Fixing the currency: analysing the implications for property investment performance

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Abstract

This paper analyses the historic effects of exchange rate movements on returns, risk and diversification of office markets within the Euro zone in order to gain insights into the investment consequences of conversion to a fixed rate currency regime. The data used in the study represents annual office rental growth rates for 22 European cities from nine European Union countries between 1985 and 1996. Relative performance is reported in terms of domestic currency and in terms of deutsche marks. The evidence presented suggests that Euro zone property investors in 'southern' countries are now protected from short term jump risk associated with flexible peg currency arrangements and medium/long-term currency volatility. Historically exchange rate movements have produced decreases in returns and increases in volatility. For northern 'bloc' cities, the effects of fixing the exchange rate are minimal. For these cities, national exchange rate fluctuations against the deutsche mark have been minor and the resultant implications for property risk and return to non-domestic SCA investors have been negligible. Moreover, although previous research would suggest that the effect of currency volatility is to decrease market correlation, this cannot be observed within the Euro zone.

Introduction

The establishment of the Euro has altered the parameters of international portfolio investment. Accordingly, for equity and bond markets, the implications of further monetary integration for asset allocation, diversification and stock selection have been the subject of discussion and empirical analysis (see Beltratti, 1999 and Freimann, 1998). However, there has been limited consideration of similar ramifications for the property sector. Whilst it is generally recognised that monetary integration within the European Union will have long term dynamic effects on macro-economic trends and patterns of regional growth and development, an obvious immediate effect of the introduction of the Euro has been the elimination of exchange rate risk for international investors investing *within* the Single Currency Area (SCA). The purpose of this paper is to analyse the historic effects of exchange rate movements on returns, volatility and correlation between office markets within the SCA in order to gain insights into the consequences of conversion to a fixed rate regime for intra-SCA property investment performance. Since previous research on international property investment and currency volatility has focussed on methods of mitigating currency risk, there has been limited measurement of the actual effects (see Johnson *et al*, 1998, Ziobrowski and Ziobrowski, 1995; Worzala, 1995; Worzala, Johnson and Lizieri, 1996; Newell and Worzala, 1995, Dawson and Rodney, 1994). Clearly, the consequences of conversion from a flexible peg to a permanent fixed rate regime depend upon (unknowable) future trends in the currency markets *in the absence of* a permanent fixed rate system. In order to provide insights as to the likely implications for patterns of returns, volatility and market correlations, the relationship between historic returns from currency and property markets for major office centres within the Euro zone will be empirically examined.

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The effects of currency volatility on property returns will be of significant consequence when two associated conditions are satisfied. First, property investors should display concern about any potential effects of exchange rate volatility in international investment performance. Second, currency volatility should be of such a magnitude that they have significant impacts on patterns of investment risk and return. The absence of these two conditions would suggest that fixing the exchange rate has limited consequences for international property investors. In order to address these questions, the remainder of the paper is organised as follows. In the first section, the background to and implications of European integration is briefly reviewed. The second section discusses the nature of currency risk, investor attitudes to currency risk and previous research on the effects of currency risk for international investment. The third section analyses empirically the historic effects of currency movements on office property performance from the perspective German investors within the SCA.

European Economic Integration and Convergence

Within the EU economic and political integration has been increasing since the formation of the European Economic Community in 1956. Although there can be little doubt that factors such as technological innovation, changing trade patterns and production processes would have produced increasingly integrated and interdependent economies within western Europe whether the EEC had been formed or not, pan-European institutions have been critical in promoting exchange rate management, regulatory harmonisation and in reducing barriers to trade, investment and market entry in the EU. The associated 'globalisation' and 'Europeanisation' activities of the corporate sector have also been an important factor in reducing the importance of national factors in performance. However, given fundamental methodological problems associated with identifying the counterfactual position, there are difficulties in attempting to quantify the effects of policies such as the introduction of the Single European Market.

A number of structural economic changes demonstrating increasing integration within the EU can be identified. First, a notable feature of the last 30 years has been the growth in intra-European trade (see Chisholm, 1995). Empirical studies (notably Ben-David, 1996) suggest that there is a strong positive relationship between the degree of bilateral trade intensity and the cross-country bilateral correlation of business cycle activity (see also Frankel and Rose, 1997). Second, within the EU there is evidence to suggest that the pattern of economic shocks has changed and become more symmetric (see Bayoumi and Prasad, 1997). Third, effects of increased integration have been identified at the regional level. Although patterns and rates of regional economic convergence vary between different sub-periods and different

subsets of regions, the balance of empirical evidence provide support for neo-classical models. Fagerberg and Verspagen (1996, p.432) find a "slow but steady reduction in differences in GDP per capita across European regions during most of the post war period". Sala-i-Martin (1996) also finds convergence in GDP growth rates with EU regions in the post war period. Fatas (1997) has shown that the economic performance of regional economies has become increasingly positively correlated with the EU generally rather than with the individual nation states. However, Baddeley *et al* (1997) find that regional unemployment differentials show persistence within the EU.

Figures 1-3 illustrate the recent decrease in dispersion of GDP growth rates, inflation rates and long term government bond yields that has occurred within the EU *prior to* the introduction of a single currency. . Convergence in 'fundamentals' has been associated with increasing integration of the capital markets (measured by market correlation). Freimann (1998, p.40) finds that from "from the mid-1970s until the end of 1996, the correlation between European stock markets has, on average, tripled – from 20 per cent to more than 60 percent". This is consistent with earlier research which found significant evidence of increasing integration for European stock markets (Beckers *et al*, 1996). These researchers generally agree that the intensification of monetary integration represented by EMU will accelerate the reduction in the importance of national factors, increase market co-movement and reduce divergence.

Currency Risk and Property Investment

The relative impact exchange rate fluctuations on the level and volatility of property returns receivable to the domestic investor in foreign property will depend on the interrelationship between the performances of individual property markets and the national currencies. Thus, the variance of international property returns is a product of the variance of the domestic property returns, the variance of currency movements and the correlation between them.

$$\sigma_i^2 = \sigma_d^2 + \sigma_c^2 + 2r\,\sigma_i\sigma_d \qquad\qquad (1)$$

where σ_i^2 is the variance of returns to an international investor, σ_d^2 is the variance of returns to a domestic investor, σ_c^2 is the variance of currency movements. The magnitude of the relative volatilities will also be relevant. Where the are large differences in the variances of the two variables, the effect may be to render one component largely irrelevant. This may be important in a flexible peg currency arrangement the variance of currency returns may be

extremely low. In addition, there has been limited consideration of the relationship between property market performance and the exchange rate. Correlations from this study provide conflicting and limited evidence of such relationships (see Appendix 1). The relatively small sample size means that confidence intervals are extremely wide and that very few co-efficients are significantly different from zero.

The *type* of exchange rate risk under consideration will also be a crucial factor in determining the exposure to risk – economic, translation or transaction. Moreover, for international investors, the relative importance of currency risk will be variable. Like other types of risk, preferences will not be homogeneous. Investor attitudes to currency risk will depend on the particular constraints, policies and motives of different investors. Investors in international property range from specialist (often well diversified) international property funds to property companies with substantial non-domestic holdings to institutional investors who allocate a relatively small proportion of their assets to property and allocate a very much smaller proportion to non-domestic property. Interestingly, it has been reported that only 20% of the sample of European investors have formal strategies for dealing with currency risk (Johnson *et al*, 1998). This can be partially explained by the relative expense of hedging and the difficulty of identifying suitable hedging vehicles for property assets. Other explanations of this relatively low concern by property investors may include the following; institutions use the services of a central Treasury department to manage currency exposure; currency movements may be perceived as part of the overall diversification strategy; property is perceived as a long term asset by investors who may be able to wait until exchange rates are favorable before exiting; non-domestic assets may be used to match non-domestic liabilities (Worzala, 1994).

Previous survey-based research indicates that the majority of investors do not attach major importance to currency risk in international property investment decisions. As stated earlier existing research on currency risk has focused either on methods of risk management or institutional attitudes to such risk. A number of points can be made based on existing survey evidence. Worzala (1994) reports that 44% of her sample (UK, Dutch, and German institutions) perceive currency fluctuations as an important variable in the international property investment decision. A similar questionnaire sent to investors based in South-East Asia finds that 89% of respondents are concerned about exchange rate risk (Worzala and Newell, 1995). McAllister's (1999) survey of British investing institutions finds that currency fluctuations are ranked fourth in a possible list of eight potential problems associated with international property investment. Therefore, although exchange rate risk may not be the

primary contributing factor deterring institutional investment in non-domestic property (except for South-East Asia), it does appear to be a significant secondary determinant.

Previous research on the relationship between currency and asset returns suggests that in a floating exchange rate environment, currency volatility can have significant effects on investment performance. In an examination of international market correlation and volatility for stocks and bonds for six major markets over a 37 year period[1], Solnik *et al* (1996) found that exchange rate movements had a number of effects. First, volatility for both stocks and bonds is increased for the non-domestic investor and that for bonds in particular that the relative increase is extremely large. This can largely be explained by the low level of volatility in the bonds relative to stocks. Second, the effect of exchange rate movement is to decrease correlation in performance between national markets and, therefore, increase potential diversification benefits. However, it was also noted that correlation co-efficients were unstable and that market correlation tended to increase in periods of instability. Reilly and Norton (1999) also report that the effect of currency movements on bond and equity market returns is to increase volatility without a compensating increase in return. They also find that correlation between the US and various alternative major bond and equity markets decline when the exchange rate effect is factored in. For example, for the period 1987-1996, Reilly and Norton demonstrate that the correlation between monthly returns on bonds denominated in the local currencies between the US and the UK is 0.4, and this declines to 0.23 when the returns are converted to US dollars.

In relation to the property market, there has been limited empirical work on the effects of exchange rate volatility. . Newell and Webb (1996) examine the effects of exchange rate volatility for five property markets (UK, US, Canada, Australia and New Zealand) between 1985 and 1993. Using bi-annual data, they identify impacts similar to the stock and bond market. Whilst acknowledging the small sample size, they report that volatility is increased and inter-market correlation is reduced for all combinations. These findings are consistent with Tarbert and McAllister (1998) who examine the similar markets over a longer timescale. Although currency volatility was not central to their research, Quan and Titman (1997) examine the relationship between changes in annual property values and rents and annual stock returns based on data from 17 urban centres in different countries for the period 1987 to 1994. They did not analyse in depth the issue of currency effects but found that "exchange rate changes did not severely distort the relative average returns in these countries" (Quan

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[1] Germany, France, UK, Switzerland, Japan and USA.

and Titman, 1997, p.23). However, this study is interesting since many of currencies in the sample were pegged against the US dollar.

Empirical Analysis

Data

For the purposes of this study the data source used is The Green Book. This is an online database of a large proportion of commercial, residential and construction statistics for a range of international markets focussing mainly (although not exclusively) on Europe. However, there are a number of striking flaws with European property market data. The main problems with the historic time series can be classified under a number of headings.

Length

Comprehensive performance monitoring is relatively new to many European markets. As a result there are relatively few reliable long-term sources of commercial property investment performance measurement. The period prior to the introduction of the 'Single Market' in 1992 was associated with a dramatic expansion of British surveying practices into the main European markets. At the same time there was a dramatic growth in market monitoring and measurement. However, the result is that much of the available data measures the 'tail-end' of a boom, a major property market downturn and a brief recovery. Generally for most major European centres, historic office rents are available from the early to mid-1980s with total return figures are generally only available from the early 1990s. Comparable data for the retail and industrial sectors is even more problematic.

Continuity

Although there are currently a large number of organisations monitoring market performance, the main relatively widespread sources of 'long term' rental series are ONCOR, ICPA, DTZ and JLW. These are used in most cases in this study. However, in a significant proportion of the individual city rental time series, there are either gaps or discontinuities. This occurs for three main reasons. First data is not collected for an individual time period. Second, the series terminates prematurely. Third the basis on which data is collected changes eg. from whole business area to disaggregation by sub-market. This limitation can be mitigated by

using comparable time series data from other sources. This is usually readily available. However, as we shall see below, it is rare that recording organisations agree completely

Selectivity

Inevitably, any index measures attempts to measure a specific element of market performance e.g. prime offices. However, much of the EU data is focussed on the major international business centres. As a result, lagging regions tend to be excluded – an important omission in terms of examining the convergence hypothesis.

Inconsistency

It has already been stated that a number of organisations are trying to measure the performance of the different centres. However, the different measures produced are often inconsistent in the sense that they tell different 'stories' about market change. Whilst it is recognised that the bases and assumptions underpinning valuations will sometimes vary between recording organisations, the size of the disagreements about the extent and timing of market change can be surprising.

Use of Appraisals

With the property research community there is a widespread belief that there is a problem with much property market data generally due to the existence of serial correlation in the time series. This is often cited as evidence of smoothing in the return series and the consequent under-recording of market volatility. Although the existence, nature and extent of smoothing can be questioned, in much of the European data there is a particular problem with quarterly rental series which tend to display extreme seasonality in the sense that rental levels change only once per year and at the same time every year. Given that zero market movement on such a consistent basis is unlikely, the explanation for the data qualities would seem to lie in the data collection process with relatively small shifts remaining unrecorded. The result is that they are effectively annual time series rather than quarterly and for the purposes of this research have been taken as such. The result is that *short term* market volatility is un- or under-recorded.

The data used in the study represents annual office rental growth rates for 22 European cities from eight European Union countries between 1985 and 1996. The exchange rate data for the eight countries has been extracted from the IMF *International Financial Statistics* series.

Market rates of US dollar per subject currency at end of period have been used and returns relative to the deutsche mark from the subject currencies have been calculated. Relative performance is presented in terms of domestic currency and in terms of deutsche marks

Results

The summary data on currency returns are presented in Table 1 and for the individual cities in Table 2. It is apparent from Table 1 that it is possible to classify the countries into 'northern' and 'southern' currency zones according to the stability of their local currency against the DM. The currencies of France, Netherlands, Belgium and Austria have remained closely aligned to the DM with consequent low volatility. For the purposes of this study, it also suggests that the any findings and conclusions concerning the effects of currency volatility for German investors also hold for these countries. For the 'southern' bloc (Italy, Spain, Portugal and Ireland), the pattern of currency performance is less stable. The peseta, escudo, lira and punt have all depreciated against the DM over the study period. However, this has not been a steady process and has been associated with 'crisis' driven realignments (and appreciations in the latter half of the 1990s). Thus they have been prone to the jump risk in their exchange rate associated with fixed and flexible peg arrangements and have suffered consequent *short term* volatility in investment performance. Moreover, from the point of view of diversification, it is also significant that currency 'crisis' points are correlated reducing potential risk reduction benefits associated with geographical diversification (see Appendix 2).

Table 1

Performance of DM Against National Currencies 1985-96

Currency	Mean % change p.a.	Standard deviation
DM/ESC	5.57%	7.46%
DM/LR	4.22%	7.41%
DM/PES	3.81%	6.84%
DM/SCH	-0.03%	1.09%
DM/GU	-0.06%	0.31%
DM/BFR	-0.20%	1.19%
DM/PUNT	1.63%	5.80%
DM/FFR	-0.79%	2.32%

Source: Adapted from IMF Statistics

Table 2

Rental Trends in Local Currency 1985-96				Rental Trends in DM 1985-96			
City	Mean	Standard Deviation	Coefficient of variation	City	Mean	Standard deviation	Coefficient of variation
Berlin	12.33%	42.39%	0.29	Berlin	12.33%	42.39%	0.29
Barcelona	11.62%	24.57%	0.47	Brussels	8.23%	8.49%	0.97
Oporto	10.85%	28.74%	0.38	Barcelona	7.81%	26.58%	0.29
Lisbon	10.25%	23.24%	0.44	Oporto	6.47%	30.22%	0.21
Madrid	6.67%	22.02%	0.30	Lisbon	5.88%	23.77%	0.25
Brussels	6.36%	8.49%	0.75	Lille	5.75%	8.88%	0.65
Koln	5.69%	10.85%	0.52	Koln	5.69%	10.85%	0.52
Lille	5.13%	8.88%	0.58	Frankfurt	4.64%	15.30%	0.30
Frankfurt	4.64%	15.30%	0.30	Munich	4.57%	13.67%	0.33
Munich	4.57%	13.67%	0.33	Marseilles	4.42%	9.26%	0.48
Dublin	4.25%	9.31%	0.46	Antwerp	4.22%	10.15%	0.42
Marseilles	3.81%	9.26%	0.41	Amsterdam	4.10%	8.90%	0.46
Amsterdam	3.79%	8.90%	0.43	Vienna	3.77%	14.28%	0.26
Vienna	3.74%	14.02%	0.27	Hamburg	3.73%	8.36%	0.45
Hamburg	3.73%	8.36%	0.45	Dusseldorf	3.31%	13.47%	0.25
Dusseldorf	3.31%	13.47%	0.25	Utrecht	3.12%	3.08%	1.01
Utrecht	2.81%	3.08%	0.91	Madrid	2.86%	25.12%	0.11
Milan	2.64%	12.53%	0.21	Paris	2.63%	11.37%	0.23
Antwerp	2.34%	10.15%	0.23	Dublin	2.62%	13.98%	0.19
Rotterdam	2.27%	2.43%	0.93	Rotterdam	2.58%	2.43%	1.06
The Hague	2.16%	3.73%	0.58	The Hague	2.48%	3.73%	0.66
Paris	2.01%	11.37%	0.18	Milan	-1.58%	16.63%	-0.10

Source: Adapted from The Green Book

The currency unadjusted and adjusted rental growth, volatility and co-efficient of variation are displayed in Table 2. In rental growth terms, Berlin appears as the best performing city due to its economic expansion following German re-unification in 1989 and the subsequent property market boom (and bust). As a group, in terms of domestic currency the best performers have been the Iberian cities. Even in DM terms, their relative performance remains strong (although the ranking of Madrid drops significantly). Medium performers include group of north European cities including the German centres, Brussels, Vienna and Lille. The worst performers are grouped around the Dutch cities, Milan and Paris. These patterns stay relatively stable after conversion to DM. Overall the effect of exchange rate converson is to produce a slight decrease in rental return although this is not surprising given the average appreciation of the DM in the study period.

The standard deviations of rental growth are displayed in Table 2. They indicate that risk/return trade-off generally holds with the most volatile markets offering the higher returns and the least volatile markets offering lower returns. Overall the effect of currency volatility

appears to be insignificant. Mean standard deviation increases from 13.85% to 14.21% after conversion to DM. However, this slight increase in volatility is not spread equally. Whilst there is no increase in volatility for the northern 'bloc' cities, where changes in standard deviation can be observed (for all the 'southern' countries), they are in an upwardly direction. This is consistent with *a priori* expectations. Given the positive relationship between rental volatility and growth, similar groupings can be identified. These results suggest that both in terms of returns and risk, the effects of fixing the exchange rate are variable according to currency 'bloc'.

In terms of diversification, the evidence suggests that the historic effects of exchange rate movement have been minor. However, the results are presented with the caveat that the relatively small sample size produces large confidence intervals around the sample correlation co-efficients. Currency unadjusted and adjusted correlation matrices are presented in Tables 3 and 4. An interesting point is that 15 cities display strong positive correlation with the JLW office rental growth index suggesting a high level of integration among EU office markets. The correlation results also indicate the existence of a distinct Iberian grouping. In term the effects of currency movements, a crude visual examination of the results suggests that the impact of adjusting for currency movements is insignificant. Indeed, although differences in co-efficients can be observed for the southern 'bloc' cities, they are always statistically insignificant.

However, apart from the constraints associated with small sample size, there are other limitations with correlation linked to the problem of scale. In basic terms, correlation measures similarities in the direction of change and ignores dissimilarities in the magnitude of change between two variables and consequently can provide misleading measures of market similarity. In order to explore the data further, cluster analysis has been used to assess whether we can identify useful groupings in the data. Furthermore, we can see whether the clusters change when currency adjustments are made. In order to minimise the possibility of applying non-existent structures to the data and to assess the stability of the outputs, a number of clustering approaches were used. They illustrated that cluster formation was sensitive to number of partitions and method specified. The results of the Ward method are displayed in Appendix 2. Essentially three clear clusters are identified, Berlin, the Iberian cities and the rest. This pattern remains when the method is also applied to currency adjusted data. It is only when we start to try to partition the data into five and six clusters that movements occur between clusters. The scatter graph illustrates visually why this approach is so sensitive to minor changes in method and minor changes in the data. Imposing further partitions seems to create 'artificial' categories in this context.

Conclusion

It was stated initially that for the fixing of exchange rates to have significant implications for property investment decisions, two conditions needed to be satisfied. Investors should display concern about currency volatility and currency volatility should have significant implications for performance. With regard to the first condition, the evidence suggests that many investors perceive exchange rate risk as a secondary factor in international investment decisions. This can be partially explained by diversity in investment circumstances. The exposure of the property portfolio to currency risk should be seen in the context of diversity of investment horizons and portfolio compositions. In terms of the second condition, the data suggests that the effects of exchange rate vary temporally and geographically. The evidence presented suggests that SCA property investors in 'southern' countries are now protected from short term jump risk associated with flexible peg currency arrangements and medium/long-term currency volatility. Historically this has produced decreases in returns and increases in volatility. However, these effects are not of the same magnitude found between markets with a floating currency. In contrast, for northern 'bloc' cities, the effects are minimal. The historic ability of these economies to maintain a currency closely aligned to the DM has meant that exchange rate fluctuations have been minor and the resultant implications for property risk and return to non-domestic SCA investors have been negligible. Moreover, although previous research would suggest that the effect of currency volatility is to decrease market correlation, this cannot be observed within the SCA. Where they exist, observed differences in market correlations are statistically insignificant.

It should be noted that using historic relationships to assess impacts in the context of EMU provides a clear case of the Lucas critique. Since EMU has fundamentally altered the economic conditions affecting property market performance, future relationships between individual markets will alter. As a result, historic patterns may tell us very little about future performance. In the case of northern 'bloc' countries, since there has been an effective fixed rate currency zone, the introduction of the Euro is unlikely to alter structural economic relationships between them. However, for the southern bloc countries, the single currency may be very significant. In the past it is apparent that the exchange rate has provided an adjustment mechanism to both positive and negative economic shocks. The loss of control of monetary and exchange rate policy has meant that the process of adjustment to asymmetric shocks will fall on fiscal policy and factor inputs. Since the former has become increasingly constrained under the Stability Pact, two remaining adjustment mechanisms are labour and land markets. The well-documented rigidities of labour markets may mean that a greater

proportion of the adjustment 'burden' is shifted to property during asymmetric economic shocks.

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