CUREM
Center for Urban & Real Estate Management – Zurich

CUREM*horizonte*

Introduction: Risk in Real Estate Investments

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24 June 2008

Risk in Finance

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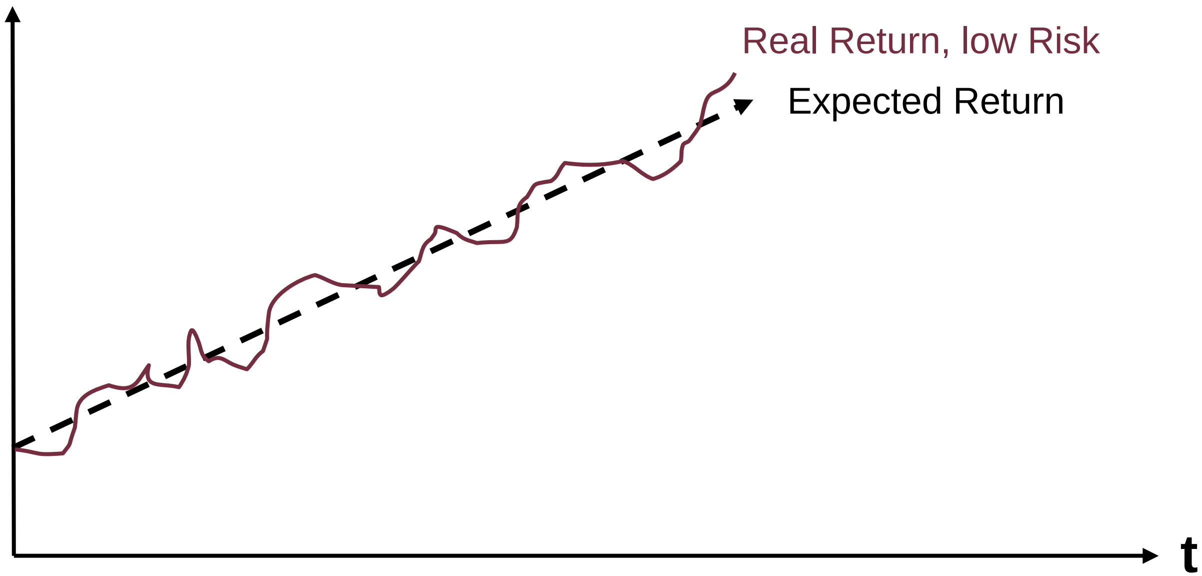
Risk in a finance context has a specific meaning (“view”) which should not be confused with our daily unspecific understanding of risk.

Risk in Finance is the – **positive and negative - uncertainty** of an expected outcome, often quantified as standard deviation (SD) of an expected return:



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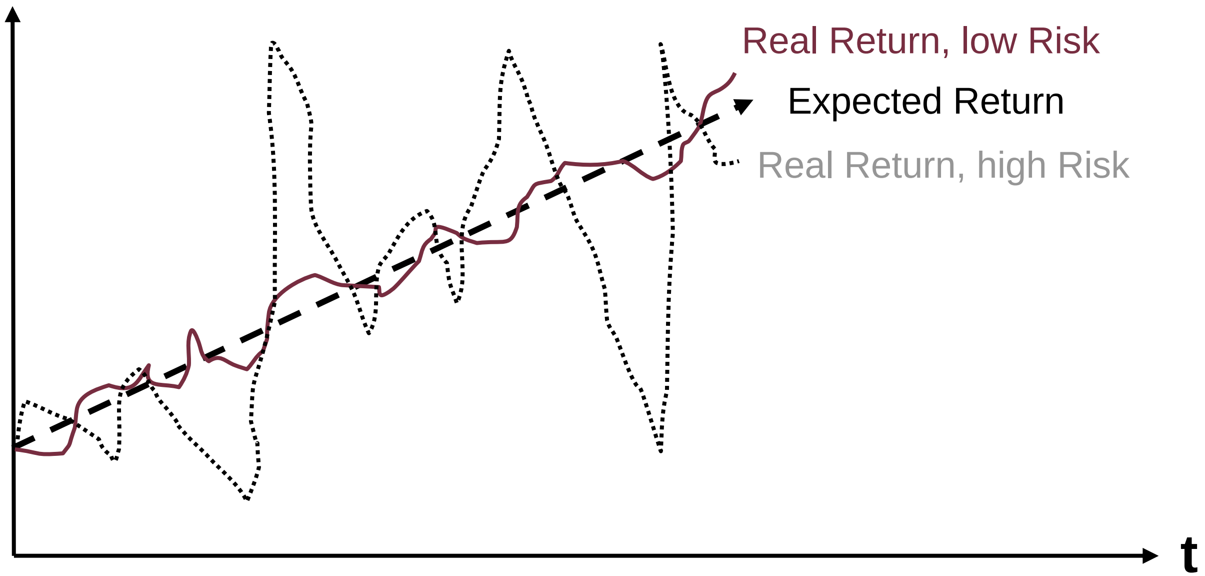
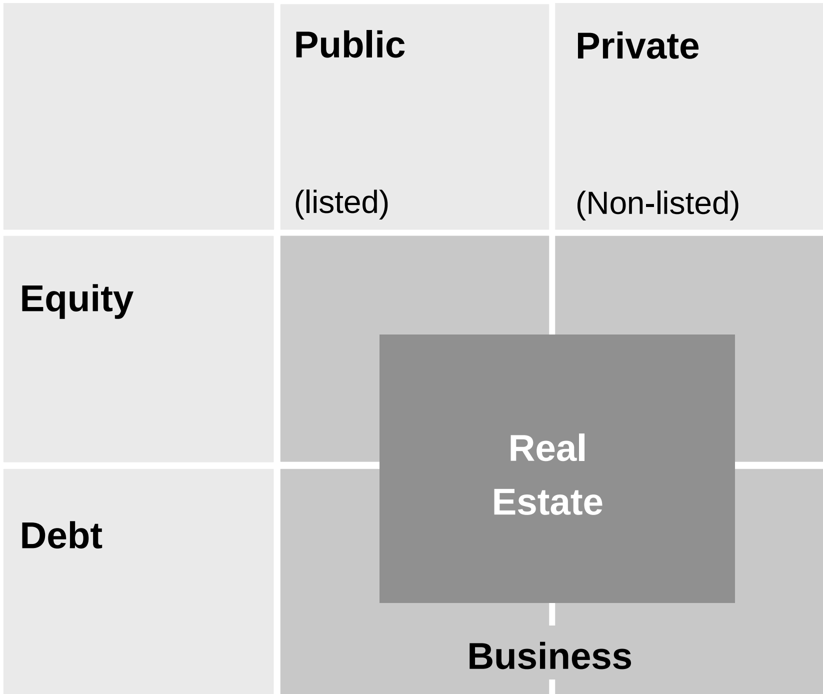


Risk in Finance: The real estate context

	Public (listed)	**Private** (Non-listed)
Equity		
Debt		

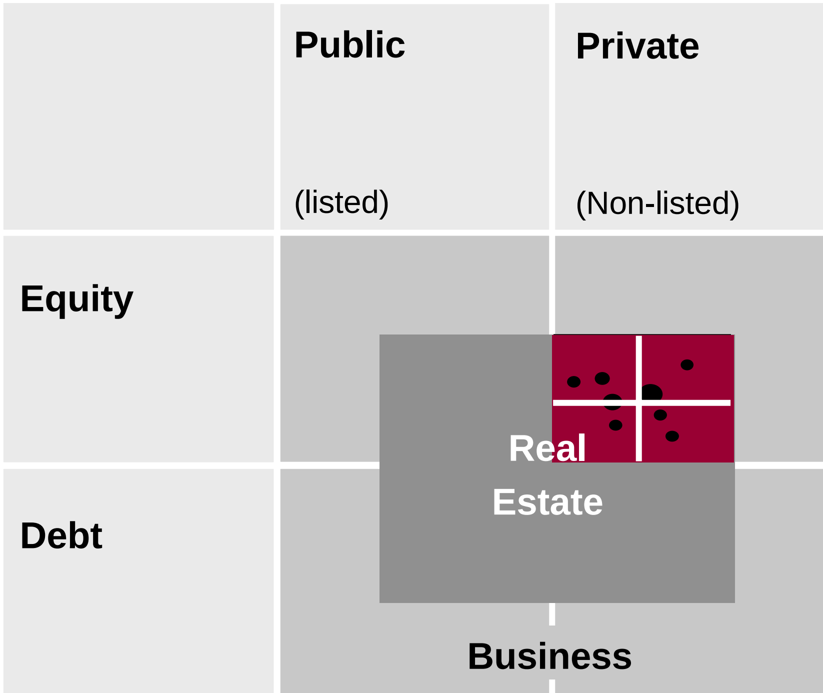
Risk in Finance: The real estate context - D-4-Q



Dual four quadrant approach (D-4-Q)

CUREM‘s integrative real estate investment approach

Risk in Finance: The real estate context - D-4-Q



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CUREM's integrative real estate investment approach

Risk in a Portfolio Context

Portfolio-Return?

return(portfolio)

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return(portfolio) = weight(1) x return(1) + weight(2) x return(2)

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Example:

$$\begin{array}{ll} r(1) = 4\% & w(1) = 0.2 \\ r(2) = 10\% & w(2) = 0.8 \end{array} \Big\} \; 1$$

0.2 x 5% + 0.8 x 10% = 9%

Risk in a Portfolio Context

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Risk in a Portfolio Context

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SD = Standard Deviation

?

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Risk in a Portfolio Context

Portfolio-Risk

$$SD(p)^2 = w(1)^2 SD(1)^2 + w(2)^2 SD(2)^2 + 2w(1)w(2)\,\mathbf{Cov}\left(\mathbf{r(1),r(2)}\right)$$

Risk in a Portfolio Context

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$$\mathbf{Cov}\left[\mathbf{r(1),r(2)}\right] = Corr\left[r(1),r(2)\right] SD(1)SD(2), \qquad -1 > Corr > +1$$

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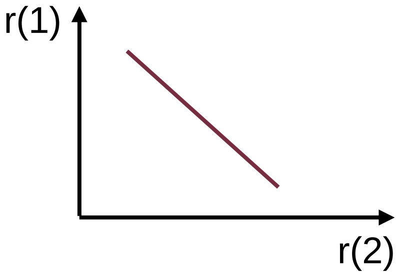
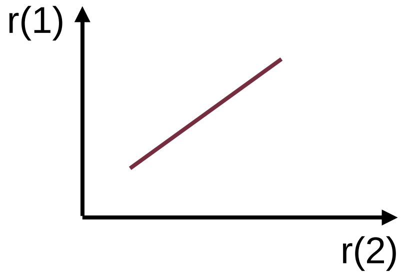
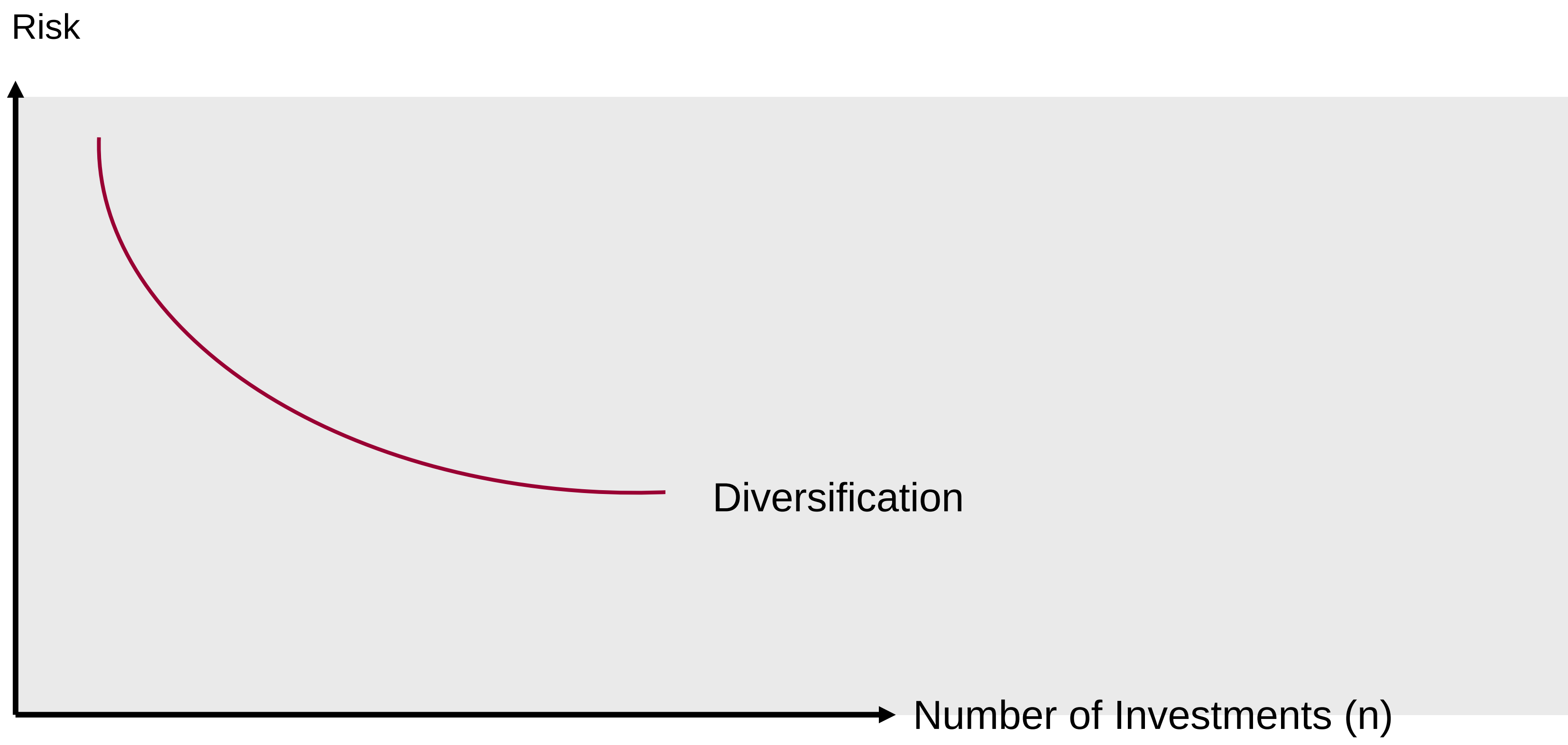
Extrem 1: Corr = -1: **SD(p) can be 0**



Extrem 2: Corr = +1: **SD(p) = w(1)SD(1) + w(2)SD(2**)



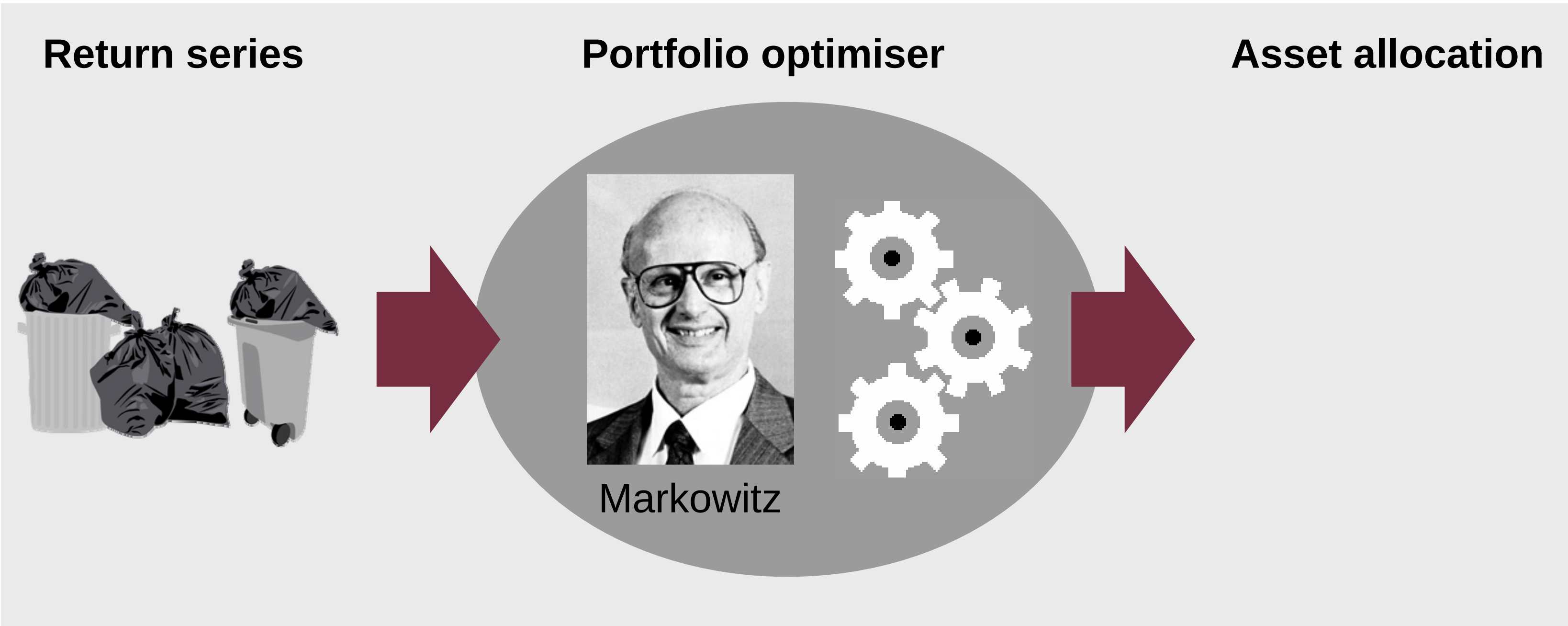
Risk in a Portfolio Context



Risk in a Portfolio Context: The Trouble with Harry

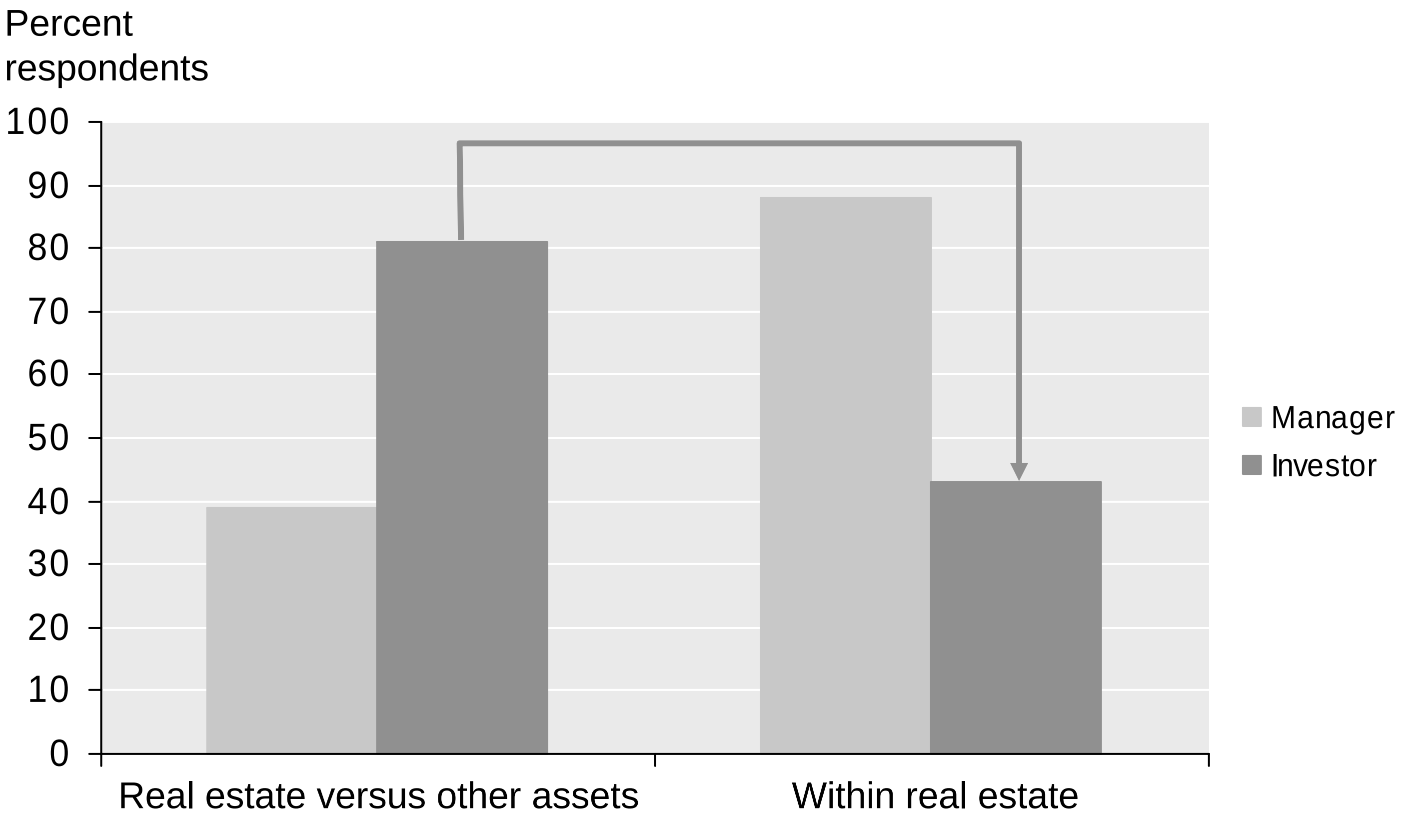
Modern Portfolio Theory is nice in theory, but application to real estate meets several problems:

- Return series not available for all markets, or not of sufficient length
- Available series suffer from specific real estate specific characteristics



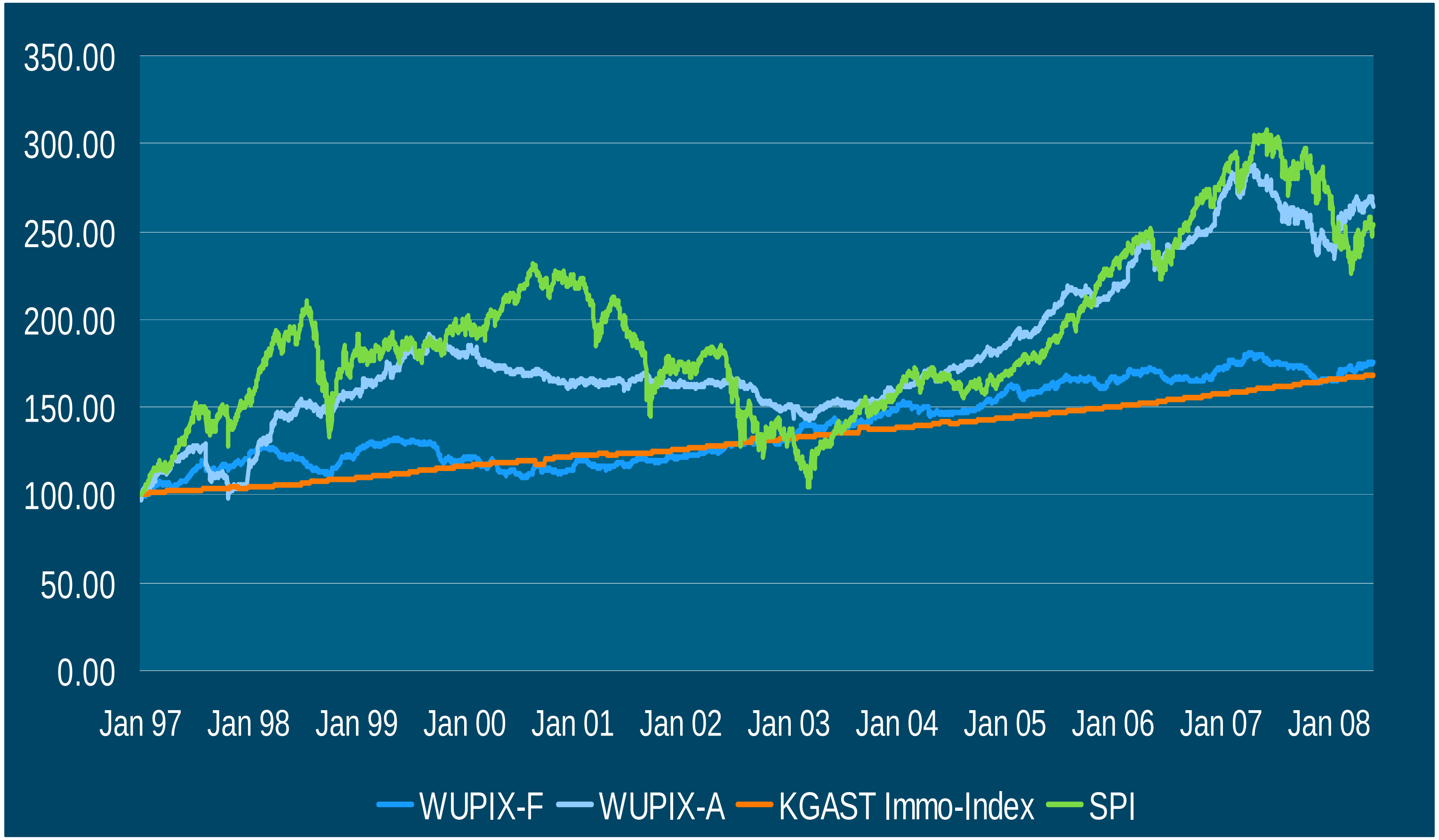
According to Maarten von der Spek, ING Real Estate

Risk in a Portfolio Context
Data Quality Limits Use of Mean-Variance in Real Estate



Note: Survey based on 36 managers and 22 investors
Source: INREV investment intentions survey, 2005

The Price of Illiquidity and the Price of Illiquidity Risk

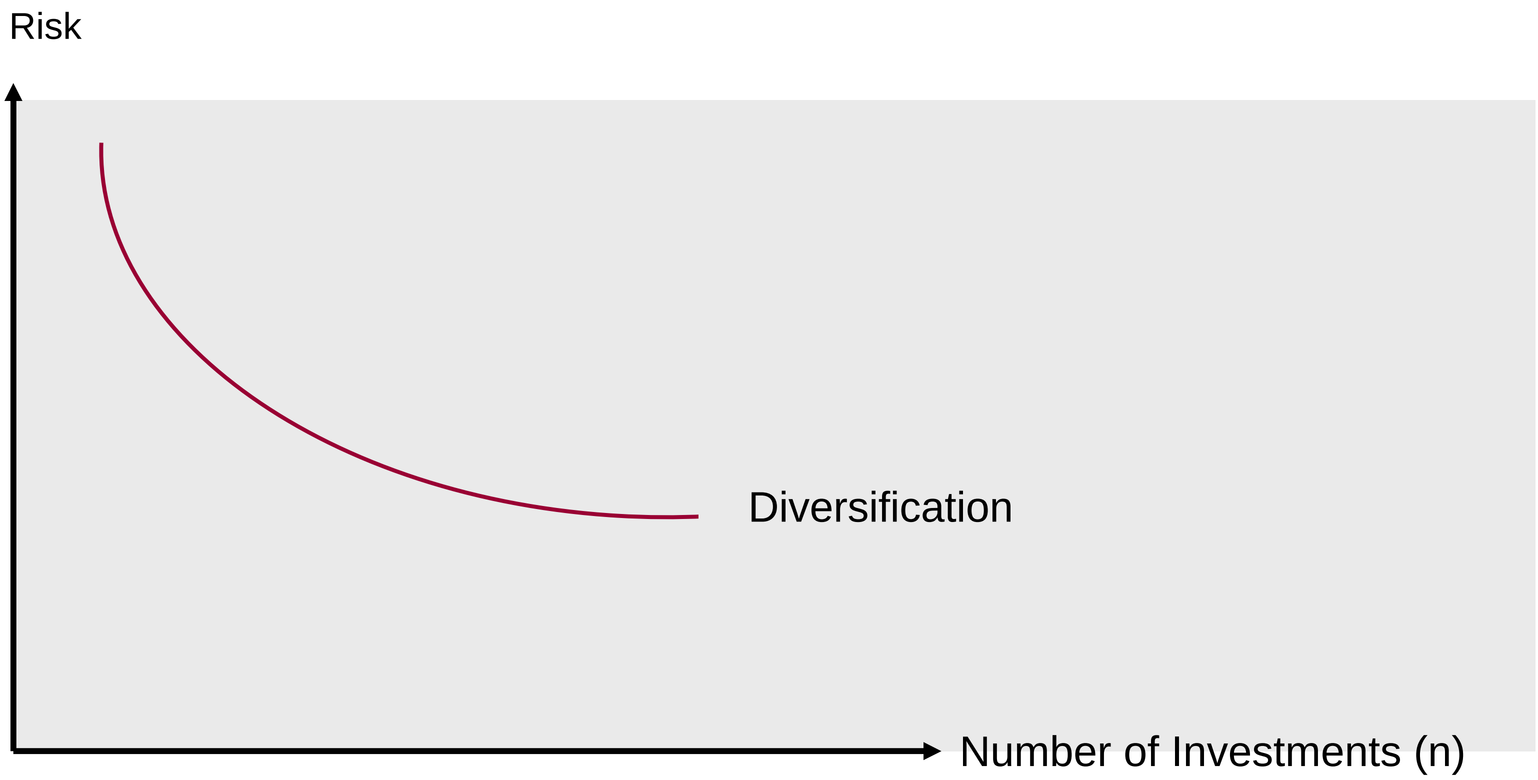


Inflation

What about the risk of (unexpected) inflation?

- Is (unexpected) inflation in your return a risk if your liabilities follow (unexpected) inflation?
- Yes, it is volatility (risk), but a “good” volatility that matches the volatility of the liabilities.

Risk Pricing



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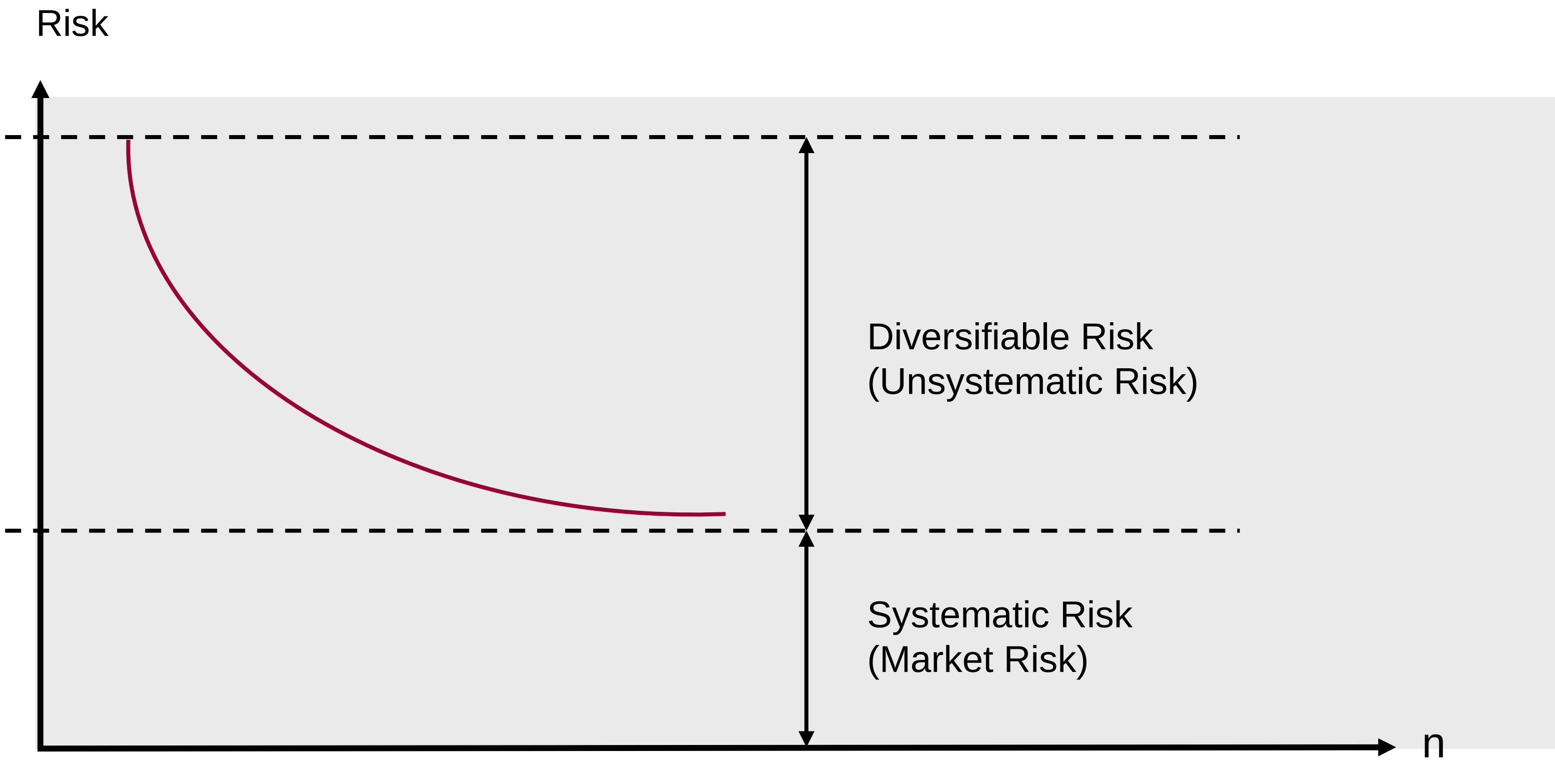

Risk Pricing:
Capital Asset Pricing Model (CAPM) vs. Real Estate Pricing

CAPM: In efficient markets is only systematic risk (market risk) priced. Rational investors do not pay for selling diversifiable risk.

Expected Return (a) = risk free rate + Beta x (expected market return - risk free rate)

$$\mathbf{Er(a) = r(f) + Beta\left(Er(m) + r(f)\right)}$$

$$\text{Beta} = \frac{\text{Cov}\left[r(a),r(m)\right]}{\text{SD}(m)^2}$$

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Real Estate Pricing (Valuation)

Er(a) = r(f) + systematic RE risk **+ object-related RE risk (unsystematic risk)**

What is the risk-reduction of a diversification in a specific RE portfolio?

What is the quantitative benefit of RE diversification?

Example of Risk Pricing in a Global RE Portfolio (PGGM)

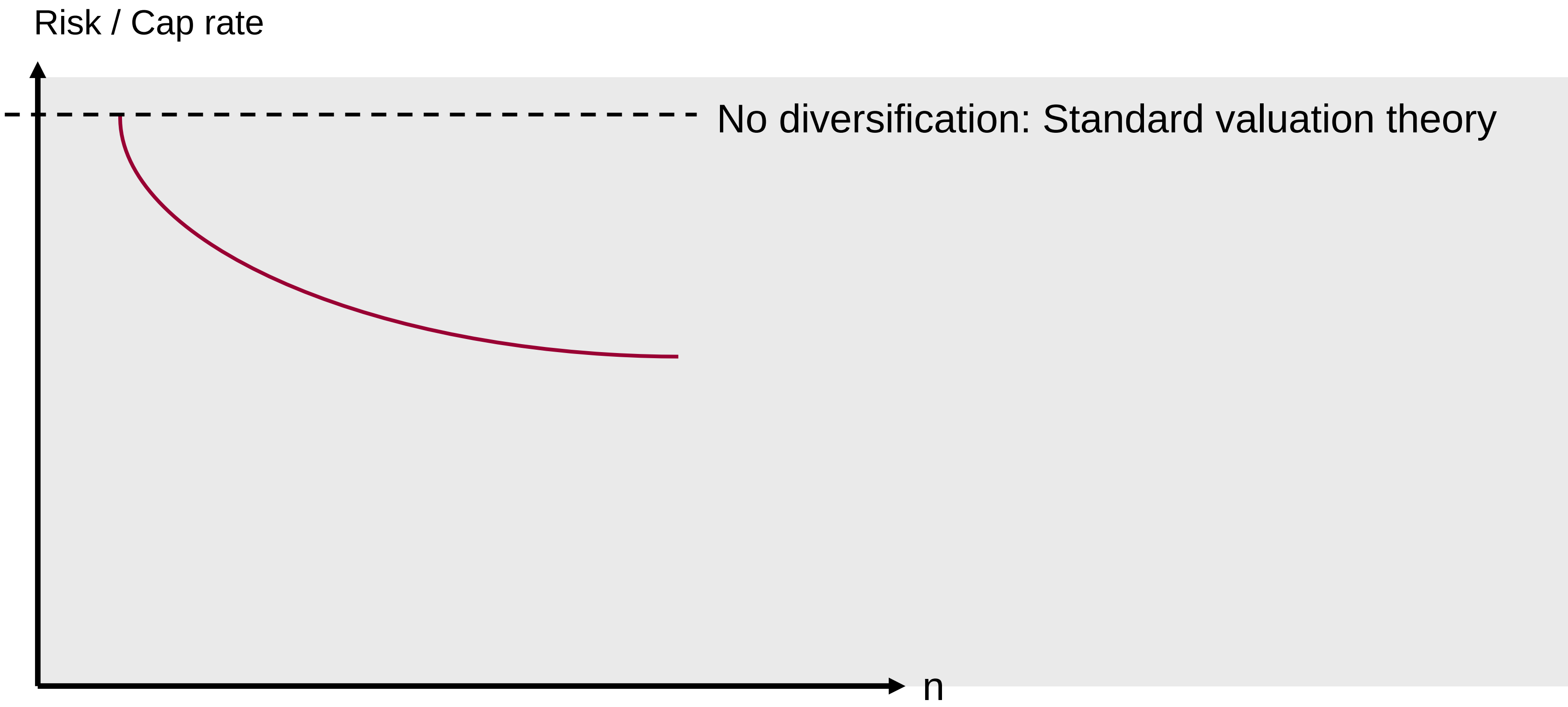
Equation

$$\mathbf{RR} = RF + \frac{GAV}{NAV} * RP_{sector} * RP_{regio} * RP_{development}$$

Factor	Explanation
RR	• Required return
RF	• Risk free rate, i.e. 10 yrs local IRS
GAV	• Gross Asset Value
NAV	• Net Asset Value
RP_{sector}	• Risk adjustment per sector, between 0.7 (residential) and 1.2 (offices)
RP_{regio}	• Risk premium per region, 2% for developed markets, 3% for emerging markets
$RP_{development}$	• Risk adjustments for development risks, is 1 for no development risk, is 2 for 100% development risk

Source: Johan van der Ende, PGGM, INREV Seminar, Amsterdam 1st April 2008

Risk Pricing – What is the Appropriate Cap Rate?



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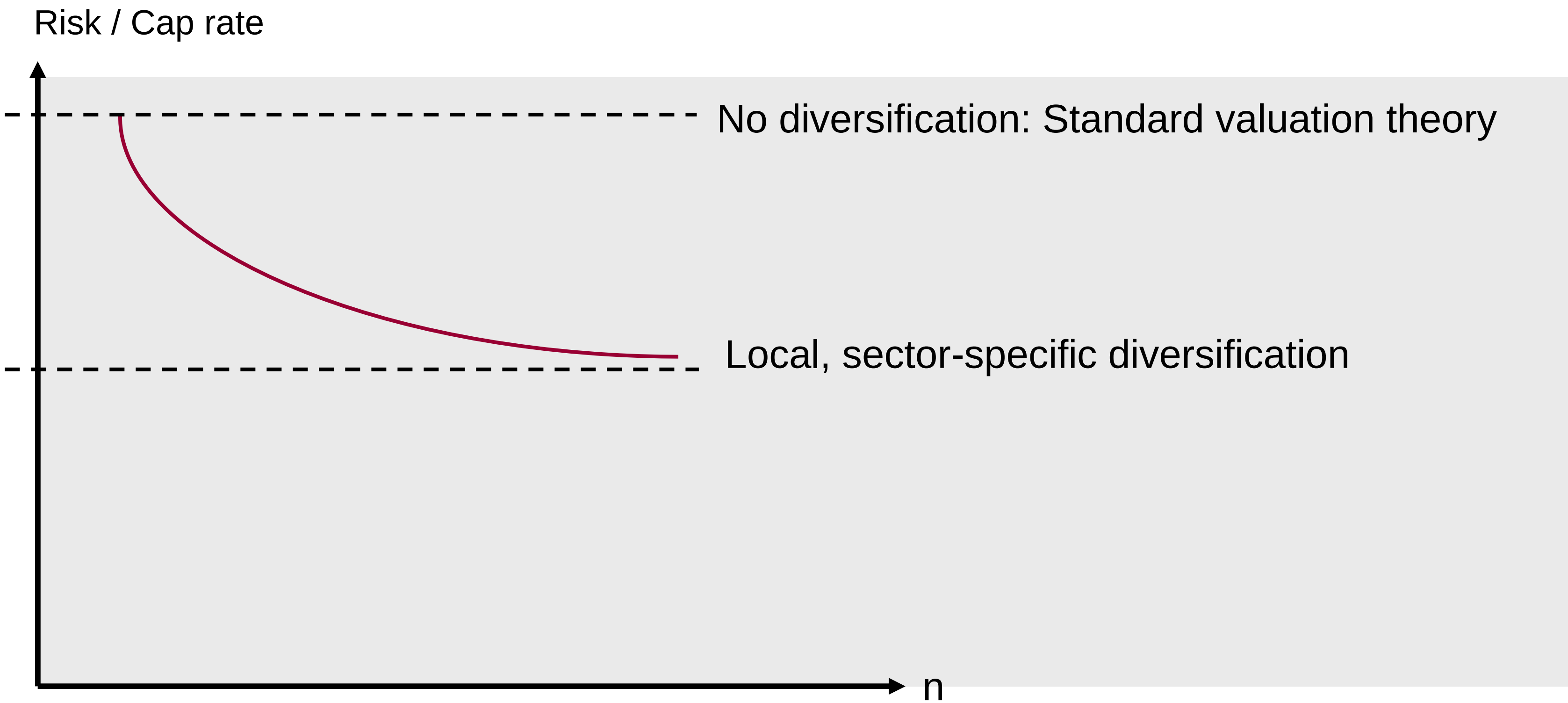

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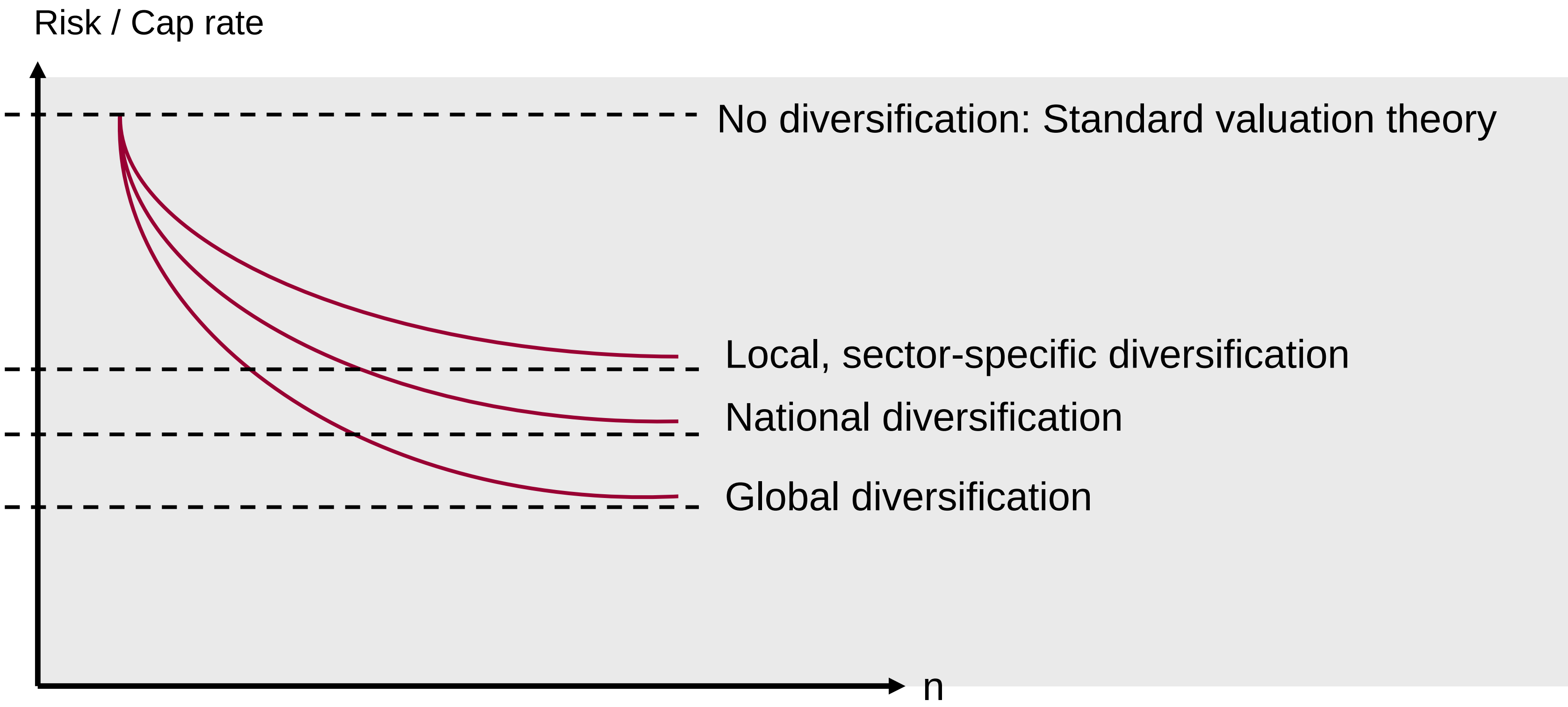

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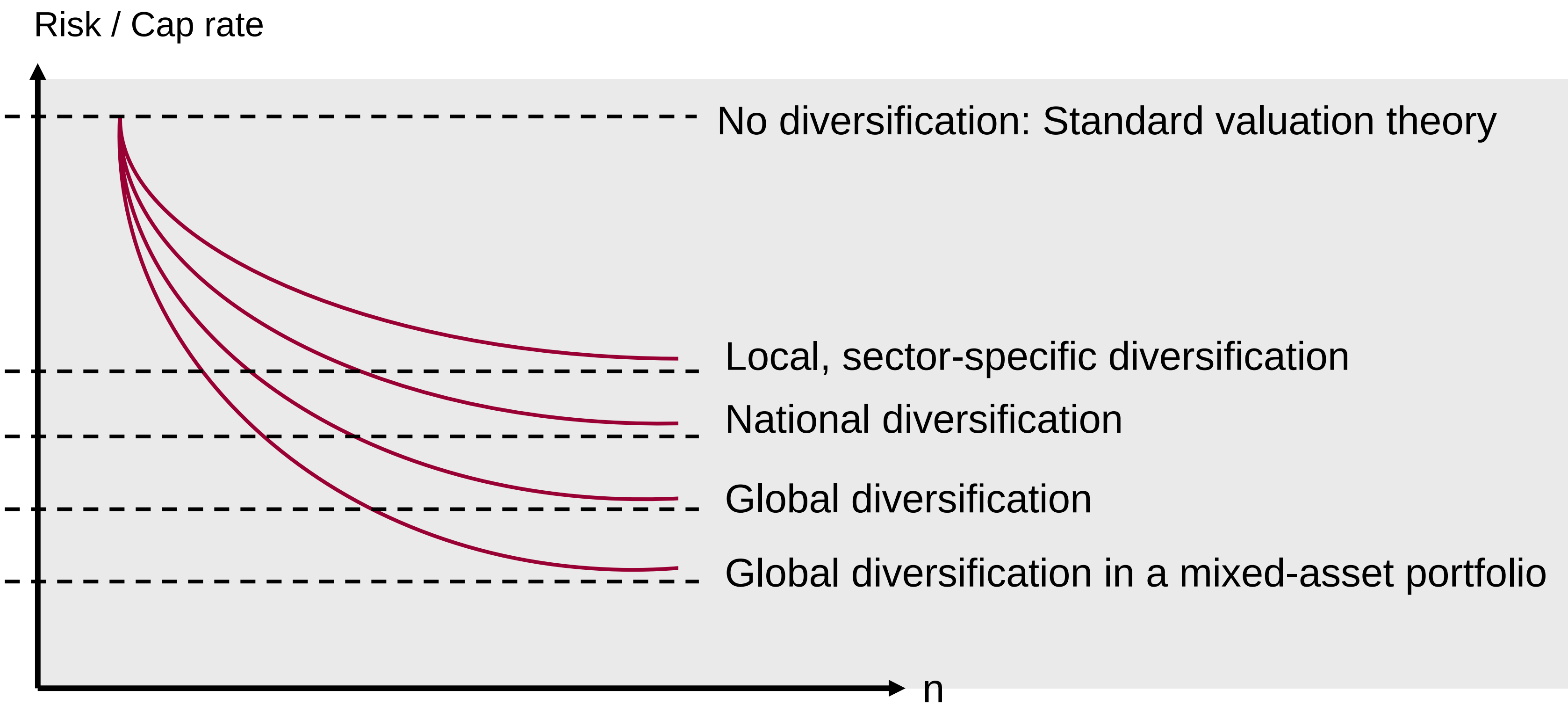

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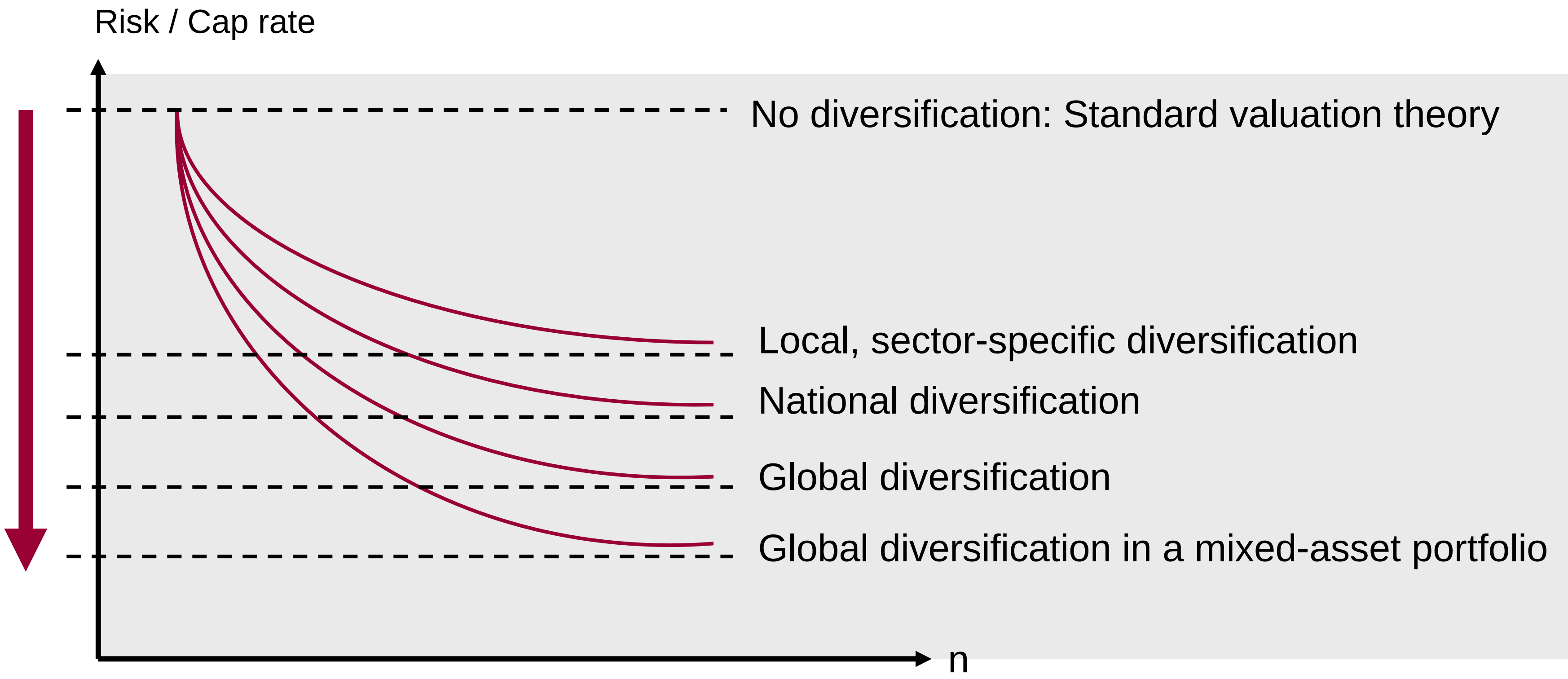

The better the diversification – the higher the willingness to pay for real estate

Conclusion

The **Best Diversifier** will be

The **Best Risk Owner**, with the highest willingness to pay, and therefore be

The **Best Owner.**

And in the end all properties are owned by their best owners.

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