A Look at the Structure of Institutional Investors' Expectations

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How do risk and return fit together?

The traditional financial economic theory postulates a **positive** relationship between *expected* or *ex-ante* return and *expected* or *ex-ante* risk.

- The Security Market Line (or the CAPM) relates the two variables linearly for any given asset i

$$\mathbb{E}[R_i] = r_f + \beta_i \times (\mathbb{E}[R_M] - r_f)$$

- The Capital Market Line for any given portfolio of assets

$$\mathbb{E}[R_p] = r_f + \sigma_p \times \frac{\mathbb{E}[R_M] - r_f}{\sigma_M}$$

How do risk and return fit together?

The above relations are estimated and tested using *ex-post* values of both returns and volatility; the rationale is that *realized* returns and *expected* returns will converge for any given time period. Asset pricing structural models assume convergence by imposing that

$$R_t^i = \mathbb{E}[R_t^i] + \epsilon_i^t, \epsilon \sim N(0,1)$$

But

- When *expected* returns for the following period increase then stock prices will fall as a result, causing the *realized* returns over the next periods to decrease. This is systematic and so the ϵ is not statistically independent over time. Convergence is not assured in this set-up.
- Realized returns may **consistently** over- or under-shoot expected returns over several periods of time.

Academic Research

Focused on equity markets

- Shefrin (2001) shows investors, portfolio managers and analysts perceive expected return to be **negatively** related to expected risk - cross-sectional analysis.
- Moreover individual investors suffer from the extrapolation bias while equity strategist from the "gambler's fallacy" - these relations show the time-series structure of returns expectations.
- Amromin et al. (2005) build upon the Michigan Surveys of Consumer Attitudes - they find that individual consumers extrapolate returns (form naive expectations) and a more optimistic assessment of macroeconomic conditions coincides with higher expected returns and lower expected volatility.

How can this be?

Behavioral economics offers some useful insights

- Finucane et al. (2000) identify the **affect heuristic** as a potential culprit for the observed behavior.
- People attach to a given prospect/item/situation either a positive or a negative label. This will cause both the benefit and the hazard of the prospect/item/situation to be evaluated by the *emotion* attached to it and not by a rational comparison of benefits and hazard.
- Items that carry a positive emotion are seen as good *AND* safe whereas negative labels will project a feeling of bad *AND* risky.
- Shefin's study shows that people see good companies as companies having good returns (high returns). The affect heuristic will drive them to see these companies also as safe -¿ thus the negative relation

Research Question of the present study

The main interest of the present study is to understand if the (cross-sectional) expectations of real estate institutional investors abide the financial economic theory.

- Can we expect a positive relation between return and risk?
- How good is the cap-rate model/static dcf model?

Data

A survey of institutional investors' expectations was designed and emailed to a list of Swiss investors.

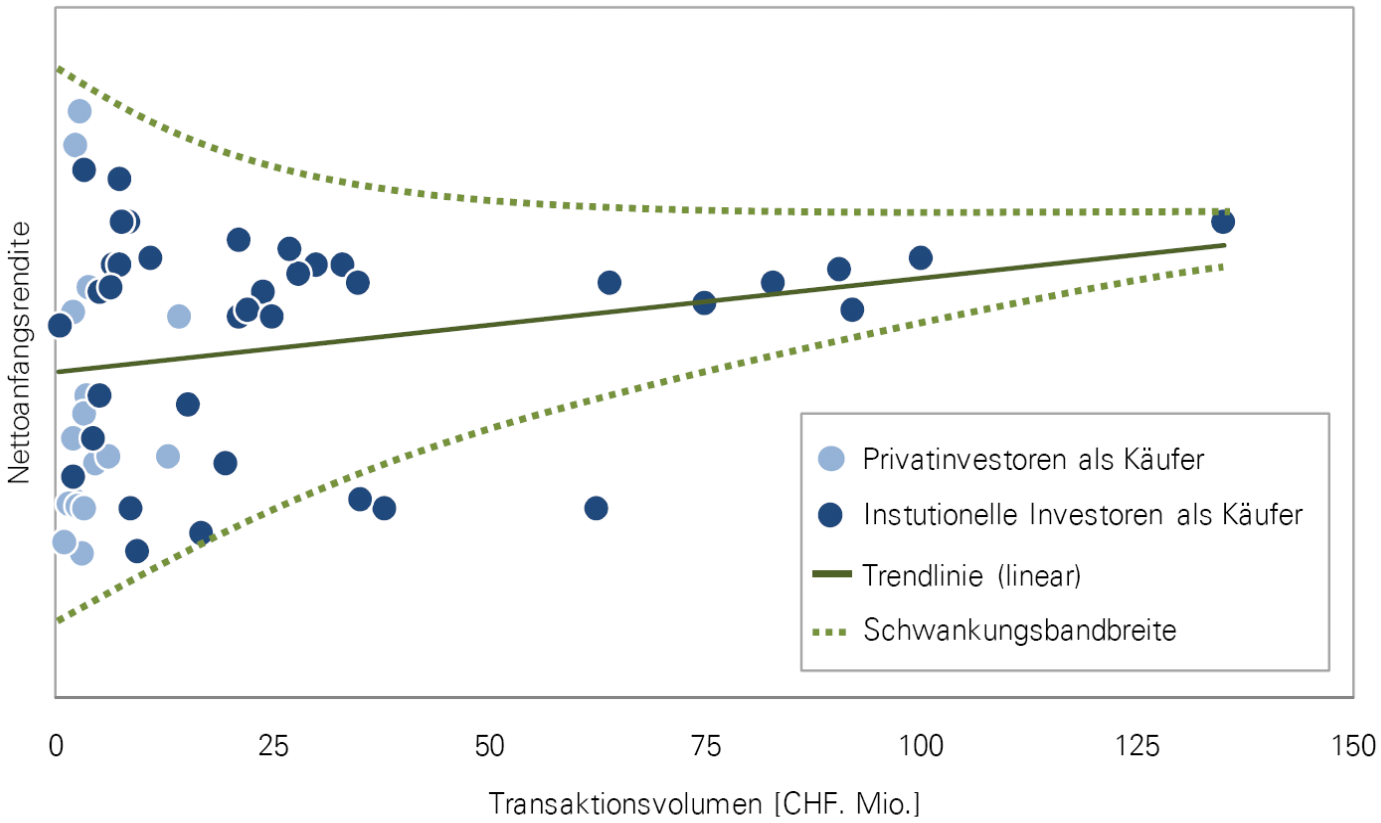
- Took place around March 2010[1].
- Online run with anonymous answers; some 35 participants answered, all from Switzerland.
- Survey: Identification Section, Transactions Section and an Expectations Section.

[1] Generous support of KPMG Switzerland is acknowledged

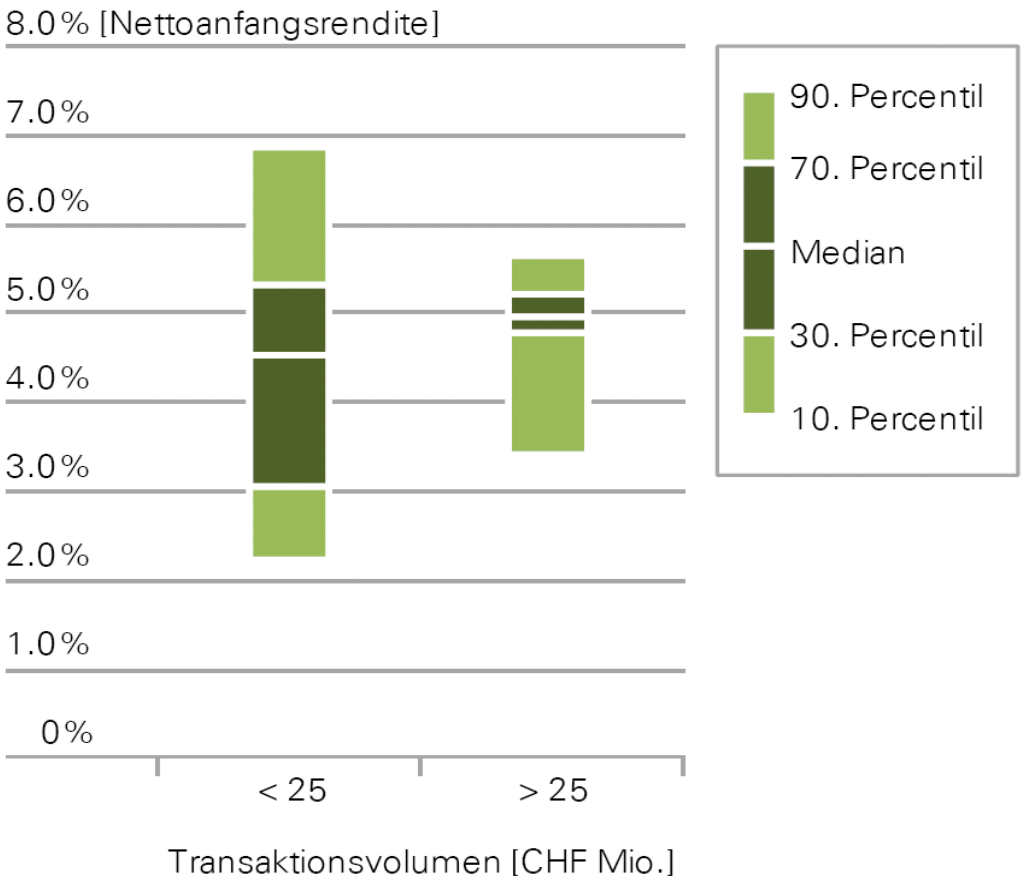
Identification - The Participants

- 65% Institutional, 14% Listed Company, 9% Developers, 5% Corporate Real Estate, 9% Private Company
- Median Allocation: 63% Residential, 24% Office, 4% Commercial, 10% Retail, 10% Other
- Average Vacancy: 1.86% Residential, 5.12% Office, 3.3% Commercial, 1.67% Retail, 6.6% Other
- Financing: Mostly Equity
- Average Portfolio Cap Rate: 4.92%; St. Dev.: 0.55%

Transactions - Summary



Transactions - Summary II



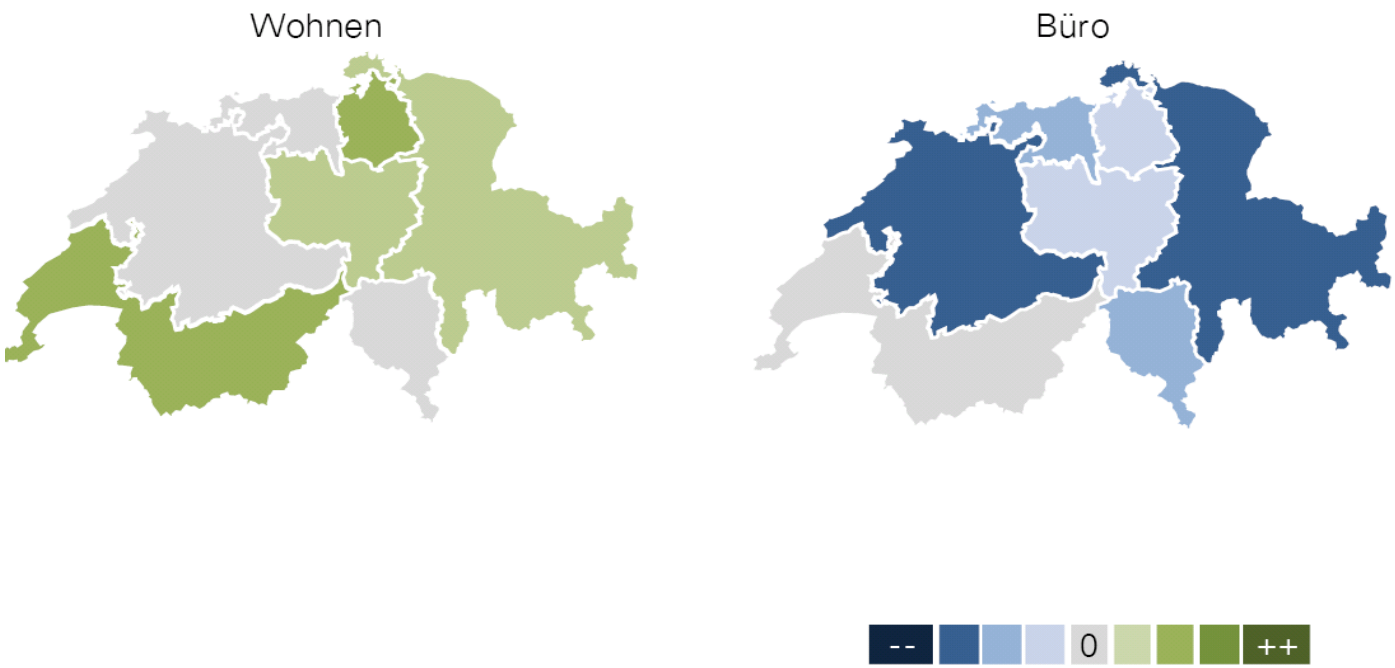
Expectations

Three sets of questions elicited the expectations of the participants with respect to *changes* in rents, vacancy rate and cap rates across regions and industries. Another set of questions asked the opinion of the participants with respect to the price level across regions and industries.

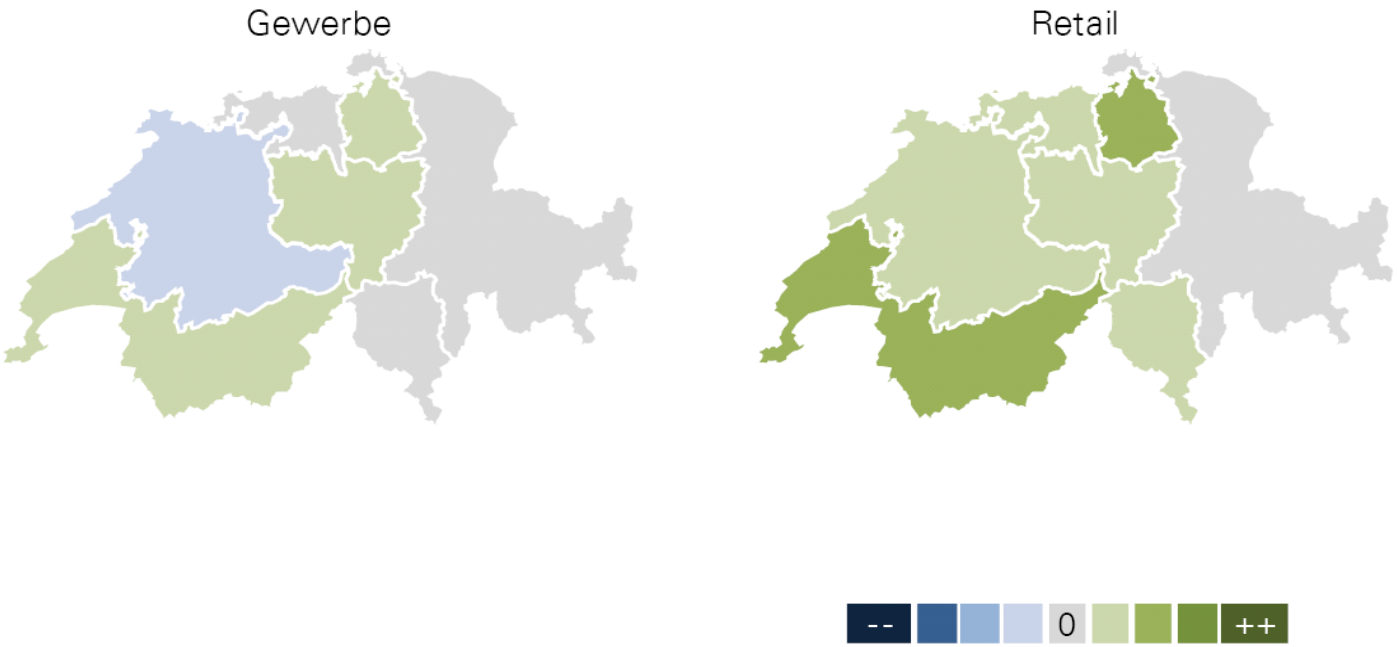
- Question: "How do you expect the rent(vacancy/cap rate) to change by the end of 2010 for market x"
- Possible Answers: strong decrease, decrease, remain constant, increase, strong increase.
- Question: "How do you perceive the price level in 2010 for market x"
- Possible Answers: strongly undervalued, undervalued, fair, overvalued, strongly overvalued.

Strongly increasing rents are used as a proxy for the growth in rents; Current opinion on prices as a proxy for expected one period returns.

Expectations of Change in Rent



Opinions about the price level



The rational model as benchmark

The DCF model is a good framework to understand how the affect heuristic might distort the relations between expectations.

- The periodic returns will be equal to the discount rate as long as there is no change in expectations of either cash-flows, growth rate, risk-free rate or risk-premium.

$$
\begin{aligned}
P_t &= \frac{D^e_{t+1}}{1+d^e} + \frac{D^e_{t+1}(1+g^e)}{(1+d^e)^2} + \frac{D^e_{t+1}(1+g^e)^3}{(1+d^e)^3} + \ldots \\
R_{t+1} &= \frac{D_{t+1}+P_{t+1}}{P_t} \text{ then we observe} \\
R_{t+1} &= 1+d^e \iff D^e, d^e, g^e \text{ are constant over time}
\end{aligned}
$$

Moreover we can use the cap rate as a short-cut

$$C_t \equiv \frac{D_{t+1}}{P_t} = d^e - g^e$$

The Campbell-Shiller dynamic DCF

Let r_{t+1} be the log return at time $t+1$ and p_t be the log price at time t:

$$\begin{aligned} r_{t+1} &\equiv log(P_{t+1} + D_{t+1}) - log(P_t) \\ &= p_{t+1} - p_t + log(1 + exp(d_{t+1} - p_{t+1})) \\ r_{t+1} &\approx k + \rho p_{t+1} + (1-\rho) d_{t+1} - p_t \end{aligned}$$

where k and ρ are parameters of the linearization, ρ being the long-run average of $P/(P+D)$ (slightly lower than 1).

The cap rate in the dynamic DCF

If we rearrange the previous formula for the periodic return we can obtain an approximation for the cap rate

$$
\begin{aligned}
r_{t+1} &\approx k + \rho p_{t+1} + (1-\rho) d_{t+1} - p_t \text{ to obtain} \\
r_{t+1} &\approx k + (d_{t+1} - p_t) - \rho(d_{t+2} - p_{t+1}) + \rho(d_{t+2} - d_{t+1}) \text{ to obtain} \\
r_{t+1} &\approx k + c_t - \rho c_{t+1} + \rho g_{t+2}
\end{aligned}
$$

where $c_t = log(D_{t+1}/P_t)$ and $g_{t+2} = log(D_{t+2}/D_{t+1})$. Conditioning on time t information we have the relation needed between the expectations of the variables of interest

$$
\begin{aligned}
\mathbb{E}_t[r_{t+1}] &\approx k + c_t - \rho\,\mathbb{E}_t[c_{t+1}] + \rho\,\mathbb{E}_t[g_{t+2}] \\
\rho\,\mathbb{E}_t[c_{t+1}] - c_t &\approx k - \mathbb{E}_t[r_{t+1}] + \rho\,\mathbb{E}_t[g_{t+2}]
\end{aligned}
$$

The Data on Expectations

The answers regarding expectations and price level were coded with 1="strong decrease" to 5="strong increase". The data was then aggregated across the 7 regions and the 4 industries to produce a sensible sample-size.

- Does the aggregation influence the result?
- Yes, but only the size of the regression parameter and not the sign.

What will be tested? Changes in the cap rate are negatively related to changes in prices and positively related to changes in dividends

$$\rho\,\mathbb{E}_t[c_{t+1}] - c_t \approx k - \mathbb{E}_t[r_{t+1}] + \rho\,\mathbb{E}_t[g_{t+2}]$$

Preliminary results

The ordered logit model was estimated with explanatory variables given by the implicit expectations of periodic returns and expectations of changes in rents:

$$Cap = Price + Rent$$

- Cap = {1,...,5}={strongly decrease,...,strongly increase} - expected changes in cap rates
- Price = {1,...,5}={strongly undervalued,...,strongly overvalued} - expected changes in periodic returns
- Rent = {1,...,5}={strongly decrease,...,strongly increase} - expected changes in rents

Preliminary results -II

Proportional Odds Logistic Model of Cap ~ Price + Rent

Coefficients:

	Value	Std. Error	t value
Price	0.515	0.159	3.22
Rent	0.708	0.169	4.18

Intercepts:

	Value	Std. Error	t value
1 | 2	-1.066	0.823	-1.29
2 | 3	3.222	0.643	5.00
3 | 4	5.026	0.696	7.22
4 | 5	8.042	0.892	9.01

Residual Deviance: 553.32

AIC: 565.3