The proper(ty) allocation
– The role of property in portfolio management

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The management of financial assets plays an important part in people's lives. Many stakeholders are dependent on institutional investors' ability to generate sustainable returns for their well-being. How can property contribute to meeting that objective?

The importance of portfolio management

Institutional investors feature very prominently in today's society. Retirement benefits are dependent on the financial performance of pension funds, insurance companies' ability to meet future claims hinge upon their assets being able to yield sufficient returns and the well-being of an entire country might in some cases depend on the success with which revenues from a finite natural resource are re-invested.

As a result of deleveraging, slowing growth in the developing world and the need for an expansionary monetary policy, the world may now have entered a period of modest growth rates and low interest rates, making it more difficult for institutional investors to honour their promises to retirees, policyholders and citizens.

The lion's share of institutional investors' capital is normally allocated to shares and bonds. In addition, a limited amount is usually allocated to other asset classes such as private equity, hedge funds and property. What is the role of property in institutional money management? Would a larger allocation to property improve the risk-return trade-off for institutional investors? How can that be achieved?

Allocation of assets under management for the ten largest Swedish institutional investors

Property 8%
Other 4%
Bonds 50%
Shares 38%
SEK 3,400 bn

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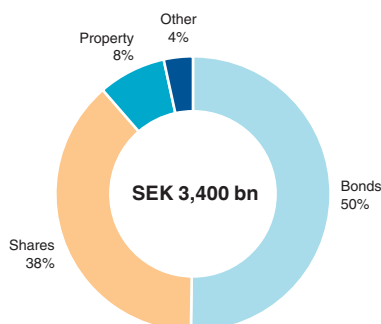
Property in comparison with other asset classes

The chart to the right shows the historical risk-return profiles for shares, bonds and property in Sweden over the past 30 years, i.e. 1984-2013.[1]

Of relevance for investments are, however, *expected* risks and returns – not historical ones – and in today's moderate-growth, low-interest-rate environment, expected returns on all asset classes including shares, bonds and property should be lower than their historical averages.

Expected returns for shares, bonds and property are 9%, 3% and 6%, respectively (see section *Estimating expected returns*).

Historical standard deviations are, on the other hand, assumed to constitute good proxies for expected standard deviations.

Historical and expected risk-return profiles

Average annual return, %

Risk (standard deviation), %
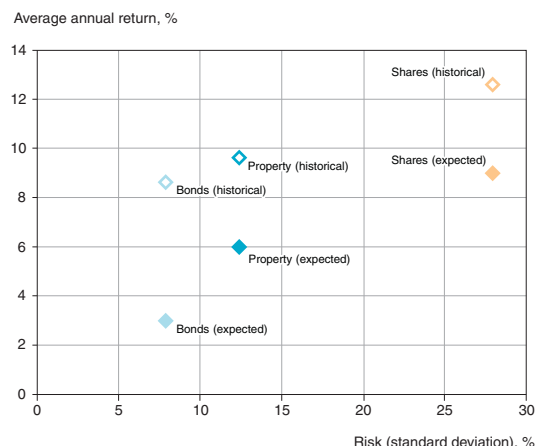
Estimating expected returns

The expected return on shares can be estimated as the inverse of the price-to-earnings ratio plus the expected growth rate in earnings. The current price-to-earnings-ratio for the OMX Stockholm index is 15. Earnings growth in line with GDP growth, which the IMF expects to be just above 2% per annum for Sweden over the coming five years, gives an expected share return of approximately 9%.

A 20-year Swedish government bond currently yields approximately 2%. By adding a smaller portion of higher-yielding bonds to the bond portfolio, an average expected bond return of around 3% might be reached.

Income return for core, institutional investment-grade property can be expected to be around 4%. Adding expected rental growth in line with GDP growth (as for shares above) gives an expected property return of 6%.

Historical one-year correlations between shares, bonds and property in Sweden for the time period 1984-2013 are tabulated to the right. It can be noted that all correlations are below one, implying that all these asset classes have a role to play in efficient asset class portfolios. Historical correlations are generally assumed to constitute good proxies for expected correlations.

Historical and expected correlations between asset classes

	Shares	Bonds	Property
Shares	1.00	-0.04	0.21
Bonds	-0.04	1.00	-0.12
Property	0.21	-0.12	1.00

The expected risk-return profiles and correlations constitute the base case outlook for the following analysis.

Knowing that shares, bonds and property all have a role to play in the composition of an efficient portfolio, how should capital be distributed across these asset classes? Moreover, how does the risk-return profile differ between a portfolio that includes property and one that does not? To answer these questions, efficient frontiers are derived based on the above outlook.

[1] Sources for returns: Bloomberg, IPD.

Calculating portfolio return and risk

The return of an asset portfolio is simply the value-weighted average return of all included assets. The portfolio's risk, measured as its standard deviation, is on the other hand a function not only of the assets' individual standard deviations, but also of the extent to which their returns correlate. The more correlated the included assets' returns are, the higher the portfolio's risk becomes and vice versa. To optimise their holdings' risk-return profile, investors should thus search for assets which give high returns in comparison not only to their individual standard deviations, but also to their correlations with other assets.

The return of a portfolio comprising N assets can be written as:

$$r_p = \sum_{i=1}^{N} x_i r_i$$

where x_i is asset i's share of the portfolio and r_i is the return from asset i.

The standard deviation of a portfolio comprising N assets becomes:

$$\sigma_p = \sqrt{\sum_{i=1}^{N} \sum_{j=1}^{N} x_i x_j \rho_{ij} \sigma_i \sigma_j}$$

where x_i and x_j are assets i and j's respective shares of the portfolio, ρ_{ij} is the correlation between returns from assets i and j, and σ_i and σ_j the standard deviations for the returns from assets i and j, respectively.

The efficient frontier

If possible combinations of assets are plotted in a risk-return chart, one finds a number of portfolios which give a higher return for any given level of risk (or lower risk for any given level of return) than all other possible portfolios. These portfolios comprise the efficient frontier.

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Properties on the frontline
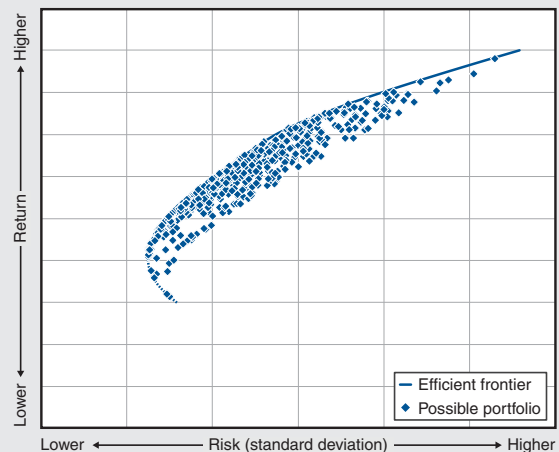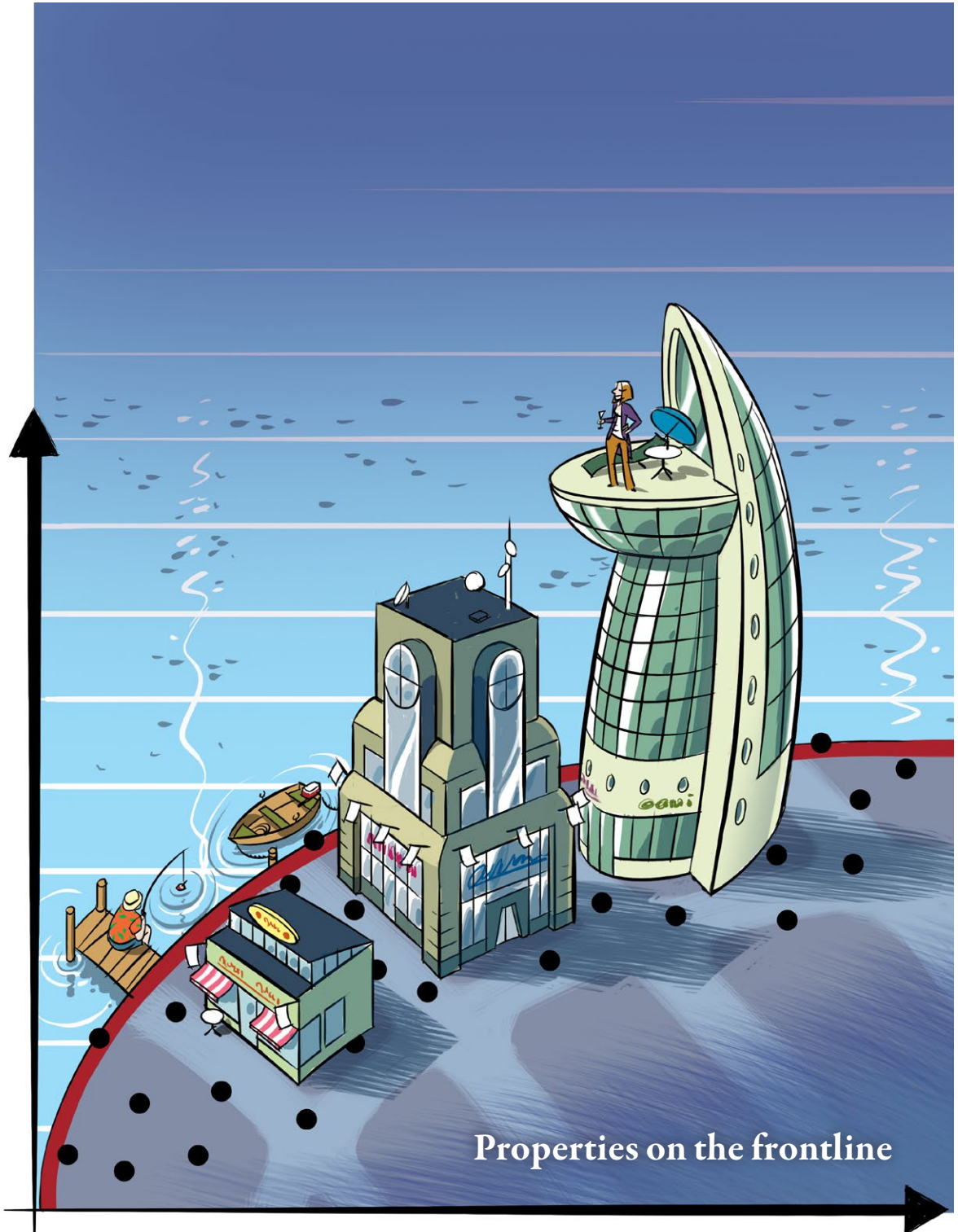
Property in an asset class portfolio

Along the efficient frontier lie those portfolios which minimise (maximise) risk (return) for any given level of return (risk). The addition of property to a universe of asset classes already comprising bonds and shares shifts the efficient frontier outwards. Hence, the inclusion of property in a portfolio makes it possible for an investor to reduce the total risk for any given level of expected return.

This is due to property being imperfectly correlated with both shares and bonds, as property has certain characteristics which other asset classes lack or at least have to a lesser extent than property, such as long term stable cash flows, which most listed companies cannot provide, and protection against inflation, which nominally denoted bonds lack. [2]

Efficient frontiers with and without property

Expected annual return, %

Risk (standard deviation), %
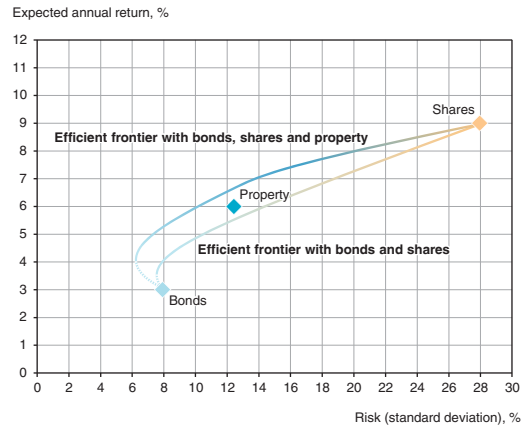
Property's share of the asset class portfolios that lie along the efficient frontier starts at approximately 30%, increases to just above 70%, and becomes 0% at the high end of the expected return spectrum.

The optimal risk-return profile, i.e. the one with the highest risk premium per unit of risk, is achieved by allocating approximately 40%[3] of capital to property.

The optimal property share is rather high, approximately 30%[4], even with a much less positive view on property's expected return in comparison with other asset classes.

Allocation within efficient frontier portfolios

Share of portfolio, %

Expected annual return, %
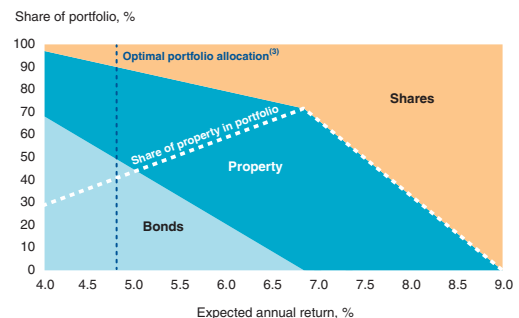
Due to the property sector's comparatively low liquidity and limited supply of investable assets, allocating as much as 40% of capital to property would be highly unpractical or even unfeasible for institutional investors. Nevertheless, investors should be able to improve the risk-return profile of their portfolios by increasing their exposure to property – albeit not necessarily to the extent that a theoretical analysis implies.

[2] Property's low correlation with other asset classes can also be argued to be due to lagging and smoothing effects in property valuations, on which its return, as measured by IPD, is based. However, should property be replaced with property shares, adjusted for leverage, in the above analysis, a similar conclusion is reached.

[3] Property's share in the optimal portfolio is 41% to be exact. Please refer to the section *How to find the optimal property allocation?* for calculations.

[4] 29% to be exact. Please refer to the section *How to find the optimal property allocation?* for calculations.

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How to find the optimal property allocation?

Which portfolio should an investor opt for among those that lie along the efficient frontier? One answer is to choose the portfolio that maximises the risk premium, i.e. the spread between the expected portfolio return (r_p) and the risk-free interest rate (r_f), per unit of risk (standard deviation, σ_p). This ratio is called the Sharpe ratio.

$$Sharpe\ ratio = \frac{r_p - r_f}{\sigma_p}$$

Expected annual return, %

Risk (standard deviation), %
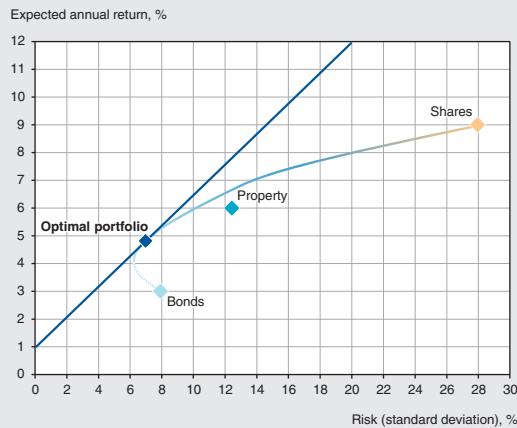
The optimal portfolio is found where a straight line with intercept at the risk-free interest rate – here assumed to be 1% – tangents the efficient frontier. The slope of this line is the maximum Sharpe ratio achievable along the efficient frontier.

With a risk-free interest rate of 1%, the portfolio which maximises the Sharpe ratio comprises 10% shares, 49% bonds and 41% property.

If expected returns for shares, bonds and property are varied with +/- 1 percentage point, the share of property in the optimal portfolio varies between 29% and 56% (see table below).

Property's share of the optimal portfolio for various asset classes' expected returns

Expected return, bonds		2%			3%			4%	
Expected return, shares	8%	9%	10%	8%	9%	10%	8%	9%	10%
Expected return, property — 5%	46%	44%	42%	36%	35%	34%	31%	30%	29%
Expected return, property — 6%	51%	50%	48%	42%	41%	39%	35%	35%	34%
Expected return, property — 7%	56%	54%	53%	46%	45%	44%	39%	39%	38%

⬚ Maximum property share ☐ Base case outlook property share ⬚ Minimum property share

Should investors wish to attain a higher return than the optimal portfolio gives, they must move further out along the efficient frontier, at the cost of a lower Sharpe ratio.[5]

For example, the average target nominal return among the first four Swedish national pension funds ('AP-funds 1-4') is 5.5% given expected inflation of 1%. The efficient portfolio giving that expected return comprises 16% shares, 33% bonds and 51% property, i.e. a deviation from the optimal portfolio.

[5] They can also achieve this, without compromising the Sharpe ratio, by borrowing at the risk-free rate and invest more than 100% of their capital in the optimal portfolio, i.e. moving upwards along the straight line from the optimal portfolio. That option may not, however, be available in reality.

Finding new sources of property

Based on the above analysis, institutional investors' substantial acquisitions of Swedish core properties over the past few years, at comparatively low yields, was probably the rational thing to do from a portfolio optimisation point-of-view. Over the last five years, institutional investors comprised the largest buyer category on the Swedish property market with more than 25% of total transaction volume.

However, supply might pose a limitation should Swedish institutional investors wish to increase their property exposure further. A doubling of the ten largest institutional investors' allocation to property, from today's 8% to 16%, would imply net property acquisitions of SEK 270 billion, i.e. 2.7 times the average annual property transaction volume in Sweden, of which not all is considered investment grade-properties by institutional investors.

From where can property be sourced, in addition to that what is currently traded at the direct property market?

- **International diversification.** Swedish institutional investors can acquire properties outside of Sweden. For geographies with which investors are less familiar, investments are preferably made indirectly through listed companies or non-listed vehicles such as private equity funds or JV/club structures.

- **Privatisations of property.** At both state, county and municipal level, the public sector in Sweden holds substantial volumes of property used as e.g. schools, homes for elderly and hospitals. Such properties might be acquired by institutional investors and leased (back) to operators.

- **Forward funding.** Institutional investors can partner with developers or construction companies and finance the construction of new property.

- **Debt financing.** Property exposure might take the form of lending instead of owning – i.e. providing the property sector with senior and/or junior debt.

- **Infrastructure.** There is still very little privately held infrastructure in Sweden which might change going forward. Infrastructure share many characteristics with property, such as stable long-term cash flows and inflation protection.

- **Sale and leasebacks.** Many corporates have substantial property holdings in the form of both offices and production and distribution facilities which could be acquired by institutional investors and leased back to operators.

| 100 |
| 80 |
| 60 |
| 40 |
| 20 |
| 0 |

Conclusion

The optimal property share of an asset class portfolio of approximately 40% might to some appear high, not least against the backdrop of institutional investors' current allocation. However, in an investment environment where bond yields are at historical low levels and shares trade at comparatively high earnings multiples, property should emerge as an attractive asset class.

More formally written, the expected Sharpe ratios for bonds, shares and property are 0.25, 0.29 and 0.40, respectively, meaning that property, in expectation, offers a better risk-return trade-off than both bonds and shares.

The above analysis implies that substantially more capital should be allocated to property than is the case among institutional investors today. However, supply poses a limitation. To be able to increase their property exposure, investors need to find ways to expand the investable property universe.

Allocation of capital in the optimal portfolio

Property
41%

Bonds
49%

Shares
10%