

Devaluation Expectations for the IR£/DM in the EMS: Some Empirical Estimates and their Relation to Fundamentals

MARY O'DONNELL*

Maynooth College, Co. Kildare

Abstract: This paper presents results for devaluation expectations for the IR£/DM for the period of EMS membership. The methodology employed produces estimates of expected rates of devaluation by adjusting the interest rate differential by the expected rate of depreciation within the band. These estimates are then related to economic fundamentals. Expected rates of devaluation are found to be positively correlated with the IR£/Stg exchange rate and marginally related to unemployment, the level of reserves and the balance of payments surplus.

I INTRODUCTION

Since 1979, Ireland has been a member of the Exchange Rate Mechanism (ERM) of the European Monetary System (EMS). During that time, Ireland's exchange rate policy has been governed by our membership of that system and has been targeted at keeping our exchange rate within a "narrow band" or target zone, relative to the mid point or central parity.¹ Irish exchange rate policy would, on purely theoretical grounds, not appear to have been fully credible during our term of EMS membership.

*The author wishes to acknowledge helpful comments from Margaret Hurley, Karen Cosgrove, Deirdre Dunne, Gerry Boyle, Maurice Roche, Paddy Geary and anonymous referees. The usual disclaimer applies.

1. All currencies were allowed a maximum deviation of approximately +/-2.25 per cent (see Honohan, 1979), except the Peseta and Escudo which were allowed to deviate by up to 6 per cent. This was the case up until August, 1993 when the bands were extended to +/-15 per cent for all currencies.

It is the purpose of this paper to empirically characterise the credibility of Irish exchange rate policy for this period through an examination of measures of realignment expectations. These will be estimated using a method which was first utilised by Bertola and Svensson (1990) and has since been used by Rose and Svensson (1993), Svensson (1991), Caramazza (1993) and Chen and Giovannini (1993) among others. The method relies on the maintained assumption of uncovered interest rate parity. It is proposed first to generate the estimated expected rates of devaluation and then to relate these estimates to economic and institutional fundamentals. These estimates should aid in indicating what influences market agents in the formation of their expectations of realignments as well as to establish what factors have been instrumental in actual realignments during the existence of the EMS.

Section II of the paper presents the methodology involved in measuring expectations of devaluations. Section III gives the empirical results of the estimation procedure. Section IV relates these empirical estimates to fundamentals. Section V concludes the paper.

II THE THEORY

It is intended here to give a brief outline of the methodology employed in computing the expected rates of devaluation. Readers are referred to Svensson (1991), or Rose and Svensson (1991), for a more detailed analysis. The method here also follows closely to that employed by Bertola and Svensson (1990).

There are two assumptions underlying the model which must be stated at the outset. First, the model relies on the assumption of uncovered interest rate parity (UIP), and second, the foreign exchange risk premium is assumed to be insignificant. While UIP has little support empirically (see Froot and Thaler (1990)), Svensson (1990) argues that it is a reasonable assumption if foreign exchange risk premia is small; he finds support that this holds empirically, even in the presence of devaluation risk. Thus UIP can be considered a good approximation in the context of the present model. Given these assumptions, it is proposed to develop a "drift adjustment" method for estimating devaluation expectations which are representative of a non-fully credible target zone i.e., a target zone in which realignments take place. A direct estimate of the expected rate of devaluation results if an estimate of the expected rate of currency depreciation within the band is constructed and this is subtracted from the interest rate differential. We can set this out formally as follows.

Let the difference between the Irish and German rates of interest i.e., the interest rate differential be denoted as

$$d_t = i_{IREt} - i_{GERt} \quad (1)$$

where i_{IREt} is the Irish rate of interest at time t , and i_{GERt} is the German rate of interest at time t for deposits/bills/bonds of the same maturity and default risk.

Uncovered interest rate parity can be expressed as

$$d_t = E_t[s_{t+\tau} - s_t] / \tau \quad (2)$$

where E_t denotes expectations conditional upon information available at time t , $[s_{t+\tau} - s_t] / \tau$ is the rate of change of the DM/IR£ spot exchange rate and τ is the term to maturity for the interest rate, in this case, 3 months. The exchange rates deviation from central parity is given by

$$x_t = s_t - c_t \quad (3)$$

x_t here is the exchange rate within the band. s_t is the log of the spot exchange rate expressed in units of domestic currency to one unit of foreign currency, and c_t here is the log of central parity. Rearranging Equation (3) and expressing it in rate of change form yields

$$E_t[c_{t+\tau} - c_t] / \tau = E_t[s_{t+\tau} - s_t] / \tau - E_t[x_{t+\tau} - x_t] / \tau \quad (4)$$

That is, the expected rate of change of central parity is equal to the total expected rate of depreciation, minus the expected rate of depreciation within the band. Substituting (2) into (4) yields

$$E_t[c_{t+\tau} - c_t] / \tau = d_t - E_t[x_{t+\tau} - x_t] / \tau \quad (5)$$

Thus the expected rate of realignment is equal to the interest rate differential minus the expected rate of depreciation within the band. In this instance, we are interested in an estimate of the left hand side of (5). To generate this, it is sufficient to generate an estimate for $E_t[x_{t+\tau} - x_t] / \tau$ and to subtract this from the interest rate differential. We follow Svensson (1991) here in estimating the expected rate of depreciation within the band conditional upon no realignment, which avoids the "Peso" problem.² This involves dropping the

2. The "Peso" problem invalidates standard statistical inference procedures and originates from the Mexican Peso which was fixed to the US\$ between 1955-76. The problem arises when the sample may contain infrequent observations of actual realignments. This creates a small sample problem when trying to estimate the effects of these shifts as the sample distribution may not be representative of the underlying distribution of the error term.

observation for the month preceding a realignment. The expected rate of depreciation within the band, $E_t[x_{t+\tau} - x_t] / \tau$, will depend on the length of time to maturity, τ . For long-term maturities, the value of this term should be approximately zero. Thus for sufficiently long maturities, the interest rate differential can be considered an adequate measure of realignment expectations. However, for short-term maturities, the expected rate of depreciation within the band may be quite large, and the adjustment of the interest rate differential by this amount can be important. In such an instance, the unadjusted interest rate differential would be a misleading measure of the expected rate of devaluation for the shorter-term maturities. Thus adjusting the interest differential by the "drift" of the exchange rate within the band yields a more precise measure of devaluation expectations.

III EMPIRICAL ESTIMATION

(i) *Estimate of Expected Rate of Depreciation Within the Band*

The first step involved in generating the expected rates of devaluation is to estimate the "drift" in the exchange rate. This estimation of the expected rate of depreciation within the band can be conducted using the following simple linear regression:

$$4(x_{t+3} - x_t) = \sum_{i=1}^9 \alpha_{0i} d_j + \alpha_1 x_t + \varepsilon_{t+3} \quad (6)^*$$

where d_j is a dummy variable for regime j . Here the single determinant of the expected future rate of depreciation within the band is the current exchange rate within the band.

The data used in the estimation procedure here are economic indicators from OECD RATS data base. Observations were monthly for all variables and

*The estimates are annualised.

Table 1: *Realignment Dates and Bilateral Central Parities*

	<i>Central Parity</i>	<i>% Devaluation</i>
February, 1979	0.263932	—
September, 1979	0.269210	2.0
October, 1981	0.284018	5.5
June, 1982	0.296090	4.25
March, 1983	0.323703	9.0
April, 1986	0.333416	3.0
August, 1986	0.362405	8.0
January, 1987	0.373281	3.0
January, 1993	0.414757	10.0

the sample period ran from February 1979 to June 1993. Data on central parities and additional observations for the spot exchange rate (end of period rates) were extracted from the Central Bank Quarterly Bulletin (1993, 4th Quarter). Data for interest rates were 3 month FIBOR and DIBOR rates and were furnished by Davy Stockbrokers. The total sample period yielded 177 observations. All data sets were checked for outliers (those observations above 3 standard deviations from the mean) and questionable observations were excluded from the sample.

Figure 1 shows the IR£/DM spot exchange rate and Figure 2 shows the Irish/German interest rate differential.

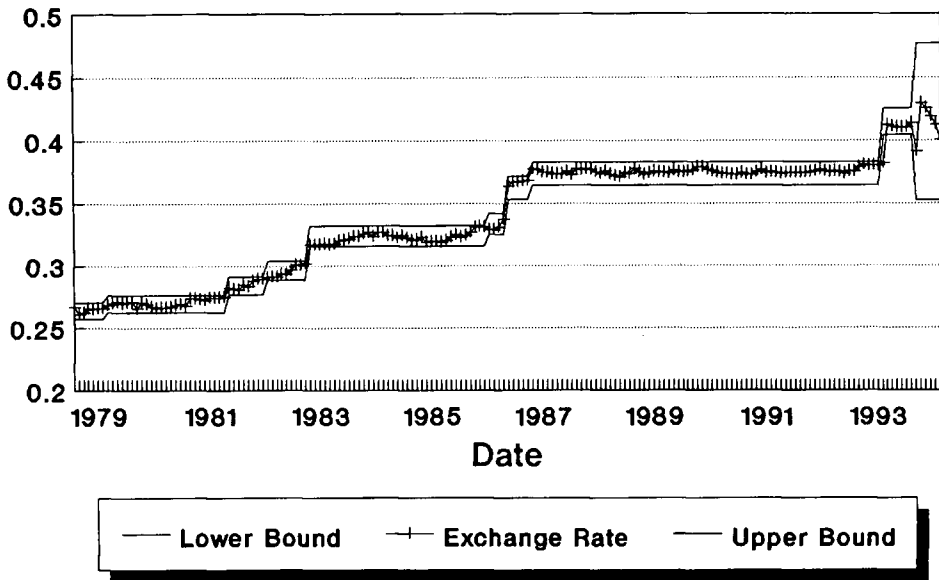
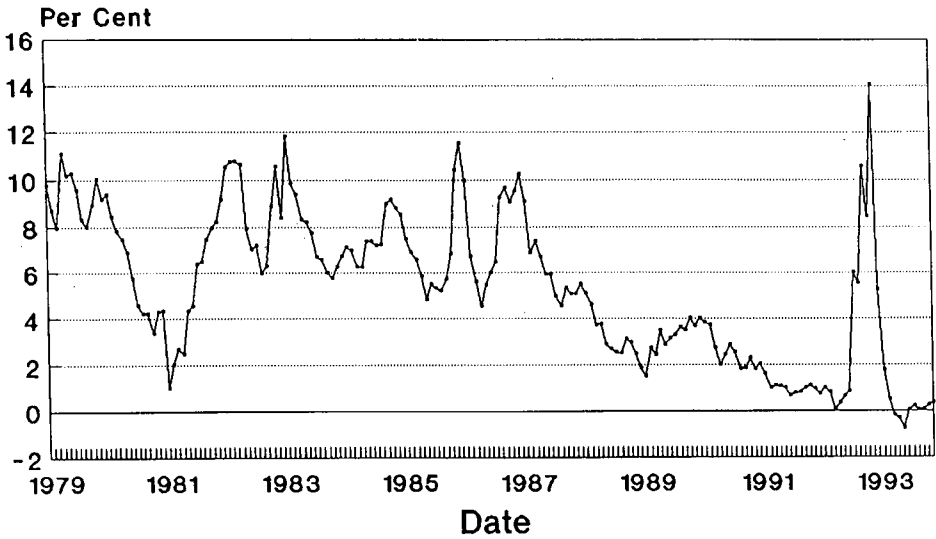


Figure 1: DM/IR£ Spot Exchange Rate

In the Irish case, there were 9 realignments in the period of analysis.³ As in Svensson's (1991) model, the value for the slope is restricted to be equal across regimes for the duration of the sample period. This alleviates small sample problems which are associated with short regimes. Results from the estimation of Equation (6), the expected rate of depreciation within the band are presented in Table 2. Dummies from regimes 1, 5, 6, 7 and 8 are significant given their p-values, as is the exchange rate within the band. The

3. Full details of realignment dates along with central parities are given in Table 1.

Figure 2: *Irish / German Interest Rate Differential*Table 2: *Estimation of the Expected Rate of Depreciation Within the Band*

	<i>Estimated Coefficient</i>	<i>t-Statistic</i>	<i>p-Value</i>
<i>Intercept</i>			
2/79	3.20	2.29	0.02
9/79	1.39	0.23	0.82
10/81	0.84	0.15	0.88
6/82	-7.60	1.07	0.28
3/83	-2.09	3.66	0.01
4/86	1.50	3.68	0.00
8/86	1.80	6.49	0.00
1/87	5.98	2.74	0.01
2/93	-5.42	0.50	0.61
x	-3.57	5.21	0.00

Notes: Adjusted $R^2 = 0.3668$. $n = 177$. x , the exchange rate within the band is the regressor and $4(x_{t+3} - x_t)$ denoted as y , is the regressand. (All intercept variables are scaled by 100).

coefficient on x here is -3.57 , with a standard error of 0.5045 . The negative coefficient here is consistent with mean reversion and indicates that an increase in deviations from central parity decreases the expected rate of depreciation within the band, which is consistent with the relationship suggested in the literature. Figure 3 displays the resulting estimates from the regression, which are the fitted values of the regressand.

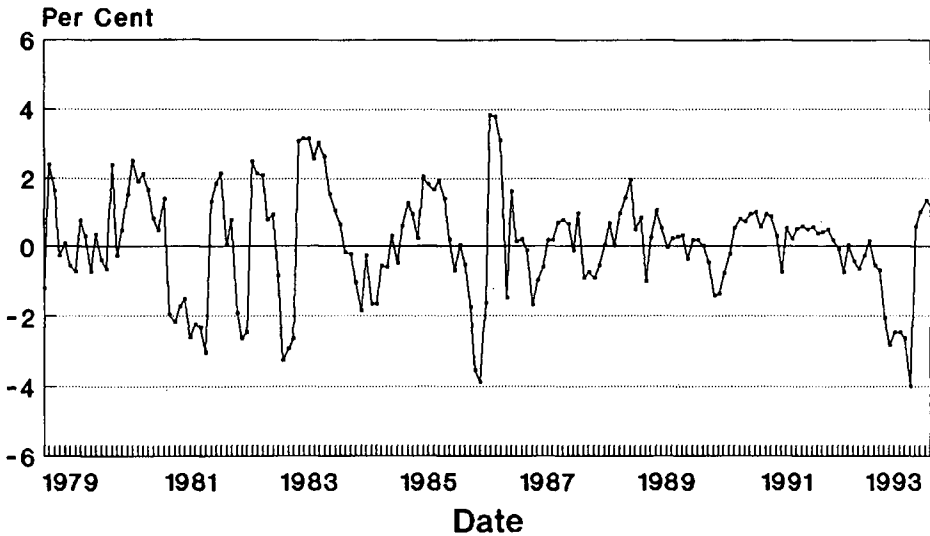


Figure 3: *Expected Rate of Depreciation Within the Band*

(ii) *Extracting the Expected Rates of Devaluation*

Having generated the expected rate of depreciation within the band, these may now be subtracted from the interest rate differential to compute the expected rate of devaluation. This adjustment is non-trivial because the exchange rate within the band clearly displays mean reversion. This is supported by a unit root test on x using a Dickey-Fuller test.⁴ A tail area of .00729 meant that the null hypothesis of non-stationarity could be rejected and the mean reverting properties of x established.

The resulting expected rates of devaluation are displayed in Figure 4. It is appropriate at this juncture to state how the estimated expected rates of devaluation should be interpreted. The expected rate of devaluation here is the product of the probability of a devaluation and the size of the expected devaluation. Thus an expected rate of devaluation of the order of 10 per cent is, in fact, the product of an expected devaluation size of, for instance, 5 per cent with the expected frequency of realignment as 2 per year. The expected time to a realignment can also be interpreted from this (i.e., the reciprocal of the frequency), in this instance, 6 months. If however, the expected devaluation size was 10 per cent, then the expected frequency of realignment is 1 per year. Our estimates show expected rates of devaluations that in some cases are close to those that actually materialised in the major episodes. After the inception of the EMS, expectations of a devaluation were high — typically

4. There was found to be no serial correlation in the exchange rate within the band, therefore an Augmented Dickey-Fuller test was not warranted.

in the region of 7-10 per cent. This may reflect the uncertainty associated with the new system and the lack of credibility of such an exchange rate system at the time, especially since the system represented a break with sterling which existed for over 150 years. Expectations remained high for some time, indicating that credibility in the policy was lacking to some extent even after three or four years of the existence of the system.

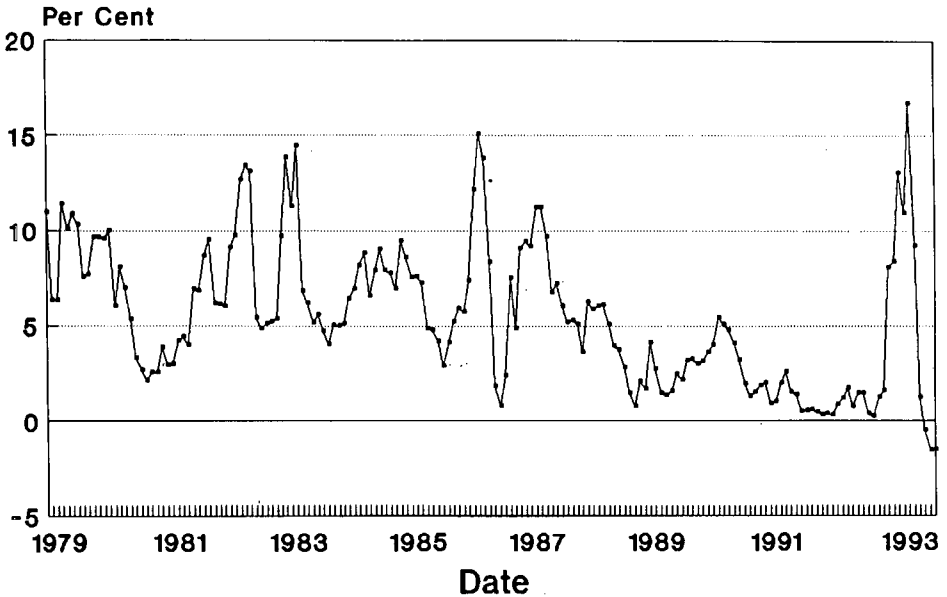


Figure 4: *Devaluation Expectations DM/IR£*

These expectations are generated, at least in part, by the high interest rate differentials between Ireland and Germany which existed during this period. In many instances such high differentials are present shortly before devaluations actually took place, reflecting market agents' demands for high interest on securities due to an impending expected devaluation, e.g., before the devaluation of October 1981, June 1986, March 1983 etc. This however may not always apply, and indeed there may be a situation whereby a high interest rate differential or high expected rate of devaluation may not signify an impending devaluation. As previously stated, this is indicative of lack of credibility/poor credibility in the exchange rate system; it may also be reflective of a situation where fundamentals are in a position which is conducive to a devaluation but that such a devaluation did not materialise. One possible explanation for such an anomaly is furnished by Chen and Giovannini (1993), who note that the discrepancy between actual observations and estimates may indicate inefficient use of information in the market place. In Ireland's

case, the expected rates of devaluation for the realignments which occurred in 1982:6 and 1986:4 are, in both instances, more than 3 per cent away from the actual devaluation that took place. One possible explanation for these differences has been put forward by Weber (1991). While the EMS has traditionally been considered a system in which Germany is the hegemonic country, Weber viewed the EMS as a "bi-polar" system rather than as a pure DM-zone. This bi-polar system consists of a hard currency option, whereby currencies are pegged to the DM. This hard currency co-exists with a "soft-currency" option whereby some currencies are linked not to the DM but to the FF. Weber has provided evidence in support of the view that Ireland was part of the "soft-currency" bloc between June 1982 and April 1986. It subsequently shifted to the "hard-currency" option of pegging to the DM sometime between April 1986 and the Basle-Nyborg agreement of September 1987. The relevance of Weber's analysis here is that it goes some way toward explaining the aforementioned anomalies in the expected rates of devaluation. An Irish-French interest rate differential was constructed using the DIBOR and PIBOR rates and "fitted values" from a regression using data for the FF/IR£ of the expected rate of depreciation within the band to yield another set of devaluation expectations. These are shown in Figure 5. For the period outlined by Weber, the FF/IR£ devaluation expectations were closer to actual

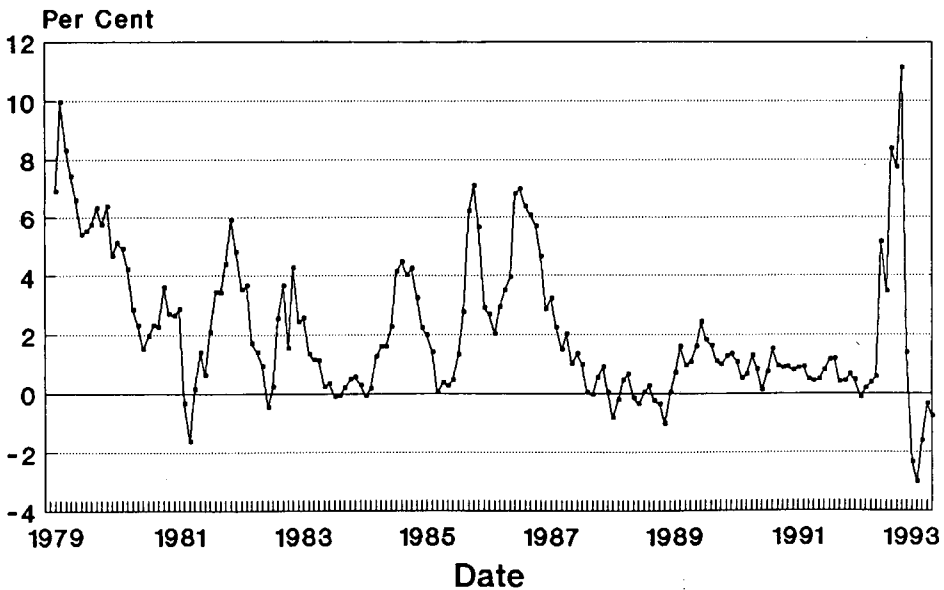


Figure. 5: *Devaluation Expectations FF/IR£*

devaluations than those based on the Irish/German interest rate differential. The expectations for June 1982 and April 1986 were within .08 and .04 percentage points respectively in the month immediately preceding the actual devaluations. Furthermore, in the sample period, DM/IR£ devaluation expectations are in the order of 6-7 per cent, and reaching as high as 11 per cent at some points, when in fact, no devaluation actually took place. The corresponding FF/IR£ devaluation expectation rates appear to be more consistent with what actually happened in Ireland and are generally in the order of 0-1 per cent, rising only to 7 per cent a few months previous to the devaluation of April 1986.

Overall, high values for the expectations are an indication of lack of credibility; the first portion of estimates (up until June 1982 essentially) can partly be explained by the insecurity and instability associated with the new system, especially in Ireland's case given that the 150 year old link with sterling was severed. The second portion (to September 1986), can be more accurately explained by looking at the Irish/French interest rate differential. After this time, there were credibility gains for all members of the EMS. Certainly in Ireland's case, the expectations reflect this increased credibility. Honohan (1993) notes how "an export boom, rising employment and lower unemployment, combined with a successful stabilisation of the public finances also contribute to the sense that devaluation could safely be ruled out as an option" (1993, p. 32). This increased credibility appears to have held until the events which culminated in the currency crisis of January, 1993. The collapse of the narrow margin regime at the end of July 1993, essentially signalled the effective suspension of that regime and halted the further accrual of credibility which exchange rate policy had achieved up to that point in time.

(iii) Determinants of Expected Rates of Devaluation

Having estimated the expected rates of devaluation, it is proposed here to attempt to identify economic and institutional factors which market agents take account of when formulating their devaluation expectations. The identification of any such factors is crucial in understanding how such expectations are formed, as well as having important implications for policy-makers. The empirical estimation here involved a regression of the estimated devaluation expectations on a number of macro-variables. There is little agreement in the literature as to what variables ought to be included in such a regression. Thus the approach here was to draw a wide variety of variables from a number of papers. It was felt that this would also facilitate comparison of results. A complete list and definition of the information variables is given in Table 3.

The results of this regression are given in Table 4. The data here were

Table 3: *Definition of the Macro Variables Used in the Estimation of Equation (7)*

Money:	growth in domestic value of M1 money supply
Reserves:	log of the relative reserve position <i>vis-à-vis</i> Germany
Trade:	difference in domestic and German trade balance surpluses
Production:	a relative industrial production index defined as $\ln[IP_{IRE} / (IP_{GER} * s)]$
Wages1:	relative wages <i>vis-à-vis</i> Germany defined as $\ln[W_{IRE} / (W_{GER} * s)]$
Wages2:	relative wages <i>vis-à-vis</i> UK $\ln[W_{IRE} / (W_{GER} * s)]$
U _{IRE} :	Standardised unemployment rate for Ireland
U _{GER} :	Standardised unemployment rate for Germany
U _{UK} :	Standardised unemployment rate for UK
Spot rate ₁ :	DM/US\$ Nominal Exchange Rate (end of period rate)
Spot rate ₂ :	£Stg/IR£ Nominal Exchange Rate (end of period rate)
X1:	the exchange rate within the band
Π:	difference in Irish and German inflation rates

checked for influential observations (defined as greater than 3 standard deviations above or below the mean), and the questionable observations were subsequently excluded from the analysis. The regression here, as previously, is conducted using Generalized Methods of Moments (GMM) which yields standard errors which are robust to both heteroscedasticity and serial correlation. Before the regression was estimated, it was felt that there may be possible non-stationary variables in the regression. Frain (1993) has highlighted the problems associated with including such variables in a regression; namely they give rise to spurious and unstable regression estimates. Thus they "cannot be used to evaluate the long-term or permanent effects of ... exchange rate policy" (1993, p. 21). In this light, the data set was checked for unit roots/non-stationary variables using Dickey-Fuller or Augmented Dickey-Fuller tests where appropriate. Having in many instances differenced the data to make the series stationary it was then felt safe to proceed and estimate the regression.

The results here may be considered rather disappointing if compared to other studies in a similar vein. Of the 12 macro variables used, only 3 of these had significant p-values; relative wages *vis-à-vis* the UK, the exchange rate

Table 4: *Regression of Devaluation Expectations on Fundamentals*

<i>Variable</i>	<i>Estimated Coefficient</i>	<i>t-Statistic</i>	<i>p-Value</i>
Money	2.75910	1.5226	0.128
Reserves	0.60116	0.4283	0.668
Trade	0.24169	1.2344	0.217
Production	-0.15010	0.8898	0.929
Wages1	-1.01188	0.1796	0.857
Wages2	10.0858	1.7349	0.083*
U _{IRE}	0.46658	0.1500	0.881
U _{GER}	-0.43480	0.4810	0.631
U _{UK}	4.65702	1.1318	0.258
Spot Rate ₁	-2.61250	0.5858	0.558
Spot Rate ₂	3.50393	2.3995	0.016*
XI	2.30043	2.3651	0.018*
Π	55.3191	0.4345	0.664

Notes: *Indicates significance at 10 per cent level. Adjusted R² = 0.2782. n=169.

within the band and the inflation differential.⁵ These significant variables were then extracted from the regression and a separate regression was run. The £Stg/IR£ nominal exchange rate was also extracted on the suspicion that this may also be significant. The results from this regression are given in Table 5. It was found that in this regression, relative wages became insignificant, while the £Stg/IR£ nominal exchange rate became significant. The significance of the £Stg/IR£ variable highlights a number of interesting points. First, its very significance in relation to the formation of devaluation expectations signifies that despite formally breaking the link with £Stg through entry into the ERM of the EMS, 15 years later, that link still appears to exist in that the £Stg/IR£ exchange rate is still taken account of by rational agents in the formulation of their expectations of devaluations of DM/IR£. Thus even though Ireland is operating in a formal target zone *vis-à-vis* the DM, it is also operating in an informal target zone *vis-à-vis* Sterling. This point has been highlighted by Hughes and Hurley (1993) in their tests of target zone credibility. Walsh (1993) has noted that "Irish interest rates have continued to be influenced by the Stg£/IR£ exchange rate" (1993, p. 443). In particular, in relation to the currency crisis of September this crisis "was not due to a change in inflationary expectations, but because the Stg£/IR£ exchange rate rose to a level that markets viewed as unsustainable" (1993, p. 444). The expectations of this devaluation contributed to the large Irish/German interest rate differential as agents demanded a premium on Irish over German rates because of the expected impending devaluation. Given the sign

5. Full details are given in Table 4.

of the coefficient here, an increase in the £Stg/IR£ exchange rate, increases rational agents' expectations that there will be a devaluation.

The exchange rate within the band (X1) is also significant. An increase in the exchange rate within the band increases expectations of a devaluation.

Table 5: *Regression of Devaluation Expectations on Fundamentals (Significant Variables)*

<i>Variable</i>	<i>Estimated Coefficient</i>	<i>t-Statistic</i>	<i>p-Value</i>
Wages2	3.7001	0.5287	0.597
X1	18.4479	1.8386	0.066*
Π	43.5786	1.9841	0.047*
Spot Rate ₁	5.4485	5.6029	0.000*

Notes: *Indicates significance at 10 per cent level. Adjusted $R^2 = 0.3024$. $n=169$.

This is as one might expect; the further the spot exchange rate deviates from central parity i.e., the closer it gets to the edges of the exchange rate bands, the greater are agents' expectations of a devaluation.

The last factor which was found to be significant was the Irish/German inflation differential. An increase in the differential between Irish and German inflation rates increases expectations of a devaluation, and represents a decrease in credibility. At the most basic level, an increase in inflation represents a loss in competitiveness i.e., Irish goods will become relatively more expensive abroad, so having a negative effect on the credibility of government policy, as such competitive losses surely cannot be sustained in the long run.

It is intended here to provide a brief comparison of our results with other studies on devaluation expectations for EMS currencies which have related these expectations to fundamentals in an attempt to determine what influences them. Rose and Svensson (1993) have actually completed some estimation in this area on the IR£. They found that there existed a potential link between inflation differentials and devaluation expectations; in fact this was the only variable they found to be significant in their analysis. Reserve levels, the trade balance, output and the real exchange rate were all found to be insignificant. They conclude by saying that there "do not appear to be tight links between realignment expectations and their potential determinants" (Rose and Svensson, 1993, p. 12). Lindberg, Svensson and Soderlind (1991) attempted to explain what macro variables were significant in explaining devaluation expectations for the Swedish Krona. They found that the real exchange rate, the trade account, inflation, the rate of nominal industrial wage growth and the rate of industrial production growth, in most cases had

Table 6: *Devaluation Expectations and Fundamentals: Comparison of Results With Other Studies*

Author(s)	Variables:										
	Money	Reserves	Industrial Production	Unemployment	DM/US\$	Inflation Differential	Stg/IR£	Trade Balance	Real Exchange Rate	Wages	X
Caramazza (1993)		*		**		**		**			**
Chen & Giovannini (1993)	*	*	*		*		*		*		**
Edin & Vredin (1993)	**	**	**					*			
Lindberg, Soderlind and Svensson (1991)	*		*	*			*	*	*	**	
Rose and Svensson (1993)	*	*	*			**		*			
Present Paper	*	*	*	*	*	**	**	*	*	*	**

**Indicates significant variable.

insignificant coefficients, as did unemployment, the money growth rate and the Central Government borrowing requirement. The change in foreign exchange reserves, the current account and the rate of real exchange rate depreciation were however found to be significant.

Chen and Giovannini (1993) in relating realignment expectations for the French Franc and the Italian Lira relative to the DM, found that regarding the variables also used in our analysis, the relative foreign exchange reserve position was significant for the FF but not for the IL. In another empirical work on the FF, Caramazza (1993) found that the inflation differential and the unemployment rate were significant factors in the determinants of FF/DM realignment expectations for 3 month maturity. The results are consistent to some extent with what has been found here.

While all the papers referred to thus far have utilised the "drift adjustment method" for generating realignment expectations, Edin and Vredin (1993) use a Probit model in examining devaluation expectations for the Nordic countries. They then relate these expectations to macro variables. They find that industrial production exerts a negative influence on devaluation expectations, with the money stock being marginally positively significant.

What is clear from the comparison here is that different variables are found significant in different circumstances. Even allowing for differences in definitions, there is still a considerable degree of heterogeneity in the results. This can at least in part be attributed to two sources. First, there are "well-known difficulties in linking exchange-rates to macroeconomic phenomena" (Rose and Svensson, 1993, p. 17). Second, there is an element of international diversity in the factors influencing devaluation expectations. What agents in one country take into consideration may not be important for agents in other countries. Indeed, Lindberg, Svensson and Soderlind (1991) cite how "experience from the foreign exchange market suggests that participants follow fads in the sense they focus for a while on a particular variable ... then switch to focus on another variable for a while" (1991, p. 35). Thus in the light of the variety inherent in the results presented here, this may not only be true within countries at a national level, but also between countries at an international level.

IV CONCLUSION

This paper has presented results for devaluation expectations for the IR£/DM for the period of EMS membership. The methodology employed produces estimates of expected rates of devaluation by adjusting the interest rate differential by the expected rate of depreciation within the band. This estimated expected rate of depreciation within the band was computed using

a simple linear regression model which resulted in estimates that seem reasonable, and that in some instances, closely mimicked actual deviations. Such devaluations were found to vary considerably over time and were not always related to correspondingly high interest rate differentials. With regard to the credibility of the EMS, the estimated devaluation expectations indicated that credibility varied quite considerably over the period of our membership. It was found that this variation in credibility could not always be explained by the movement of the DM/IR£. One interesting alternative explanation was propounded concerning the FF/IR£ for the period 1984-86. These rates were then related to economic fundamentals in an attempt to establish what factors market agents take into account when formulating their devaluation expectations. It was found that the IR£/£Stg nominal exchange rate, the exchange rate within the band and the Irish/German inflation differential were all found to be significant with regard to devaluation expectations for the DM/IR£. While some of these factors have previously been found to be significant in similar studies, others indicate new elements considered by rational agents in the formulation of their expectations of a devaluation.

While the evidence presented here cannot be considered conclusive, it can be viewed in conjunction with existing evidence and studies along the same vein. The prominence of exchange rate policy on the political agenda indicates how Ireland's membership of the EMS/ERM was not merely an economic issue but also a political one. Presently, Ireland's exchange rate policy appears to be searching for a new direction in the aftermath of the events of August, 1993. By taking note of the existing evidence, alternatives to Ireland's current exchange rate policy, and ways of overcoming the problems associated with lack of credibility, should make such policy options less difficult to assess.

REFERENCES

- BERTOLA, G., and L.E.O. SVENSSON, 1990. "Stochastic Devaluation Risk and the Empirical Fit of Target Zone Models", Seminar Paper, No. 481, Stockholm: Institute for International Economic Studies (IIES).
- CARAMAZZA, F., 1993. "French-German Interest Rate Differentials and Time-Varying Realignment Risk", International Monetary Fund, Working Paper No. WP/93/1.
- CENTRAL BANK OF IRELAND, 1993. *Quarterly Bulletin*, Winter.
- CENTRAL BANK OF IRELAND, 1994. *Quarterly Bulletin*, Spring.
- CHEN, Z., and A. GIOVANNINI, 1993. "The Determinants of Realignment Expectations Under the EMS: Some Empirical Regularities", Working Paper No. 4291, Cambridge, Massachusetts: National Bureau of Economic Research (NBER).
- EDIN, P.A., and A. VREDIN, 1993. "Devaluation Risk in Target Zones: Evidence from

- the Nordic Countries", *The Economic Journal*, Vol. 103, pp. 161-175.
- FRAIN, J., 1993. "A Critique of Recent Analyses of the Relationship Between the Sterling Exchange Rate and Irish Interest Rates", Central Bank of Ireland, Research Paper, No. 2/RT/93.
- FROOT, K.A., and R.H. THALER, 1990. "Anomalies: Foreign Exchange, *Journal of Economic Perspectives*, Vol. 4, No. 3, pp. 179-192.
- HONOHAN, P., 1979. "A Guide to the Arithmetic of the EMS Exchange Rate Mechanism", Central Bank of Ireland, *Quarterly Bulletin*, Autumn.
- HONOHAN, P., 1993. *An Examination of Irish Currency Policy*, Dublin: The Economic and Social Research Institute, Policy Research Series, Paper No. 18.
- HUGHES, J., and HURLEY, M., 1993. "Simple Tests of Target Zones: The Irish Case", *Applied Economics*, Vol. 28, No. 8, pp. 757-765.
- LINDBERG, H., L.E.O. SVENSSON, and P. SODERLIND, 1991. "Devaluation Expectations: The Swedish Krona 1982-1991", Seminar Paper No. 495, Stockholm: Institute for International Economic Studies (IIES).
- ROSE, A.K., and L.E.O. SVENSSON, 1991. "Expected and Predicted Realignment: The FF/DM Exchange Rate During the EMS", Seminar Paper No. 485, Stockholm: Institute for International Economic Studies (IIES).
- ROSE, A.K., and L.E.O. SVENSSON, 1993. "European Exchange Rate Credibility Before the Fall", Working Paper No. 4,495, Cambridge, Massachusetts: National Bureau of Economic Research (NBER).
- SVENSSON, L.E.O., 1990. "The Foreign Exchange Risk Premium in a Target Zone with Devaluation Risk", Seminar Paper, No. 475, Stockholm: Institute for International Economic Studies (IIES).
- SVENSSON, L.E.O., 1991. "Assessing Target Zone Credibility: Mean Reversion and Devaluation Expectations in the EMS", Seminar Paper, No. 493, Stockholm: Institute for International Economic Studies (IIES).
- WALSH, B., 1993. "Credibility, Interest Rates and the ERM: The Irish Experience", *Oxford Bulletin of Economics and Statistics*, Vol. 55, No. 4, pp. 439-452.
- WEBER, A., 1994. "Reputation and Credibility in the European Monetary System", *Economic Policy*, Vol. 12, pp. 57-102.