



An MSCI Brand

Norwegian Government Pension Fund

Real Estate Portfolio Report, 2012

November 2013

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Executive summary

The report, commissioned by the Ministry of Finance, has been prepared by Investment Property Databank ('IPD') to provide quality assurance of Norges Bank's return calculation and to provide a return objective (benchmark) with corresponding benchmarking analysis of the Government Pension Fund Global ('GPFG') real estate portfolio.

In the report, IPD verifies Norges Bank's calculations of total return for the real estate portfolio at -0.50% and 5.77% measured in NOK, and the GPFG's currency basket respectively. This Net Asset Value (NAV) return is based upon fund subsidiaries and structures used for holding real estate assets, taking into account the effects of leverage, other assets and liabilities, fees, and any other financial structuring.

Separate to this report, Norges Bank have been verified as being GIPS (Global Investment Performance Standard) compliant. Also all balance sheet and income statements have been subject to external audit by Deloitte AS.

For the benchmarking analysis calculated by IPD, a methodology different from that of Norges Bank is used to calculate the return of the real estate portfolio and the benchmark. IPD's methodology is based upon calculations of returns starting at the property level, common to most of the direct property benchmarks that IPD constructs, and rising through the vehicle to the portfolio level ('bottom-up approach'). The use of this methodology enables the benchmarking of the GPFG portfolio against the broader real estate market. As explained in the report, this may lead to different return figures between the bottom up IPD approach and the Norges Bank methodology. The reasons behind them are covered, although as calculations span longer time horizons and asset specific factors become smaller relative to the overall portfolio size, they should become of less importance. Such differences are therefore to be expected, and relate to the dual role of the report, to provide both quality assurance of the Norges Bank return calculations and the benchmarking of real estate performance.

Beyond the differences in the methodology, it is important to recognise that in the early stages of building up a real estate portfolio there are likely to be wide differences between the portfolio and benchmark performance. These differences, which arise due to the high concentration of the portfolio on a small number of assets and the acquisition costs associated with building the real estate portfolio, become less significant once the portfolio has moved beyond its construction phase.

IPD's methodology gives a total return of 2.6% and -0.4% measured in NOK, for the real estate portfolio and the benchmark respectively. All returns are based on data held throughout the year ending December 2012 except where stated differently. The outperformance of the real estate portfolio relative to the benchmark is mainly a result of property specific factors and allocation to sub segments that has shown strong returns in 2012. However, such benchmark comparisons should, as highlighted in the report, be interpreted with caution at this early stage. The variation in market performance also within countries, particularly evident at city level, is covered in the market review section.



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Explanatory section

Background and role of IPD

This report has been commissioned by the Ministry of Finance ('MoF') and has been prepared by Investment Property Databank ('IPD')¹. The scope of the report incorporates two approaches to performance measurement a) quality assurance on the performance calculations carried out by Norges Bank and b) the calculation of the direct property performance of the Government Pension Fund Global ('GPF') Property Portfolio (the 'Portfolio') relating to the return objective (benchmark) as described in the 'Real estate benchmarking' chapter. As outlined in the methodology chapter, there are distinct methodological differences between the quality assurance calculations and the direct property performance calculations. Because of these differences, a description of the main sources is also included in this report. IPD does not perform an audit control on the underlying data provided by Norges Bank or any other third party, which has been required to perform relevant calculations, and this should not be seen to fall under the scope of this report. Separately to this report however, the GPF balance sheet and income statement have been subject to external audit, and Norges Bank has been verified as being GIPS (Global Investment Performance Standards) compliant.

The report bridges between the two different methodologies employed by IPD in its analysis of performance by Norges Bank, these being a 'top-down' quality assurance and a 'bottom-up' direct property performance analysis.

¹ IPD provides real estate benchmarking and portfolio analysis services to clients in over 30 countries around the world. These services incorporate more than 1,500 funds containing nearly 77,000 assets, with a total capital value of over USD 1.9 trillion (as at July 2013). Each year, IPD produces more than 120 indices helping real estate market transparency and performance comparisons, as well as nearly 600 benchmarks for client portfolios. IPD is a subsidiary of MSCI Inc., a leading provider of investment decision support tools to investors globally, and clients include real estate investors, managers, consultants, lenders and occupiers. For further information on IPD, please visit www.ipd.com.

Norges Bank's 'top-down' methodology

The quality assurance calculations, which form the basis of the top-down approach, aim to independently verify the calculation methodology employed by Norges Bank, and validate the return from a methodological standpoint. All Norges Bank Real Estate ring fenced accounting terms are included, and incorporate all underlying assets and liabilities, working capital and management costs (excluding NBIM employee costs). Valuations are made in accordance with IFRS (International Financial Reporting Standards) accounting principles. Under IFRS accruals principle revenue is reported in the fiscal period it was earned regardless of when it is received, and expenses are deducted in the fiscal period they are incurred whether they are paid or not.

Based on these valuations return calculations are performed monthly and upon significant cash flow events. Performance calculations are calculated accordingly to a Time Weighted Return ('TWR') methodology, with the data required to perform these submitted by Norges Bank, according to pre-specified data requirements deemed necessary for the verification by IPD.

More information on Norges Bank calculation principles can be found at:

www.nbim.no/en/Investments/Return-on-the-fund/methodology-for-the-calculation-of-returns/

Information on Real Estate structures within GPF can be found in the GPF annual report at:

<http://www.nbim.no/en/press-and-publications/Reports/2012/annual-report-2012/>



IPD's 'bottom-up' methodology

The bottom-up calculations follow IPD methodology and are based upon returns from the individual property assets through to the vehicle level, and finally aggregated up to the portfolio level. IPD also employs a Time Weighted Return ('TWR') methodology for all performance calculations on a monthly basis. This measure takes into account investment income, as well as realised and unrealised capital profit and loss. The use of a TWR minimises some of the timing distortions that exist in money-weighted formulae, and the difference that can occur depending on when cash flows in and out of a portfolio are recorded.

Differences in return are likely to be greatest where a portfolio is growing rapidly over the period of measurement, and in particular where significant transactions have occurred near the start or end of the period. The TWR formula treats transactions the same regardless of the month in which they take place and there is no incentive to delay transactions because of the effect that timing will have on measurement.

Further details on IPD standard processes, methodology and indices can be found at www.ipd.com/about/ipd-guides-and-standards/

Furthermore, the technical note in the back of this report describes calculation methodologies specific to this report. All of the data required to perform the calculations, except transaction information, has been submitted by Norges Bank's joint venture (JV) partners according to pre-specified IPD data requirements. Debt, transaction information and that relating to fund management fees and expenses have been submitted by Norges Bank.

Differences in methodology

The differences in performance that result from the 'top-down' and 'bottom-up' methodology are to be expected, although with calculations over longer time periods and when transactions become smaller relative to total real estate portfolio size, these differences should become of less importance. Following comparative reviews of the Norges Bank and IPD standard performance calculation methodologies, the differences can be summarised as follows:

Difference	Norges Bank	IPD
Valuation hierarchy	Asset class. IFRS fair value of total GPFG real estate asset class. Net Asset Value (NAV) incorporating all financial assets and liabilities, fund management fees and operating expenses, capital transfers in and out of the fund, and applicable accounting adjustments	Property level. Gross Asset Value (GAV) valuation of direct real estate investments. Incorporating fund management and operating fees incurred by Norges Bank
Foreign exchange rates	GPFG values in both NOK and Currency Basket (CCY); converted monthly, and upon significant capital transfer events	Values converted to Norwegian Kroner (NOK) at WM/Reuters end-month closing spot rates
Acquisition and valuation	Acquisition price, then held down for next subsequent valuation	Acquisition price, then interpolated between external valuation estimates
Calculation method	Time Weighted Returns (TWR) calculated at month end, and capital transfer events	Time Weighted Returns (TWR) calculated at month end



Quality assurance calculations

The publication of the GPFG annual report makes the investment return performance across all asset classes publically available, along with all of the calculation methodologies used in generating these returns. For the real estate asset class, IPD has performed a control function to validate the performance calculations of Norges Bank, the purpose of which is a level of quality assurance that calculations have been performed to the stated methodology and thus consistent across asset classes. This part of the report forms the basis for our top-down analysis.

For the year to December 2012, the GPFG annual report states these total returns as -0.50% and -5.77% calculated in NOK and the funds international currency basket (CCY) respectively. The high-level performance calculation of the return is the result of two primary inputs, the Net Asset Value (NAV) which is the total value of the assets less the value of the liabilities, and the transfer of capital into and out of the fund, and so the verification of these components has been central to the quality assurance function. The review of the NAV component was conducted in the context of its

composition; this being bank deposits, real estate assets and investment properties, and all other financial assets and liabilities. The second primary input relates to the transfer of capital into and out of the real estate portfolio, most particularly the acquisitions of financial assets and investment properties throughout the year.

Using the input data alongside supplied foreign exchange rates and accounting adjustments, IPD have verified the calculation methodology on which the performance results are based in relation to the NAV and capital transfers provided at each month and transfer event. Furthermore, upon rolling up the inputs into a set of performance returns for the construction of the published annual return, IPD is able to replicate the published results on both a NOK and CCY denominated basis.

On the basis of these quality assurance calculations, it is the opinion of IPD that the performance statements and headline results published by Norges Bank on its real estate investments has been calculated consistently and in accordance with the methodology required by the Norwegian Ministry of Finance.

Performance calculation (year to Dec-12)	Norges Bank	IPD	Difference
Net asset value as at Dec-12 (NOK), millions	25,123	25,123	0.00
Net transfers into the portfolio (NOK), millions	14,262	14,262	0.00
Annual return (NOK)	-0.50%	-0.50%	0.00
Annual return (CCY)	5.77%	5.77%	0.00

Source: IPD, Norges Bank



IPD performance analysis

Real estate benchmarking

Given the maturing nature and globalization of real estate markets, there is scope to measure and compare performance across global markets. Benchmarking is a well established tool in liquid asset classes and has started to be applied for direct real estate. As for other asset classes, the benchmarking of real estate portfolios may enable investors to monitor their investments in a wider context, and provide useful insights into the reasons for over- or under-performance.

Although improvements have been made in developing real estate benchmarks, there remain limitations due to the uniqueness and potential large scale or 'lumpiness' of individual real estate assets. These difficulties are compounded when building benchmarks across national real estate markets due to differences in the quality of data and the frequency with which the benchmarks are released. A further factor to consider is that individual assets can have a significant influence on a portfolio's return during the early stages of building up a real estate portfolio. In addition, real estate benchmarks are likely to comprise of mostly held investments, and thus a smaller proportion having been subject to transaction or development than a portfolio under construction. The level of acquisition costs in the benchmark will therefore be limited compared with those of that portfolio.

At this stage of portfolio construction there are likely to be wide differences between the portfolio and benchmark due to asset-specific factors. For this combination of reasons, the results of the analysis need to be interpreted with care.

For more information on real estate benchmarking www.ipd.com/about/ipd-guides-and-standards/

In this report the benchmark determined by MoF includes European countries where IPD is represented, excluding Norway, and is adjusted for IPD estimated market weights applied to the IPD Pan-European Annual Property Index (www.ipd.com/real-estate-indices/geography/regional-indices.html)

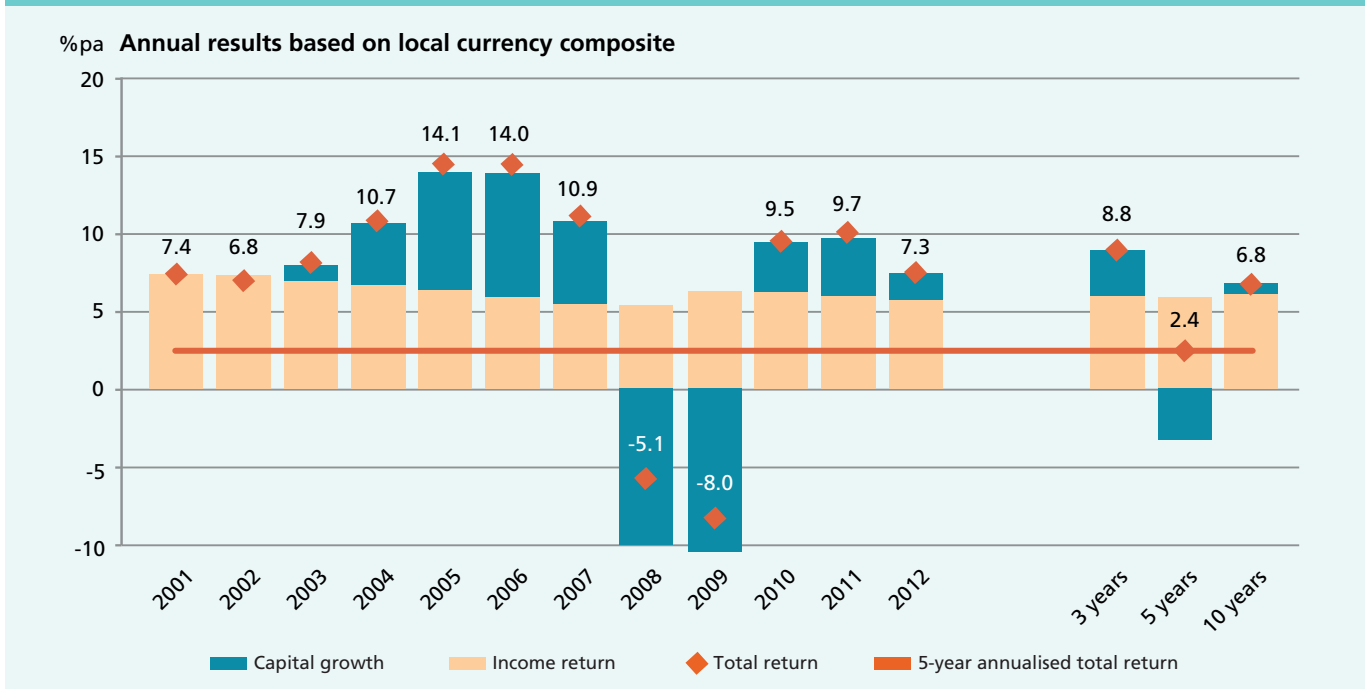
Given that the GPF is benchmarked against the wider European real estate market, including countries where the fund is not currently represented, it is important to understand the main trends in the market during the course of the year. For this reason, the following section provides a broad review of the European and Global real estate during the course of 2012.



Real estate market review

Across asset classes, 2012 was the year of strong equity performance, with the MSCI World Index posting a local currency return of over 15% for the year as a whole. Real estate securities markets posted even stronger performance, at over 20% for most major markets. The performance of the direct real estate markets show a slowing of momentum but, due to the relatively high income return, still positive performance at 7.3% for the year as a whole.

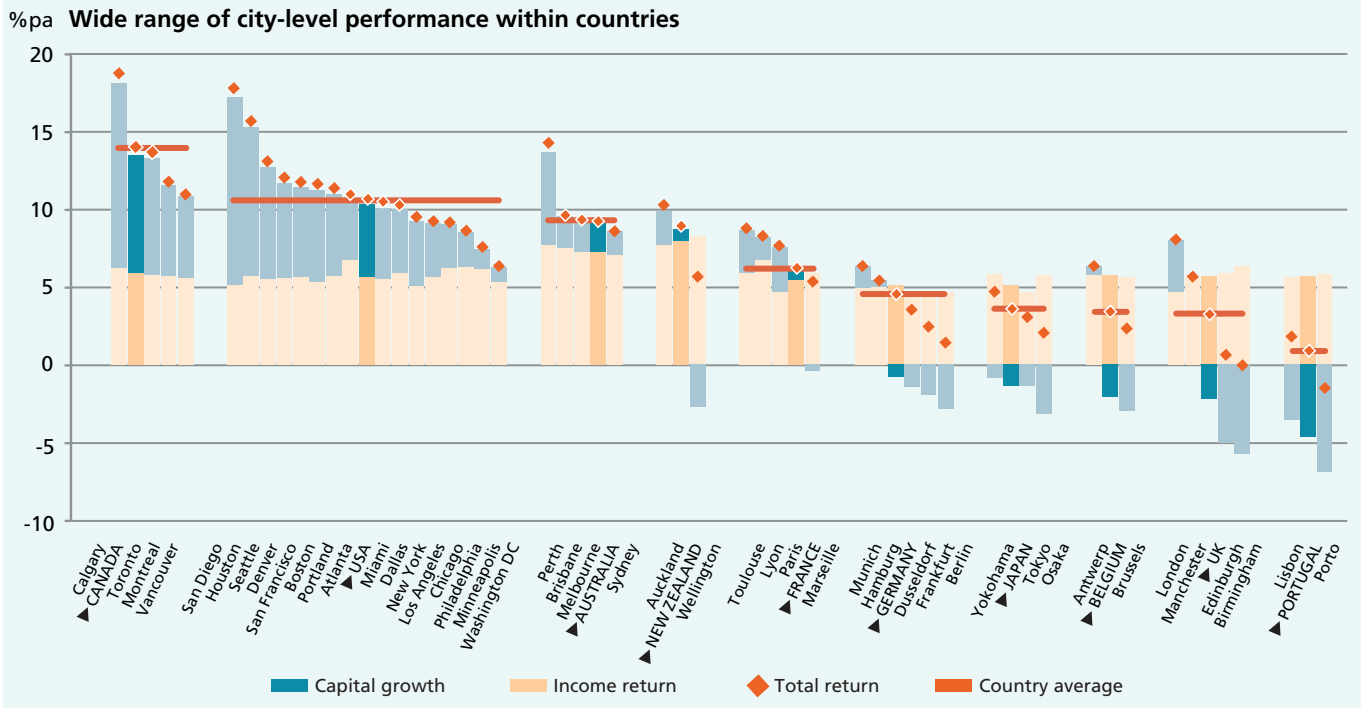
Figure 1: Total global returns



Source: IPD



Figure 2: City-level total returns in selected countries, 2012



Source: IPD

Although slowing during 2012, this was the third year of relatively strong performance across the major global real estate markets since the downturn of 2008/9. As usual, there were significant variations across markets, with Canada, South Africa and the US continuing to lead performance, with double digit returns for the year as a whole. At the other extreme, fifteen markets experienced value declines during 2012 all of which, with the exception of Japan, were in Europe. The most significant value declines were in Spain (-7.4%) and Hungary (-7.2%), with the relatively strong income returns in the other markets meaning that total returns remained positive for the year as a whole.

Although income returns held up performance during 2012, the weight of capital meant that by the end of the year, income returns were at, or generally near, historic lows for many countries. This was certainly the case across much of Europe including Austria, France, Netherlands and Switzerland, with Germany being the main exception. It was also the situation in North America with US income returns falling below 6% compared with close to 7% in 2010, and Canadian income returns at historic low levels. Although the spreads between government long dated bond yields and real estate

income returns remained relatively wide, this was driven by the continued lowering of bond yields during the course of the year.

As for previous years, the major theme for 2012 related to the variations in performance across markets and property types. This was particularly evident at the level of individual cities, with often as much variation within countries as between them, with more than 2,100 basis points separating the best performing Calgary (19%) from the worst performing Barcelona (-2%). These variations were clearly apparent across the global markets, but there was also a wide range of performance within most countries. In the US, for example, the city with the best performance (San Diego) was separated from the worst (Washington DC) by 1,159 basis points. Smaller countries also showed significant variations across their domestic markets, as illustrated by the UK and Canada where around 800 bps separated the best and worst cities (for UK, London (8.2%) and Birmingham (0.2%) and for Canada, Calgary (19%) and Vancouver (11.2%)). There were also marked variations of nearly 500 bps between cities in Germany and Australia, and over 300 bps for Belgium, France, Portugal, and New Zealand.



Portfolio and relative performance

IPD is best known for the indices and benchmarks it provides on direct real estate, on portfolios of property held by investing institutions, and this forms the basis for the 'bottom-up' approach to performance measurement in this report. This focuses on the performance of direct real estate investment based on the Gross Asset Value (GAV) of the properties and their relative performance against comparable benchmarks. One of the key strengths with this methodology is the analytical capabilities it presents.

During the course of 2012, GPFG invested in three major assets, in Sheffield (October), Paris (October) and Zurich (November). The difference in the timing of the investments needs to be taken into account in calculating performance relative to the benchmark. A more fundamental caveat relates to the early stage and high asset concentration of the portfolio. At the early stages of building up a real estate portfolio it is likely that there will be wide differences between the portfolio and benchmark performance due to the high concentration and property risks. These asset specific factors become less significant once the portfolio has moved beyond its construction phase.

The overall fund performance for the relevant time period was 2.6% calculated on a NOK basis. This performance was mostly attributable to the direct real estate component given the limited amount of leverage over the period. The benchmark, which is adjusted for management costs² and leverage, returned -0.4% in the same period. The underlying direct real estate performance was 2.7% and it compares with the benchmark return of -0.2%. This direct real estate outperformance was driven by less capital decline (-1.8% compared with -5.2% for the benchmark) somewhat offset by weaker income return (4.7% compared with 5.3%). The weaker income return reflects in this case the investments in sub segments generally considered less risky, rather than a shortfall of income due to void and lease terms.

There were marked differences in the performance of the portfolio although, as already stressed, the high concentration and property-specific factors means there are limitations that can be drawn from any comparisons with the benchmarks at this stage. Despite this, the analysis illustrates the types of insights that can be gained and will become more useful as the portfolio grows in scale. For instance, the attribution analysis demonstrates that the outperformance in UK Retail was driven by asset specific factors, rather than structural factors related to country allocation decisions.

² The Fund Management Fees and Fund Operating Expenses included in the portfolio and benchmark returns are equivalent to the total expenses borne by the fund over the period to December 2012. These costs were equivalent to NOK 54 million and equated to 0.21% of year-end Gross Asset Value. The Fund Management Fees included all fees charged by external fund managers for their fund management services as defined by the fund management agreement. In addition, Non-rechargeable expenses incurred in the course of undertaking normal business are also included. These reflect the operating costs incurred in the holding structure of entities owned and operated by NBIM. Specifically these relate to accounting, insurance, legal costs, valuation fees and any other expenses.

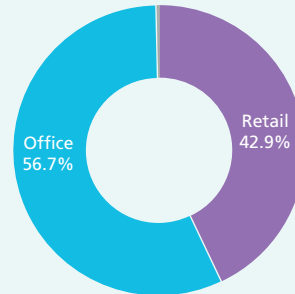


Balance sheet

January to December 2012

The Portfolio balance sheet shows the composition of the Portfolio. Starting from the overall exposure or gross asset value (GAV), the net asset value (NAV) is derived from deducting the total liabilities. The GAV is a composition of direct property investments (DIP) and other indirect assets (OIA).

Europe – Direct property



Capital value per end of period quantifies the respective holding in an asset class. Gross asset value is total wealth accumulated within the Portfolio. Total liabilities are the total of all debt and cash position. Net asset value is the numeric subtraction between GAV and total liabilities.

All figures shown in NOK million	Capital value Dec '11	Capital value Dec '12	Net investment	Value change
Gross asset value (GAV)	10,932.0	26,320.9	15,626.4	-237.5
Direct property investments (DIP)	10,932.0	26,320.9	15,626.4	-237.5
Europe	10,932.0	26,320.9	15,626.4	-237.5
Retail	3,006.1	11,302.7	8,205.5	91.1
France	5.6	1,016.2	1,016.9	-6.3
UK	3,000.5	10,286.5	7,188.6	97.4
Switzerland	0.0	0.0	0.0	0.0
Office	7,883.5	14,927.3	7,365.2	-321.4
France	6,466.8	7,252.1	1,232.3	-446.9
UK	1,416.7	1,360.7	8.5	-64.5
Switzerland	0.0	6,314.4	6,124.4	190.0
Industrial	0.0	17.6	18.0	-0.4
France	0.0	0.0	0.0	0.0
UK	0.0	17.6	18.0	-0.4
Switzerland	0.0	0.0	0.0	0.0
Residential	31.7	34.5	0.2	2.6
France	0.0	0.0	0.0	0.0
UK	31.7	34.5	0.2	2.6
Switzerland	0.0	0.0	0.0	0.0
Other	10.8	38.8	37.5	-9.4
France	0.0	0.0	0.0	0.0
UK	10.8	38.8	37.5	-9.4
Switzerland	0.0	0.0	0.0	0.0
Other indirect assets (OIA)	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0
Total liabilities	0.0	-3,523.0	-3,523.0	0.0
Net cash/debt	0.0	-3,523.0	-3,523.0	0.0
Net asset value (NAV)	10,932.0	22,797.9	12,103.4	-237.5



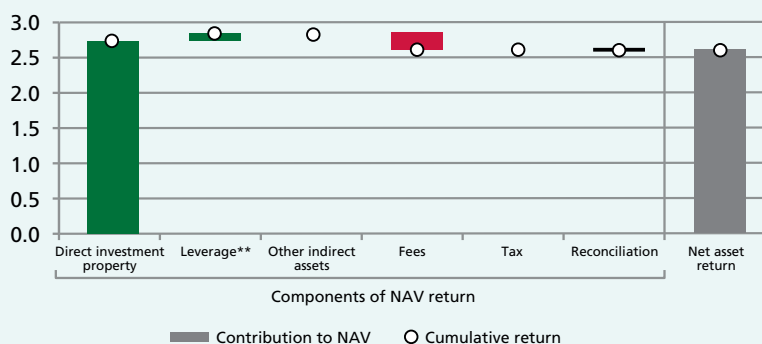
Absolute returns

January to December 2012

The table below shows the Portfolio performance per segment, sector and on total level. The net asset return of the Portfolio is reconciled with the direct property, other indirect assets, fees and tax performance.

All figures shown in %, returns in NOK	Components of net asset return								
	Net asset return	Impact of leverage **	Direct investment property			Other indirect assets	Fees	Tax	Reconciliation
			Total	Income	Capital				
All regions - Benchmark ***	-0.4	0.0	-0.2	5.3	-5.2	-	-0.3	0.0	0.0
All regions - Portfolio	2.6	0.1	2.7	4.7	-1.8	-	-0.3	0.0	0.0
Europe - Portfolio	2.6	0.1	2.7	4.7	-1.8	-	-0.3	0.0	0.0
Retail	8.2	-0.1	8.6	4.3	4.1	-	-0.4	0.0	0.0
France	-5.1	0.0	-4.9	0.0	-5.0	-	-0.2	0.0	0.0
UK	8.3	-0.1	8.6	4.4	4.1	-	-0.4	0.0	0.0
Switzerland	-	-	-	-	-	-	-	-	-
Office	0.6	0.0	0.8	4.9	-3.9	-	-0.2	0.0	0.0
France	-2.0	0.0	-1.8	5.2	-6.7	-	-0.2	0.0	0.0
UK	3.5	0.0	3.8	4.6	-0.7	-	-0.3	0.0	0.0
Switzerland*	3.5	0.0	3.5	0.4	3.1	-	0.0	0.0	0.0
Industrial	-3.3	0.0	-3.3	-1.2	-2.2	-	0.0	0.0	0.0
France	-	-	-	-	-	-	-	-	-
UK	-3.3	0.0	-3.3	-1.2	-2.2	-	0.0	0.0	0.0
Switzerland	-	-	-	-	-	-	-	-	-
Residential	11.7	0.0	12.0	3.6	8.2	-	-0.4	0.0	0.0
France	-	-	-	-	-	-	-	-	-
UK	11.7	0.0	12.0	3.6	8.2	-	-0.4	0.0	0.0
Switzerland	-	-	-	-	-	-	-	-	-
Other	-68.3	0.0	-68.2	-32.7	-51.0	-	-0.1	0.0	0.0
France	-	-	-	-	-	-	-	-	-
UK****	-68.3	0.0	-68.2	-32.7	-51.0	-	-0.1	0.0	0.0
Switzerland	-	-	-	-	-	-	-	-	-

Components of portfolio net asset value return, in %



Note: The graph to the left displays the breakdown of the Portfolio NAV return by each individual component. Starting with direct property investment on the left, each component adds either a positive or negative return (bar) to the cumulated NAV return (dot). A green bar indicates that the components have a positive contribution to the NAV return. A red bar indicates that the component records a negative return over the period and therefore contributes negatively to the NAV return. The sum of the components results in the total NAV over the period which is shown by the bar on the right

*Swiss return based on only 2 months of data. ** There is currently only 3 months of leverage within the portfolio. *** Benchmark adjusted by the same level of Debt/Fee/Tax components (as a percentage of value), as reported by NBIM. **** Negative return due to dummy properties holding costs such as legal fees and transaction costs which cannot be attributed to a single property. All calculated periodic returns are linked geometrically.



Attribution analysis

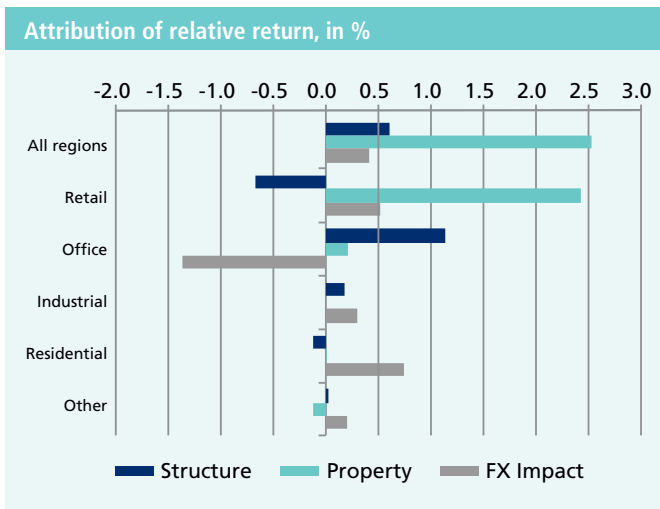
January to December 2012

The attribution technique calculates that part of the relative return derived from the Portfolio's gross asset value relative weighting in the strong or weak sectors of the market

(structure component), and that portion which is due to the exceptional performance of the Portfolio's own assets within each segment of the market (property component).

All figures shown in %, returns in NOK	Total return			Attribution of relative return			Percentage of capital employed		
	Portfolio	Bmk	Rel.	Structure	Property	FX impact	Portfolio	Bmk	Difference
All regions	2.7	-0.2	2.9	0.6	2.5	0.4	100.0	100.0	0.0
Europe	2.7	-0.2	2.9	0.6	2.5	0.4	100.0	100.0	0.0
Retail	8.6	0.2	8.4	-0.6	2.4	0.5	43.0	31.3	11.7
France	-4.9	2.8	-7.8	-0.1	-0.1	0.2	3.8	4.3	-0.5
UK	8.6	-0.1	8.7	-0.4	2.5	-0.6	39.1	9.2	29.9
Switzerland*	-	2.1	-	0.0	-	0.1	0.0	1.8	-1.8
Rest of Europe	-	-0.4	-	0.0	-	0.8	0.0	15.9	-15.9
Office	0.8	-0.8	1.6	1.1	0.2	-1.3	56.7	41.3	15.4
France	-1.8	-0.2	-1.6	0.4	-0.7	-2.5	27.8	8.3	19.4
UK	3.8	2.4	1.4	0.0	0.2	0.0	5.2	5.1	0.2
Switzerland	3.5	1.5	2.0	0.4	0.7	0.0	23.7	2.9	20.8
Rest of Europe	-	-1.9	-	0.4	-	1.2	0.0	25.0	-25.0
Industrial	-3.3	-1.3	-2.0	0.2	-	0.3	0.1	7.3	-7.2
France	-	-1.3	-	0.0	-	0.1	0.0	1.1	-1.1
UK	-3.3	0.3	-3.7	0.0	0.0	0.1	0.1	2.9	-2.9
Switzerland	-	0.9	-	0.1	-	0.0	0.0	0.2	-0.2
Rest of Europe	-	-3.0	-	0.1	-	0.2	0.0	3.0	-3.0
Residential	12.0	0.9	11.1	-0.1	0.0	0.7	0.1	15.5	-15.4
France	-	1.4	-	0.0	-	0.1	0.0	2.0	-2.0
UK	12.0	6.5	5.5	0.0	0.0	0.0	0.1	0.8	-0.7
Switzerland	-	2.2	-	0.0	-	0.2	0.0	4.6	-4.6
Rest of Europe	-	-0.4	-	0.0	-	0.4	0.0	8.1	-8.1
Other	-68.2	0.2	-68.4	0.0	-0.1	0.2	0.1	4.7	-4.5
France	-	5.0	-	0.0	-	0.0	0.0	0.4	-0.4
UK	-68.2	3.4	-71.6	0.0	-0.1	0.0	0.1	1.1	-1.0
Switzerland	-	2.3	-	0.0	-	0.0	0.0	0.2	-0.2
Rest of Europe	-	-1.8	-	0.0	-	0.1	0.0	2.9	-2.9

*Swiss return based on only 2 months of data.



Structure score

If a Portfolio has an above-average weighting in a strong performing segment of the market, the structure component for the segment will be positive. Conversely an above-average weighting in a poor performing segment of the market will result in a negative structure component.

Property score

If a Portfolio is represented in a segment of the market, and its properties have recorded above-average returns relative to the benchmark, the resultant property score will be positive.

FX impact

Displays the impact of currency exchange rate fluctuation on the relative return of the portfolio vs. the benchmark. A positive currency impact implies that currency movements affected the portfolio 'better' than the benchmark.



Appendix: Technical note

All calculations within the report and specified in this section are in line with IPD standard methodology if not stated otherwise. Further information on IPD applied methodologies can be found in the IPD Index Guide available from ipd.com/indexguide

Total return (direct property/other indirect assets)

The return on an asset is the capital appreciation net of capital expenditure and receipts plus net income generated from the asset expressed as a percentage of capital employed during the holding period. Capital employed is the capital invested in an asset during the analysis period, that is, the capital value of the asset at the start of the holding period and any additional investments to the asset during the holding period.

In other words, total return is the total money return ('numerator') as a percentage of the capital employed ('denominator').

$$TR_{GAV,t} = \frac{(CV_t - CV_{(t-1)} - CEXP_t + CREC_t + NI_t)}{(CV_{(t-1)} + CEXP_t)} \times 100$$

CV_t = Current Capital Value

$CV_{(t-1)}$ = Previous Month Capital Value

$CEXP_t$ = Total Capital Expenditure during month (incl. purchase, development and capital expenditure)

$CREC_t$ = Total Capital Receipts during the month (including sales and other receipts)

NI_t = Net Income Receivable over the month

Capital growth

The capital growth component is defined as following

$$CG_{GAV,t} = \frac{(CV_t - CV_{(t-1)} - CEXP_t + CREC_t)}{(CV_{(t-1)} + CEXP_t)} \times 100$$

Income return

The income return component is defined as following

$$IR_{GAV,t} = \frac{NI_t}{(CV_{(t-1)} + CEXP_t)} \times 100$$



Total return (NAV)

Total return on NAV level is an extension of the GAV total return formula. The existing methodology is enriched by including fees, tax and debt. The net asset value in each time period is calculated as the difference between current GAV and net debt.

$$NAV_t = GAV_t - NetDebt_t$$

Where net debt is calculated as follow

$$NetDebt_t = Debt_t - Cash_t$$

The NAV total return is defined as

$$TR_{NAV,t} = \frac{(NAV_t - NAV_{(t-1)} - CEXP_t + CREC_t - RP_t + DD_t - Tax_t - Fees_t) + (NI_t - I_t)}{(NAV_{(t-1)} + CEXP_t - DD_t)} \times 100$$

I_t = Interest payments on NetDebt_t

RP_t = Repayment on NetDebt_t

DD_t = Drawdown / Increase in NetDebt_t

Tax_t = Tax payments in period t

$Fees_t$ = Fees in period t

Impact of debt

IPD uses the ratio method to calculate impact of debt. However, in this report, the impact of debt (IDt) is the arithmetic difference between the leveraged direct property returns and the total return on GAV basis.

$$ID_t = TR_{Leveraged,t} - TR_{GAV,t}$$

Leveraged returns are calculated similar to the NAV calculation, but ignore tax and fees.

$$TR_{Leveraged,t} = \frac{(NAV_t - NAV_{(t-1)} - CEXP_t + CREC_t - RP_t + DD_t) + (NI_t - I_t)}{(NAV_{(t-1)} + CEXP_t - DD_t)} \times 100$$



Relative return

IPD standard methodology for calculating relative returns is by taking the ratio of the fund return to the benchmark return. In this report, the relative return is the arithmetic difference between the fund performance and the chosen benchmark performance.

$$RR_t = TR_{fund,t} - TR_{benchmark,t}$$

RR_t = Relative return

$TR_{fund,t}$ = Total return of fund (NAV)

$TR_{benchmark,t}$ = Total return of benchmark (NAV)

Compounded performance measures

All IPD measures are calculated on monthly basis. In order to produce measures on a higher time denomination, the concept of compounding is applied. Compounding is performed as following (taking the annualised total return measure as an example):

$$100 \times \left[\prod_{i=0}^{11} \left(1 + \frac{TR_{t+i}}{100} \right) - 1 \right] = 100 \times \left[\left(1 + \frac{TR_t}{100} \right) \times \left(1 + \frac{TR_{t-1}}{100} \right) \times \dots \times \left(1 + \frac{TR_{t-11}}{100} \right) - 1 \right]$$

TR_t = Total return

Attribution analysis: structure score

Structure Score provides information on whether, compared with a peer group, an individual portfolio is best allocated to take advantage of market conditions.

IPD standard methodology for relative return is the geometric method which stands in contrast to the arithmetic approach used in this formula.

Structure Score is the proportion of the relative return attributable to the weightings of the portfolio relative to the benchmark in each of the segments used in the analysis.

$Weighting_{Fund,t}$ = Weighting of the fund by Capital Employed

$Weighting_{Market,t}$ = Weighting of the market by Capital Employed

$TR_{Market_Segment,t}$ = Market Total Return per segment in period t

$TR_{Market,t}$ = Market Total Return in period t

$$\left[Weighting_{Fund,t} - Weighting_{Market,t} \right] \times \left[TR_{Market_Segment,t} - TR_{Market,t} \right]$$



Attribution analysis: Property score

Property scores indicate how well individual assets are performing when compared with their peers.

IPD standard methodology for relative return is the geometric method which stands in contrast to the arithmetic approach used in this formula.

Property score is the proportion of the relative return attributable to the performance of the fund's properties relative to the benchmark in each segment.

$$\text{Weighting}_{\text{Fund},t} \times \left[\text{TR}_{\text{Fund_Segment},t} - \text{TR}_{\text{Market_Segment},t} \right]$$

$\text{Weighting}_{\text{Fund},t}$ = Weighting of the fund by Capital Employed

$\text{TR}_{\text{Fund_Segment},t}$ = Fund Total Return per segment in period t

$\text{TR}_{\text{Market_Segment},t}$ = Market Total Return per segment in period t

Attribution analysis: Foreign exchange (FX) impact

IPD standard methodology for relative return is the geometric method which stands in contrast to the arithmetic approach used in this formula.

The FX impact in context with the attribution analysis explains the contribution of the relative out- or under-performance of the fund's FX impact with the benchmark's FX impact. FX impact behaves qualitative as the property score, but is solely focused on FX.

$$\text{Weighting}_{\text{Fund},t} \times \left(\text{TR}_{\text{FX,Fund},t} - \text{TR}_{\text{no-FX,Fund},t} \right) - \text{Weighting}_{\text{Market},t} \times \left(\text{TR}_{\text{FX,Market},t} - \text{TR}_{\text{no-FX,Market},t} \right)$$

$\text{Weighting}_{\text{Fund},t}$ = Weighting of the fund by Capital Employed in period t

$\text{Weighting}_{\text{Market},t}$ = Weighting of the market by Capital Employed in period t

$\text{TR}_{\text{FX,Fund},t}$ = Fund Total Return in period t, with currency impact

$\text{TR}_{\text{no-FX,Fund},t}$ = Fund Total Return in period t, without currency impact

$\text{TR}_{\text{FX,Market},t}$ = Market Total Return in period t, with currency impact

$\text{TR}_{\text{no-FX,Market},t}$ = Market Total Return in period t, without currency impact

Currency Exchange Rates

All foreign currencies are converted to the reporting currency at the WM/Reuters end-month closing spot rates.



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