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Does the Fed Model Travel Well?

For short run tactical allocation, yes, but not for the long-haul

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ABSTRACT

Equity markets are frequently valued on the basis of the relative yields of stocks and bonds. The most widely known of these comparisons is the Fed model. We extend previous research by examining the performance of this metric across six international markets and also relative to more traditional valuation measures such as earnings and dividend yields. We find the Fed model to be poor for explaining long-run returns but that it has some merit as a short-term tactical asset allocation tool.

Market commentators frequently use stock and bond market yields in assessing the valuation of the equity market. A particularly popular version of this is the comparison of the stock market earnings yield with the current nominal interest rate (often the ten-year Treasury yield): this is called the Fed model. Asness [2003] offers an exhaustive review of the issues surrounding the use of such models, and a detailed empirical analysis of US evidence since 1871. While he finds that the Fed model fails as a predictive tool for long-term stock returns, it is more useful for understanding how investors choose to set current stock market price-earnings ratios.

Analysts have recently noted that the S&P 500 earnings yield is above the 10-year Treasury yield for a sustained period for the first time since the early 1980's, which some believe may have been the trigger for the great equity bull market of the 1980's and 1990's. Certainly previous periods during the last two decades of the twentieth century when the earnings yield came close to the 10-year bond also preceded significant rises in the equity market. For those who subscribe to the Fed model the current scenario is indeed bullish for stocks, though doubters point to bonds having been in a bull market of their own and thus, whilst stocks may outperform bonds in the future, the gap between the earnings yield and Treasury yields may close as a result of bond yields rising rather than an appreciation of stock prices.

In this study we review alternative methods favoured by analysts that utilize stock and bond yields to predict future stock returns, and extend the analysis to six countries (including the US) to see if such models are useful in a wider international context. We consider seven models in total, including three based on single yields (earnings, dividends and bonds) and a further four based on combinations of these yields to describe relative value. The justification for introducing simple single yield models is the persuasive evidence presented in a wide range of studies that these absolute valuation levels have long-run predictive power. Asness [2003] finds that earnings yield and the long-bond yield individually dominate the Fed model over a long-run of data (see also Campbell and Shiller [1988]), while many studies have found that high dividend yield is consistent with subsequent high returns (e.g. Fama and French [1988] and Campbell and Hamao [1989]). However, given international differences in taxation and share repurchase activity, a 'purer' measure of absolute value for international companies may well be the earnings yield. The rationale for testing relative value models in addition to the Fed model comes from studies such as those describing the bond-equity yield ratio as a useful metric for predicting future returns (e.g. Clare et al [1994] for the UK).

We find that:

1. While absolute value metrics certainly explain a large amount of the variation in 5-year returns, they are less successful when used as a trading rule.

2. From a tactical asset allocation standpoint, relative value models were clearly better than absolute models for 1-year horizons with the Fed model being the best.

Data and Methodology

This study is based on a sample of six countries, namely the US, the UK, France (FR), Germany (GY), Switzerland (SW) and Japan (JP). For the US, the S&P 500 index is used as an aggregate equity market index. A total market index is chosen as an aggregate equity market measure for the remaining countries, except for Germany. For Germany, the DAX 30 Index is used because the total market index had missing values. The data series range from July 1973 to the end of December 2003. The dataset consists of monthly values of dividend yield, earnings yield, the Retail Price Index (RPI) or Consumer Price Index (CPI) as appropriate, and the monthly stock index level. The source is DataStream, an online database covering all listed companies from the world's major stock exchanges. The nominal bond yield used is a long-term government bond yield. As per the definition of International Financial Statistics (IFS), the long term government bond yield refers to one or more series representing yields to maturity of government bonds or other bonds that would indicate longer term rates than other available interest rates. This compares with Asness [2003] who uses the 10-year Treasury Rate. Unless explicitly stated, all earnings yields used in this study are based on 5-year trailing earnings. The earnings yield values are calculated following the approach of Shiller [2000] and Asness [2003] to create a smoothed series.

The Fed Model

To assess the ability of the Fed model to explain real returns we follow the method of Asness [2003]. For each of the six countries in our study three different regressions are run, each with real returns as the dependent variable. These comprise of a univariate regression with earnings yield [EY] as the independent variable, another univariate regression with EY minus the long-bond rate [LB], i.e. the Fed model, and a bivariate regression containing both EY and LB. Whereas Asness [2003] reports results based on 10- and 20-year real returns, we opt for 5-year real returns given the shorter data period available for countries outside of the US.

Table 1 exhibits the results of the eighteen regressions with *t*-statistics shown in parentheses (adjusted for overlapping observations). For each of the six countries a positive relationship is observed between returns and EY. This variable alone is enough to explain about half of the variation in returns for the UK, France, Germany and Japan. In contrast, the Fed model has the expected positive relationship with returns for only four of the countries with Japan and the UK having negative coefficients. Furthermore the positive coefficients that do exist are only significant for France and Germany. The explanatory power of the Fed model regressions is almost universally poor and always considerably lower than EY alone. In the bivariate regressions, LB has a positive coefficient in five of the six countries with France the lone exception. The coefficients typically have some degree of statistical significance and cause the power of EY to diminish somewhat.

Our international findings are consistent with Asness [2003] to the extent that EY has considerable ability to explain real returns whilst the Fed model fails in each market examined. Asness [2003] finds no significance for LB in the bivariate regressions, which clearly differs from the findings reported here, where LB is statistically significant in many of the regressions and in some cases appears more powerful than EY itself.

Within-Sample Estimation

The most important factor for any absolute or relative value model is the ability to explain returns. Table 2 displays the results of univariate regressions using three absolute valuation metrics (EY, the dividend yield [DY] and LB) and four relative valuation metrics (the Fed model [EY-LB], the bond-equity ratio [LB/DY] and two 'opposite' models of [LB-EY] and [DY-LB]) as independent variables. The dependent variable is 1-year returns, with results based on both real and nominal returns reported. Model performance is evaluated using the methodology of Harris and Sanchez-Valle [2000], whereby the average adjusted-R^2 value is reported across a number of regressions. These regressions take the form of recursive regressions, where all of the data available at the time is used, and rolling regressions, with only the most recent 60 observations being used. Each type of regression was estimated only once 60 complete observations were available. For example, beginning in July 1973, the first 60 months of data were used to calculate the initial earnings yield, whilst the next 60 months formed the basis of the data for the first regressions, along with the subsequent return over the next year. Thus observations were collected from June 1978 to the end of December 2002, allowing for 1-year returns to run until the end of December 2003. The advantage of using the average explanatory power approach is that it replicates the past performance observed by a practitioner using the variables to forecast returns on a continual basis.

Panel A of Table 2 reveals that for the recursive regressions it is considerably easier to explain nominal returns than real returns. Both DY-LB and LB are very poor metrics regardless of the type of return. There is little to choose between EY-LB, EY and LB/EY (i.e. those models dominated by earnings) for real returns except for France where EY-LB and LB/EY are clearly superior, and this is also true for nominal returns. Of the remaining models containing dividend yield, LB/DY is slightly better than DY for real and nominal returns and the explanatory power is particularly high for the UK. In general, there is not much difference across the performance of the relative value models of EY-LB, LB/EY and LB/DY.

Panel B demonstrates that there is far less difference between the general explanatory power of real and nominal returns when rolling regressions are used. As would be expected, the rolling regressions explain much more of the variation in returns than their recursive counterparts. DY-LB and LB remain the poorest metrics. DY is the best for three of the six markets in both real and nominal terms, however it is relatively poor for the French market. LB/EY is nearly always better than EY-LB although the difference is often only small. There is no metric that clearly dominates all others across every market.

Table 3 presents the results of a similar process to that in Table 2, but where 5-year returns are now the independent variable. The observations used are from June 1978 to the end of December 1998 to allow for 5-year returns to run until the end of December 2003. As before, 60 complete observations were recorded before the analysis began. Looking firstly at the recursive regressions in Panel A, *the relative value metrics are generally poorer at explaining real returns compared to the absolute valuation metrics of EY and DY*. EY-LB is very poor for US returns, consistent with the previous findings of Asness [2003]. This is also true for nominal returns. LB has considerably more explanatory power for 5-year real and nominal returns compared to 1-year returns. Of the relative value models, LB/EY is better than EY-LB, and DY-LB is better that LB/DY. Overall LB/EY is probably the best relative metric for 5-year returns.

Panel B reports the results of the rolling regressions. The first point to note regarding these regressions is that with 60 observations being used, this is equivalent to just one independent time period. In contrast, for the 1-year returns in Table 2, the same 60 observations lead to five independent periods. Therefore, one might reasonably expect the 5-year regressions to be less useful at predicting returns. With this caveat in mind, EY is the superior metric apart from Japan where DY is more appropriate. As with the recursive regressions, absolute valuation is preferable to relative valuation for explaining 5-year returns. Of the relative models, LB/EY is again the best performer.

In summary, the results in Tables 2 and 3 point to relative value models being considerably better at explaining 1-year returns, particularly nominal returns, compared to 5-year returns. Absolute valuation metrics are clearly the best at explaining 5-year returns whilst there is little to choose between these and relative valuation metrics for 1-year returns. The explanatory power of 5-year returns is almost universally better than that of 1-year returns. This confirms the previous counter-intuitive findings by Fama and French [1988] and Asness [2003] that it is far harder to predict short-term movements of equity markets compared to the long-term movements.

Trading Rule

The true test of any valuation metric is how well it performs when implemented as a trading strategy. For the model to be valuable to a practitioner it should be able to deliver excess returns when used as a tactical asset allocation tool. The strategy tested here is such that each month the nominal forecasted returns over the 1-year and 5-year horizons are compared with the nominal risk free rate (assumed to be the annual interest rate on three-month Government bills). If the forecasted equity return is higher, then a 100% long position is taken in equities and otherwise 100% of the investment is placed in the short-term bills. To add a dose of realism to the exercise, a transaction cost of 0.5% is levied each time the switch is made from equities to bills or vice versa. This is accounted for in making the asset allocation decision each month, i.e. if the one-year holding period return is estimated at 10% from equities and 9.6% from bills, and the money is already in the latter, then it is assumed no change in investment policy is made. In the case of the same annual returns as before but with the equity return being a *five* year return, then the change would be made since the compounding of the additional 0.4% difference in annual returns would more than compensate for the 0.5% one-off trading cost.

Table 4 presents the results of implementing the trading strategy between May 1988 and September 2003. All the results are recorded as annually compounded returns relative to the buy and hold return of the specific country. Results based on nominal returns are reported, because these appeared to be superior for tactical asset allocation purposes given the results in Tables 2 and 3. The results of trading based on forecasts from the recursive regressions are shown in Panel A. It is noticeable that a number of the strategies showed exactly the same performance as the buy and hold return. This was almost universally due to the strategies always favouring equities over T-bills in every period. The markets where most value could be added through 1-year forecast trading strategies were the UK and Japan. Germany and Switzerland exhibit most variation across the different metrics. No value was added in the US or France. The relative value models were clearly better than the absolute value models for 1-year forecasts, with EY-LB being the best. This was the only metric that did not create a loss in any country relative to the buy and hold position. Using the 5-year forecasts, it is very hard to add value. The absolute value metrics, which looked very good from the within sample tests in Table 3, were poor on a trading basis. Japan was the only market where these models added meaningful value.

Panel B presents the trading performance for 1 and 5-year forecasts based on rolling regressions. As with the 1-year forecasts in Panel A, the absolute value metrics are not very successful. By contrast, *EY-LB adds value in four of the six markets*, with only Switzerland showing negative relative returns. LB/EY also adds value in four countries, although both metrics fail to generate any excess returns in the US. EY-LB and LB/EY both add more value using the rolling regressions than in the recursive case; this is as expected given the findings presented in Table 3. Five-year forecasts continue to add little excess returns, especially for the absolute value models. There is modest support for EY-LB, in that it is the only metric to deliver non-negative outcomes for each market. The only country where positive relative returns were generated was in Japan where every metric except LB generated trading profits.

Overall, trading based solely on valuation models generated varying results. Despite the theoretical inconsistencies highlighted by Ritter and Warr [2002] and Asness [2003], investors would clearly have benefited from focussing on the relative valuation metrics of EY-LB and LB/EY when using 1-year forecasts for tactical asset allocation. Absolute valuation models were poor regardless of whether short- or long-term forecasts were used. This was very much in contrast to the good performance observed in the earlier retrospective estimations.

The Relationship between Price-Earnings Ratios and Nominal Interest Rates

Asness [2000; 2003] argues that the Fed model, in addition to its theoretical shortcomings, fails to consider a further important factor: investors' perceptions of the relative risks of stocks relative to bonds and vice versa. Asness [2003] suggests that it is arbitrary for the Fed model to assume that EY and LB should be equal; instead EY could be any linear function of LB. By taking this one step further, Asness [2003] suggests the following equation to explain how investors set EY:

$$EY = a + bLB + c\sigma_{stocks} + d\sigma_{bonds} \qquad \text{Equation (1)}$$

where σ_{stocks} and σ_{bonds} are the prior 20-year volatilities of stocks and bonds respectively.

Asness [2003] hypothesizes that the coefficients, *b* and *c*, should be positive and that *d* should be negative. Thus the weighted difference of stock and bond volatility affects EY with relatively higher stock volatility leading to a higher EY being demanded by investors. When tested in the US between 1926-2001 the coefficients of the variables have the anticipated signs and the ability to explain EY is fairly substantial, certainly far greater than the Fed model in its most basic form. Asness (2000) shows that despite the econometric difficulties associated with Equation 1, the results remain robust.

Having found very little support for the Fed model in Table 1 of this study, we investigate whether price-earnings ratios are set internationally in the way that Asness [2003] describes. As before, we modify the variables by using 5-year volatilities for stocks and bonds given our shorter data period. Table 5 reports the results of Equation 1 for the six countries. The evidence for the US is indeed consistent with Asness [2003]; both the coefficients on LB and σ_{stocks} are positive whilst the coefficient on σ_{bonds} is negative. Perhaps surprisingly, we find that none of the remaining five countries display the same characteristics. Whilst all exhibit positive and statistically significant coefficients on LB (as anticipated), only the UK has a positive (though not statistically significant) coefficient on σ_{stocks}. Indeed, the coefficients on σ_{stocks} are strongly negative for France, Switzerland and Japan. Only France and Japan have the expected negative σ_{bonds} coefficient. However, the adjusted-R^2 value of each regression is fairly high, suggesting that the volatilities of the asset classes are important factors but in a different way from that observed for the US by Asness [2003]. Whilst it would clearly be interesting to be able to use 20-year volatilities as a robustness check on these results, the consistency between the 20-year findings of Asness [2003] and our own 5-year findings in Table 5 is reassuring.

Conclusion

The Fed model has been widely used in the US as a measure to describe whether stocks are cheap or expensive. We have extended previous US based work by considering this model from an international perspective against other absolute and relative valuation models. It is found that absolute valuation metrics such as earnings yield and dividend yield are able to explain a considerable amount of the variation in 5-year returns internationally whilst the Fed model fails in each country on a within-sample basis. Relative valuation models are considerably better at explaining 1-year returns and perform the task at least as well as absolute metrics, and in some cases better. However, a trading rule finds the Fed model to be the best performing metric using 1-year forecasts when measured against a traditional buy-and-hold strategy. Despite its theoretical inconsistencies, highlighted by Ritter and Warr [2002] and Asness [2003], the Fed model would have been a useful tactical asset allocation tool for investors.

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Table 1

Five-Year Real Returns Described by Earnings Yield, Bond Yields and the Fed Model

Country	Intercept	EY	LB	EY - LB	Adj. R^2
United States	0.01	1.16	-	-	18.8%
	(0.33)	(3.76)			
	0.01	-	-	0.77	1.8%
	(8.15)			(1.29)	
	-0.03	0.40	1.11	-	21.2%
	(-0.85)	(0.86)	(2.13)		
Utd. Kingdom	-0.08	2.15	-	-	49.0%
	(-2.66)	(6.58)			
	0.08	-	-	-1.07	2.4%
	(3.64)			(-1.35)	
	-0.14	-0.05	2.53	-	63.2%
	(-6.35)	(-0.09)	(5.13)		
France	-0.09	2.41	-	-	51.4%
	(-3.80)	(9.54)			
	0.12	-	-	1.76	7.6%
	(6.72)			(2.75)	
	-0.08	2.61	-0.24	-	51.4%
	(-2.74)	(4.56)	(-0.41)		
Germany	-0.18	3.70	-	-	48.1%
	(-5.70)	(9.67)			
	0.07	-	-	2.70	11.5%
	(4.47)			(2.83)	
	-0.24	2.66	1.95	-	51.2%
	(-5.88)	(4.46)	(2.27)		
Switzerland	-0.01	1.34	-	-	12.9%
	(-0.23)	(2.89)			
	0.07	-	-	0.50	1.3%
	(3.04)			(0.91)	
	-0.22	0.53	6.01	-	45.1%
	(-5.13)	(1.45)	(7.23)		
Japan	-0.19	8.28	-	-	61.8%
	(-7.29)	(7.02)			
	-0.01	-	-	-2.38	14.2%
	(-0.93)			(-2.93)	
	-0.20	6.55	1.22	-	65.3%
	(-8.75)	(4.40)	(2.38)		

Table 2

Estimation of Within Sample Performance for 1-Year International Equity Returns 1978-2003 using Average Adjusted-R^2 Values

Panel A: Recursive Regressions

Country	Real Returns							Nominal Returns						
	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB
United States	0.066	0.071	0.001	0.024	0.040	0.027	-0.004	0.090	0.129	0.002	0.088	0.110	0.079	0.009
Utd. Kingdom	0.025	0.082	0.015	0.059	0.238	0.085	0.047	0.096	0.174	0.039	0.127	0.197	0.171	0.029
France	0.037	0.002	0.019	0.268	0.074	0.228	0.058	0.068	0.022	0.017	0.292	0.116	0.267	0.054
Germany	0.020	0.009	0.006	0.046	0.028	0.052	0.014	0.033	0.012	0.004	0.064	0.036	0.074	0.013
Switzerland	0.025	0.028	0.000	0.024	0.018	0.016	0.009	0.027	0.035	-0.002	0.024	0.019	0.016	0.008
Japan	0.071	0.080	0.027	0.033	0.129	0.096	0.023	0.077	0.085	0.025	0.030	0.130	0.098	0.020
Average	**0.041**	**0.045**	**0.011**	**0.076**	**0.088**	**0.084**	**0.025**	**0.065**	**0.076**	**0.014**	**0.104**	**0.101**	**0.118**	**0.022**

Panel B: Rolling Regressions

Country	Real Returns							Nominal Returns						
	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB
United States	0.309	0.325	0.078	0.214	0.289	0.258	0.116	0.311	0.342	0.088	0.229	0.303	0.267	0.126
Utd. Kingdom	0.224	0.266	0.107	0.221	0.206	0.258	0.109	0.231	0.276	0.107	0.225	0.201	0.261	0.108
France	0.245	0.200	0.080	0.265	0.263	0.291	0.138	0.242	0.202	0.078	0.269	0.264	0.293	0.134
Germany	0.196	0.210	0.167	0.257	0.235	0.265	0.173	0.214	0.226	0.157	0.265	0.245	0.276	0.164
Switzerland	0.224	0.195	0.079	0.237	0.192	0.202	0.097	0.239	0.203	0.075	0.239	0.181	0.199	0.088
Japan	0.271	0.345	0.117	0.247	0.261	0.271	0.158	0.268	0.341	0.107	0.107	0.253	0.264	0.147
Average	**0.245**	**0.257**	**0.105**	**0.240**	**0.241**	**0.258**	**0.132**	**0.251**	**0.265**	**0.102**	**0.222**	**0.241**	**0.260**	**0.128**

Table 3

Estimation of Within Sample Performance for 5-Year International Equity Returns 1978-2003 using Average Adjusted-R^2 Values

Panel A: Recursive Regressions

Country	Real Returns							Nominal Returns						
	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB
United States	0.230	0.135	0.299	0.008	0.039	0.028	0.217	0.376	0.308	0.242	0.057	0.013	0.103	0.102
Utd. Kingdom	0.402	0.534	0.265	0.244	0.100	0.360	0.098	0.689	0.656	0.461	0.359	0.027	0.498	0.249
France	0.608	0.421	0.467	0.225	0.110	0.282	0.284	0.756	0.667	0.595	0.253	0.256	0.374	0.262
Germany	0.568	0.341	0.490	0.217	0.054	0.232	0.249	0.657	0.457	0.512	0.283	0.081	0.305	0.206
Switzerland	0.069	0.138	0.349	0.042	0.096	0.099	0.165	0.080	0.150	0.347	0.032	0.086	0.082	0.155
Japan	0.458	0.461	0.325	0.055	0.333	0.285	0.232	0.485	0.493	0.344	0.050	0.345	0.295	0.239
Average	**0.389**	**0.338**	**0.366**	**0.132**	**0.122**	**0.214**	**0.208**	**0.507**	**0.455**	**0.417**	**0.172**	**0.135**	**0.276**	**0.202**

Panel B: Rolling Regressions

Country	Real Returns							Nominal Returns						
	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB
United States	0.491	0.495	0.301	0.164	0.141	0.233	0.204	0.504	0.501	0.265	0.164	0.137	0.236	0.170
Utd. Kingdom	0.503	0.476	0.169	0.368	0.366	0.448	0.180	0.511	0.454	0.190	0.393	0.343	0.461	0.208
France	0.467	0.363	0.400	0.399	0.289	0.471	0.284	0.460	0.389	0.433	0.368	0.296	0.434	0.285
Germany	0.493	0.424	0.394	0.340	0.208	0.400	0.231	0.536	0.469	0.389	0.361	0.222	0.430	0.212
Switzerland	0.415	0.329	0.198	0.229	0.168	0.188	0.126	0.424	0.322	0.174	0.246	0.156	0.198	0.111
Japan	0.551	0.613	0.252	0.183	0.370	0.399	0.236	0.539	0.604	0.244	0.181	0.381	0.407	0.230
Average	**0.487**	**0.450**	**0.286**	**0.281**	**0.257**	**0.357**	**0.210**	**0.496**	**0.457**	**0.283**	**0.286**	**0.256**	**0.361**	**0.203**

Table 4

Compound Returns Relative to a Buy and Hold Strategy for Seven Tactical Equity Strategies in Six International Markets for 1988-2003

Panel A: Recursive Regressions

Country	Buy & Hold	1-Year Nominal Forecasts							5-Year Nominal Forecasts						
		EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB
United States	+11.10	+0.00	-2.00	+0.00	+0.00	-0.49	-1.41	+0.00	-1.27	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
Utd. Kingdom	+9.85	-0.56	+0.94	+0.49	+1.80	+0.00	+2.57	+0.49	-0.51	+0.51	+0.04	+0.00	+0.00	+0.00	+0.00
France	+11.03	+0.00	+0.00	-5.57	+0.00	-0.43	-0.47	-2.10	+0.00	-3.33	-7.43	+0.00	+0.00	+0.00	-5.57
Germany	+6.88	-3.04	-5.07	-0.45	+2.88	+3.55	+2.59	+0.00	-6.18	-2.07	-5.29	+0.00	+0.00	+0.43	+0.00
Switzerland	+12.32	-1.84	-3.40	-1.52	+1.37	-1.77	+0.74	-0.91	-3.17	-0.97	+0.00	+0.00	+0.00	+0.00	+0.00
Japan	-4.73	-0.35	+0.24	-0.41	+2.29	+3.14	+4.97	+0.00	+3.59	+1.07	+1.81	+0.27	+0.00	+0.00	+1.75

Panel B: Rolling Regressions

Country	Buy & Hold	1-Year Nominal Forecasts							5-Year Nominal Forecasts						
		EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB	EY	DY	LB	EY-LB	LB/DY	LB/EY	DY-LB
United States	+11.10	-2.68	-1.96	-2.35	+0.00	+0.00	-0.22	+0.00	-2.67	+0.00	+0.00	+0.00	-1.01	+0.06	+0.00
Utd. Kingdom	+9.85	-1.30	+1.43	-1.18	+4.26	-0.37	+4.88	-0.37	-0.50	+0.00	+0.59	+0.00	+0.00	+0.00	+0.49
France	+11.03	-2.54	-5.04	-2.84	+0.86	-1.70	-0.26	+0.00	-2.92	-3.10	-2.10	+0.00	+0.00	+0.86	-1.77
Germany	+6.88	-1.94	+0.85	+0.78	+4.52	+4.35	+2.18	+0.86	-6.67	-5.80	-0.48	+0.95	+4.97	+1.47	+0.00
Switzerland	+12.32	-2.97	-2.64	-3.07	-3.07	-1.77	+1.03	-0.91	-3.93	-2.03	+0.00	+0.50	-2.22	-0.31	-1.94
Japan	-4.73	+1.35	+1.33	-0.31	+0.48	+0.36	+3.22	-0.97	+3.07	+2.36	-2.18	+0.20	+6.45	+3.96	+0.37

Table 5

Earnings Yield as a function of Bond Yield, Standard Deviation of Stocks and Standard Deviation of Bonds

Country	Intercept	LB	σ_{stocks}	σ_{bonds}	Adj. R^2
United States	-0.04	1.22	0.15	-1.22	72.1%
	(-3.86)	(10.20)	(3.24)	(-2.22)	
Utd. Kingdom	-0.03	0.85	0.03	1.61	82.4%
	(-3.47)	(11.61)	(0.99)	(4.57)	
France	0.02	1.02	-0.10	-0.48	75.0%
	(2.46)	(9.75)	(-2.48)	(-0.97)	
Germany	0.01	0.80	-0.06	1.10	60.4%
	(0.78)	(7.11)	(-1.75)	(1.30)	
Switzerland	0.08	1.01	-0.33	0.88	44.7%
	(6.12)	(4.21)	(-6.22)	(0.66)	
Japan	0.04	0.18	-0.10	-0.32	60.4%
	(9.54)	(5.57)	(-7.67)	(-1.14)	