years.

But why did this run on the pound occur when it did? We find that over the period as a whole, exchange rate expectations did affect current pound-dollar exchange rate movements within the band, and that in the last three months of the regime the markets were expecting a devaluation of the central parity. However, on the evidence that we are able to present we are not convinced that this speculative attack against the pound was by any means entirely provoked by the Bank of England's management of the money base. Indeed, the money base had increased by only four percent in the first six months of the year – hardly a runaway rate of expansion and, as is shown below, during the seven months before the September 1931 devaluation of the pound the Bank of England's management of domestic credit was helping to *reduce* exchange market pressure on the pound. Rather we side with the view of Cairncross and Eichengreen (1983) that the speculative attack against the pound was provoked by something else. Cairncross and Eichengreen estimate the determinants of the level of the UK's gold and foreign exchange reserves using macroeconomic and monetary data from 1926 to early-1931 and forecast reserves for the rest of 1931. They find that since actual reserves were much less than forecasted something else must also have contributed to the weakness of the pound. This "something else" could well have been the financial crises in Austria and Germany that cut the Bank of England off from some of its assets and gave warning that other

countries too could be vulnerable.[2] Another telling point that the speculative attack

against the pound was a surprise is that prior to summer 1931 there was no mention of a

possible exchange rate crisis in important publications such as *The Economist* and the

Federal Reserve Bulletin. Nor did the forward pound move outside of the gold points

during 1931 prior to the actual crisis, except briefly in January (Eichengreen, 1992).

The paper proceeds as follows: in section 1 a model is developed to explain exchange

market pressure against the pound. Section 2 discusses how the Krugman (1988, 1991)

target zone model, as extended by Svensson (1991 and 1993) and Bertola and Svensson

(1993), can be used to reveal realignment expectations during the UK's gold standard

pegging episode of 1925-1931. These realignment expectations are used in section 3 as

an independent variable and are shown to contribute to exchange market pressure against

the pound along with the macroeconomic and monetary variables derived from the

exchange market pressure model. Conclusions are drawn in section 4.

Section 1: Exchange market pressure and the pound

The exchange market pressure model is a natural development out of the monetary

approach to the balance of payments and the monetary approach to the exchange rate.

The two fundamental assumptions of these models are that agents have desired levels of

real money balances, and that while the balance of payments is made up of three sub-

accounts – goods, capital and money – which sum to zero, the analytical emphasis is on

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[2] That the pound-dollar gold peg was indeed vulnerable was well understood at the time. The MacMillan
Committee, in pointing out that the UK was financing current and long-term capital account deficits with
short-term (reversible) capital inflows, concluded that the UK's balance of payments position was
"precarious".

the monetary account. The two central equations of these models are pairs of money demand and money supply functions, one for each country in a two-country world. Money demand is a standard function of real income, prices and nominal interest rates, and the domestic money supply is backed by domestic assets and gold and foreign exchange acquired over time through central bank foreign exchange intervention.

What Girton and Roper (1977) do in their seminal paper on exchange market pressure (and extended by Weymark, 1995, 1998) is, in effect, to combine the monetary approaches to the balance of payments and to the exchange rate into a single model. Thus, if an exchange rate is allowed to move within a fluctuation band (or, target zone), taken separately, neither movement of the exchange rate nor the movement of foreign exchange reserves will necessarily give an accurate measure of exchange market pressure. For example, the exchange rate could be steady or even appreciating, while foreign exchange reserves where falling rapidly. However, taken together, movements in rates and reserves can be used to indicate exchange market pressure.

The Girton and Roper model of foreign exchange market flow equilibrium can be expressed in logarithms as

$$\Delta m_t^s = \Delta d_t + \Delta f_t \qquad\qquad \Delta m_t^{*s} = \Delta d_t^* + \Delta f_t^* \qquad\qquad (1)$$

$$\Delta m_t^d = \Delta p_t + \beta \Delta y_t - \alpha \Delta i_t \qquad \Delta m_t^{*d} = \Delta p_t^* + \beta \Delta y_t^* - \alpha \Delta i_t^* \qquad (2)$$

$$\Delta p_t = \Delta p_t^* + \Delta s_t + \theta_t \qquad\qquad\qquad\qquad\qquad\qquad (3)$$

$$\Delta i_t = \Delta i_t^* + \delta_t \qquad\qquad\qquad\qquad\qquad\qquad\qquad (4)$$

Variables with an asterisk signify US variables and those without an asterisk, domestic UK variables. Equation (1) sets the growth in the supply of base money (Δm^s_t) equal to the sum of domestic credit expansion (Δd_t) and the growth of foreign exchange reserves (Δf_t). Equation (2) describes the growth of demand for nominal domestic money balances (Δm^d_t) in terms of growth in domestic prices (Δp_t), real income (Δy_t) and an appropriate index of nominal interest rates (Δi_t). Equivalent money supply and demand relationships hold for the USA. The income elasticity of demand for money is β, and the interest semi-elasticity of demand for money is α. Equation (3) allows relative purchasing power parity to hold continuously if the real exchange rate, θ_t, is forced equal to zero. However, variations of the real exchange rate from zero means that purchasing power parity does not hold exactly. Note that the nominal exchange rate (the price of the dollar in terms of pounds) is defined such that a positive value of Δs_t represents the rate of depreciation of the pound. Equation (4) simply sets δ_t equal to the change in the interest rate differential.[3] Svensson (1993, page 766) points out that the interest differential may combine both exchange rate expectations and a risk premium – an increase in the differential indicating some combination of (a) increased expectations of depreciation and (b) a greater premium attached to that risk. In common with most papers in this area we will continue to regard the interest differential as indicating just expectations of future exchange rate changes because which ever component increases, pressure on a currency will increase as investors readjust their portfolios against it.

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[3] Weymark (1998) discusses the role of exchange rate expectations in the derivation of model-consistent exchange market pressure indices. Thus, static exchange rate expectations would mean δ_t represents changes in the risk premium implicit in domestic interest rates.

An issue is how to measure exchange market pressure (EMP) against a currency.

Weymark (1998) develops a model-independent formula to calculate exchange market

pressure that she claims can be applied to virtually any exchange rate model, such as the

monetary-asset approach used in this paper. She defines EMP as the total excess demand

for a currency and shows that it can be measured by the exchange rate change which

would have been required to remove the excess demand in the absence of money or

foreign exchange market intervention, given that expectations are generated by the

exchange policy actually implemented. However, since this definition of EMP is

unobservable (because the authorities usually do intervene in the markets, particularly in

the period under examination here), it needs to be made operational, and that requires a

model. Weymark (1998) argues that model-specific measures of EMP should conform to

her model-independent definition. In general, this independent measure is stated as the

expected change in the exchange rate plus the weighted change in foreign exchange

reserves.[4] The magnitude of the weight may have to be econometrically estimated from a

structural model of a macro-economy.[5]

Some manipulation of equations (1)-(4) yields:

$$\Delta f_t - \Delta f_t^* - \Delta s_t = -\Delta d_t + \Delta d_t^* + \beta\left(\Delta y_t - \Delta y_t^*\right) - \theta_t - \alpha\delta_t \qquad (5)$$

The composite dependent variable in equation (5) is the Girton-Roper model-specific

measure of exchange market pressure (where the weight on reserve changes is unity). A

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[4] This assumes that changes in domestic credit are not an instrument of exchange rate policy.
[5] Spolander (1999) includes a very detailed discussion of this process.

lower numerical value of this EMP measure signifies greater pressure against the Bank of England because there is some combination of a decline in the rate of growth of UK foreign exchange reserves relative to reserve growth in the USA and a rise in the rate of the pound's depreciation (a rise in Δs_t). According to the model, EMP against the pound increases with an increase in the UK's rate of domestic credit expansion, or its rate of interest (i.e. δ_t increases), or with an increase in the real exchange rate. Pressure diminishes with an increase in the rate of growth of British real income relative to that of the USA. Weymark (1998) shows that the Girton and Roper (1977) model-specific formula for exchange market pressure that we deploy does conform to her model-independent formula. Tanner (2001) is in agreement with this.

2: Revealing realignment expectations

If an exchange rate is to be confined to a target zone, financial markets need to believe that the authorities are willing to defend that zone otherwise international capital flows will destroy the peg. Thus, monetary policy must be used to defend the parity. The exchange rate is determined as:

$$s_t = m_t^s + v_t + \alpha E_t [ds_t]/dt \qquad (6)$$

As earlier, in natural logarithms, s_t is the domestic currency price of foreign exchange, m_t^s is the money supply, and α is the semi-elasticity of demand for money. The term v is a general purpose term that includes anything else that impacts the demand or supply for money (e.g. changes in real income). Most simply v is taken to be the cumulative value

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of velocity (Miller and Weller, 1991). Shocks to velocity are assumed to be random with zero mean, and to be normally distributed such that the cumulative value of v follows a continuous-time random walk. The term, $E_t[ds_t]/dt$, is the instantaneous rationally expected rate of change of the exchange rate.

To maintain credibility, an exogenous shock to fundamentals such as a fall in real economic activity that would otherwise push the exchange rate outside of the target zone must be offset by a monetary contraction – for instance, by open market sales of domestic securities or a rise in discount rate. At the edges of the target zone monetary policy must be geared exclusively to the exchange rate and not, say, towards influencing business conditions. But when the exchange rate is in the interior of the zone the monetary authorities do have some freedom of action. The domestic interest rate can differ from the foreign interest rate provided that the indicated exchange rate expectation is not forced outside of the intervention points.

A measure of realignment expectations has been developed in Svensson (1991, 1993), and Bertola and Svensson (1993). Thus, in natural logarithms at time t the nominal exchange rate, s_t, is:

$$s_t = x_t + c_t \qquad\qquad (7)$$

where c_t is the central parity and x_t is the proportionate deviation from parity. Taking time derivatives:

$$E_t\left[ds_t\right]/dt = E_t\left[dx_t\right]/dt + E_t\left[dc_t\right]/dt \qquad (8)$$

Equation (8) says that the rationally expected rate of change of the exchange rate can be divided into the expected movement 'within the band', $E_t[dx_t]/dt$, plus the expected rate of depreciation of the central parity, $E_t[dc_t]/dt$. Furthermore, for any given x_t, the movement within the band is bounded by the lower ("strong") gold import point and upper ("weak") gold export point.

$$\left(x_t^l - x_t\right)/dt \le E_t\left[dx_t\right]/dt \le \left(x_t^u - x_t\right)/dt \qquad (9)$$

where x^l is the lower bound of s_t, and x^u, the upper bound.

On using equations (8) and (9) we discover the confidence interval for realignment expectations:

$$\left(i_t - i_t^*\right) - \left(x_t^u - x_t\right)/dt \le E_t\left[dc_t\right]/dt \le \left(i_t - i_t^*\right) - \left(x_t^l - x_t\right)/dt \qquad (10)$$

where as before i_t is the home country's interest rate and i^*_t is a comparable interest rate in the foreign country. The term $(i_t - i^*_t)$ has been substituted for $E_t[ds_t]/dt$ because we are assuming that uncovered interest parity holds. Thus, equation (10) defines the minimum and maximum bounds of the market's rationally expected rate of realignment of the central parity (a 100% confidence interval, assuming the gold points are known with

certainty).

Rearranging equation (8) obtains a statement of the rationally expected realignment expectation as:

$$E_t\left[dc_t\right]/dt = E_t\left[ds_t\right]/dt - E_t\left[dx_t\right]/dt \qquad (11)$$

This realignment expectation can be calculated if the two terms on the right hand side are known. The total expected change in the exchange rate, $E_t[ds_t]/dt$, is known from the interest differential. Svensson (1993) details a simple but robust method for calculating the expected movement of the exchange rate within the band. He takes this to be a linear function of the current deviation of the exchange rate from the central parity, x_t, such that the expected movement of the exchange rate within the band is empirically estimated as the fitted value from the following regression:

$$x_{t+m} - x_t = a_0 + a_1 x_t + u_t \qquad (12)$$

In this unit root test, mean reversion is occurring if a_1 is significantly less than zero.

Implementing equation (12) using pound-dollar exchange rate data for May 1925 (the month when the UK began pegging after world war I) to August 1931 (the full month before pegging was abandoned), we find evidence, reported in Table 1, of mean reversion within the band of the pound-dollar exchange rate. The regression is conducted with m

set equal to three months to match the maturity of the forward rate contracts used later in this paper. This choice of m induces second order serial correlation in the equation so all statistics are computed using Newey-West generalised method of moments estimators (see Sarno and Taylor, 2002, appendix C).

It is perhaps not surprising to find mean reversion in an exchange rate that in fact remained within its band for as long as six years. However, it can be noted that mean reversion is not inevitable. A currency could move to an intervention point and then just bump along there without reverting to the center of its band. Rather, the finding of mean reversion indicates that the market indeed had confidence in the pound. Cairncross and Eichengreen (1983) document that confidence in the pound recovered once the speculative episodes of 1927 and 1929 were weathered. Also, the finding of mean reversion suggests that the relative price level issue that had so bedeviled the UK's return to the gold standard after WWI – the UK's price level having risen sharply relative to that of the USA after the abandonment of the gold standard in 1914 – was not a direct factor affecting the exchange rate. Certainly, a lower relative UK price level might have eased the Bank of England's job of keeping the pound on gold by giving it greater freedom to reduce interest rates, thereby allowing some stimulus to the depressed British economy. However, the fact of the matter is that, notwithstanding the depressed British economy, the Bank of England was prepared to manage interest rates to keep the pound on gold.

The final step in implementing equation (11) is to take the 95% confidence intervals for mean reversion calculated using equation (12), and to combine them with the interest rate

differential data, which proxy for $E_t[ds_t]/dt$, to calculate '95%' confidence intervals for realignment expectations.

We reproduce our calculations of monthly realignment expectations for the pound-dollar exchange rate May 1925 to August 1931 in Figure 2. When the upper and lower bounds for realignment expectations are on different sides of the zero line (or x-axis) realignment expectations are not statistically significant. That is, there is no strong evidence of speculation against the pound. However, things were very different in the summer of 1931 when realignment expectations turned strongly against the pound (the upper and lower bounds of realignment expectations were both positive). This provoked capital outflows from the UK, exerting exchange market pressure against it, so much so that the pound was to be bumped off of its gold-dollar peg.

3: Empirical results revealing exchange market pressure

But what was the cause of exchange market pressure against the pound? To investigate this question we implement equation (5) which, it will be recalled, shows exchange market pressure as being determined by macroeconomic variables and a monetary variable, the rate of domestic credit expansion, that was under the direct control of the Bank of England.

Equation (5) is tested using monthly data for the interwar gold standard period. Since reliable contemporaneous quotations of interest rates of the same maturity are hard to find for this period we assume covered interest parity holds and use the forward

premium/discount as our measure of the interest differential. Our data sources are: s*pot*

and three month forward exchange rates from Einzig (1937, appendix 1). *Reserves data*

from various issues of League of Nations*, Monthly Bulletin of Statistics*. Data on the

money base of USA from Friedman and Schwartz (1970), and that of the UK from Capie

and Webber (1985). *National income data* is proxied by industrial production with US

data taken from Federal Reserve Board (1943) and that for the UK from League of

Nations, *Monthly Bulletin of Statistics*. Finally, *price series* data were abstracted from

Federal Reserve Board (1943). We seasonally adjust all data except the spot and forward

exchange rate series using the RATS "esmooth" command. Table 2 contains some brief

descriptive statistics of the key series. It is noticeable that monthly annualized growth of

domestic credit, growth of industrial production and inflation were all negative on

average during this period for both the UK and USA.

The equations presented in table 3 were estimated using the McCallum-Wickens

instrumental variables technique. In each case the dependent variable is exchange market

pressure and the exchange rate is the pound-dollar rate. The instrument set is the

dependent and each explanatory variable lagged by two and three periods, together with a

constant and a time trend. The figures in parentheses under the coefficient estimates are

t-statistics computed with Newey-West GMM standard errors, robust to serial correlation

and heteroskedasticity.

Column A of table 3 details the results of the most rigid interpretation of equation (5).

The coefficient on UK domestic credit growth is statistically significant, correctly signed

and not far from its theoretical value of minus unity (a test of this restriction cannot be rejected – see *H*1). US domestic credit growth and relative income growth rates are both insignificant (though correctly signed). The coefficient on the real exchange rate term carries the correct sign and is significantly different from both zero and its theoretical value of minus unity (*H*2). Finally, the coefficient on the change in our proxy for the interest differential, δ, is also significant and correctly signed. Column B of table 3 loosens the restriction that the income elasticity of demand for money is equal in the two countries.[6] There are two points to note. First, the coefficient on US (UK) income growth is significantly positive (insignificantly negative). Second, the coefficient on the real exchange rate is now insignificantly different from its hypothesized value.

In columns C and D we decompose changes in the interest rate differential proxy into changes in the expected movement of the exchange rate within the band, $\Delta E[dx_t]/dt$, and changes in the expected rate of devaluation of the pound, $\Delta E[dc_t]/dt$, based on equation (8). Both of these factors are expected to affect exchange market pressure on the Bank of England, though perhaps not equally. With equal and opposite signs imposed on income growth in the two countries (column C), the two new terms are both negative and statistically significant while the other coefficient estimates are essentially unchanged from the baseline regression in column A.

Removing the restriction on income growth we obtain the results in column D. The adjusted coefficient of determination is highest in this version of the model while the

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[6] We would have also liked to relax the assumption that the interest semi-elasticities are equal in the two countries, however since we do not have reliable interest rate data and are instead using the forward

standard error of the equation is the lowest, suggesting this to be the statistically preferred specification. Coefficient estimates are little changed from the regression in column B. Thus, an increase in the UK's rate of domestic credit expansion, Δd_t, increases exchange market pressure, as do changes in the macroeconomic variables – the UK's real exchange rate, θ_t, and faster economic growth in the US. The joint hypothesis that the coefficients on UK domestic credit growth and the real exchange rate term are both equal to –1 cannot be rejected. The rate of US domestic credit expansion has the correct sign but is insignificant in every specification of the regression. Perhaps this is due to the well known fact that during the period the USA was not playing by the rules of the game since it was sterilizing the effect of its payments surpluses on its money base.

What is most interesting about this last regression is the correct and significant signs on $\Delta E[dx_t]/dt$ and $\Delta E[dc_t]/dt$. Significantly, an increase in realignment expectations, $\Delta E[dc_t]/dt$, increased pressure against the pound. This pressure, according to the definition of EMP, taking the form of depreciation of the pound within the band, or a reduction in foreign exchange reserves to protect the pound, or both. What is happening is that a rise in $E[dc_t]/dt$ – an increase in either the probability or the magnitude of the expected devaluation of the pound – is encouraging capital outflows which in turn are pressuring the Bank of England to intervene. Importantly, this speculative pressure is additional to the pressure exerted by the fundamental variables in the regression equation; the rates of domestic credit expansion and real income growth in the UK and the USA, and the real exchange rate.

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premium to measure the spread, this is not possible.

Figure 3 plots the contributions to exchange market pressure from the significant terms in the final specification of our estimation (column D). The solid line shows the dependent variable, EMP. The pressure on the pound in May-August 1931 was such that EMP took four of its five lowest values. The only other time the pound had been under such downward pressure was in the speculative attack of late 1929. Focusing on the period after January 1930 several points are noticeable. First, domestic credit growth in the UK and US were always acting to reduce exchange market pressure on the pound (the relevant bars are always positive in the final twenty months of the peg). Conversely, the real exchange rate is always adding to the pressure. The remaining two terms – changes in the expected reversion within the band and changes in the expected devaluation – regularly switch sign. Most significantly, however, in the critical final two months of the peg devaluation expectations were adding hugely to the pressure on the pound. Indeed, if we exclude the effect of changes in devaluation expectations, pressure would have turned positive in July 1931 and been only slightly negative in August 1931. This situation can be compared to earlier episodes of pressure on the pound. At the local minima of EMP in March 1927 and October 1929, changes in devaluation expectations were acting to *reduce* exchange market pressure on the pound. In July-August 1931, changes in devaluation expectations did not come to the rescue and, in combination with an overvalued real exchange rate, in fact drove the pound off gold.

4: Conclusions

Our main finding is that exchange market pressure against the pound while it was operating a peg to gold and through it to the US dollar during the inter-war period is quite

well explained by the models that we use here. Furthermore, we find that devaluation expectations had statistically and economically significant explanatory power in addition to the behavior of UK fundamentals. The main implication of this latter finding is that disciplined management of fundamentals even over a period as long as six years may not be enough to maintain a currency peg. As capital outflows from the UK during the summer of 1931 where not necessarily driven by fundamentals, perhaps the peg could have been saved by the imposition of capital controls. Put differently, we find that the "unholy" trinity of a pegged exchange rate, open capital markets and an independent monetary policy may not be viable even when monetary policy appears to be disciplined. We think that this unfortunate experience is relevant to the choice of an exchange rate regime today.

Table 1: Expected change of the exchange rate within the band 1925(6) - 1931(8)

Constant	0.854
	(1.860)
x	-0.622
	(3.53)
R^2	0.310
Standard error	0.00197

Notes: Figures in parentheses are *t* statistics computed with GMM standard errors to account for serial correlation induced by the overlapping observations.

Table 2: Descriptive Statistics

Series	Mean	Min	Max
Change in UK reserves	0.03%	-0.39%	0.47%
Change in US Reserves	1.88%	-15.14%	17.29%
Change in UK domestic credit	-1.03%	-4.10%	7.27%
Change in US domestic credit	-1.59%	-38.03%	62.07%
Change in UK industrial prod.	-5.03%	-236.82%	260.19%
Change in US industrial prod.	-2.39%	-26.18%	21.14%
UK inflation	-2.27%	-6.78%	0.91%
US inflation	-5.83%	-21.87%	5.99%

*Notes*: All values monthly averages given in annualized percentage form.

Table 3: Exchange market pressure on the pound-dollar exchange rate: 1925 - 1931

	(A)	(B)	(C)	(D)
Constant	-0.001	-0.0001	-0.001	-0.0002
	(1.177)	(0.132)	(1.256)	(0.327)
Δd	-1.240	-1.366	-1.398	-1.460
	(2.195)	(2.408)	(2.431)	(2.822)
Δd^*	0.083	0.069	0.095	0.101
	(0.716)	(0.538)	(0.798)	(1.001)
$\Delta y - \Delta y^*$	0.001		-0.003	
	(0.032)		(0.798)	
Δy		0.009		0.002
		(0.351)		(0.117)
Δy^*		-0.306		-0.272
		(1.996)		(1.980)
θ	-0.416	-0.824	-0.501	-0.849
	(2.883)	(3.404)	(3.466)	(4.157)
δ	-9.086	-9.477		
	(3.524)	(3.692)		
$\Delta E[dx]/dt$			-2.300	-2.087
			(4.542)	(5.375)
$\Delta E[dc]/dt$			-1.690	-1.797
			(2.472)	(2.445)
Adj-R^2	0.053	0.002	0.192	0.304
Standard error	0.0055	0.0057	0.0051	0.0047
Q-statistic	22.61	17.18	29.40	23.64
P-value	0.26	0.58	0.06	0.21
$H1$	0.67	0.52	0.49	0.37
$H2$	0.00	0.00	0.00	0.00
$H3$	0.00	0.47	0.00	0.46
$H4$	0.00	0.30	0.00	0.19

Notes: Δd denotes the growth of domestic credit (domestic credit defined as base money less reserves), and Δy denotes the growth in income as proxied by industrial production. An asterisk denotes a foreign (US) variable. θ is the UK's real exchange rate, and δ denotes the growth in the interest rate differential as proxied by the forward premium. $\Delta E[dx_t]/dt$ and $\Delta E[dc_t]/dt$ denote respectively changes in the expected movement of the exchange rate within the band and changes in devaluation expectations. The figures in parentheses beneath the parameter estimates are *t*-statistics derived using GMM standard errors robust to serial correlation and heteroskedasticity. Some descriptive and diagnostic statistics are reported beneath the parameter estimates. Adj-R^2 gives the adjusted coefficient of determination. The next row gives the standard error of the estimated equation. Q-statistic denotes the Q-test for serial correlation of up to 19 lags, and the P-value statistic gives the significance level of the Q-statistic. The figures $H1$-$H4$ denote the significance of chi-squared tests of coefficient restrictions. $H1$ imposes the constraint that the coefficient on the growth of domestic credit is –1. $H2$ imposes the restrictions that the coefficients on UK and US domestic credit growth are equal to –1 and +1 respectively. $H3$ restricts the coefficient on θ to be –1, and $H4$ restricts the coefficient on the growth of domestic credit to be –1, and the coefficient on θ to be –1.

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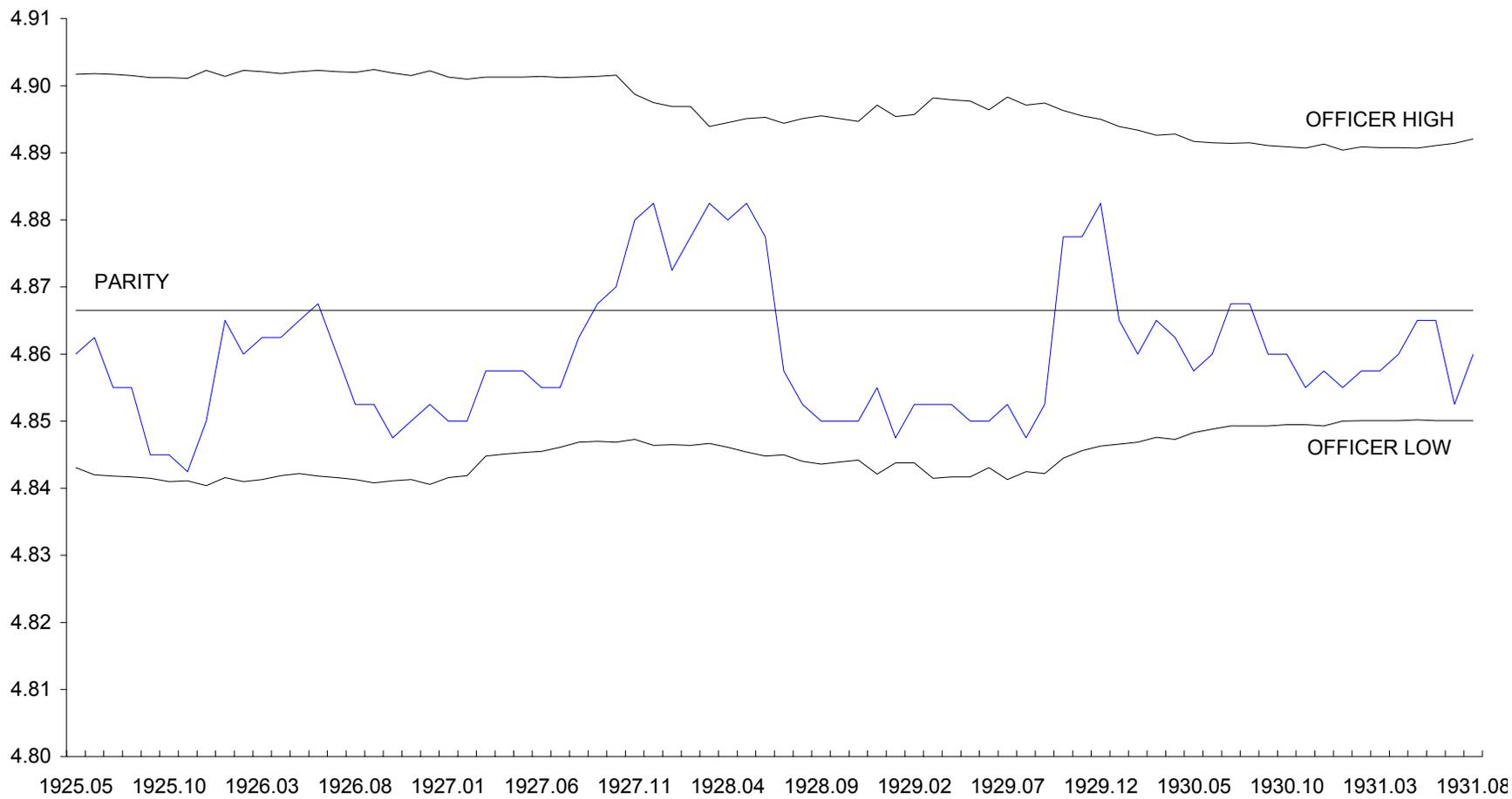
Figure 1   Pound-dollar spot exchange rate and estimated gold points

Figure 2: **Estimated realignment expectations**
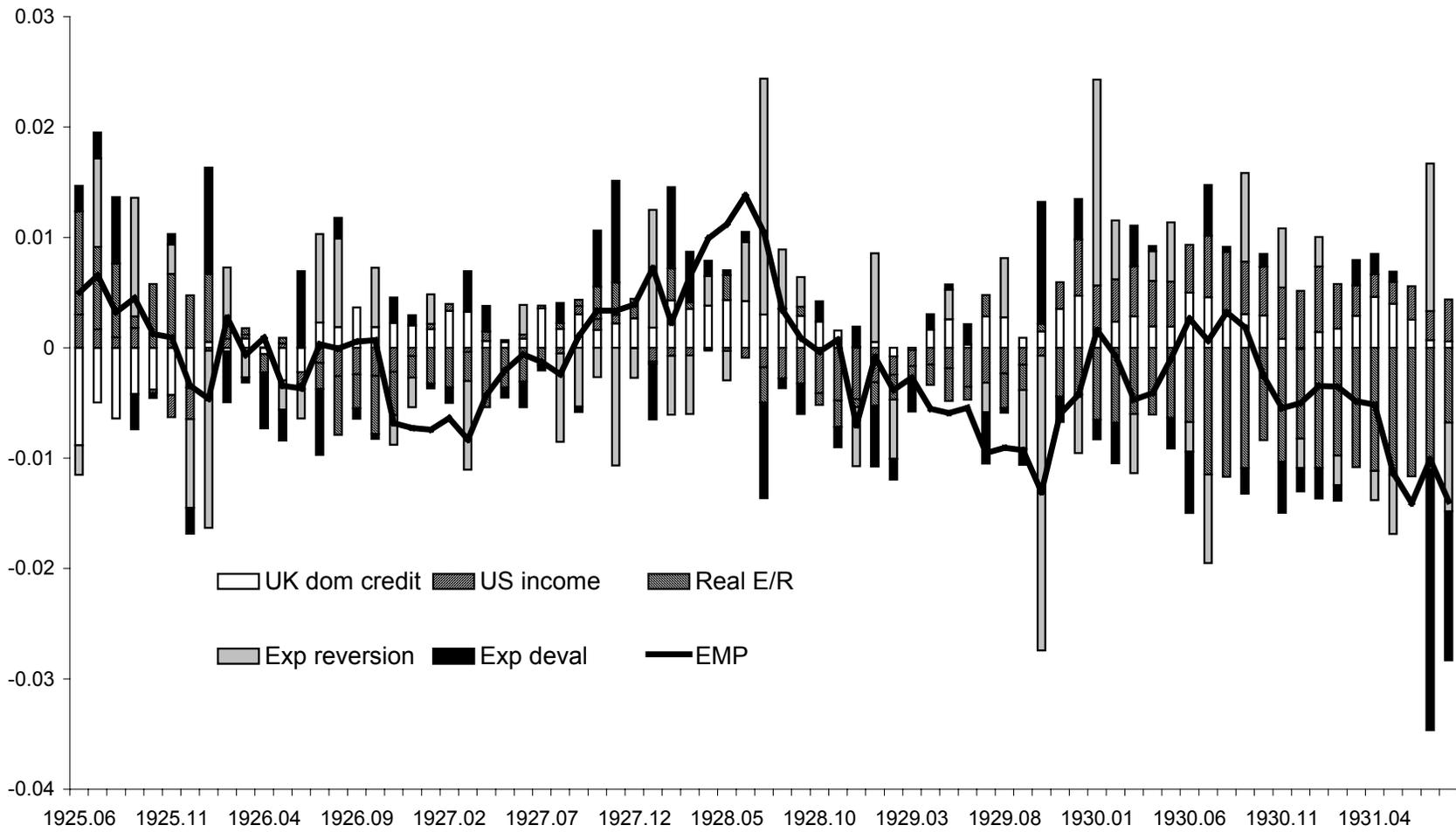
Figure 3: **Contributions to exchange market pressure**