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Exchange Rate Dynamics and the Term Structure of Interest Rates

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Abstract: This paper examines the nature of the relationship which exists between the dynamics of exchange rate adjustments and the term structure of interest rates. In the absence of anticipated economic disturbances, there exists a well-defined negative relationship between movements in the exchange rate and the long-short interest rate differential which does not persist in the presence of anticipated disturbances. It follows that any empirical test of the relationship between the exchange rate and the term structure of interest rates necessitates the utilisation of a measure of the yield curve which is considerably more sophisticated than the differential between interest rates on assets with long and short terms to maturity. An appropriate yield curve approximation is estimated on monthly Irish data over the period 1979(4)-1986(12) and employed to examine its relationship with the rate of foreign exchange of the Irish punt over the same period.

I INTRODUCTION

The experience of floating exchange rates in the past decade and a half has contributed to the growth of an impressive literature which examines the main determinants of equilibrium exchange rates together with their dynamics of adjustment. Dornbusch (1976) and Buiter and Miller (1981) have emphasised the role of sluggish price adjustment in determining the nature of short-run exchange rate dynamics. A domestic monetary contraction in these models causes the exchange rate to appreciate above its long-run equilibrium value (i.e., to overshoot) by an amount which depends upon the interest elasticity of the demand for money, the degree of capital mobility and the speed of adjustment in the markets for goods and assets. Alternative explanations of exchange rate dynamics with sluggish price level adjustment have been provided which admit the possibility of exchange rate undershooting in response to a domestic monetary contraction. Branson (1976 and 1979) emphasising stock/flow interactions and Niehans (1981) focusing on trade balance effects are relevant in this regard as is Currie (1981) who demonstrates how overshooting of pre-announced monetary targets can cause the exchange rate to appreciate in response to expectations of corrective action by the monetary authorities in the form of higher rates of interest. In addition, Frenkel and Rodriguez (1982) show how the exchange rate is likely to undershoot in the Dornbusch model with limited capital mobility.

A number of empirical studies have investigated the dynamics of exchange rate adjustment in order to examine the validity of the theoretical models alluded to above. Bilson (1978) provides suggestive evidence on the appropriateness of the Dornbusch model for the deutschmark/dollar rate and Frenkel (1979) extends this model by incorporating secular rates of inflation before reporting results using the deutschmark/US dollar rate. Driskill (1981) examines the predictions of the Dornbusch and stock/flow models against US/Swiss exchange rate data over the period 1973-1977. He addresses the question of whether there is short-term exchange rate overshooting, whether exchange rate and price level adjustment is monotonic in the intermediate run and whether proportionality exists between these variables and the money stock in the long run. He finds evidence of considerable exchange rate overshooting accompanied by nonmonotonic adjustment patterns.

The purpose of the present paper is to examine the nature of the relationship which exists between the dynamics of exchange rate adjustments and the term structure of interest rates. If risk-neutral agents operate in efficient financial markets, long-term interest rates will be determined as an average of expected future short rates. In this case an economic disturbance which leads to overshooting of the exchange rate will be associated with an inverted yield to maturity curve. It follows that if agents form their expectations consistently across financial markets, one should observe an empirical relationship between movements in the exchange rate and in the yield to maturity curve. It must be noted, however, that the existence of a simple relationship between these variables depends upon the extent to which economic disturbances are anticipated by market participants. Section II demonstrates in the context of a standard open-economy macromodel that when agents anticipate future policy initiatives, measurement of the relationship between the exchange rate and the term structure of interest rates necessitates the utilisation of a measure of the yield curve which is considerably more sophisticated than the differential between the yields on long- and short-term financial assets. Section III develops a model of the yield to maturity curve which is based upon the procedure pioneered by Heller and Khan (1979). This is subsequently used to examine the relationship between the punt/deutschmark exchange rate, the punt's effective exchange rate index and the term structure of Irish interest rates using monthly data over the period 1979(5)-1986(12). Section IV summarises the paper and draws conclusions.

II THE THEORY

We begin by characterising the foreign exchange market as being composed of risk-neutral infinitely-elastic covered interest arbitrageurs who possess full information. As a result, the uncovered interest differential in favour of the domestic currency is equal to the forward discount on the currency. Equation (1) describes equilibrium in this market as

$$\dot{e} = r - r^* \tag{1}$$

where e = the price of a unit of foreign currency (so that a rise in e denotes a weak domestic currency and vice versa).
r = the domestic short interest rate
r* = the foreign short interest rate, and
'.' = time derivative, e.g. $\dot{x} = \frac{dx}{dt}$.

Consider next the term structure of interest rates. Risk-neutral speculators who operate in efficient bond markets will arbitrage the yield on long bonds to equal the expected yield from holding an equivalent amount of money in short bonds. This means that

$$R + R\,\frac{d(1/R)}{dt} = r$$

which can be rewritten as

$$\dot{R} = R(R-r) \tag{2}$$

with R denoting the long-term interest rate on consols.

Equations (1) and (2) describe how, in the absence of anticipated disturbances, the exchange rate and the long-term interest rate will evolve as the short-term rate approaches its equilibrium level. The precise paths which are followed by these variables depend upon the structure of the economy in which the equilibrium short rate is determined, and a number of models have been proposed. In this vein, Blanchard (1981) and Turnovsky and Miller (1984) have illustrated the dynamics of response of the term structure of interest rates to both anticipated and previously unanticipated monetary policy slowdowns in closed economies. Dixit (1981) has shown that the impact effects of an unanticipated monetary contraction in an open economy context causes the exchange rate to appreciate by an amount which overshoots its long-run equilibrium level while the yield to maturity curve becomes inverted. Related work by Collins (1984) demonstrates how the term structure of interest rates can signal the expected timing of a depreciation under fixed exchange rates.

The purpose of this section is to construct and analyse a dynamic macroeconomic model of an open economy which is inhabited by market operators who form their expectations rationally. After deriving the long-run equilibrium properties, the model is simulated in order to obtain both the impact responses as well as the subsequent adjustment dynamics of the exchange rate and the term structure of interest rates to a monetary policy initiative which has been anticipated prior to its implementation. The predictions which are obtained from this model are readily seen to constitute generalisations of those which have emanated from the prior literature and they form the benchmark from which to judge the empirical results which are presented in the next section.

The equations of the model are presented below.

$$m - p = ky - \lambda r \tag{3}$$

$$y^* = \alpha y + \beta(e - p) - \gamma(R - h) + \delta g \tag{4}$$

$$\dot{y} = \psi(y^* - y) \tag{5}$$

$$\dot{R} = \hat{R}(R - r) \tag{2}$$

$$\dot{e} = r - r^* \tag{1}$$

$$\dot{p} = h + \phi(y - \hat{y}) \tag{6}$$

$$\dot{h} = \epsilon(\mu - h) \tag{7}$$

All variables except interest rates are in logs and:

- m = nominal money stock
- p = price level
- y = real output (y* = desired real output)
- r = nominal short interest rate
- R = nominal long interest rate
- e = rate of exchange
- h = expectations of long-run inflation
- g = exogenous disturbances
- μ = rate of growth of the money stock (= $\dot{m}$)

In addition,

'^' denotes the long-run equilibrium value of a variable, while

'.' denotes the time derivative (e.g. $\dot{x} = \frac{dx}{dt}$).

Equation (3) describes a conventional LM schedule in which the short-term rate of interest is assumed to equilibrate the money market to keep the economy on the schedule. Equation (4) describes the IS curve in which the real exchange rate (i.e. competitiveness) features along with the real long-term interest rate (R- h). Equation (5) is the Lundberg lag which allows the economy to adjust towards the IS curve whenever $\psi < \infty$. Equation (2) describes the evolution of the long rate of interest as discussed above, and it is linearised about the long-run equilibrium rate $\hat{R}$. Equation (1), also as before, describes the rate of exchange as the domestic-foreign interest rate differential under the assumption that domestic and foreign bonds are perfectly substitutable. The expectations-augmented Phillips curve Equation (6) is supplemented by an expectations-adjustment Equation (7) which states that expectations of long-run inflation are adjusted in line with monetary growth.

By defining l (liquidity) = m - p, C (competitiveness) = e - p and x = h - u, we can write the full system of Equations (1)-(7) in state space form.

$$\begin{bmatrix} \dot{x} \\ \dot{l} \\ \dot{y} \\ \dot{C} \\ \dot{R} \end{bmatrix} = \begin{bmatrix} -\xi & 0 & 0 & 0 & 0 \\ -1 & 0 & -\phi & 0 & 0 \\ \psi\gamma & 0 & \psi(\alpha-1) & \psi\beta & -\psi\gamma \\ -1 & -\lambda^{-1} & k\lambda^{-1}-\phi & 0 & 0 \\ 0 & \hat{R}\lambda^{-1} & -\hat{R}k\lambda^{-1} & 0 & \hat{R} \end{bmatrix} \begin{bmatrix} x \\ l \\ y \\ C \\ R \end{bmatrix} + \begin{bmatrix} 0 & 0 & 0 & 0 \\ \phi & 0 & 0 & 0 \\ 0 & \psi\gamma & \psi\delta & 0 \\ \phi & -1 & 0 & -1 \\ 0 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} \hat{y} \\ \mu \\ g \\ r^* \end{bmatrix} \quad (8)$$

The long-run equilibrium properties of this fifth order linear system are obtained by setting $\dot{x} = \dot{l} = \dot{y} = \dot{C} = \dot{R} = 0$ and are mostly self-explanatory.

$$\dot{p} = h = \mu \quad (9)$$

$$\hat{l} = k\hat{y} - \lambda(r^* + \mu) \quad (10)$$

$$\hat{y} = y \quad (11)$$

$$\hat{C} = \frac{1-\alpha}{\beta}\hat{y} + \frac{\gamma}{\beta}r^* - \frac{\delta}{\beta}g \quad (12)$$

$$\hat{R} = \hat{r} = r^* + \mu \quad (13)$$

Equation (9) states that when the economy is in equilibrium, expectations of long-run inflation are equal to actual inflation which is given by the rate of monetary growth. Equation (10) is the equilibrium LM condition. Equation (12) describes equilibrium competitiveness as depending positively on output and the foreign short interest rate and negatively on other exogenous disturbances. Equation (13) asserts that the yield curve is flat in equilibrium reflecting the absence of liquidity premia and equals the sum of the foreign rate plus the rate of domestic monetary expansion. Finally, although money is neutral in this model, it is not super-neutral in so far as equilibrium liquidity varies with the rate of monetary growth.

A dynamic linear model with N_1 backward-looking and N_2 forward-looking variables has a unique saddlepath converging to the long-run equilibrium provided there are N_1 stable roots (corresponding to the N_1 pre-determined variables) and N_2 unstable roots (corresponding to the N_2 free or jump variables). In the model outlined above C and R are forward-looking variables because they are prices which clear efficient financial markets. They make discrete jumps in response to "news" (all unanticipated current or future changes in exogenous variables and policy instruments). The other state variables x, l and y are pre-determined at any point in time and are updated by their respective dynamic equations.

It is not our intention to derive analytical results from solving the model.[1] We are more concerned to examine its simulation properties in order to cast light upon the nature of the relationship which exists between the dynamics of exchange rate adjustments and the term structure of interest rates when financial market participants anticipate policy changes or other exogenous disturbances.[2] Figure 1 depicts the effects of a 1 per cent reduction in the rate of monetary growth on the exchange rate and the term structure of interest rates when the policy has been announced 10 periods prior to implementation.[3]

As soon as market participants obtain information about the impending policy change, the long rate of interest declines in a manner which reflects market expectations of lower future short rates. This is accompanied by an immediate loss of international competitiveness which is caused by nominal exchange rate appreciation which is not matched by the more slowly-moving price level. It is clear from Equation (4) that the response of domestic income is ambiguous. If long-run inflationary expectations are not immediately revised downwards to the new equilibrium inflation rate (i.e., if $\epsilon < \infty$ in Equation (7)), the lower long interest rate will raise domestic output by reducing the cost of capital. This effect will be offset, however, by the lower level of inter-

1. Buiter and Miller (1981) and Turnovsky and Miller (1984) discuss analytical solutions to smaller models of this vintage. The determinant of the state matrix in our model is $/A/ = \epsilon\phi\psi\beta\hat{R}\lambda^{-1} < 0$.

2. The following parameter values are chosen for the reported simulations:

$$\lambda = 2,\ k = \gamma = \psi = \epsilon = \delta = 1,\ \alpha = \phi = .5,\ \beta = .2 \text{ and } r^* = u = .1.$$

Kearney (1985a) provides justification for this choice, and notes that the results are not very sensitive to changes in these values. The objective in this context is illustrative rather than rigour.

3. The model has been solved using the "Saddlepoint" program constructed by J. Austin and W. Buiter.

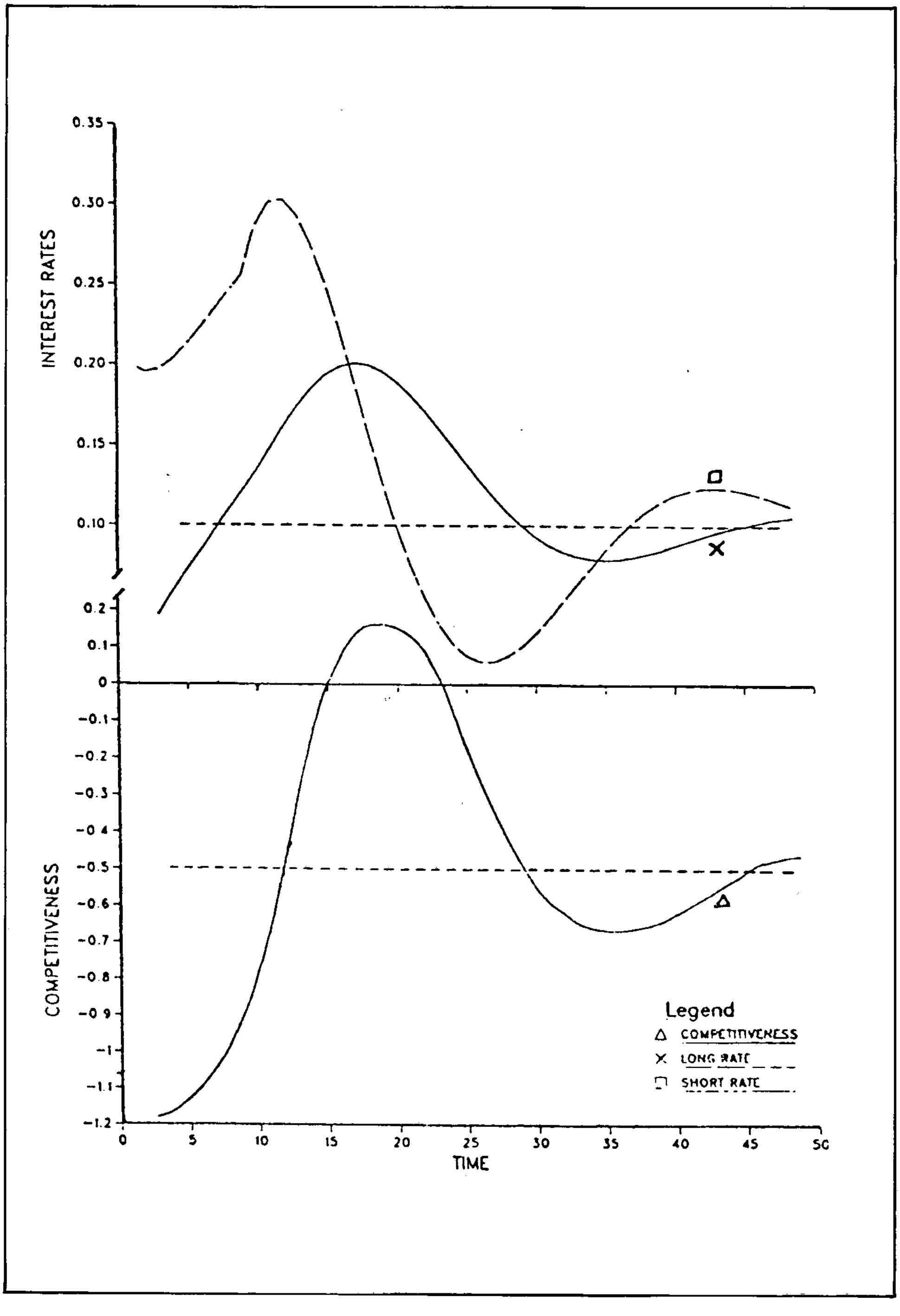

Figure 1: *Anticipated Monetary Contraction Competitivess and the Term Structure*

national competitiveness which reduces the demand for net exports. The latter effect dominates in our model given the choice of parameters (see Footnote 2), so domestic output initially declines. This moderates the demand for money balances and forces the short interest rate up to clear the money market. The yield to maturity curve has thus become inverted.

When the monetary authorities eventually implement the monetary contraction, it comes as no surprise to the financial markets. The long rate of interest and the level of competitiveness continue to evolve along their adjustment paths as the short rate rises more steeply in response to the tightened money market conditions. As time proceeds, the domestic rate of inflation begins to decline due to lower aggregate demand and reduced expectations concerning the economy's long-run level of inflation. The effect of this is to halt the decline in the real money supply so that the upwards trend in the short rate of interest is reversed. This process gives rise to the oscillatory nature of the adjustment dynamics which is clearly visible from inspection of Figure 1.

It is interesting to observe from the Figure that there exists a marginal/average relationship between long and short interest rates which is implied by the expectations hypothesis of the term structure. Of prime importance in the current context, however, is the non-existence of a simple relationship between the long-short interest differential and the strength of the currency's foreign exchange value. When long rates are above shorts, for example, the exchange rate becomes stronger as competitiveness declines and this occurs while the long-short interest differential rises to a maximum and subsequently declines. We conclude, therefore, by observing an important implication of this analysis for the design of the empirical tests reported in the next section. In the absence of anticipated future disturbances, a strong foreign exchange rate will be associated with an inversely-sloped yield curve. When economic agents anticipate the occurrence of future disturbances, however, the relationship between these variables becomes considerably more complex. This requires our obtaining a measure of the yield curve which is more sophisticated than the simple long-short interest rate differential.

III EMPIRICAL EVIDENCE

The procedure adopted in this section to approximate the term structure of interest rates is based upon refinements of the technique pioneered by Heller and Khan (1979) which measures changes in the yield to maturity curve using a small number of parameters. The basic approach involves estimating the yield curve for each time period using a quadratic approximation. The resulting parameters are then entered directly into standard money demand equations in order to provide a multi-interest rate aspect to the equation without confronting problems of multicollinearity. This approach also allows inspection of how changes in the intercept, slope and curvature of the yield curve influence the demand for money.

A general description of the term structure approximations which have been employed in the literature to date is as follows:

$$\ln Rm_t = \alpha_1 + \alpha_2 \ln M_t + \alpha_3 \ln M_t^2 + \alpha_4 \ln M_t^3 + vm \quad (14)$$

where ln stands for natural logs and

Rm_t = nominal interest rate on an asset[4] of maturity M at time t
α_i = parameters (i = 1 . . . 4)
vm = independently distributed random variable with zero mean and a variance which is constant for all values of the maturity variable.

A number of variations on this logged cubic specification have been used in order to introduce the term structure of interest rates into money demand equations. Bilson and Hale (1980) set $\alpha_4 = 0$ in proposing a logged quadratic approximation. Allen and Hafer (1983) proposed an unlogged version of Equation (14) in order to capture humps in the yield curve. Kearney (1985b) examined a variety of term structure approximations of the Irish yield curve before concluding that the logged quadratic version could not be significantly improved upon for quarterly data over the period 1971(1)-1981(4).

The empirical results reported in this paper are derived from end-monthly Irish data over the period 1979 (April)-1986 (December).[5] The yield curve approximation equations were fitted to a series of seven interest rates, these being the Central Bank overnight rate, the 3 month Exchequer Bill rate, and the rates on 1, 3, 5, 8 and 15-year government bonds. As with the former study, the logged quadratic specifications could not be significantly improved upon and Table 1 provides a sample of the results. Generally speaking, these yield curve approximations are encouraging in so far as the intercept term is always highly significant while both the slope and curvature coefficients are also statistically significant at the 5 per cent level in most cases. It is clear from these results that the Irish yield curve has experienced significant changes in its slope and curvature over the period being analysed. Figure 2 reinforces this observation by plotting the time series of the full set of yield curve approximation coefficients together with the log change in the Irish punt's Deutschmark and effective exchange rates. It is clear from inspection of the Figure that the data which are used for the analysis have been rendered stationary.

4. In Equation (14), M denotes the maturity of an asset in months (e.g., M = 60 for a 5-year bond).
5. All data employed in this study are obtained from the *Central Bank Quarterly Bulletin*, various issues.

Table 1: *Sample Cross Sectional Estimates of the Irish Yield Curve: 1979(12)-1986(12)*

Time	INT	SLO	CURV	$\bar{R}^2$	SEE	$\bar{y}$
1979(12)	2.839 (139.00)	-.044 (3.02)	.006 (2.78)	.77	.009	2.78
1980(12)	2.617 (45.91)	-.068 (1.68)	.017 (2.72)	.92	.026	2.62
1981(12)	2.813 (120.98)	.047 (2.85)	-.006 (2.20)	.86	.011	2.90
1982(12)	2.761 (153.27)	-.078 (6.08)	.012 (5.86)	.93	.008	2.66
1983(12)	2.462 (55.14)	.007 (0.23)	.006 (1.26)	.95	.020	2.58
1984(12)	2.742 (119.83)	-.035 (2.13)	-.005 (2.12)	.60	.010	2.70
1985(12)	2.396 (49.65)	.023 (0.82)	-.002 (0.48)	.54	.018	2.45
1986(12)	2.622 (592.87)	-.010 (3.24)	-.001 (0.38)	.99	.002	2.58

Notes to the Table: The estimates are of Equation (14) on cross sectional data at the specified time. INT, SLO and CURV denote the intercept, slope and curvature of the yield curve approximations, i.e., the parameters α_1, α_2 and α_3 from Equation (14). $\bar{R}^2$, SEE and $\bar{y}$ denote the correlation coefficients, equation standard errors and dependent variable means, respectively.

Table 2 provides the summary statistics of the data which are mostly apparent from the Figure. Concerning the exchange rates, the sample means of the punt's trade weighted index and its bilateral DM rate are insignificantly positive and significantly negatively different from zero, respectively. This is consistent with the Figure which shows that for the DM/punt rate, most of the data points are negative while the largest downward fluctuations in this rate outweigh the largest upward fluctuations. The reverse condition applies to the other time series data which are employed in the tests below. Friedman and Vandersteel (1982) have interestingly reported similar properties for daily observations of US dollar exchange rates over the 1970s and suggested the possibility that these properties of the data may result from their being drawn from normal processes which are possessed of time-varying parameters.

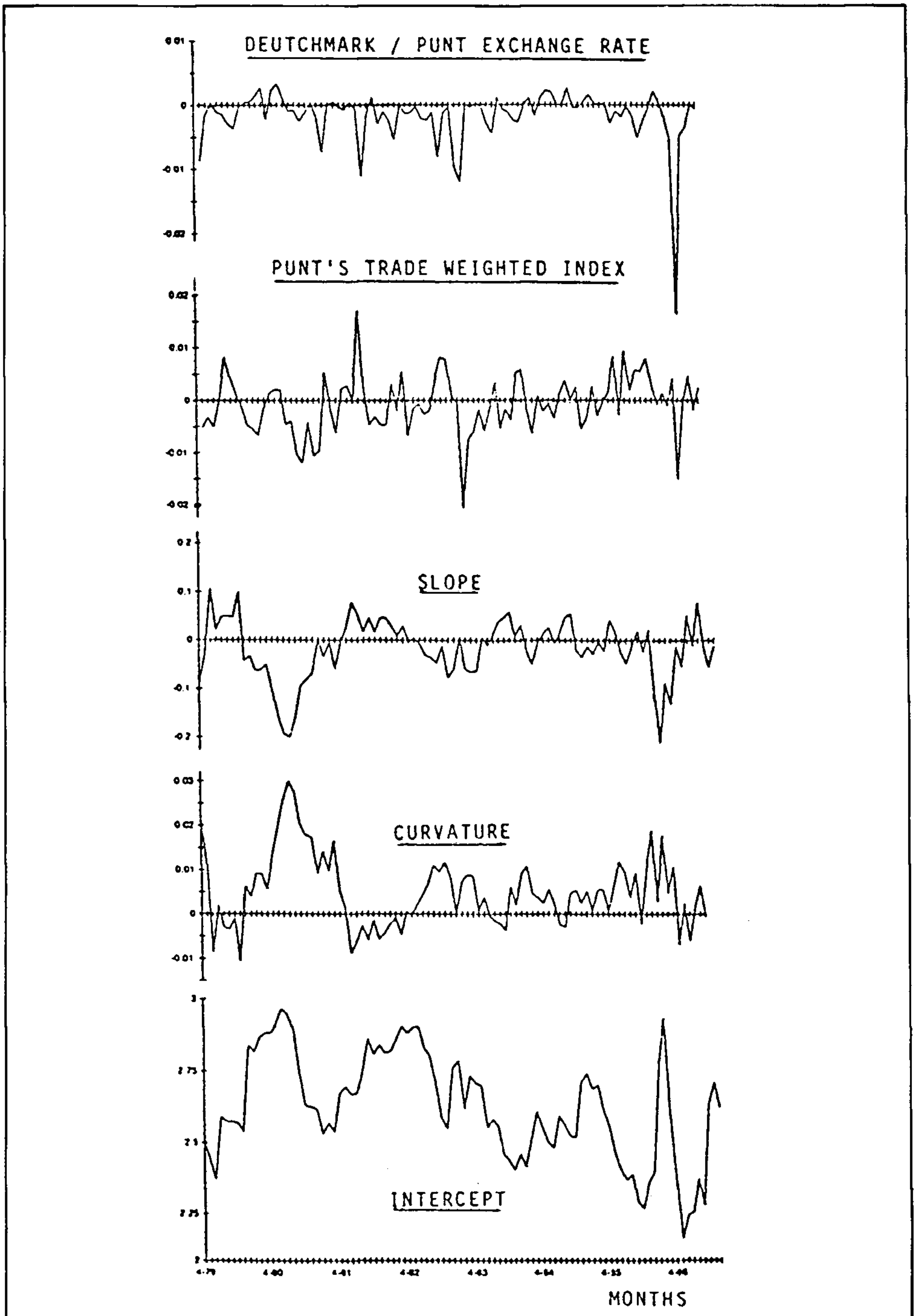

Figure 2: *Time Series of Exchange Rates and Yield Curve Approximation*

Table 2: *Summary Statistics of the Time Series Data*

	Exchange Rates		*Yield Curve*		
	ΔLXF	ΔLXG	INT	SLO	CURV
Sample Mean	-.002	-.004	4.003	.041	.004
T-statistic for Zero Mean	-1.190 (.24)	-3.667 (.00)	4.119 (.00)	.993 (.32)	4.049 (.00)
Variance	.0002	.001	6.919	.159	.0001
Standard Deviation (SD)	.013	.010	9.323	.398	.010
Minimum Value	-.047 (1983:4)	-.075 (1986:8)	2.162 (1986:8)	-.210 (1986:5)	-.055 (1979:5)
Maximum Value	.040 (1981:9)	.007 (1980:7)	3.1638 (1979:6)	2.710 (1979:5)	.030 (1980:11)

Notes to the Table: ΔLXF and ΔLXG denote the log differences of the Irish punt's trade weighted index and DM rate, respectively. INT, SLO and CURV are as defined in Table 1. The figures in parentheses are either marginal significance levels or, in the case of the last two rows, denote the dates corresponding to the extreme data points.

The equation which is estimated on this data set is

$$\Delta LX_t = \beta_1 INT_t + \beta_2 SLO_t + \beta_3 CURV_t + v_t \qquad (15)$$

where ΔLX denotes the log difference of the punt's foreign exchange rate and the other symbols retain the meanings which have been attributed to them previously. The results are presented in Table 3 using alternatively the punt's trade weighted index and the bilateral DM/punt exchange rate. Both equations include dummy variables (D1 and D2) to capture the effects of the major re-alignments of the Irish punt within the EMS which occurred on March 21st 1983 and August 2nd 1986. The former realignment which involved a 3.5 per cent devaluation of the punt was the most extensive since the inception of the EMS. The latter realignment involved a more extensive devaluation of 8 percentage points.

The equations were initially estimated using the ordinary least squares (OLS) estimating procedure, but the results which were obtained indicated the existence of autocorrelated residuals in Equation (16), while the DW statistic for Equation (17) was within the band of uncertainty. Both equations were accordingly re-estimated by autoregressive least squares (ARI) and it is these latter results which are presented in the Table. It is worth noting that the ARI estimates have accounted for first order autocorrelation, the coefficient of

Table 3: *Autoregressive Least Squares Estimates of the Relationship Between the Irish Yield Curve and the Punt's Foreign Exchange Rate*

Equation Number	*Dependent Variable*	INT	SLO	CURV	D1	D2
(16)	ΔLXF	.001	-.111	-.929	-.043	-.037
		(0.98)	(2.11)	(2.29)	(4.10)	(3.56)
(17)	ΔLXG	-.001	-.002	.120	-.023	-.070
		(3.34)	(0.07)	(0.60)	(3.63)	(12.07)

Equation Diagnostics

Equation Number	$\bar{R}^2$	SEE	DW	RHO	Q	F
(16)	.31	.011	2.04	.275	34.15	2.632
				(2.61)	(0.16)	(0.08)
(17)	.66	.006	1.95	.182	34.86	1.158
				(1.56)	(0.14)	(0.32)

Notes to the Table:
(1) All equations are estimated on monthly data over the period 1979 (April)-1986 (December).
(2) Variables are defined in Table 2. In addition, D1 and D2 are dummy variables for 1983 (March) and 1986 (August), respectively.
(3) $\bar{R}^2$, SEE, DW and RHO denote the adjusted correlation coefficient, the regression standard errors, the Durbin-Watson statistic and the autocorrelation coefficient (with its associated t-statistic in parentheses). Q is the Box-Pierce statistic (with its marginal significance level in parentheses). F is the F-statistic for testing the exclusion restrictions that the term structure coefficients (on the intercept, slope and curvature) are all zero – the figure in parentheses beneath it is the associated marginal significance level.

which is given in the Table as RHO along with its associated t-statistic. In addition, the Box-Pierce statistics indicate the absence of higher order autocorrelation in these equations.

Of prime importance in the current context, however, is the extent to which variations in the yield curve have been systematically related to the strength of the punt's foreign exchange rate. Table 3 indicates the presence of such a relationship in so far as the F-test for the hypothesis that the coefficients on the slope, intercept and curvature of the yield curve are all zero is rejected in both Equations (16) and (17). It is interesting to note that while not all of the yield curve coefficients are significant explanatory variables in both equations, those which are significant at the 5 per cent level are all negatively signed. The intercept term in Equation (17) implies that a uniformly upward shift in the

Irish yield curve is associated with a weak value of the DM/punt rate.[6] This obviously reflects the monetary authorities' policy of using high interest rates rather than low monetary growth in order to protect the value of the currency in line with the EMS bands.

In contrast to the influence of the yield curve intercept, its slope and curvature are more important determinants of the punt's trade weighted index. In Equation (16), both the slope and curvature of the yield curve are negatively related to the fortunes of the punt's trade weighted index. Overall, the results are generally supportive of the theoretical predictions of the previous section concerning the relationship which exists between the term structure of interest rates and the rate of exchange. More specifically, the behaviour of sophisticated financial market operators who anticipate future policy and other economic disturbances will not generally cause strong currencies to be associated with inverted yield to maturity curves. Rather, the evidence presented in this paper shows that over the time period being analysed, increases in the level and the slope of the term structure of Irish interest rates have been associated with periods of weakness in the punt's foreign exchange value.

IV SUMMARY AND CONCLUSIONS

This paper has examined the nature of the relationship which exists between the dynamics of exchange rate adjustments and the term structure of interest rates. The recent theoretical literature points to the existence of a well-defined negative relationship between a currency's foreign exchange value and its long-short interest rate differential which persists as long as future economic disturbances are not anticipated. The theoretical model of Section II illustrated how this relationship can become reversible when rational market operators anticipate future disturbances. This finding necessitated the use of a term structure measure in the empirical analysis which is considerably more sophisticated than the long-short interest differential. The appropriate approximation allowed us to conclude that increases in the overall yield curve as well as in its slope have been associated with weak foreign exchange values of the Irish punt's DM rate and foreign exchange index. This finding is consistent with the theoretical model of Section II in which financial market operators anticipate future economic disturbances while it is not supportive of earlier results which imply that these market operators are myopic. It is also consistent with the use of high interest rates by the monetary authorities in order to manage the punt's foreign exchange rate.

6. The empirical section of the paper defines the exchange rate as the foreign currency price of domestic currency for ease of comparison of the results for the DM/punt rate with its trade weighted index.

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