STOCK RETURN PREDICTABILITY IN THE SPANISH STOCK MARKET

A CONVENTIONAL AND AN ALTERNATIVE METHODOLOGY

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1. INTRODUCTION

Most of the investment funds run by professional investors fail to beat the average market return. The literature background shows that only a few researchers are able to find a model that can predict returns. We study the predictability of the Spanish Stock Market through two different methodologies.

2. PURPOSE

Our objective is to find evidence of return predictability (in-sample and out-of-sample). Whether the stocks monthly returns can be predicted and which variables are more relevant to forecast returns.

3. MATERIALS AND METHODS

Materials

We study the monthly returns of the stocks traded in the Spanish Stock Market from July 2003 to July 2015 (144 monthly periods). Not all the stocks have traded during the whole period.

We follow specific procedures to ensure that investors have the data of the predictors before of the month *t* begins. The stocks from the financial sector are excluded. We end up with 132 stocks and 13,170 observations. An unbalanced data panel.

The explained variable is the **monthly excess return** (T-Bill is discounted). We use nine explanatory variables that can be split in two groups:

- Business performance predictors: Book to market ratio (BM), Dividend pay-out ratio (DE), Dividend price ratio (DP), Earnings price ratio (EP), Cash flow price ratio (CFP).
- Macroeconomic predictors: Inflation, Exchange rate EUDOLLR, Gold return, Oil return. The last two are non-traditional variables.

Methods

The stock returns predictive regression is stated as follows:

$$r_t = \propto + \beta_i x_{i,t-1} + \varepsilon_{r,t}$$

Two different methodologies are used:

- A linear approach. The **feasible generalised least squares** (FGLS), which is robust against endogeneity, heteroscedasticity of the returns and persistency of the predictors.
- Non-parametric approach. The **RE-EM Tree**, which benefits from the flexibility of a regression tree method and the mixed effect structure model for longitudinal and clustered data. It is tested in-sample (70% of the full period) and out-of-sample (30%).

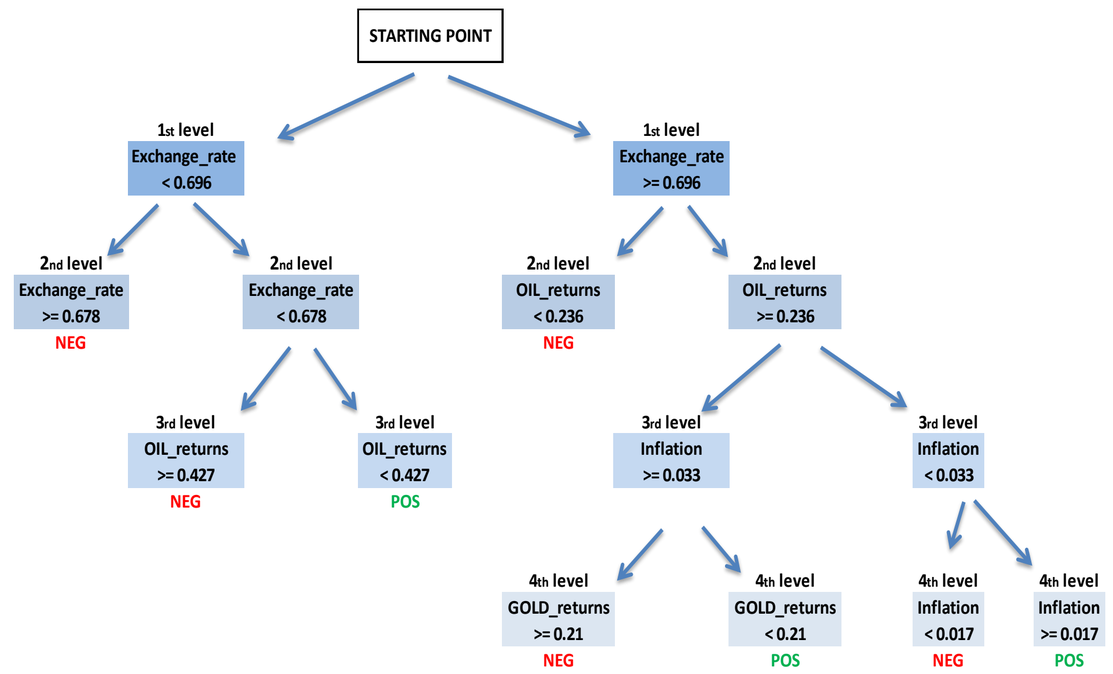
4. RESULTS

Table 1. In-sample FGLS estimator by sector

	BM	DE	DP	EP	CFP	Exchange rate	Inflation	GOLD returns	OIL returns	R-squared
ALL STOCKS	POS		POS	POS	NEG	POS	NEG	NEG	POS	4.45%
BASIC MATERIALS	POS	NEG	POS	POS	NEG	POS	NEG	NEG	POS	6.01%
CONSUMER GOODS	POS	NEG	POS	POS	NEG	POS	NEG		POS	4.38%
CONSUMER SERVICES	POS	NEG	POS	NEG	NEG	POS	NEG		POS	NEG
HEALTHCARE	POS	POS			POS	POS		NEG	POS	6.62%
INDUSTRIALS	POS	NEG	POS	POS	POS	POS	NEG	NEG	POS	6.55%
OIL & GAS										2.16%
TECHNOLOGY						POS				NEG
TELECOMUNICATIONS										NEG
UTILITIES	POS	NEG	POS	POS	NEG	POS	POS	NEG	POS	4.92%

Source: Own calculations. It shows the sign of the coefficients of the predictors, and the percentage of variability explained by each sector (right column). Blanks mean that the predictor is not significant.

Table 2. In-sample regression tree (simplified)



Source: Own calculations. We will follow all the predictors' conditions up to the end, where it is found the excess return sign forecast. Predictors that appear first are more relevant than predictors that appear later.

5. DISCUSSION

FGLS (in-sample)

- Small part of excess return variability explained. Similar to the academic literature results.
- The BM, DP, EP, Exchange rate, Oil returns coefficients usually have a positive sign. The DE, CFP, Inflation, Gold returns coefficients usually have a negative sign.
- More unstable sectors such as Oil & Gas or Technology, are more difficult to forecast. On the contrary, more stable sectors such as Utilities or Industrials, are easier to forecast.

RE-EM Tree (in-sample and out-of-sample)

- It brings different results compared with a linear model, as it was expected.
- It shows that macroeconomic predictors are the variables useful to forecast excess returns.
- Out-of-sample: We find a 56.8% of success forecasting the sign of the excess return in the out-of-sample period.

6. CONCLUSIONS

- ✓ We find evidence in favour of the in-sample return predictability with both methodologies.
- ✓ The percentage of success forecasting the sign of the real returns in the out-of-sample period (through RE-EM Tree) may not be enough to outperform the market once the transaction costs are discounted.
- ✓ We also find that the return predictability is heterogeneous among different sectors.
- ✓ We conclude that macroeconomic variables are more relevant forecasting monthly returns than the business performance predictors.
- ✓ We can also conclude that non-traditional predictors analysed (gold and oil returns), are useful forecasting returns.
- ✓ Non-parametric approach, the RE-EM tree estimator can be used in future studies as an alternative of the conventional estimators.

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