



## Article

## Equity premia predictability in the EuroZone



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## ABSTRACT

In this paper we study the equity premium predictability in eleven EuroZone countries. Besides some traditional predictive variables, we have also chosen two other that, to our knowledge, have never been previously used in the literature: the change in the OECD normalized composite leading indicator, and the change in the OECD business confidence indicator. The models based on the OECD variables outperform the historical average, in particular during the early stages of the recent financial crisis. We also show that the forecasts, based on these predictors, provide substantial utility gains for a mean-variance investor.

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## 1. Introduction

The theme of stock return predictability has been widely studied in the financial literature, but it remains highly controversial. Some authors argue that macroeconomic and financial variables can be used to forecast stock returns, while others assert that the evidence of predictability is illusory, because models are unstable and could not have been used by an investor to profitably time the market. This subject is relevant, not only to financial researchers, but also to asset managers and other investors that should take into account the potential existence of stock return predictability in their investment decisions.

In the United States, there are studies that report the presence of stock return predictability, based on a wide set of macroeconomic and financial variables, such as the dividend yield (Pettenuzzo and Timmermann, 2011; Neely et al., 2014; Lewellen, 2004), price dividend ratios (Bingsbergen and Kojien, 2010; Neely et al., 2014; Campbell and Yogo, 2006), valuation ratios (Lewellen, 2004; Campbell and Yogo, 2006), payout yields (Boudoukh et al., 2007), dividend growth ratios (Bingsbergen and Kojien, 2010), price earnings ratios (Rapach and Wohar, 2006), interest rates (Pettenuzzo and Timmermann, 2011; Ang and Bekaert, 2007; Campbell and Hamao, 1992), the term spread (Rapach and Wohar, 2006), the consumption-wealth ratio (Lettau and Ludvigson, 2001; Guo, 2002; Corte et al., 2010; Hahn and Lee, 2006), the output gap (Cooper and Priestley, 2009), the ratio of share prices to GDP (Rangvid, 2006),

the stock variance (Guo, 2002) and expected business conditions (Campbell and Diebold, 2009). On the other hand, Goyal and Welch (2008) conducted a very comprehensive study of U.S. equity premium predictability, using a wide set of variables, and concluded that predictability was restricted to specific time periods, and that it disappeared in the most recent part of their sample.

Research on equity premium predictability outside the United States is more scarce and focuses mainly on developed countries. Papers that address this theme include, among others, Corte et al. (2010) (United States, United Kingdom, France and Japan), Harvey (1991) (16 OECD countries and Hong Kong), Cutler et al. (1991) (13 developed countries), Campbell and Hamao (1992) (United States and Japan), Ang and Bekaert (2007) (United States, United Kingdom, Germany and France), Kellard et al. (2010) (United States and United Kingdom), Paye and Timmermann (2006) (United States and United Kingdom), and Henkel et al. (2011) (G7 countries). Rapach et al. (2005) studied stock return predictability in twelve developed countries, using a wide set of variables, and concluded that interest rates are the most consistent predictors across all countries. Rapach et al. (2013) tested the lead-lag relationship between the U.S. and several developed stock markets, and found that the United States leads international stock markets. To our knowledge, the most comprehensive paper on international stock return predictability was conducted by Hjalmarsson (2010) who studied 24 developed and 16 developing countries. He concluded that short-term interest rates and term spreads are robust predictors of equity premia in developed countries, and that the dividend price ratios also show some predictive ability, for both emerging and developed countries.

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**Table 1**  
Descriptive statistics for country-specific variables.

		AUT	BEL	FIN	FR	GER	GR	IR	IT	NL	PT	SP
EP	Av	0.07	0.17	0.32	0.24	0.29	-0.34	-0.17	0.03	0.38	0.05	0.38
	Std	7.32	5.63	9.24	5.44	6.32	9.42	6.35	6.41	5.32	5.95	6.41
	Max	20.07	14.25	28.03	12.62	18.8	35.61	18.14	21.5	13.01	21.52	16.45
	Min	-36.4	-35.7	-34.5	-17.7	-28.9	-35.9	-25.9	-17.1	-20.6	-22.6	-25.5
DIV	Av	2.24	4.02	2.79	2.59	2.53	2.96	2.49	3.28	3.71	3.37	4.1
	Std	1.01	1.23	1.28	0.95	0.88	1.63	0.71	1.13	0.78	1.16	1.58
	Max	7.45	7.22	7.93	6.21	5.93	7.92	4.39	6.16	6.29	6.44	8.34
	Min	0.73	1.18	0.35	0.65	0.88	0.4	0.82	1.34	1.35	1.03	1.38
STIR	Av	-0.1	-0.15	-0.22	-0.17	-0.1	-0.18	-0.17	-0.21	-0.11	-0.28	-0.26
	Std	0.79	0.8	1.19	0.91	0.78	0.87	2.46	1.12	0.78	1.06	1.06
	Max	2.43	1.68	3.9	2.29	1.91	2.3	28.71	4.76	1.9	3	3.15
	Min	-2.62	-2.62	-4.08	-3.19	-2.62	-3.14	-8.81	-3.78	-2.62	-3.7	-3.44
LTY	Av	-0.11	-0.12	-0.2	-0.15	-0.12	-0.07	-0.08	-0.13	-0.1	-0.1	-0.13
	Std	0.49	0.53	0.81	0.53	0.5	2.16	0.97	0.92	0.52	1.16	0.88
	Max	1.35	1.83	2.69	1.59	1.47	12.31	3.96	2.38	1.48	4.8	2.08
	Min	-1.13	-1.15	-2.92	-1.49	-1.03	-9.82	-2.41	-3.36	-1.32	-3.78	-2.57
NCLI	Av	0	-0.01	-0.01	-0.01	-0.01	-0.01	0	-0.01	0	0	0
	Std	0.19	0.22	0.18	0.2	0.22	0.15	0.17	0.18	0.22	0.21	0.12
	Max	0.45	0.6	0.47	-0.52	0.74	0.37	0.39	0.45	0.66	0.57	0.3
	Min	-0.57	-0.76	-0.39	0.5	-0.91	-0.53	-0.56	-0.62	-1.02	-0.8	-0.39
BCI	Av	-0.01	-0.01	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	Std	0.17	0.2	0.4	0.17	0.23	0.23	0.53	0.18	0.21	0.21	0.15
	Max	0.35	0.49	0.97	0.47	0.4	0.51	1.18	0.36	0.53	0.48	0.42
	Min	-0.7	-0.71	-1.23	-0.66	-1.04	-0.99	-1.64	-0.69	-1.16	-1.03	-0.51

EP – Equity premia, DIV – Dividend yield, STIR – Short-term interest rate less its twelve month moving average, LTY – Long-term bond yield less its twelve month moving average, NCLI – Monthly change in the OECD normalized composite leading indicator, BCI – Monthly change in the OECD business confidence indicator. Av – Average, Std – Standard deviation, Max – Maximum, Min – Minimum. All the values are in percentage points, except for NCLI and BCI.

In this paper, we study equity premia predictability in eleven EuroZone countries. The EuroZone is formed by a relatively homogeneous group of countries that share a common currency, and trade large volumes of goods and services. Furthermore, some of these countries were strongly affected by the recent financial crisis, and their GDP is still clearly below the pre-crisis level.

We have chosen, as forecasting variables, the dividend yield, the short-term interest rate, the long-term bond yield, the change in the OECD normalized composite leading indicator, and the change in the OECD business confidence indicator. Our choice was motivated by the fact that the dividend yield and the interest rates were widely used in previous studies. Regarding the OECD variables, we intended to test their ability to predict equity premia and, in particular, their effectiveness in anticipating the stock market contraction associated with the recent crisis. The OECD composite leading indicator was developed in the 1970s, and intends to anticipate turning points of the economic activity. OECD chooses component series that have a high economic significance, and that cover a large part of the economy. Monthly series, with a large time span, and that are not subject to frequent revisions are preferred to quarterly series. The series used and their weights vary from country to country, but typically includes the future tendency of production in the manufacturing sector, order books in the manufacturing sector, consumer and business confidence indicators, among many others. The component series are seasonally adjusted and filtered. Finally, each series is normalized, by subtracting from the filtered series its mean, dividing it by the mean absolute deviation and adding 100.

The OECD business confidence indicator is computed from companies' surveys of the manufacturing sector. According to OECD "The Business Confidence Indicators (BCIs) augment the information set of cyclical indicators by providing indicators that can reinforce signals of the Composite Leading Indicators (CLIs), since these indicators tend to have shorter but more stable lead times than the CLIs, and they are subject to little or almost no revision at all". The BCIs are standardized, through a process similar to the one used for CLIs.

Several EuroZone companies have a multinational nature, and obtain a large fraction of their revenues outside their home country. For these firms, EuroZone indicators might be more adequate

performance predictors than country-specific indicators. Therefore, we also tried to forecast the equity premia based on the EuroZone composite leading indicator and business confidence indicator.

The rest of this paper is organized as follows. In Section 2, we present the data and the variable definitions. In Section 3, we describe the methodology. In Section 4, we present the main results and discuss their relevance. Finally, in Section 5, we conclude.

## 2. Data and variable definition

Our dataset comprises monthly data, from January 1988 to December 2012, on eleven EuroZone countries: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain. All data are from Datastream, except the OECD normalized composite leading indicator and the OECD business confidence indicator.

The equity premia is computed as the difference between the log stock market total return (MSCI country index in local currency) and the one-month German money market rate.

We considered two types of explanatory variables: country-specific and EuroZone variables.

### 2.1. Country-specific variables

- Dividend yield (DIV) – Dividend yield, over the last 12 months, is computed from the MSCI total returns index and the MSCI price index, using the method described in [Campbell and Viceira \(1999\)](#).
- Short-term interest rate (STIR) – We followed [Rapach et al. \(2005\)](#) and used, as explanatory variable, the difference between 3-month money market rate and its 12 month backward-looking moving average.<sup>1</sup>
- Long-term bond yield (LTY) – Once again, we followed [Rapach et al. \(2005\)](#) and computed the difference between the 10 year

<sup>1</sup> For Greece and Italy we have used the 3-month treasury-bill rate, because we could not obtain money market data for the entire period.

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