

Real Estate Yields: A Global Analysis

INTRODUCTION

The post-crisis economic landscape has been very kind to real estate, particularly prime property in 'gateway' cities. Fiscal and monetary stimulus has produced some economic growth but no self-sustaining momentum has developed. Deleveraging in the OECD has been a headwind, as has crisis in the euro zone. Nevertheless, there has been sufficient economic activity to support rental values in the key property investment markets whilst super-loose monetary policy has driven the 'search for yield'.

The so called 'new normal' of low growth, low inflation and low interest rates is very good for high grade real estate. Quantitative Easing (QE) is designed to boost the value of risky financial assets and feeds directly into activity and remuneration in the large financially orientated cities such as Hong Kong, London and New York. It has other effects as well. Countries in which central banks have expanded their balance sheets aggressively, the US, UK and Japan, have seen the value of their currencies fall. Their property markets, re-priced internationally if not domestically, have attracted strong inward capital flows. Emerging markets have seen hot money inflow which has stimulated the acquisition of local real estate assets due to excess liquidity and overseas real estate assets due to currency appreciation. Finally, even the most defensively minded investors cannot tolerate *de minimis* returns from cash for long, particularly given the potential link between QE and inflation, so family offices and sovereign wealth funds have been targeting real estate as well.

CHART 1: COMPOSITE GLOBAL OFFICE YIELD

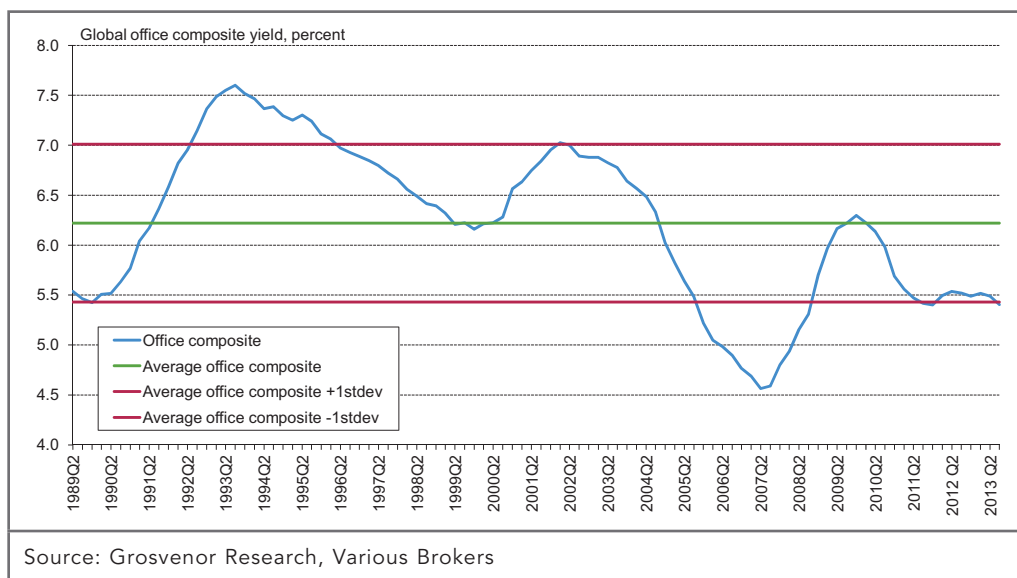
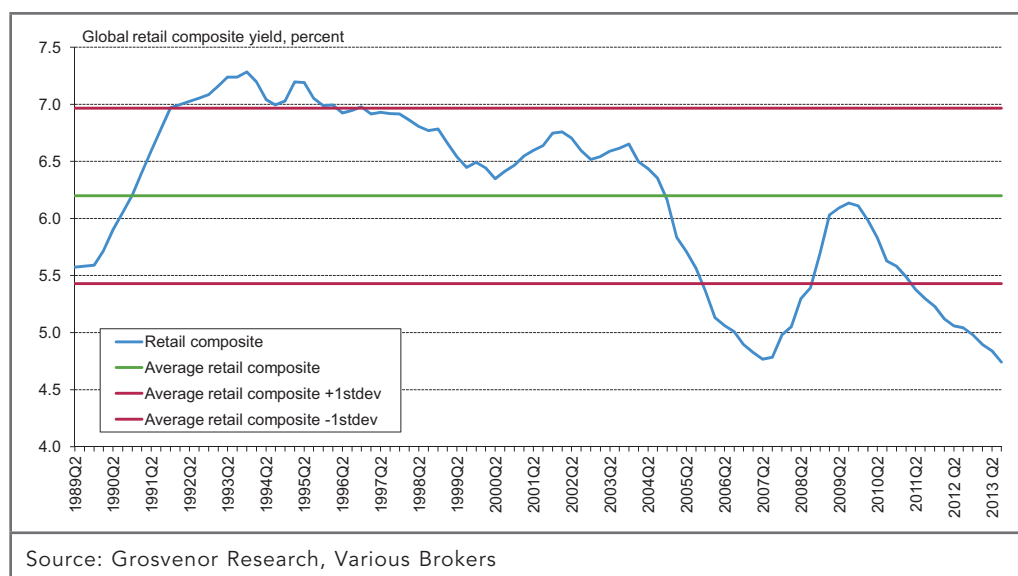


CHART 2: COMPOSITE GLOBAL RETAIL YIELD



Charts 1 and 2ⁱ show how prime yields have compressed since the middle of 2009, the point at which it became clear that governments had stabilised the international banking system. Both series are global composites: averages of prime initial yields in the world's main investment markets. Chart 1 indicates that office yields have fallen by around 90 basis points since Q3 2009 and are now stable at around 5.4%. Average retail yields have fallen by 135 basis points to 4.75% and appear likely to fall further. Remarkably, this yield compression has taken place in the near absence of upward rental pressure. Moreover, even in the depths of the 'Great Financial Crisis' the yields barely moved above their long term averages. All of this suggests that policy, particularly monetary policy, has been a substantive driver of yield compression over the last five years. So, as the US Federal Reserve becomes the first central bank to wind back QE, albeit as cautiously as can be, it is sensible to consider the potential impact of monetary normalisation on real estate yieldsⁱⁱ.

Are the global composite yield series, drawn as they are from the most liquid markets in the world's leading 'gateway cities', representative of broader real estate markets? It is worth considering this question before we turn to the econometric evidence. Charts 3 to 6 compare the Grosvenor global composite prime yield series with average yields in the US and the UK. In the US, the recent inward yield shift in office sector is much greater than that seen globally current yield levels are about the same. US office markets are hot. Whilst US retail yields have the same broad profile as the global composite the level of yield compression has been much less and the current level of yields is much higher. This suggests that US retail offers value.

In the UK, the global composites are compared to the IPD equivalent and initial yield series. The global office composite has a very similar history as both the initial and equivalent office yields in the UK. The yield compression in the prime retail composite seems to have been greater than in the broader UK retail market though the broad pattern of movement is the same. Again, the retail sector in the UK seems to offer value.

ⁱ The composite yield series are un-weighted averages of prime yields in the most liquid and densely traded cities around the world. They are intended to be indicative and are not used in the statistical analysis.

ⁱⁱ The so-called 'taper tantrums' in which emerging markets have suffered the outflow of hot money and abrupt currency depreciation, show that relatively small changes in US monetary policy can have a large impact on bond markets outside the OECD.

CHART 3: GLOBAL COMPOSITE OFFICE YIELD VS US OFFICE YIELD

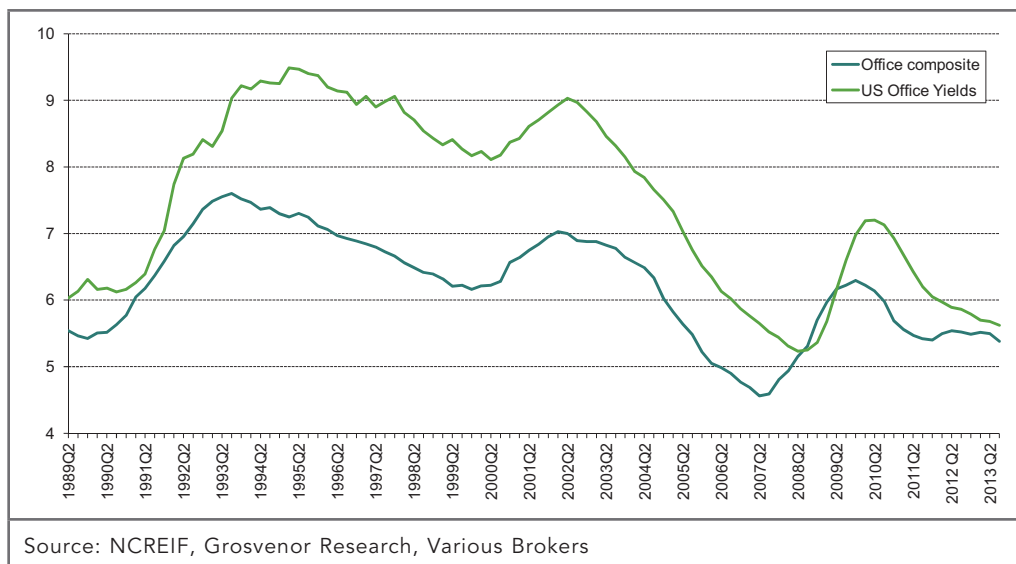


CHART 4: GLOBAL COMPOSITE RETAIL YIELD VS US RETAIL YIELD

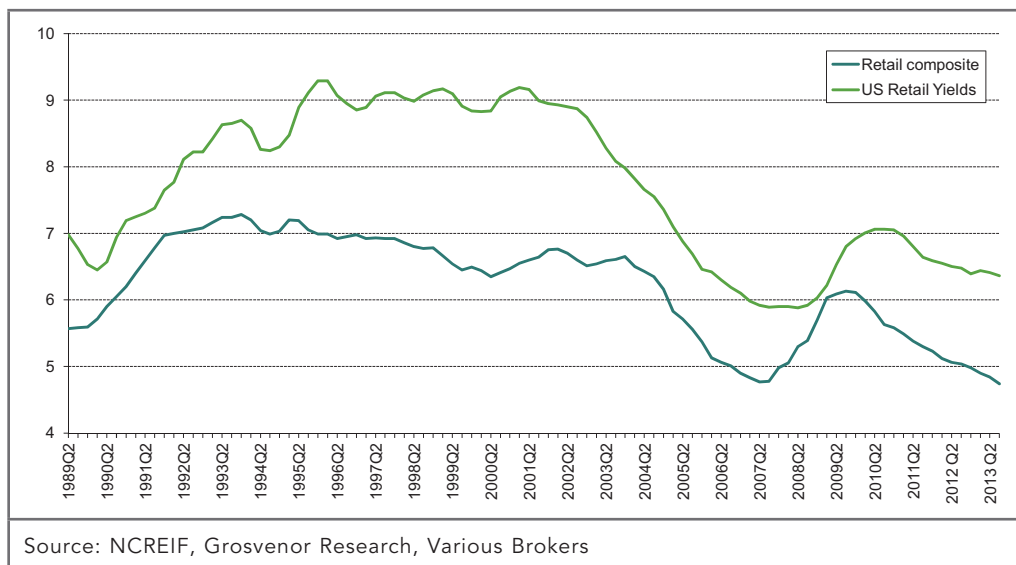


CHART 5: GLOBAL RETAIL COMPOSITE VS UK INITIAL AND EQUIVALENT

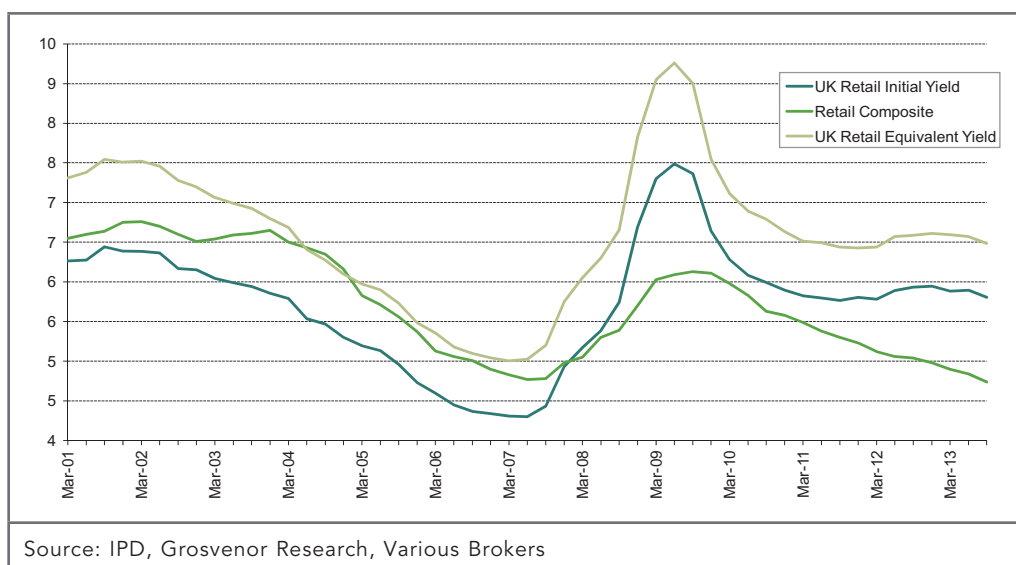
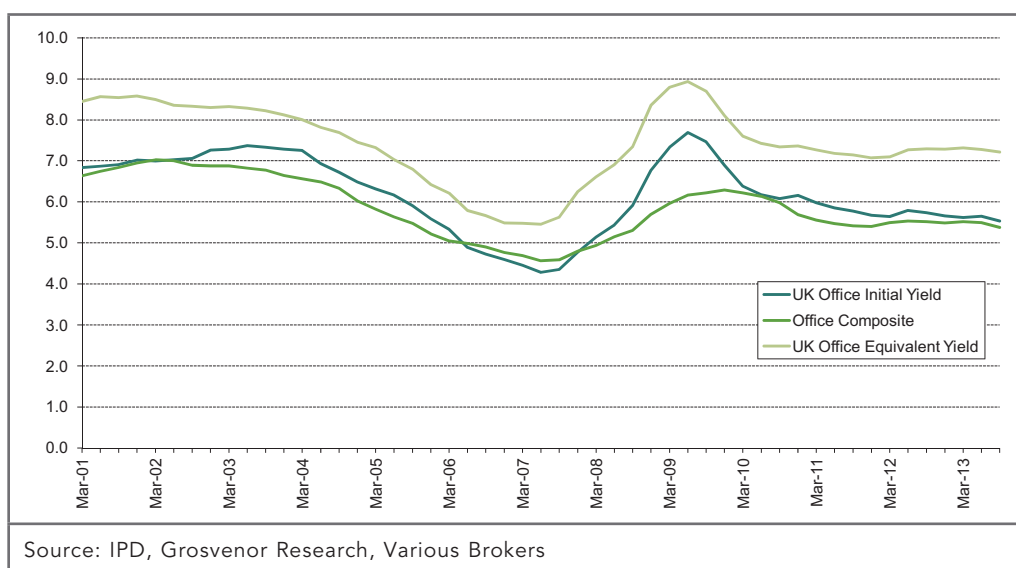


CHART 6: GLOBAL OFFICE COMPOSITE VS UK INITIAL AND EQUIVALENT



There are two points to be drawn from this analysis. First we should be cautious about suggesting that yields are too low in all parts of the real estate market. Clearly real estate markets have responded to monetary policyⁱⁱⁱ, because all have shown yield compression at a time of weak or not existent rental value growth. However, in both the US and the UK average retail yields are much less close to their floors than their prime equivalents, so further yield compression is entirely possible. Office yields, even the broader market series, are close to the floor of their trading ranges. Here further value growth will only be due to rental uplift the prospects for which are improving due to declining vacancy rates. The second point to note is the degree of correlation in global real estate markets, especially since 2001. The date is significant. The global economy was struggling in the wake of the tech crash when 9 /11 happened. The Fed, and the other OECD central banks adopted a near zero interest rate policy. It was an early intimation of how aggressive monetary policy was to become in the era of globalisation.

At the turn of 2014 it seems that the global economy is at last beginning to shake off the effects of the GFC. Global growth is picking up particularly in the US. Now that the threat of a euro zone break up is almost over, monetary policy is driving a cyclical recovery in consumer spending and investment. Moreover, central banks, at least those in the US, UK and Japan are prioritising growth in employment as well as price stability. Activist central banking

ⁱⁱⁱ As they did in the period 2003 to 2007 following an earlier round of monetary stimulus introduced in the wake of the dotcom crash.

alongside falling inflation means that interest rates are unlikely to rise materially for the next two, possibly three, years. However, unless the OECD is entering secular stagnation, like post crisis Japan, super-benign real estate conditions will not last for ever: QE will be wound back and interest rates will start to rise. Real estate bought now, with a view to a 5 to 7 year hold period will be affected by rising interest rates. This paper attempts to assess the extent changing monetary conditions will affect real estate values beyond the medium term and is structured as follows:

- Section 1: is the introduction above;
- Section 2: presents recent Grosvenor research on the relationship between interest rates and property yields;
- Section 3: concludes.

ECONOMETRIC EVIDENCE

We adopt an informal framework for our analysis of the relationship between interest rates and yields. Real estate yields are set by the relationship between investors' cost of capital (ICC) and the prospective returns from owning real estate (RER). If the ICC falls relative to the RER then yields will fall (prices rise). If the RER falls relative to the ICC the yields rise (prices fall). Real estate is not traded on an efficient centralised bourse, but in a jumble of technically and 'informationally' inefficient sub-markets, so prices and valuations adjust slowly in respect to changes in capital market or real estate market conditions. In other words there are lags between movements in economic variables and movements in yields.

ICC is determined in the capital markets by the yield on risk free securities^{iv} plus the appropriate risk premium. The market generally regards the 10 year government bond as the appropriate risk free benchmark for real estate, though shorter (or longer) duration instruments, such as five years swap rates, are also relevant. The risk premium is the return over gilts that investors require to compensate for such factors as illiquidity, risk of tenant default and risk of unexpected depreciation. Expected inflation and a premium for unexpected price rises is contained within the bond yield. To the extent that investors believe that real estate preserves the real value of capital, the risk premium on real estate might shrink a little in times of high inflation or excessive monetary stimulus. Real estate cash flows are relatively secure due to the nature of lease contracts and the long life of the physical assets, so the premium averages around 200 to 300 basis points^v. When vacancy is high relative to annual take up, as in periods of recession or following a construction boom, the risk premium can rise to offset re-letting risk.

The prospective RER is determined by the cash yield on real estate, less any amounts required to remediate expected depreciation^{vi} and the annualised rate of rental growth. Real rental growth is determined by the demand for and supply of space by businesses. Economic growth via employment growth determines the demand for space and supply is the net addition to stock by new construction (less demolition) in any period. Real rental growth is generally the lagged cyclical inverse of real estate completions but it also reflects the scarcity of land for development. As well as any cyclical or long run rise due to constrained land supply, rents normally keep pace with inflation, in the long term. Thus real estate is often favoured by investors when the possibility of inflation is high.

So if:

ICC = Risk Free Rate (RFR) + Risk Premium (RP) and,

RER = Net Yield (NY) + Rental Value Growth (RVG)

Then:

NY = RFR + RP – RVG

In general our models have gross yields as the dependent variable and the risk free rate and rental value growth as the independent variables. Notwithstanding the above, the risk premium is difficult to measure ex ante. We assume that it follows a somewhat random process with a positive average, this it is picked up in the regression models in the constant and error terms.

Our empirical analysis uses office market data because of its breadth, depth and international consistency. It is in three stages: simple cross-sectional analysis, panel regression and long term time series analysis.

^{iv} Which are broadly equivalent in duration.

^v With some variation between countries.

^{vi} In other words the amount needed to keep the building competitive in the market place.

SIMPLE CROSS-SECTIONAL ANALYSIS

CHART 7: OFFICE YIELDS – LONG RUN AVERAGE AND CYCLICAL VARIATION

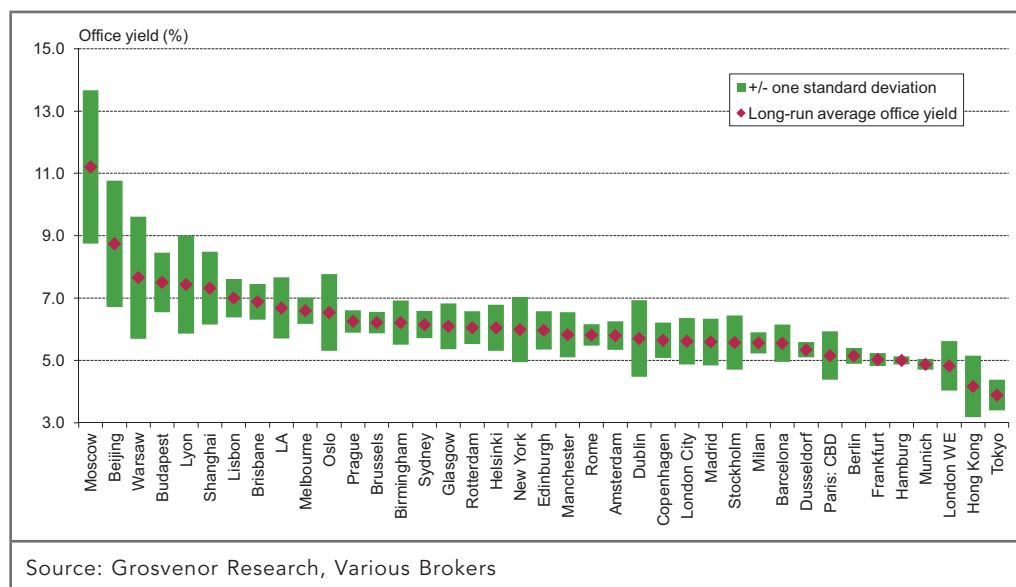


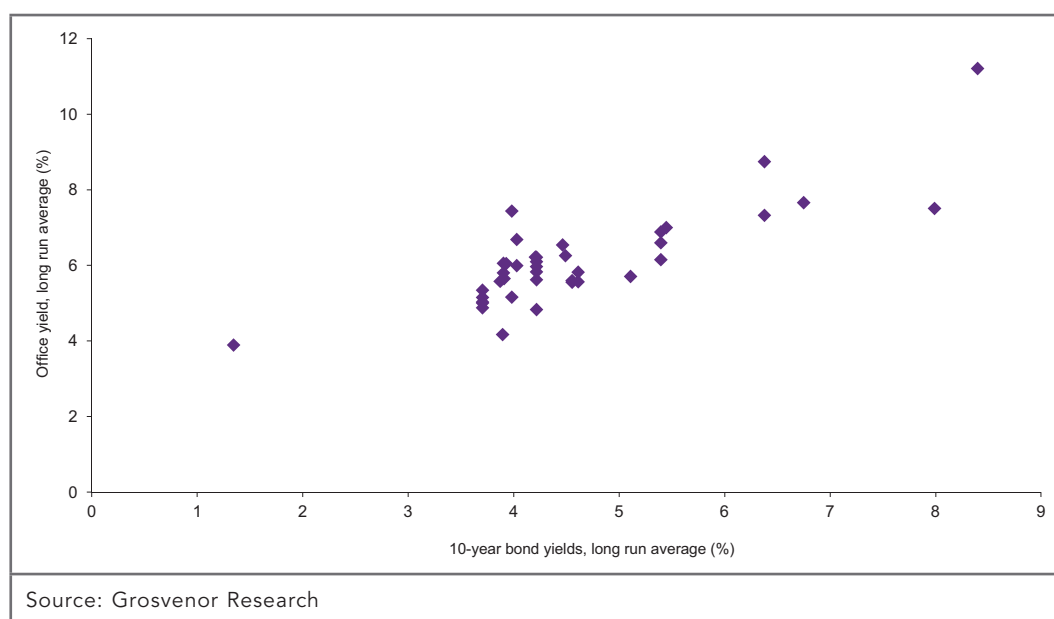
Chart 7 shows the long term average (2001 to 2013) of the prime office yield in 36 major office markets around the world and the degree of cyclical variation around this value. If yields have a stable long run relationship with bond rates with a cyclical pattern determined by real rental value growth then long run average bond rates ought to correlate with long run average yields. Chart 8 shows that this is the case and that the level of correlation is very high. The regression results are in Table 1. We tested a wide range of variables within a multiple regression framework to see if there are any other long run macroeconomic influences on the cross sectional pattern of yields: average inflation was also found to have a small but significant and positive impact. No other macro-economic variables were found to have any relationship with yields in the long run.

There are two possible explanations for the significance of inflation. First, high rates of inflation are more volatile than low rates of inflation. When inflation is unpredictable, investors will require a higher risk premium as compensation. This should be picked up in the bond rate but it may also contribute to the real estate risk premium if it leads to uncertainty about the future direction of short term interest rates or exchange rates. Second, the sample of countries in this analysis includes a number of emerging markets with low levels of transparency and weak macro-policy settings. Higher average rates of inflation may act as a proxy dummy variable for these emerging markets. In any case, the coefficient on the inflation variable is small. In the very long term bond rates are the dominant influence on prime office yields.

TABLE 1: REGRESSION RESULTS – LONG RUN AVERAGE BOND YIELDS AND PROPERTY YIELDS

Dependent variable: Office yield (% p.a., 2001-2013 average)				
Method: Least Squares				
Included observations: 39 after adjustments				
White Heteroskedasticity — Consistent Standard Errors & Covariance				
Variable	Coefficient	Std. Error	t-Stat	Probability
Constant	3.08	0.53	5.79	0.00
10-year bond yields (%p.a., 2001-2013 average)	0.62	0.13	4.85	0.00
Inflation (CPI, %p.a. 1990-2012 average)	0.04	0.01	4.77	0.00
R-squared	0.76	Mean dependent variable		6.12
Adjusted R-squared	0.75	S.D. dependent variable		1.27
S.E. of regression	0.64	Akaike info criterion		2.03
Sum squared residuals	14.84	Schwarz criterion		2.15
Log likelihood	-36.50	F-statistic		56.55
Durbin-Watson statistics	1.78	Prob (F-statistic)		0.00

CHART 8: SCATTER PLOT: AVERAGE YIELDS VS AVERAGE BOND RATES



The regression suggests that a 100 basis points increase in the long run average bond rate pushes real estate yields up by 62 basis points. Given that US bond rates have risen by 100 basis points in the last year and are forecast to rise by a further 150 over the next three years, will that generate upward pressure on yields? Not according to this analysis. Even if 10 year bond yields rise to 4.6% by 2018, as they are forecast to do, the long term average does not begin to rise until 2017, and then only gently^{vii}. So, although analysis strongly supports the idea that the key determinant of property yields is bond rates it suggests that, on current forecasts it might take up to ten years for monetary normalisation to have its full impact on real estate values.

^{vii} Bond yields have been depressed for five years and are projected to reach their equilibrium levels (i.e. approximately the trend rate of nominal GDP growth) only by 2018. Due to the 'time weighting' effect the long run average continues to fall for three years before rising slightly at the end of the period.

PANEL ANALYSIS

Panel analysis is a regression technique that permits the estimation of economic relationships on the basis of cross sectional and time series data. The benefit of the technique is that the actual time series data can be used, rather than the long run averages as in 2.1, and all of the cities can be included at the same time. The drawback is that the historical information included in the regression is only as long as the shortest time series. All of the cities have to have the same number of data points. The cross sectional analysis is based on 39 observations. The panel estimates are based on 1872 (12 years of quarterly data for 39 cities) and are, in statistical terms, much more reliable than those in the simple cross sectional analysis.

In addition to the statistical refinements we add two additional variables to the analysis. A cross sectional variable, a country corruption index score is included to indicate the level of transparency in each market^{viii}. The rate of real rental growth over the previous year is included because, as discussed above, it is thought to influence the cyclical pattern of real estate yields. In addition to real rental value growth, an independent 'time trend' variable is included. This picks up any time series influences not described by bond rates or real rental value growth. Bond rates are nominal and so capture expected inflation as well as the real interest rate.

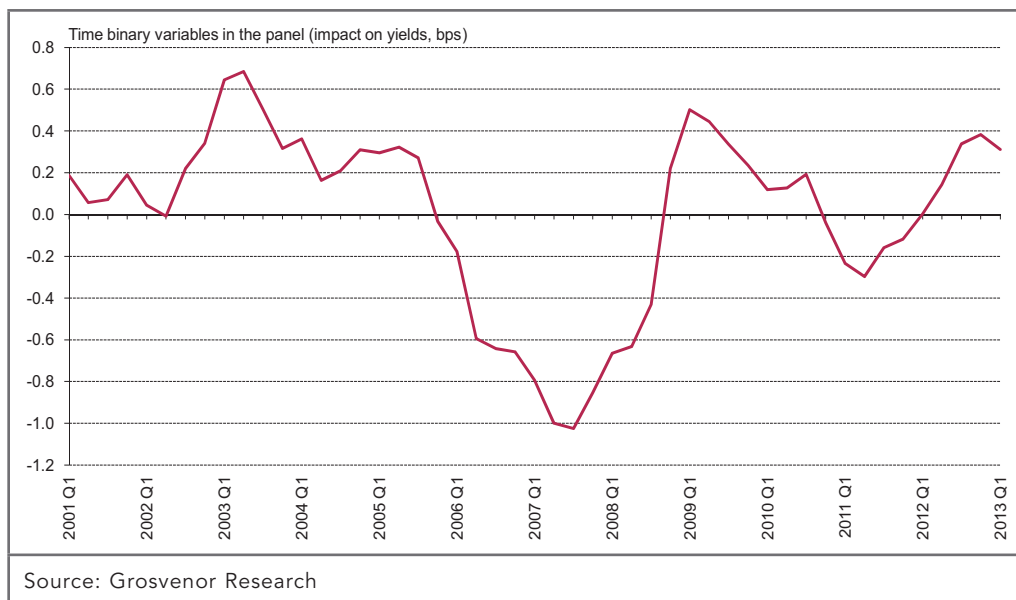
Table 2 shows the results of the analysis. All of the individual variables are significant and the overall 'fit' of the model is 53%. In non-statistical language that means 47% of the movement in yields is not explained by the model. By far and away the most important explicit variable in the model is bond rates. A rise in bond yields of 100 basis points, all other things being equal, leads to a 48 basis points rise in yields, and vice versa. The coefficient on the real rental growth variable is significant but small: a 100 basis points increase in rental growth leads to only a 0.5 basis points fall in yields. Why is this? It may be due to the fact that office rents tend to be stable or declining over time, in real terms. Investors simply do not believe that cyclical rental increases are permanent or even long lasting. Moreover, in the period of this analysis, office markets have seen relatively static nominal rental growth, albeit with two clear cycles, due to the impact of two quite serious recessions. The corruption index, in which low values mean high levels of transparency, is negatively related to yields as would be expected.

**TABLE 2: PANEL REGRESSION RESULT —
OFFICE YIELDS, BOND YIELDS, RENTAL VALUE GROWTH, CORRUPTION INDEX**

Dependent Variable: OFFYIELD Method: Panel Least Squares Sample (adjusted): 2001Q1 2013Q1 Cross-sections included: 39 Total panel (unbalanced) observations: 1850				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Real office rental growth (% p.a., y-o-y)	-0.005	0.00	-2.19	0.03
10-year bond yields (% p.a.)	0.48	0.02	26.83	0.00
Constant	5.27	0.17	31.56	0.00
Corruption index	-0.19	0.02	-12.09	0.00
Period fixed (dummy variables)				
R-squared	0.53	Mean dependent variable		6.04
Adjusted R-squared	0.52	S.D. dependent variable		1.44
S.E. of regression	1.00	Akaike info criterion		2.86
Sum squared resid	1,788.16	Schwarz criterion		3.02
Log likelihood	-2,593.59	F-statistic		40.39
Durbin-Watson stat	0.09	Prob (F-statistic)		0.00

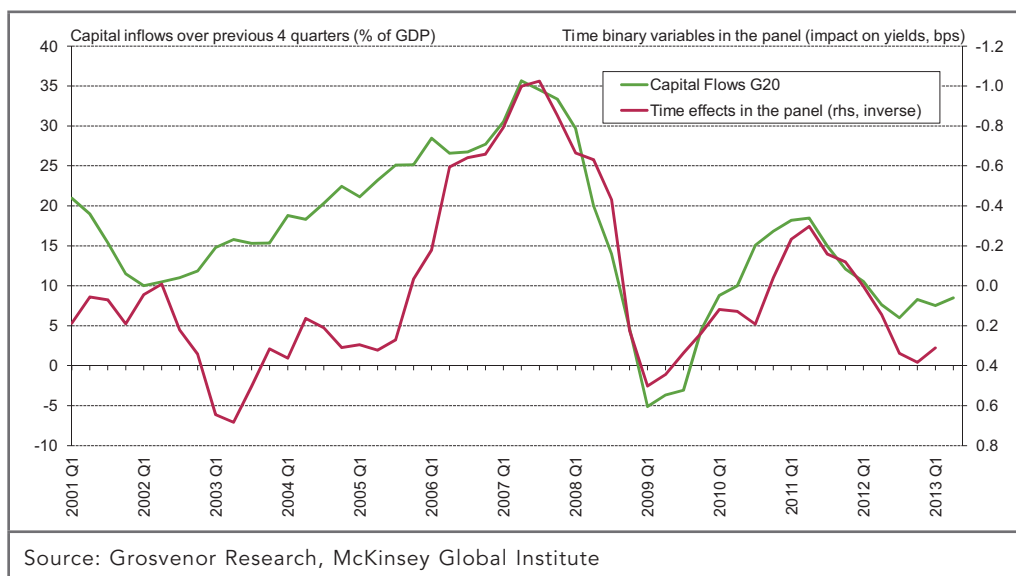
^{viii} From Transparency International.

CHART 9: PANEL REGRESSION – TIME EFFECTS DUMMY VARIABLES



One of the most interesting, if statistically arcane, outputs of the panel regression are the coefficients on the time effects variables (Chart 9). The pattern is clearly not random so it has economic meaning, but that does not mean it is easily correlated with economic data for the purpose of forecasting. The best relationship we can find is with G20 cross border capital flows (Chart 10). There is a very strong (-0.68) negative correlation. As global cross border capital flows increase, yields fall, and vice versa. The problem from an analytical perspective, is that global cross border capital flows are themselves driven by a complex mix of credit conditions, economic growth and sentiment. As McKinsey^{ix} has recently noted, global capital flows have dropped substantially in the wake of the euro zone crisis despite the fact that global growth has been positive. Chart 11 shows the relationship between G20 capital flows and world GDP growth. The contemporaneous correlation is strong (0.75) but the chart also suggests that capital flows are the cumulative product of several periods of GDP growth presumably because confidence takes time to build and deals take time to arrange. Growth in global capital flows is nowhere near as high as in the pre-crisis period, as sentiment has not fully recovered. Chart 12 shows the relationship between capital flows and global broad money growth. Broad money growth seems to lag G20 capital flows.

CHART 10: RELATIONSHIP BETWEEN TIME EFFECTS AND G20 CAPITAL FLOWS



^{ix} Financial Globalisation: Repeat or Reset, McKinsey Global Institute, June 2013.

CHART 11: RELATIONSHIP BETWEEN WORLD GDP GROWTH AND G20 CAPITAL FLOWS

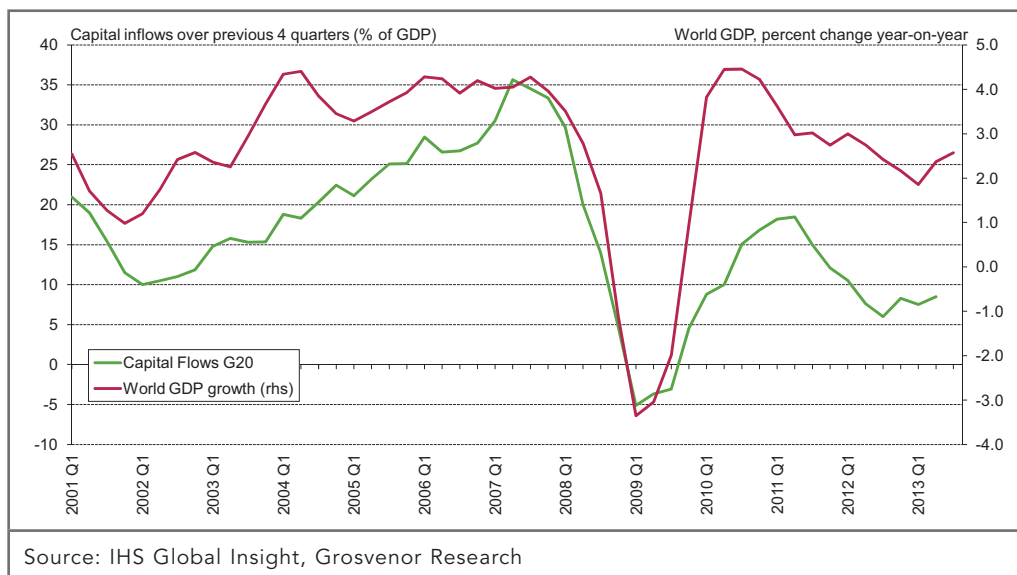
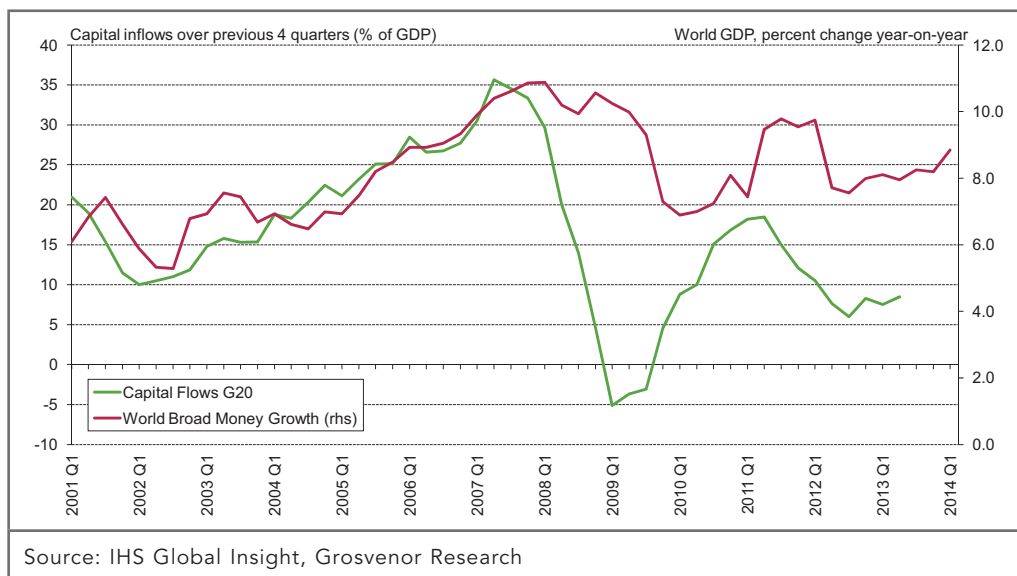


CHART 12: RELATIONSHIP BETWEEN WORLD GDP GROWTH AND G20 CAPITAL FLOWS



Our interpretation is that the time effects variable represents the level of economic confidence which is a time varying function of the number of preceding years of continuous economic growth and credit conditions including in the shadow banking sector. That capital flows have not returned to the previous levels probably reflects the reduction in gearing in the banking sector due to increased regulation and the negative impact on sentiment from the Eurozone crisis.

The conclusion from this part of the analysis is that office yields are strongly related to bond rates which have trended down since 2000, weakly related to property market fundamentals and strongly related to economic sentiment which is in turn, a lagged and cumulative effect of economic growth. The good news for real estate is that the forecast 250 basis points increase in bond rates need not necessarily lead to a rise in yields if economic growth is robust. The bad news is that the sentiment effect, whilst ultimately GDP driven, is volatile and subject to a time varying lag.

TIME SERIES ANALYSIS

Whilst the analysis of the 39 cities in the panel analysis provides breadth of market type and circumstance the robustness of the estimates is somewhat compromised by the relatively short time period of the data. In order to add 'length' as well as 'breadth' to our analysis, which allows a closer look at the impact of rental pressure on yields, we examine five key markets over a much longer period. The sector is again offices and the markets are: London, Paris, Hong Kong, New York and Los Angeles. In London, New York and Los Angeles we have data back to the early 1980s. The Hong Kong series stretches back to the mid-1990s and the Paris data starts in 2000.

In the longer term, in each market, a cointegrated vector of bond yields and rental growth accounts for a relatively high level of the time series variation in yields. Charts 12 to 17 show actual and predicted model values and the residuals (the portion of the yield not explained by the model). Formally the goodness of fit is 59% for the London model, 75% for Paris, 65% for Hong Kong, 89% for New York and 81% for Los Angeles. Some markets react more quickly to changes in bond rates than others. The Hong Kong market seems to react almost simultaneously to US bond rate changes. London takes 6 months to adjust, Paris one year and the US markets can take up to three years to re-price after bond rate change. The relationship between US yields, after adjusting for lags is almost one for one: a 100 basis points increase or decrease in bond rates leads to a change in cap rates of the same magnitude.

CHART 13: LONG RUN OFFICE MODEL – LONDON WEST END

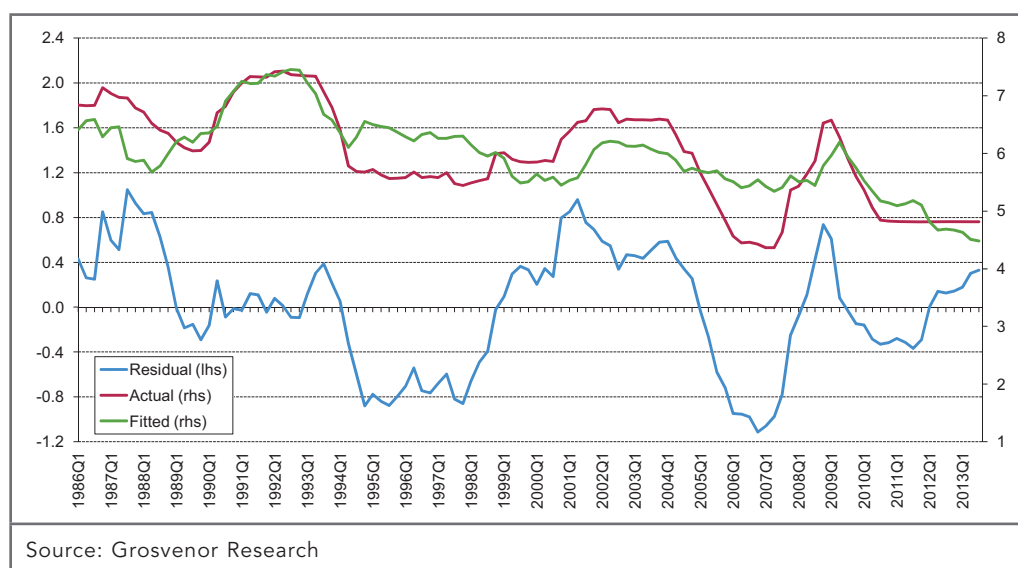


CHART 14: LONG RUN OFFICE MODEL – PARIS

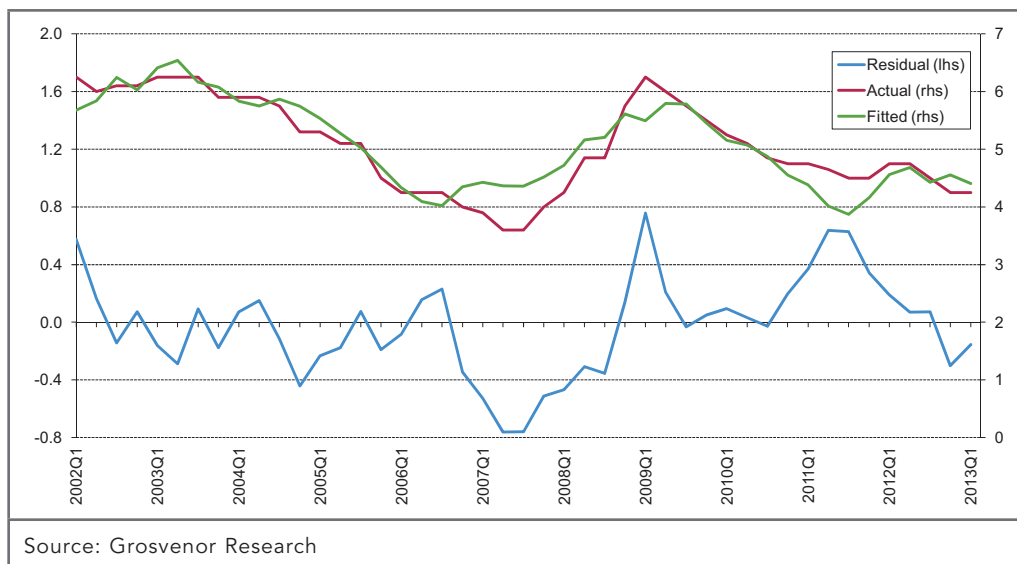


CHART 15: LONG RUN OFFICE MODEL – HONG KONG

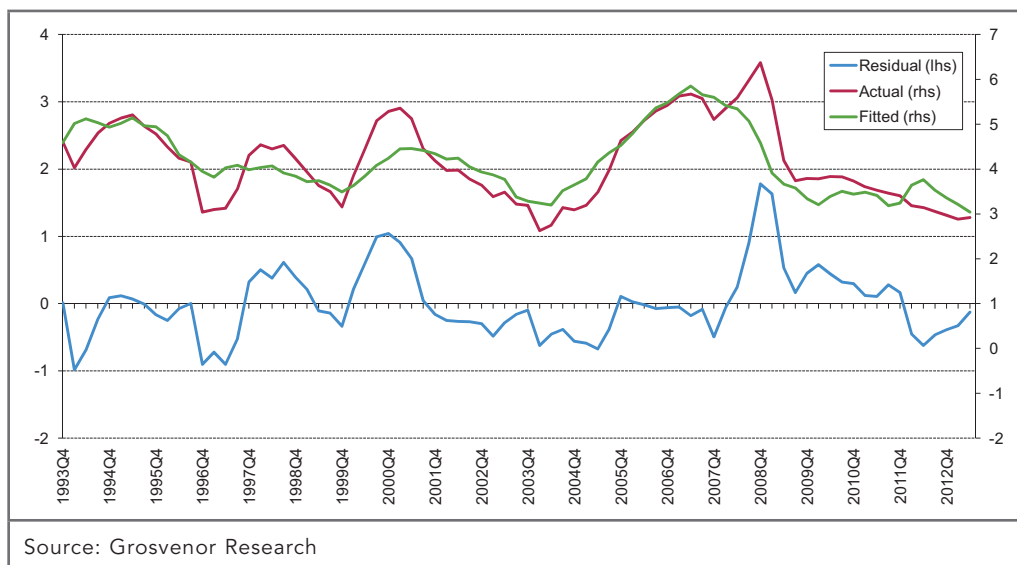


CHART 16: LONG RUN OFFICE MODEL – NEW YORK

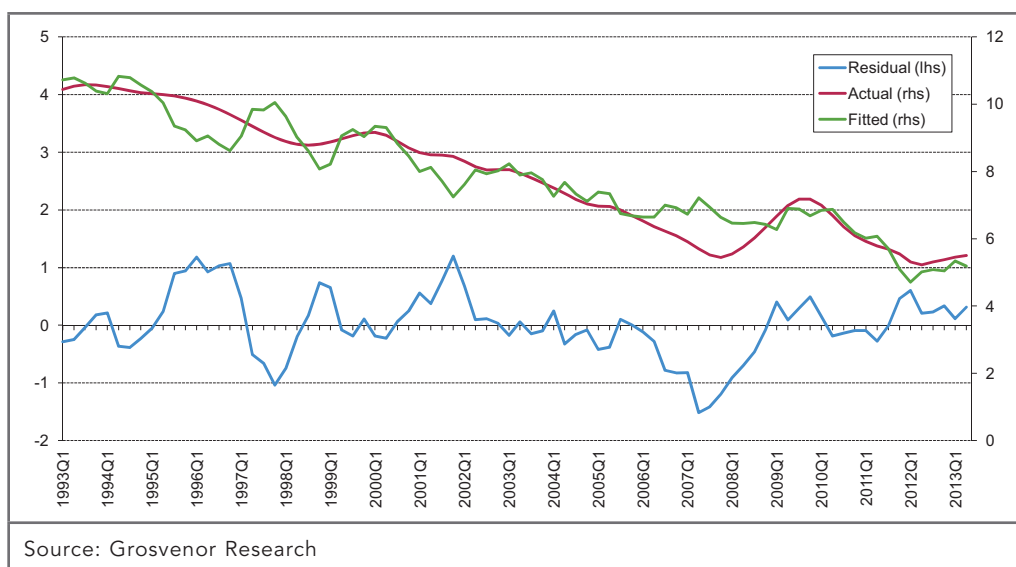
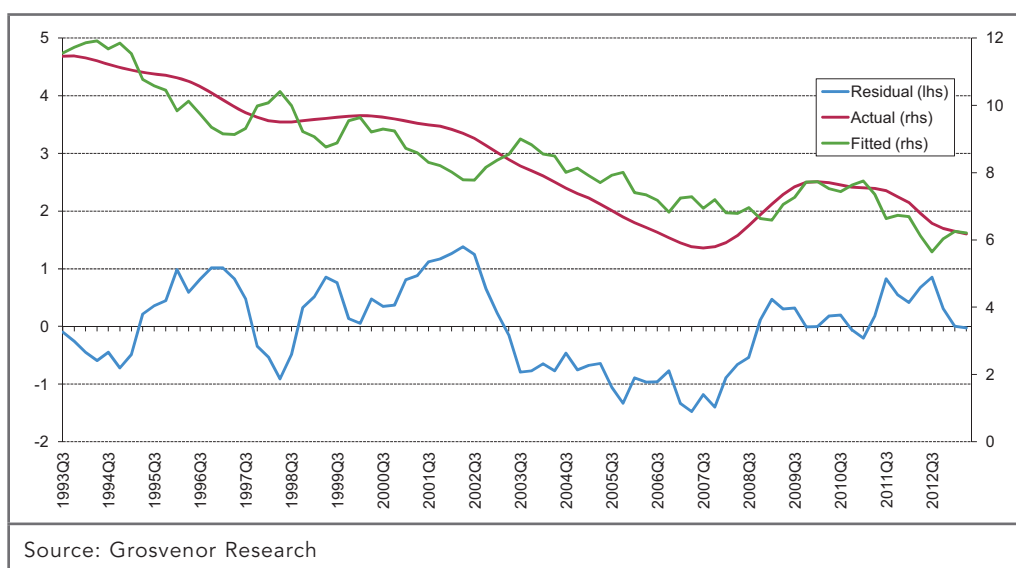


CHART 17: LONG RUN OFFICE MODEL – LOS ANGELES



As in the panel analysis the impact of real rental value growth is much less than the impact of bond rates. Office rents, as we have noted, in large urban centres tend to decline in real terms over time suggesting that the long run office supply curve is flat or possibly even downward sloping. Office centres have the ability to add space vertically without raising the average real cost of construction. Innovation in construction technology possibly even reduces it. Real and nominal rental growth in the major office centres is only ever cyclical, apart from in one or two cases. Under these circumstances it is only natural that yields follow bond rates in the long term.

Chart 18 shows five year forecasts of 10 year bond rates. If we apply these and the Grosvenor rental value growth forecasts to the yield models we can estimate the implied change in yields over the next five years. These are in Chart 19. According to this analysis, office yields are set to rise by between 70 basis points and 130 basis points over the next five year.

CHART 18: LONG TERM GOVERNMENT BOND YIELDS

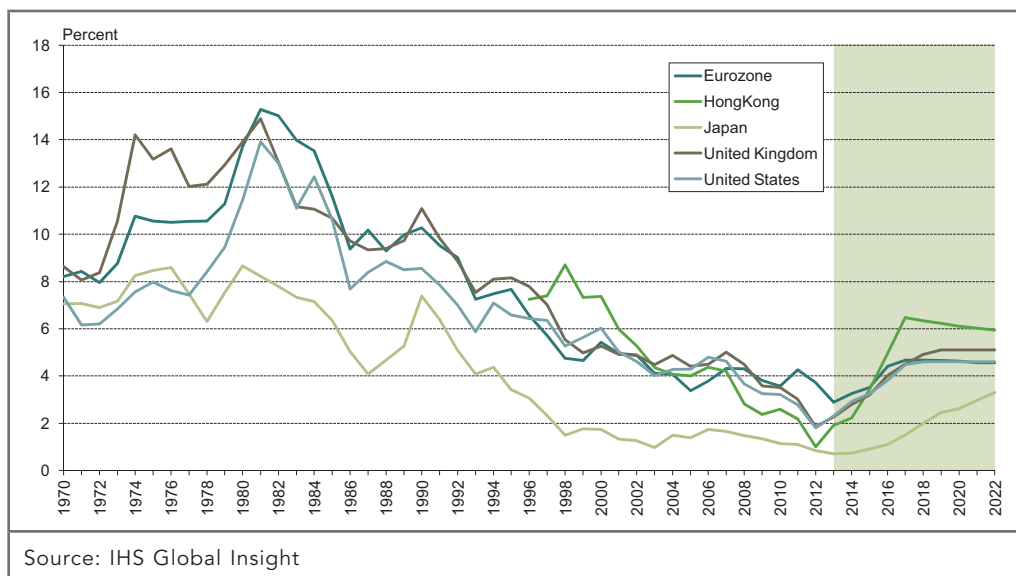
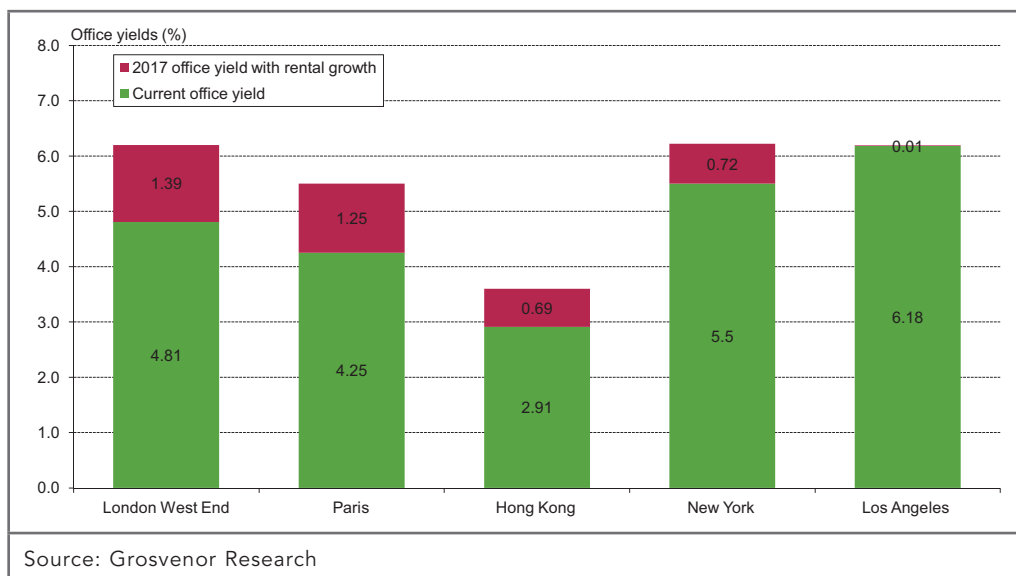


CHART 19: FIVE YEAR FORECAST YIELDS



CONCLUSION AND IMPLICATIONS

All three econometric approaches point to a strong relationship between long term bond rates and property yields. The models in 2.3 are robust, based on long time series and have high 'goodness of fit statistics' and provide the best basis for making forecasts. Thus, as the OECD returns to economic normality, QE is unwound and bond rates increase we should expect a rise in property yields of between 70 and 150 basis points. If rents are stable, this equates to a fall in values of between 10% and 20%.

These capital value falls will not occur overnight. First, bond rates will increase only slowly over the next five years and, in most markets interest rates affect property markets only with a lag. The lag appears to be shortest in Hong Kong and longest in some US markets. If economic growth generates rental pressure without stimulating a supply side response it is even possible that the fall in capital values will only manifest itself as a medium term 'drag' on capital value growth. This may be over-optimistic though, our analysis suggests that bond rates dominate rental value growth in property price formation.

Does an analysis conducted on office market data have implications for retail, industrial and residential sectors? Yes it does, the evidence suggest that real estate yields are highly correlated across all sectors. It will take longer for rising bond rates to affect sectors such as retail where real rental growth is possible and assets are subject to a wider range of often highly localised factors. Ultimately, real estate capital values move together in all sectors.

Is it possible that yields move asymmetrically with regard to bond rates: that is, they move down slowly when bond rates decline, but up sharply when they rise? We are at the end of a 30 years bull run in the bond market with the last seven years turbo charged by QE. Our analysis is based on a period of downward trending bond rates and it is entirely possible that yields will move out more quickly than they moved in, although we have no firm evidence on this.

If growth resumed more strongly than we expect, could positive sentiment suppress the impact of rising bond rates, as implied by the panel analysis presented in 2.3? Certainly, a period of strong growth and/or robust credit expansion as in the period 2003 to 2007 would probably remove any threat at all of rising capitalisation rates. The impact would be magnified if central banks focussed on employment creation, rather than only price stability, as they appear to be doing and were ultra-cautious in their wind back of QE. However, under these circumstance we would likely see inflation pressure emerging toward the end of the period, say 2017 to 2018, and a much stronger spike in bond rates than at that time than is currently expected.

Are there any broader issues that may accentuate the forecast rise in yields or dampen it? Yes, China's reform programme is a key factor, the results of which cannot be accurately predicted. The shift of production to China over the last fifteen years as well as its undervalued currency has delivered cheap goods to OECD markets which have helped suppress inflation. This has helped bond rates to trend down. China no longer has an undervalued currency and is shifting its growth model towards consumption. This implies a reduced flow of cheap goods and some increase in global inflationary pressure in the medium term. This should not be overstated, low value add production is already shifting to countries such as Vietnam and Bangladesh to the inflation suppressing impact of globalisation should continue. Of greater moment perhaps, is the possibility that China will open up its capital account over the next five years. There is an estimated \$4.5trn of savings in China which would seep, if not flood, into western bond and asset markets. This will certainly suppress long term interest rates.

On balance, there might be a slight sense that the balance of risk is on the upside, that global forces will put downward pressure on property yields even as bond rates are rising but it would be unwise to place too much emphasis on this fact. Within Grosvenor Fund Management our emphasis will be in locating assets in which our creativity and property expertise can unlock rental uplift which is good for values, even in a period of rising interest rates.

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