AEW RESEARCH

AEW

FACTOR INVESTING IN EUROPEAN OFFICES

SMART BETA COMPARED TO TRADITIONAL STYLES

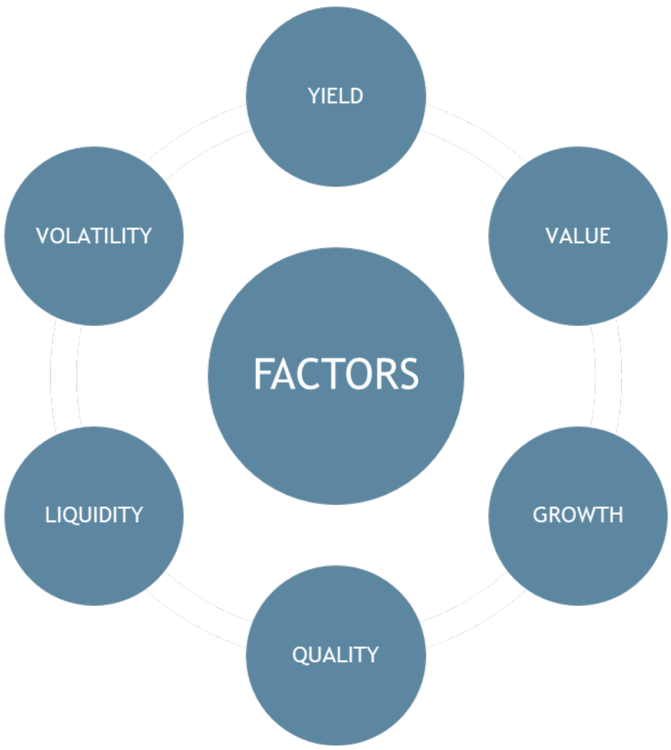
Q2 2019

TABLE OF CONTENTS

HOW CAN INVESTORS USE FACTOR INVESTING IN EUROPEAN OFFICES?

Factor investing is an investment approach successfully used in fixed income and equity investment management. It is based on academic work by Fama & French (1993) among many others. The approach identifies multiple factors that explain excess returns compared to the market portfolio. Initially these factors focused on small caps, value and growth stocks, but then expanded in scope. By identifying the most relevant underlying factors, investors can benefit from market inefficiencies in a rules-based and transparent way. If you consistently select stocks, bonds or sectors whose performance have been driven most by factors delivering excess return, you should beat the market benchmark in the long term. These so-called smart beta strategies use factors such as volatility, liquidity, quality, value, yield and growth. In this report, we apply this factor investing approach to close to 40 European office markets for the first time. We will also compare factor investing to the traditional core and value add investment styles.

FACTORS USED IN FACTOR INVESTING FRAMEWORK



Source: AEW

SUMMARY: GROWTH OFFERS BEST EXCESS RETURNS THROUGH THE CYCLE

- In this report, we apply our new factor investing approach to close to 40 European office markets for the first time. This framework quantifies factors such as Volatility, Liquidity, Quality, Value, Yield and Growth. A comparison of our factor investing results to the traditional "core" and "value-add" investment styles is also provided.

- Our three steps factor investing framework (1) defines the six most relevant conceptual factors; (2) selects the most appropriate available data series to represent each factor and identifies each market's exposure to the same factors; and (3) creates a historical total return series based on the top markets per factor for each quarter.

- Our key results for both risk and return across our six different factor office portfolios are as follows:

  - Growth and Value outperformed the Universe for the three periods (2003-07, 2008-13 and 2014-18) considered;
  - Growth was well ahead of Value in all three periods;
  - Quality and Yield performed well in the earlier upcycle of 2003-07 also;
  - Low Volatility performed particularly well with low risk and good returns during the down cycle in 2008-13;
  - Yield performance suffered especially during the GFC period, compared to the other factor portfolios.

- To put our new factor-based investing results into the context of our traditional core and value-add investment styles, we selected two factors that in our view best fit with these styles. In our view, Quality and Liquidity are the best factors for "core" style investing while Growth and Value fit best with the traditional "value-add" style.

- Surprisingly, we find a consistently higher risk for "core" than "value-add" for each of the three distinct periods. Only in the 2008-13 downturn period did the core office market portfolio show better returns than "value-add".

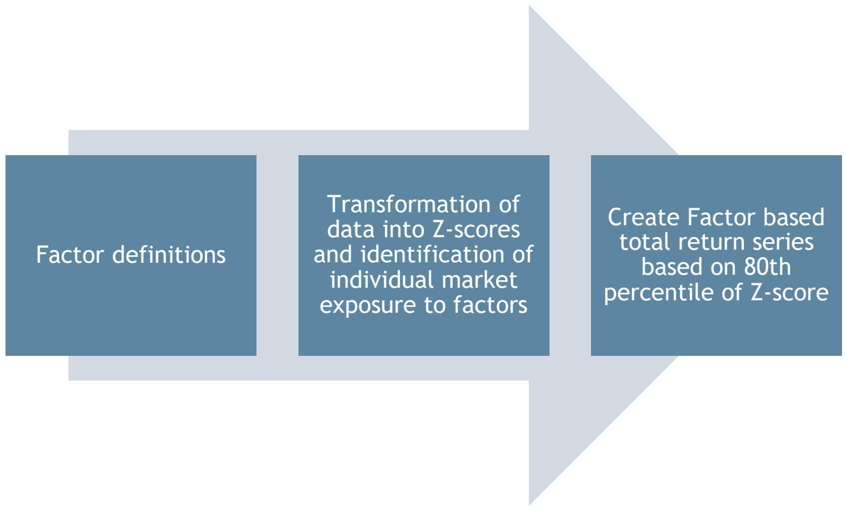
GROWTH & VALUE SHOWED CONSISTENTLY BETTER RETURNS RELATIVE TO UNIVERSE AND OTHER FACTORS

Sources: AEW, CBRE, JLL, Oxford Economics & RCA

SECTION 1: METHODOLOGY – OUR FACTOR INVESTING FRAMEWORK

THREE STEP FRAMEWORK TO FACTOR INVESTING

- To formulate our rules-based Factor investing framework we take three steps.
- First, we define the six most relevant conceptual factors based on our review of academic and industry literature.
- Secondly, we select the most appropriate available data series to represent each of these six factors, normalise these based on their Z-scores and identify each market's exposure to these factors.
- Thirdly, we create the historical total return series for each quarter over the last 15 years using the 80th percentile of our market universe (top 8 of 40 markets).



Source: AEW

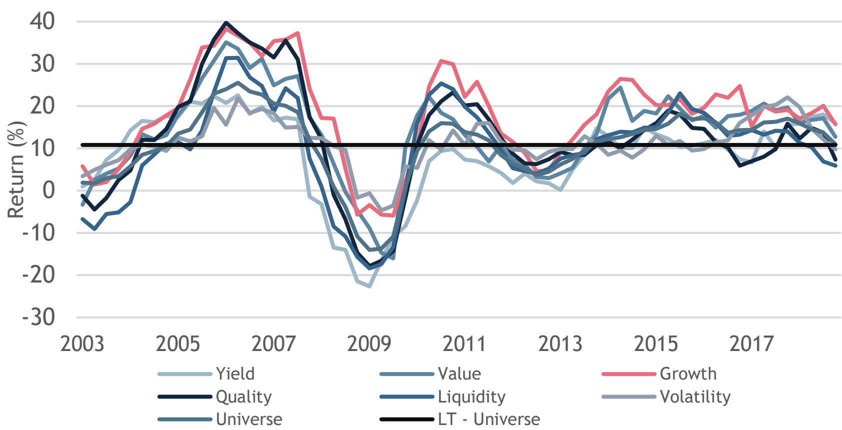
SELECTING DATA SERIES TO FIT BEST WITH EACH FACTOR

- For each of our six factors, we select data series that best fit the conceptual framework of the six factors.
- Depending on the factor concept, we have selected between one and five data series to reflect the factor.
- We have tested these and also tried to avoid duplicate impacts after some initial testing.
- It is important to note that we use Prime overall market property data and explicitly assume that only long positions can be considered.

Sources: AEW, CBRE, JLL, Oxford Economics & RCA

FACTOR-RETURNS COMPARED TO UNIVERSE AND ITS LONG-TERM AVERAGE

- The historical returns (yearly total returns) for each factor is shown using the 80th percentile (top 8 markets) for each quarter.
- The trend line shows that most factors are moving broadly in line with the overall universe over time.
- We add the long term average to allow us to identify the periods across the cycles during the last 15 years.
- Since the line chart is not that straight forward to read, we can summarise our results in other ways below.

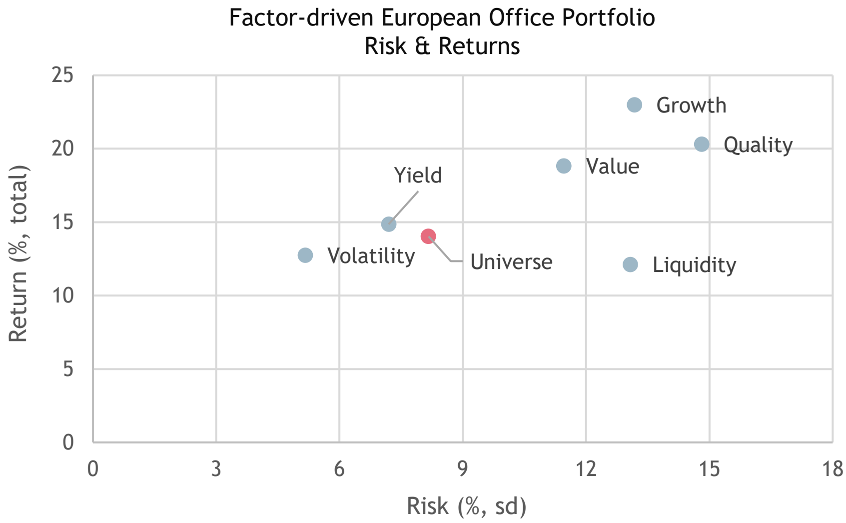


Sources: AEW, CBRE, JLL, Oxford Economics & RCA

SECTION 2: RESULTS FOR FACTOR BASED FRAMEWORK

FACTOR-DRIVEN OFFICE PORTFOLIO RISK & RETURNS FOR 2003-07: GROWTH, VALUE & QUALITY OUTPERFORM

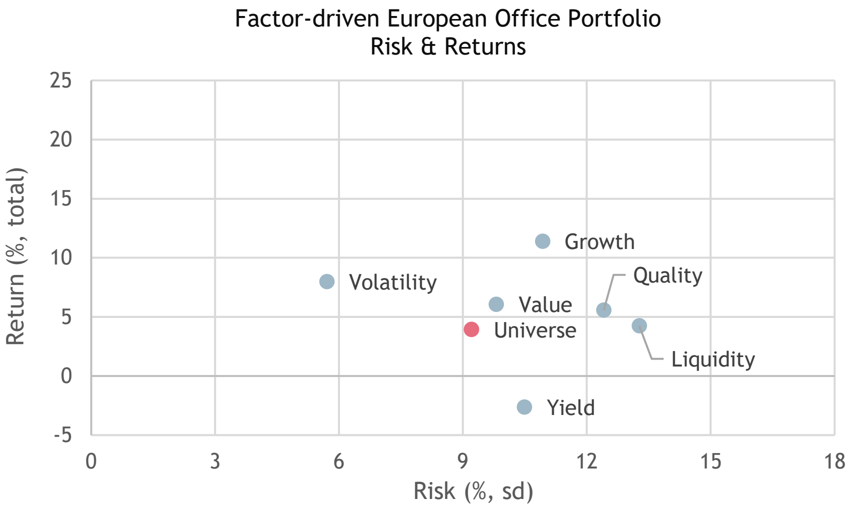
- Based on our review of historical European office universe returns, we selected three different periods to reflect the different phases in the cycle.
- For each factor, we show both returns and risks.
- In the run up to the GFC, we are seeing good relative performance for both Growth and Quality factors.
- These results seem sensible, as economic and rental growth was strong, driving returns above the long-run average.
- The Liquidity factor shows higher risk and lower returns than the Universe.



Sources: AEW, CBRE, JLL, Oxford Economics & RCA

GROWTH, VALUE & LOW VOLATILITLY OUTPERFORMED DURING THE 2008-2013 PERIOD

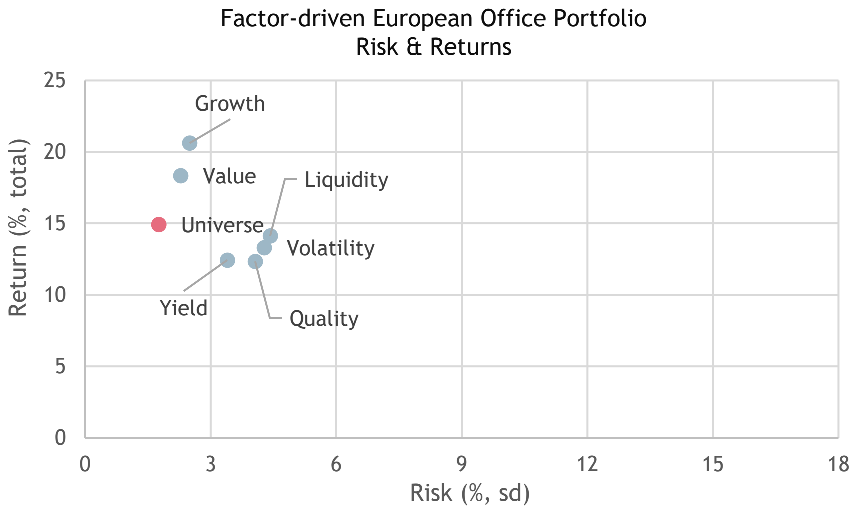
- In the 2008-13 period following the GFC, returns experienced a sharp decline in 2008-09, then a strong recovery in 2010-11 followed by a second phase of decline due to the Eurozone crisis.
- All portfolio returns suffered in this period, and were nearly half the levels of 2003-07.
- High yield markets suffered the most as many investors avoided the segment.
- Growth and Quality showed relatively strong performance over the period.
- Low Volatility outperformed the Universe in terms of risk-adjusted returns, which should serve as confirmation that this factor is minimizing risk in a downturn.



Sources: AEW, CBRE, JLL, Oxford Economics & RCA

FACTOR-DRIVEN EUROPEAN OFFICE PORTFOLIO RISK & RETURNS FOR 2014-18: GROWTH & VALUE

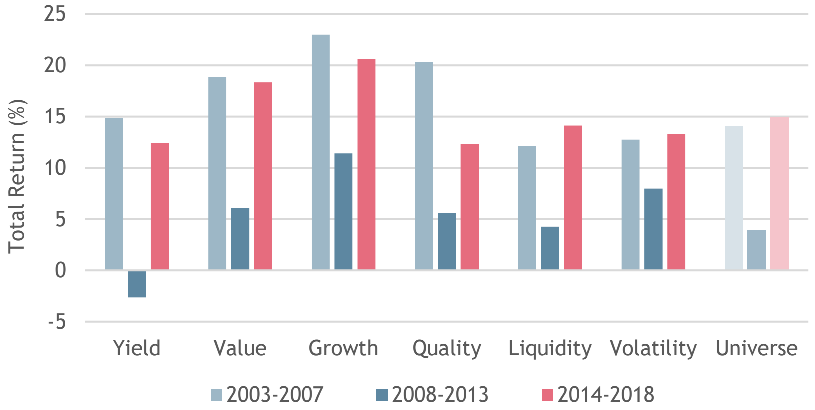
- In the last five year period, there is less dispersion between the factor portfolios, compared to the previous periods. This is also a result of a higher interconnected global real estate market with increasing cross-border capital.
- Growth and Value both showed better returns at only moderately higher risk levels than the Universe.
- All other factor-driven portfolios show lower returns and higher risks.
- When we consider the moderate economic growth and extended low interest rate environment, these results again seem reasonable.



Sources: AEW, CBRE, JLL, Oxford Economics & RCA

GROWTH & VALUE SHOWED CONSISTENTLY BETTER RETURNS RELATIVE TO UNIVERSE AND OTHER FACTORS

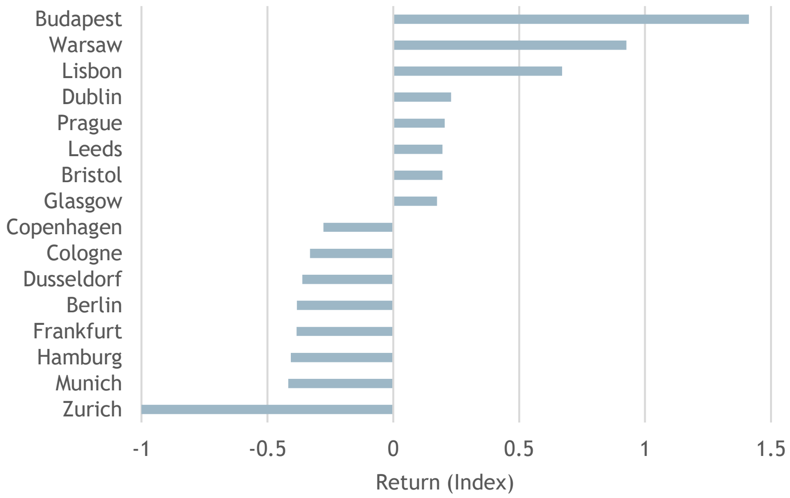
- When we combine the return results for all three periods, Growth and Value consistently outperformed the Universe.
- However, Growth is well ahead of Value in all periods.
- Quality and Yield do well in 2003-07 also, but Yield especially suffered during the GFC period.
- Low Volatility does well in the downturn, as expected.



Sources: AEW, CBRE, JLL, Oxford Economics & RCA

VALUE-DRIVEN PORTFOLIO DOMINATED BY CEE, FRINGE AND REGIONAL UK MARKETS

- Further sense checking the results can be achieved by looking at the exposure of individual office markets to certain factors.
- Office markets having strong exposure to our selected Value factors include CEE, fringe and regional UK markets over the entire 15-year period.
- On the other hand, German and Swiss markets show the weakest exposure to the Value factor.
- Given the fact that these markets have traditionally been well provided with domestic capital, this seems logical.



Sources: AEW, CBRE, JLL, Oxford Economics & RCA

LOW VOLATILITY PORTFOLIO LEAD BY FRENCH AND GERMAN REGIONAL OFFICE MARKETS

- Our Volatility factor results also seem reasonable when we consider the specific over- and underperformers.
- Dublin, London and some CEE markets have the weakest exposure to low Volatility based on the last 15 years.
- In contrast, office markets showing strong exposure to our selected Volatility factors include French, German and Austrian markets.
- Again, these market selections seem reasonable and confirm that the factor approach works.

Sources: AEW, CBRE, JLL, Oxford Economics & RCA

SECTION 3: COMPARISON OF FACTOR INVESTING WITH TRADITIONAL STYLES

LINKING TRADITIONAL INVESTMENT STYLES WITH FACTOR INVESTING

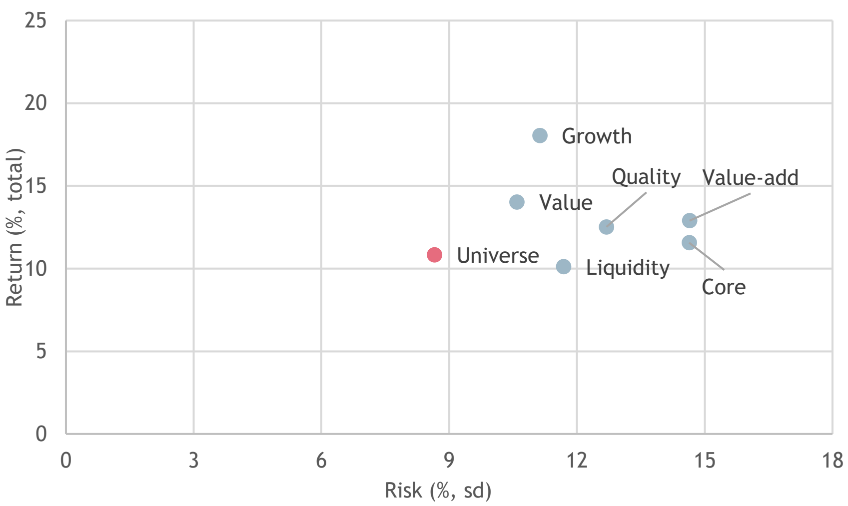
- To put our new factor-based investing results into the context of our traditional "core" and "value-add" investment styles, we selected two factors that in our view best fit with these styles.
- Since there is no officially sanctioned style definition, this can be customised according to investor's preferences.
- In our view, Quality and Liquidity are the best factors for "core" style investing.
- Growth and Value fit best with the traditional "value-add" style.
- In our view, the selected "core" and "value-add" markets confirm our factor selection.

STYLE	CORE	VALUE ADD
FACTORS	LIQUIDITY & QUALITY	GROWTH & VALUE
MARKETS	LONDON CITY	BUDAPEST
	LONDON WEST-END	WARSAW
	PARIS	DUBLIN
	PARIS - LA DEFENSE	OSLO
	FRANKFURT	PRAGUE
	STOCKHOLM	LONDON WEST-END
	MUNICH	MANCHESTER
	OSLO	LONDON CITY

Sources: AEW, CBRE, JLL, Oxford Economics & RCA

BOTH VALUE-ADD AND CORE SHOW MARGINALLY BETTER RETURNS THAN UNIVERSE, BUT AT HIGHER RISK

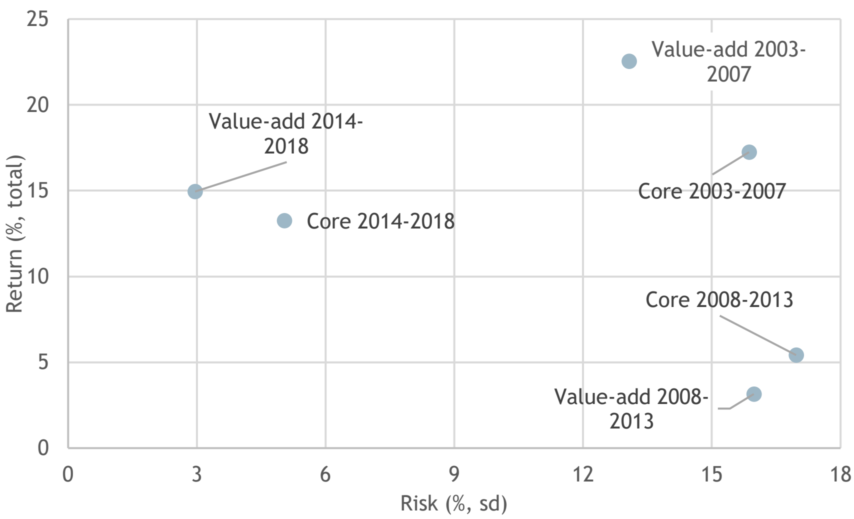
- When calculating the return and risk profile for the "core" and "value-add" office portfolio of top 8 markets, we note that "value-add" offers better return than "core" at a nearly identical risk level.
- It should be noted that the both "value-add" and "core" results are negatively impacted by the fact that the same markets are used for each quarter over the 15 years.
- The other pure factor portfolio returns allow for re-balancing, where the selected top-8 markets change over time.



Sources: AEW, CBRE, JLL, Oxford Economics & RCA

CORE SHOWS HIGHER RISK THAN VALUE-ADD ACROSS THE CYCLE, WITH BETTER RETURN ONLY IN 2008-13

- Surprisingly, we show a consistently higher risk for "core" than "value-add" for each of the three distinct periods across the last 15-year market cycles.
- Since we measure risk as standard deviation, this represents both upside and downside from the average.
- Only in the 2008-13 downturn the top-8 "core" office markets show better returns than "value-add".



Sources: AEW, CBRE, JLL, Oxford Economics & RCA

ABOUT AEW

AEW is one of the world's largest real estate asset managers, with €67.6bn of assets under management as at 31 March 2019. AEW has over 700 employees, with its main offices located in Boston, London, Paris and Hong Kong and offers a wide range of real estate investment products including comingled funds, separate accounts and securities mandates across the full spectrum of investment strategies. AEW represents the real estate asset management platform of Natixis Investment Managers, one of the largest asset managers in the world.

As at 31 March 2019, AEW managed €31.8bn of real estate assets in Europe on behalf of a number of funds and separate accounts. AEW has over 400 employees based in 9 offices across Europe and has a long track record of successfully implementing core, value-add and opportunistic investment strategies on behalf of its clients. In the last five years, AEW has invested and divested a total volume of over €20bn of real estate across European markets.

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ADDITIONAL NOTES

All amounts shown are expressed in USD unless otherwise indicated.