EUROPEAN CENTRAL BANK

EUROSYSTEM

Discussion of P. Bacchetta, E. Mertens, and E. van Wincoop paper *"Predictability in Financial Markets: What Do Survey Expectations Tell Us?"*

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The usual disclaimers apply.

Contribution

- Novel and original approach to understand predictability of excess returns of asset prices
- Uncover important stylised facts
  1. Predictability of forecast errors suggestive of violation of strong rationality by agents
  2. Money market as exception
- New dataset on surveys for 4 asset markets
- Great paper – difficult to discuss

The idea

$$q_{t+n} = \alpha + \beta x_t + u_{t+n} \qquad (1)$$

$$(q_{t+n} - E_t q_{t+n}) = \gamma + \delta x_t + v_{t+n} \qquad (2)$$

$$E_t q_{t+n} = \mu + \lambda x_t + w_{t+n} \qquad (2')$$

- RE theory: $\beta \approx \lambda$ and $\delta = 0$ (by definition: $\beta - \lambda = \delta$)
- Empirically: $\beta \approx \delta \neq 0$ and $\lambda = 0$ (FX, equity & bonds)
- $\beta \approx \delta = 0$ and $\lambda \neq 0$ (money market)

➔ violation of strong form of rationality (?)

(though $\beta \neq 0$ ok if x_t correlated e.g. with risk premium; but then also $\delta \neq 0$ should hold)

Discussion

- Careful analysis of paper & uncovering of really neat stylised fact
- Are these findings economically meaningful & important ?
- Can we go a step further – what are explanations for apparent "puzzle" ?

Query #1: Risk premia

- Causality may run from expectational errors to excess returns: $q_{t+n} = rp + e_{t+n}$ and $E_t q_{t+n} = rp$
- Hence any variable predicting e_{t+n} has same coefficient for q_{t+n} (Gourinchas & Jeanne 2004)
- Test for role of risk premia, e.g. Fama (1984):

$$\Delta s_{t+k} = \alpha + \beta(f_t^k - s_t) + \eta_{t+k} \qquad (x)$$

$$f_t^k - s_{t+k} = \gamma + \delta\,(f_t^k - s_t) + v_{t+k} \qquad (z)$$

which yields: $\beta = \mathrm{cov}(\Delta_k s_{t+k}, f_t^k - s_t) / \mathrm{var}(f_t^k - s_t)$

$\delta = \mathrm{cov}(f_t^k - s_{t+k}, f_t^k - s_t) / \mathrm{var}(f_t^k - s_t)$

Fama decomposition

- Literature suggests that significant FX excess returns exist which can be predicted using current information and the variance of these returns is larger than the variance of expected FX changes
- Outcome is that to explain the observed data, agents must be *very* risk averse
- Does this hold for exercise with survey data of present paper?

Query #2: Measurement error

- How good is the quality of the surveys?
  - Agents tend to have much shorter time horizon
  - Incentives for participants to report accurately
- Note: measurement error biases results only to the extent that it is related to x_t
- Tests of unbiasedness (U) and efficiency (E):

$$U: q_{t+n} = \alpha + \beta E_t q_{t+n} + \varsigma_{t+n} \qquad H_0: \alpha = 0, \beta = 1$$

$$E: (q_{t+n} - E_t q_{t+n}) = \gamma + \sum_k \eta_k q_{t-k} + \xi_{t+n} \qquad H_0: \eta_1 = \eta_2 = \ldots = 0$$

- Useful test of weak form of rationality (Fama 1991)

2. Measurement error

	Unbiasedness test		Efficiency test
	α	β	η
Australia	-0.038	0.842	0.253 **
Canada	-0.002	0.694	0.415 ***
Switzerland	-0.002	0.256 **	0.010
Germany	-0.008	0.197 **	0.099
France	-0.016	0.049 ***	0.066
U.K.	-0.034 **	0.810	-0.185
Japan	-0.021	0.546	0.095

- Quality of overall survey data in most cases ok [here for exchange rate survey]

3. Stability of results

- Is the stylised fact economically meaningful?
- How does excess return predictability square with evidence of RW behaviour of asset prices?
- First piece of evidence: stability of relations over time

3. Stability of results

	Full period	1986 - 1990	1991 - 1994	1995 - 1999	2000 - 2004
SURVEY ERROR	coef.	coef.	coef.	coef.	coef.
Australia	-3.323***	-0.914	0.116	-5.003**	-6.128***
Germany	-2.615***	-2.499	1.112	-3.173	-8.363***
Switzerland	-2.996***	-3.463*	1.741	2.174	-8.157***
EXCESS RETURN					
Australia	-2.487***	-1.519*	2.081*	-4.542**	-6.461***
Germany	-2.432**	-2.172	0.685	-2.978*	-7.510***
Switzerland	-2.761***	-3.366	1.232	5.431*	-6.615***
EXPECTED EXCESS RETURN					
Australia	0.835***	-0.606***	1.965***	0.461	-0.333**
Germany	0.183	0.326	-0.428***	0.195	0.853**
Switzerland	0.235	0.098	-0.509***	3.257*	1.541**

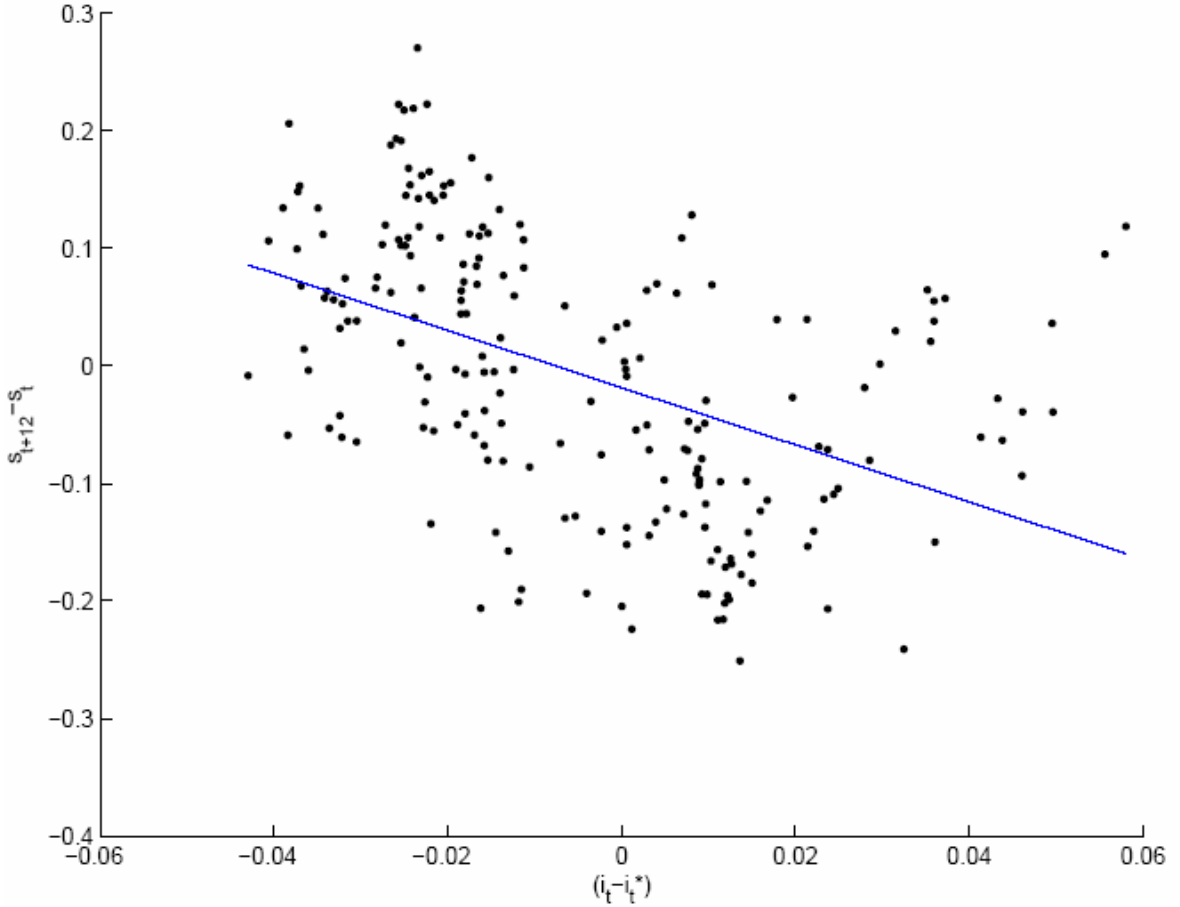
3. Stability of results

	Full period	1986 - 1990	1991 - 1994	1995 - 1999	2000 - 2004
SURVEY ERROR	coef.	coef.	coef.	coef.	coef.
Australia	-3.323***	-0.914	0.116	-5.003**	-6.128***
Canada	-2.024***	0.873	-0.884	-3.367***	-5.417***
France	-2.763**	0.591	1.947*	-2.654	-8.180***
Germany	-2.615***	-2.499	1.112	-3.173	-8.363***
Japan	-2.927***	-5.581**	-2.323*	-2.034	-2.467**
Switzerland	-2.996***	-3.463*	1.741	2.174	-8.157***
U.K.	-1.848	-4.000**	1.866	-0.81	-5.907***
EXCESS RETURN					
Australia	-2.487***	-1.519*	2.081*	-4.542**	-6.461***
Canada	-1.973***	0.548	0.117	-3.884***	-6.481***
France	-2.252**	-0.926	1.631*	-1.27	-7.474***
Germany	-2.432**	-2.172	0.685	-2.978*	-7.510***
Japan	-3.876***	-5.164**	-4.171***	3.752	-4.393***
Switzerland	-2.761***	-3.366	1.232	5.431*	-6.615***
U.K.	-1.341	-3.357**	1.899	0.162	-5.523***
EXPECTED EXCESS RETURN					
Australia	0.835***	-0.606***	1.965***	0.461	-0.333**
Canada	0.051	-0.325	1.001	-0.517***	-1.064***
France	0.511	-1.517	-0.316***	1.384	0.706***
Germany	0.183	0.326	-0.428***	0.195	0.853**
Japan	-0.949***	0.417	-1.849***	5.786**	-1.926***
Switzerland	0.235	0.098	-0.509***	3.257*	1.541**
U.K.	0.507	0.643	0.033	0.972	0.384

4. Noise

Is the stylised fact economically meaningful?

Figure 1: Predictability of Excess Return on Deutschmark



4. Noise

Correlation coefficient betw. $E_t q_{t+12}$ and abs. forecast error = –0.13

	Full period		1986 - 1990		1991 - 1994		1995 - 1999		2000 - 2004	
EXPECTED EXCESS RETURN	coef.	absolute forec. error	coef.	absolute forec. error	coef.	absolute forec. error	coef.	absolute forec. error	coef.	absolute forec. error
Australia	0.835***	*0.092*	-0.606***	*0.105*	1.965***	*0.058*	0.461	*0.090*	-0.333**	*0.085*
Canada	0.051	*0.051*	-0.325	*0.043*	1.001	*0.122*	-0.517***	*0.100*	-1.064***	*0.058*
France	0.511	*0.103*	-1.517	*0.051*	-0.316***	*0.085*	1.384	*0.087*	0.706***	*0.138*
Germany	0.183	*0.103*	0.326	*0.106*	-0.428***	*0.089*	0.195	*0.121*	0.853**	*0.105*
Japan	-0.949***	*0.110*	0.417	*0.050*	-1.849***	*0.122*	5.786**	*0.120*	-1.926***	*0.079*
Switzerland	0.235	*0.106*	0.098	*0.113*	-0.509***	*0.133*	3.257*	*0.106*	1.541**	*0.079*
U.K.	0.507	*0.085*	0.643	*0.043*	0.033	*0.100*	0.972	*0.099*	0.384	*0.124*

- There is basically a zero correlation coefficient between size of forecast error and whether or not forward discount affects expectations
- Indicative that weak form of RE holds: use of forward discount to predict exchange rates, ceteris paribus, does not lower forecast error

5. Other predictors

- Does the puzzle hold for other x_t ?
- Engel, Mark and West (2007): it is changes in *expectations* of future fundamentals that should affect asset prices

5. Other predictors

- Use of *expected* change in forward discount / interest rate differential as predictor (from Table 5 of BMW)
- Results are quite similar to those of BMW Table 1 – puzzle is persistent !
- Further support for BMW argument

SURVEY ERROR	coef	std. error
Australia	-5.075 *	*-3.004*
Canada	-1.266	*-0.970*
Switzerland	-9.824 ***	*-2.367*
Germany	-8.591 ***	*-2.448*
France	-8.158 ***	*-2.368*
U.K.	-3.909	*-2.493*
Japan	-5.752	*-4.380*
EXCESS RETURN		
Australia	-6.271 *	*-3.178*
Canada	-0.827	*-0.849*
Switzerland	-11.477 ***	*-2.230*
Germany	-6.827 ***	*-2.256*
France	-6.749 ***	*-2.355*
U.K.	-2.325	*-2.224*
Japan	-8.245 *	*-4.266*
EXPECTED EXCESS RETURN		
Australia	-1.196	*-2.663*
Canada	0.438	*-0.515*
Switzerland	-1.653	*-1.388*
Germany	1.763	*-1.539*
France	1.409	*-0.961*
U.K.	1.583	*-1.083*
Japan	-2.493 *	*-1.356*

6. Heterogeneity of agents

- If violation of RE is key, does it apply equally to all survey participants?
  - Do "good" forecasters have the same model as "poor" forecasters, i.e. $\beta \approx \delta \neq 0$ and $\lambda = 0$?
- Evidence: Huge forecaster heterogeneity for US monetary policy prediction (Berger, Ehrmann and Fratzscher 2006)
  - Individual forecasters' Taylor rules different
  - Good forecasters' prediction errors do not relate to same determinants as FOMC decisions
- Is there similar evidence in BMW data?

Summary

- Important contribution, stylised fact
- Key for understanding behaviour & predictability of asset prices, esp. exchange rates
- Can we go a step further and find an explanation?
- Survey data is always an issue
- What is an appropriate model for empirical test?
- How to account for size of variations over time