Expected Returns and Expected Dividend Growth in Europe

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Expected Returns and Expected Dividend Growth in Europe: Legal Origin, Institutional and Financial Determinants.

ABSTRACT

This paper uses a present value approach to show that price movements for equity indices in a sample of European stock markets can be traced to legal origin, institutional and corporate financial factors. The present value literature states that stock indices move due to changes either in discount rates, dividend growth or a combination of the two. Empirically, little is known about the mechanism through which legal, institutional and corporate financial factors influence these variables, especially in a European context. The current paper attempts to plug this gap in the literature. Using the state space approach, we show that while expected returns are highly persistent, expected dividend growth tends to vary across the sample. Movements in markets are mainly due to changes in the discount rate. However, there appears to be a difference in the proportion of movements attributable to discount rate and dividend growth components. Stock markets in civil law countries tend to have a stronger link with the dividend growth variables as well as market size and activity measures. Expected dividend growth is also driven by profitability factors in both types of country. By contrast, there is no strong evidence of corporate indicators influencing expected returns.

1. Introduction

There is a great deal of evidence that the present value model of equity prices can either forecast dividend growth or equity returns, or a combination of the two (Campbell and Shiller,1988). This predictability literature usually uses the price-dividend variable as one of the main valuation ratios to forecast either returns or dividend growth. Moreover, movements in equity prices can be decomposed into variations between either discount rates or expected dividend growth. However, different findings have emerged within this literature when different approaches to forecasting equity prices have been employed. The relative importance of expected returns or expected dividend growth components has varied across different studies.

A plethora of models and factors have been considered in this literature to improve inference properties, explain persistence of the price-dividend ratio over time, and account for where stock market movements come from. In this paper, we examine the properties of expected returns and expected dividend growth as well as stock market movements in Europe according to the legal tradition and institutional factors within a country as well as measures of corporate financial performance. The findings suggest that a country's legal origin, institutional framework and corporate financial characteristics may offer some explanations as to the different properties of expected returns, expected dividend growth and the present value model more generally in various national settings.

One of the main premises of present value models is that, while stock prices can be characterised by a random walk, their movements can be traced to variations in discount rates (Cochrane, 2011) or dividend growth (Chen, 2009). The standard asset pricing model assumes that stock prices are simply discounted expected future dividends. Hence, higher expected dividends or higher growth rates of dividend lead to price increases. Similarly, lower expected returns also imply higher prices. A low price dividend ratio relative to the mean (over time, or across different industries) implies either higher returns or lower future growth, or a combination of the two. One of the major challenges faced by researchers in this area is how to empirically estimate the expected returns and expected dividend growth ex ante. One interesting solution to this problem proposed by Koijen and Van Binsbergen (2010) is the State Space approach where the dividend yield is decomposed into its expected returns and expected dividend growth components. Their methodology yields a set of parameters which are estimated jointly and which can be used to calculate expected returns and expected dividend growth in a time varying environment.

To date, a great deal of work in this area has focused on the US market. Relatively few researchers have so far sought to understand the properties of expected returns and expected

dividends in another setting. Those that have adopted a non-US focus have produced a small but growing body of evidence on return predictability in global or European markets. However, different results have emerged from these investigations using non-US data. For instance, Engsted and Pedersen (2010) note that dividend growth and return predictability are influenced by inflation and the smoothing of dividends, especially in the UK. Henkel et al. (2011) show that return predictability is higher during economic contractions for G7 economies, which they associate with counter-cyclical risk premiums. Jordan et al. (2014) examine monthly return predictability in the case of 14 countries and find that fundamental ratios (such as dividend yield, the earnings-price ratio and the dividend-payout ratio) have weak predictive power for equity returns compared to macroeconomic variables. Rangvid et al. (2010) show that predictability of dividend growth rates is better than return predictability in smaller stock markets. Dividend growth predictability also tends to differ depending on how the portfolios of equities are constructed. Rambaccussing and Power (2017) provide evidence that predictability may differ across different frequencies in United Kingdom.

Most of the literature in this area attempts to examine predictability, but little is understood as to why predictability is more pronounced in some markets rather than others. While some papers explain predictability through asset pricing models, this paper looks at the supply side of the story where frictions exist in terms of the legal and institutional environments in which firms operate. The current paper also recognises that expected returns and expected dividend growth are based on company policies which are themselves affected by a firm's operating financial performance (or structure). Thus, legal origin, institutional and company financial factors are considered in this analysis.

The current paper bridges the gap between the financial environment and asset pricing strands of the literature. It recognises that the legal and institutional structures within a country "have

important implications for financial markets" (Beck et al., 2003)[1] which may impact on the financial decisions which companies make (La Porta et al. 1996; Demirgüç-Kunt and Maksimovic, 1998). Dividend payments, as well as expected dividend growth will depend on the level and type of external funding which is used to finance investment. For instance, La Porta et al. (2000) argue that "firms in common law countries where investor protection is typically better, make higher dividend payouts than firms in civil law countries do. Moreover in common but not civil law countries, high growth firms make lower dividend payouts than low growth firms. …[I]nvestors in good legal protection countries use their legal powers to extract dividends from firms, especially when re-investment opportunities are poor" (p. 2)[2]. Where creditor rights are protected on the other hand, (which usually characterises countries with Civil Law traditions) and "creditors get paid because they have the power to repossess collateral" (La Porta et al., 1998), firms may find it easier to access debt finance. The interest rate channel may play a more important role in this latter setting where companies operate with higher gearing ratios. A stable system may mean that interest rates are persistent and this persistence is imparted to expected returns. In the current paper, we focus on eight European countries, which differ in terms of their legal systems and institutional structures. The financial environments in which firms operate are also different. As a result, we examine whether movements in equity indices are explained by three main factors. Firstly, the legal origins of a country are used to comment on the results. Secondly, we look at the impact on our findings of three variables employed in Levine (2001) to characterize a financial system: namely the

[1] Specifically, Beck et al. (2003, p. 137) evaluate whether the level of financial development in a country depends on the "legal traditions, brought by colonizers, [and the protection of] the rights of private investors vis-à-vis the state". There empirical results offer support for this legal-tradition view although their findings also provide backing for an endowment theory argues that "the disease environment encountered by colonizers influences the formation of long-lasting institutions that shape financial development".

[2] Although La Porta et al.'s (2000) argument is couched in terms of dividend payments, one might also hypothesize that investors in Common Law countries with "good legal protection" will also use their powers to ensure that there is a more persistent level of expected dividend growth.

relative size, activity and efficiency of its stock market. Lastly, we study whether profitability and gearing ratios at the corporate finance level may influence stock market movements.

The remainder of this paper is structured as follows. Section 2 explains the log-linear present value model, and illustrates how it may be formulated using the State Space approach. Section 3 reports the results from the State Space model and also applies decomposition analysis to the returns. Section 4 documents the findings from a joint significance test. Section 5 explains the results and discusses the findings. Section 6 concludes.

2. The present value model

In this section, we illustrate the log-linearized present value model and show how it may be estimated using an application of the state space approach. Denoting D_t and P_t as the dividend from the stock market index and the stock price at time *t*, the log returns on the index from t to t+1 (r_{t+1}), dividend growth from t to t+1 (Δd_{t+1}) and the logarithm of the price-dividend ratio (pd_t) can be defined as follows:

$$r_{t+1} = ln\left(\frac{P_{t+1} + D_{t+1}}{P_t}\right) \quad (1)$$

$$pd_t = \ln\left(\frac{P_t}{D_t}\right) \quad (2)$$

$$\Delta d_{t+1} = ln\left(\frac{D_{t+1}}{D_t}\right) \quad (3)$$

Definitions (1)-(3) can be used to derive the Campbell-Shiller dynamic present value relationship. This dynamic present value relationship is given as follows:

$$pd_t \simeq \kappa + \rho pd_{t+1} + \Delta d_{t+1} - r_{t+1}, \quad (4)$$

where $\kappa = \ln(1 + e^{\overline{pd}}) - \rho pd$ and $\rho = \frac{e^{\overline{pd}}}{1+e^{\overline{pd}}}$. $\overline{pd}$ is the mean of the price-dividend ratio. Equation (4) implies that current price-dividend ratio is equal to the next period dividend

growth rate and the rate of return. ρpd_{t+1} is the next period price-dividend ratio discounted by the log-linearization parameter. This term is usually important when allowing for price bubbles in the present value model with a constant rate of return. However, assuming that a bubble can never exist, $lim\ \rho^{\infty} pd_{t+\infty} = 0$. Solving for pd_{t+1}, returns can be written as follows:

$$pd_t = \frac{\kappa}{1-\rho} + \frac{1}{1-\rho}\Delta d_{t+1} - \frac{1}{1-\rho} r_{t+1} \qquad (5)$$

Equation (5) is a long run condition which simply states that the current price-dividend ratio will move only if the next period's realized dividend growth or returns change. It should be noted that at time t, both r_{t+1} and Δd_{t+1} are unknown.

The State Space Model

The variables r_{t+1} and Δd_{t+1} , being unknown at time t, are driven by expectations. Consider the market conditional expectations of r_{t+1} and Δd_{t+1} as being denoted by μ_t and g_t. Equation (5) can simply be rewritten as (6):

$$pd_t = \frac{\kappa}{1-\rho} + \frac{1}{1-\rho} g_t - \frac{1}{1-\rho} \mu_t \qquad (6)$$

Equation (6) is simply the price dividend ratio broken down into its expected dividend growth and expected returns components. In the current setting, g_t and μ_t are constant. However, g_t and μ_t can assume any functional form as long as it includes details about the information set involved. Two specifications that have been explored in this literature are the AR(p) and ARFIMA (p,d,q) as in Golinski et al. (2015). Following Koijen and Van Binsbergen (2010), an AR(1) is assumed in the current analysis. Hence, expected returns and the expected dividend growth rate, in demeaned form can be written as follows:

$$\mu_{t+1} - \phi_{\mu 0} = \phi_{\mu 1}(\mu_t - \phi_{\mu 0}) + \varepsilon_{\mu,t+1}\ , \qquad (7)$$

$$g_{t+1} - \phi_{g0} = \phi_{g1}(g_t - \phi_{g0}) + \varepsilon_{g,t+1}\,, \qquad (8)$$

where $\mu_t = E_t(r_{t+1})$ and $g_t = E_t(\Delta d_{t+1})$. μ_{t+1} and $g_{t+1}$are market expectations of future realized returns and dividend growth respectively. $\phi_{\mu,0}$ and $\phi_{g,0}$ represent the unconditional mean of the expected returns and dividend growth respectively. $\phi_{\mu,1}$ and $\phi_{g,1}$ are the autoregressive parameters and are usually assumed to be less than one. The error terms are assumed to be normally distributed with $\varepsilon_{\mu,t+1} \sim N(0, \sigma_\mu^2)$ and $\varepsilon_{g,t+1} \sim N(0, \sigma_g^2)$. The correlation between the residuals is denoted by$\rho_{g\mu}$.

The measurement equation requires two observed variables with two state variables. One of the observed variables is the price-dividend ratio. The other variable can be either realized returns or observed dividend growth. These may be related to their expected counterparts by the following equations:

$$r_{t+1} = \mu_t + \varepsilon_{r,t+1}\,, \qquad (9)$$

$$\Delta d_{t+1} = g_t + \varepsilon_{\mathrm{d},t+1}\,, \qquad (10)$$

In order to allow for more flexibility with expected returns, the second observed variable is given by (10), where realized growth is linearly determined by expected dividend growth. Formally, equations (7) and (8) can be rewritten in demeaned form as expected dividend growth **{** HYPERLINK \l "bookmark5" **}** and conditional expected returns **{** HYPERLINK \l "bookmark6" **}**

$$\hat{\mu}_{t+1} = \phi_{\mu 1}\hat{\mu}_t + \varepsilon_{\mu,t+1}, \qquad (11)$$

$$\hat{g}_{t+1} = \phi_{g1}\hat{g}_t + \varepsilon_{g,t+1}, \qquad (12)$$

where $\hat{g}_{t+1}$ and $\hat{\mu}_{t+1}$ are demeaned expected dividend growth and returns. In other words, $\hat{g}_{t+1} = g_{t+1} - \phi_{g0}$ and $\hat{\mu}_{t+1} = \mu_{t+1} - \phi_{\mu 0}$.

The measurement equations are given by the following:

$$\Delta d_{t+1} = \phi_{g0} + \hat{g}_t + \varepsilon_{\mathrm{d},t+1}, \tag{13}$$

$$pd_t = \mathrm{B}_0 - \mathrm{B}_1\hat{\mu}_t + \mathrm{B}_2\hat{g}_t. \tag{14}$$

Equation (13) states that realized dividend growth is equal to its expected counterpart plus the unobserved shock ($\varepsilon_{\mathrm{d},t+1}$). Equation (14) is the Campbell-Shiller (1988) present value form which relates the price–dividend ratio to expected dividend growth and expected returns. The terms B_0, B_1 and B_2 are defined as follows:

$$\mathrm{B}_0 = \frac{\kappa}{1-\rho} + \frac{\phi_{g0} - \phi_{\mu 0}}{1-\rho}, \tag{15}$$

$$\mathrm{B}_1 = \frac{1}{1 - \rho\phi_{\mu 1}}, \tag{16}$$

$$\mathrm{B}_2 = \frac{1}{1 - \rho\phi_{g1}}. \tag{17}$$

The Kalman Filter can be applied to the model by optimising the log-likelihood function from the Kalman Filter to the data. The objective of such a procedure is to yield the autoregressive terms ($\phi_{\mu,1}$ and $\phi_{g,1}$), the intercept terms ($\phi_{\mu 0}$ and $\phi_{g,0}$), the shock terms (σ_μ , σ_g , σ_d) and the correlation parameters ($\rho_{g\mu}, \rho_{x\mu}$) . The vector of parameters to be estimated from the model is given by:

$$\Phi = (\phi_{g0}, \phi_{\mu 0}, \phi_{g1}, \phi_{\mu 1}, \sigma_\mu \ , \sigma_g \ , \sigma_d \ , \rho_{g\mu}, \rho_{x\mu})$$

Sequentially, once the optimal values are solved, it is possible to derive a time series of expected returns and expected dividend growth values; the implied present value parameters $\mathrm{B}_0, \mathrm{B}_1$and B_2 can also be determined. The last two parameters depend on the autoregressive

parameters $\phi_{\mu 1}$ and ϕ_{g1}. High levels of persistence, implying high values for the autoregressive parameters, give greater weight in the decomposition to a particular series. For instance, if expected returns are more persistent ($\phi_{\mu 1} > \phi_{g1}$), then most of the variation in the price-dividend ratio is due to expected returns. However, this will also depend on the variance of the noise terms σ_μ and σ_g .

Decomposition of Price Movements.

Decomposing the price-dividend ratio into expected returns and expected dividend growth provides a measure of what moves stock market prices (assuming that dividends are more or less constant). The variance of the price-dividend ratio can be written as follows:

$$\sigma_{pd}^2 = B_1^2\sigma_\mu^2 + B_2^2\sigma_g^2 - 2B_1B_2\sigma_{\mu g}\,, \qquad (18)$$

where $B_1^2\sigma_\mu^2$ refers to the proportion of the variance of the price dividend ratio, which is due to the variance of expected returns (discount rate). $B_2^2\sigma_g^2$ is that part of the variance due to variation in expected dividend growth. $2B_1B_2\sigma_{\mu g}$ measures the covariation between both components. From the optimized model, the time series of expected returns and expected dividend growth are shown.

3. Results

Data on monthly dividends and the dividend yields were collected from Thompson Reuters DataStream for the period January 1973 until December 2014. Dividends were geometrically compounded to get the annual growth rate. The price-dividend ratio is the average of the monthly price-dividend ratio over the year. This data were analysed for eight European

countries[3]: Belgium, France, Germany, Italy, Ireland, the Netherlands, the UK and Switzerland. The countries were selected on the basis of data availability for the 42 years being studied. In addition, an attempt was made to examine a range of countries with different legal origins and institutional structures. We selected a sample where stock markets varied in in terms of size and funding importance within a country. An analysis of Table 1 reveals that two of the countries (Ireland and the UK) have common law traditions while the other 6 (Belgium, France, Germany, Italy, the Netherlands and Switzerland) have legal origins based on civil law[4]. The stock markets in the different countries varied in size ranging from a low of 18.54 % of GDP for Italy to a high of 145.9% of GDP for Switzerland.

Structure Activity, Structure Size and Structure Efficiency of the financial sector, as defined in Levine (2001) are also reported. In each of these measures, market-based systems score higher than bank based system. For instance, a higher value for size means that the stock market is bigger relative to the banking sector. Similarly, a higher value for activity implies that funding from stock markets tend to be more prominent than that of banks. A high efficiency value may be due to high overhead costs or total value traded. In the case of the former, high overhead costs in the banking sector means that the stock market is more efficient than the banking sector, on average.

The size of the stock market as measured by the market capitalization ratio, equals the value of equities divided by the GDP. The size of the banking sector is measured by the bank credit

[3]This study focussed on countries in Europe. Only 8 of these countries are considered in the current study since complete data in terms of returns, dividend yield, corporate financial characteristics and corporate governance variables were not available for other European nations over the 42-year time horizon examined.

[4] La Porta et al. (1997) argue that "legal rules protecting investors… differ greatly and systematically across countries." In particular, they suggest that "these rules vary systematically by legal origin, which is either English, French, German or Scandinavian. English law is common law made by judges and subsequently incorporated into legislature. French, German and Scandinavian laws, in contrast, are part of the … civil law, tradition, which dates back to Roman law". In the current paper, we combine all of the six countries with civil law tradition into one group and ignore the differences between the French, German and Scandinavian legal origins, which some studies recognize (i.e. Beck et al., 2003).

ratio (total bank credit/GDP). Therefore, Structure Size is equal to the logarithm of the market capitalization ratio divided by the bank credit. Structure Efficiency is a measure of liquidity of the stock market. Hence, it is the logarithm of the total value traded ratio divided by the overhead costs of the banking sector (which is a measure of the efficiency of banks). The total value traded is a measure of the value of equities traded as a proportion of GDP. To measure the Activity variable, the total value traded ratio is divided by the bank credit ratio.

The results of this paper are presented in two sections. The findings from estimating the parameters for the present value model applied to each of the eight countries under the state-space approach are initially reported. Then, we attempt to determine whether these findings are linked to (i) the legal origin of a country, (ii) institutional factors which measure the prominence of the stock market within a country and (iii) the financial performances of companies in the countries being studied.

Table 2 reports the estimation results from the optimization of the state space model (Equations (11) to (14)). For each of the eight countries, the vector of parameters ϕ_{g0}, $\phi_{\mu 0}$, ϕ_{g1}, $\phi_{\mu 1}$, σ_{μ} , σ_{g} , σ_{d} , $\rho_{g\mu}$and $\rho_{d\mu}$ is shown. From these optimal parameter estimates, a time series of expected dividend growth and expected returns values are then calculated and displayed in Figure 1 and figure 2 respectively.

A number of findings emerge from an analysis of the results in Table 2. First, the autoregressive parameters for the expected dividend growth rate in the current study tend to be relatively higher than those documented for the US[5] in prior investigations. It our analysis, the persistence parameter for expected dividend growth is lowest for Germany and Switzerland at 0.120 and 0.081 respectively. The estimated persistence term for the expected dividend growth in Italy

[5] Studies of US data have typically reported values for $\phi_{g,1}$ of 0.354 (Cash-Reinvested Dividends) and 0.638 (Market-Reinvested Dividends) (Koijen and Binsbergen, 2010).

seems very high at 0.714; in fact, it is more than double the next highest values for $\phi_{g,1}$ for the UK and Ireland. Relatively high persistence is estimated in the case of the UK and Ireland where the values for $\phi_{g,1}$ are 0.399 and 0.391 respectively; in these two countries (as well as in Italy), the impact of a change in expected dividend growth from last year continues to influence expected dividend growth into the future for several years. If investors anticipate that a share's expect dividend growth will rise by 1%, for example, the influence of this expected dividend rise would remain above 0.05 of 1% for over three years. Such expectations among UK and Irish investors may be based on a level of persistence in dividend changes which has been reported for UK (Lonie et al., 1996) and Irish (McCluskey et al., 2007) companies[6].

Expected returns are more persistent than expected dividend growth rates for all eight countries included in the current investigation. The values of $\phi_{\mu 1}$ documented range from a low of 0.654 for Germany to a high of 0.990 for the Netherlands; in fact, with the exception of Germany and Italy, all of the $\phi_{\mu 1}$ values reported are greater than 0.850. Indeed, for four of the countries (Belgium, Ireland, the Netherlands and Switzerland), $\phi_{\mu 1}$ is greater than 0.90. The persistence in expected returns is statistically significant for all countries which may be due to persistence among interest rates in the sample countries.

Shocks to the realized dividend growth are generally higher than shocks to expected dividend growth from one period to another. The Netherlands, Germany and the UK appear as exceptions to this generalisation where the values for σ_d are higher than the estimates for σ_g . The realized dividend growth rate in UK is moderately lower than its counterparts in other European countries especially Ireland, Belgium and Italy. Interestingly, the UK has the lowest realized dividend growth shock which links to the notion that UK companies try not to surprise

[6] Evidence suggests that managers of companies in these two countries will only raise a dividend when they expect to maintain the dividend at the new higher level into the future. In addition, managers of UK and Irish companies appear reluctant to cut dividends unless the reduction is forced on them by a lack of liquidity.

the market by maintaining dividend growth at a constant rate (Lonie at al., 1996). Shocks to the expected returns process are very small in the Netherlands, which contrasts with the case of Belgian where the standard deviation is 11.4 %. Other countries having a high ratio of standard deviation to expected returns include Italy and Germany. Low shocks to expected returns are also noted for Ireland, Italy, the Netherlands and Switzerland. Correlations among the present value parameters tend to differ across the sample countries both in sign and magnitude. The correlation between expected returns and expected dividend growth is positive in most instances, except in the German case which has a correlation close to zero.

Table 3 describes the percentages of market movements, which either can be attributed to either discount rates or expected dividend growth. In most European countries, it appears that the movement of the price-dividend ratio is mainly attributable to discount rates. However, the importance of this component varies across countries. It is highest in France (133.8%) and lowest in Italy (66.2%). Indeed, for the six remaining countries, the percentage attributed to the discount rate is higher than 98%. Dividend growth news plays only a minor role in influencing movements in the markets, with the exception of Germany and Italy. Statistically, this corresponds to the low persistence in the autoregressive term or/and low volatility of expected dividend growth. A change in expectations about the variable will dissipate relatively quickly. France and the UK also exhibit strong negative covariation between discount rates and dividend growth in their stock market decompositions. Thus, a change to either explanation of the share price movements would be associated with the opposite change of the other two factors considered.

Having estimated the parameters of the present value model using the state space approach, this paper investigates whether the persistence parameters for expected dividend growth and expected returns are linked to the "legal origin" of a country. In an influential body of work, La Porta et al. (1997, 1998) developed the proposition that stock market size and consequent

economic development are promoted by a legal system in which the interests of shareholders are protected. Their investigation of legal regimes showed that common law countries (such as Ireland and the UK) generally offer stronger legal protection for shareholders than their civil law counterparts (including Belgium, France, Germany, Italy, the Netherlands and Switzerland). One of the main variables that they linked with a country's legal origin was a "rule of law" measure. Thus, a version of this "rule of law" variable is employed in the current analysis from Levine, et al. (2015) which is an assessment of the law and order tradition in the country[7]; this was analysed for the persistence parameters being studied and the results shown in Figure 3.

Common law countries such as Ireland and the UK which have higher rule of law measures also have a higher level of persistence in expected returns. With the strong protection of shareholder rights within these common law countries, it is not too surprising that persistence in expected returns is present. By contrast, in a country such as Germany where creditor rights are deemed to underpin the legal tradition, persistence in expected returns is relatively lower – presumably because of the prominence given to the rights of debtholders. Therefore, a factor such as "the Rule of Law" appears to shape the habits of companies and the expectations of investors in general according to the findings of the current investigation[8].

The results on common and civil are reported in Table 4[9]. On average, the autoregressive parameter in expected returns is slightly higher for the common law countries of Ireland and

[7] Specifically, it is an average of the monthly index using a scale from 0 to 2, with lower scores for where there is less of a tradition for law and order.

[8] We also find different patterns among the parameters of the present value model measures for other measures considered by La Porta et al. (1997): creditor rights, the rule of law and an anti-self-dealing index. It appears that a stronger rule of law measure implies lower persistence of expected dividend growth. It is also noted that a higher anti-self-dealing index number implies a higher correlation between expected returns and expected dividend growth shocks. Meanwhile better creditor rights also imply lower realized dividend growth shocks.

[9] The reported figures (for expositional purposes) are averages across those countries which are identified as common law nations (UK and Ireland) and countries with a civil law tradition (Belgium, France, Germany, Italy, the Netherlands and Switzerland).

the UK (0.932 v 0.843). The autoregressive parameter for the expected dividend growth is also relatively higher in the common law countries (0.395 v 0.296) although the overall level of persistence in expected dividend growth is much lower than in expected returns. For civil law countries, therefore, a change in expected dividend growth or expected returns tends not to influence future values of the series to the same extent possibly because the stock market plays a less prominent role in the fund raising process for corporations. Shocks to expected dividend growth and realized dividend growth do not differ a great deal across the legal systems. However, it is worth noting that shocks to expected returns are twice as big in countries with a civil law tradition.

The impact of the institutional characteristics of a country on the time series of expected returns and expected dividend growth is also considered in this paper. Following the literature on bank-based and market-based systems (Levine 2001), the effects of structure size (Size), structure activity (Activity) and structure efficiency (Efficiency) are examined on the filtered variables:

$$y_{it} = \beta_1 \, Efficiency_{it} + \beta_2 \, Size_{it} + \beta_3 \, Activity_{it} + \alpha_i + \epsilon_{it} \qquad (19)$$

Where y_{it} is the dependent variable, which is the filtered series of (i) expected returns and (ii) expected dividend growth. The results from estimating this equation for common and civil law countries separately are illustrated in Table 5[10].

In common law countries, greater Activity implies higher expected returns as well as larger expected dividend growth. This is shown by the p-values of less than 0.05. Moreover, Size has a negative association with expected returns and a positive but insignificant relationship with expected dividend growth for countries where their legal system is based on common law. For civil law countries, the opposite result is uncovered; Size is only significant in the expected

[10] Since some of the data were not available for each of the Structure variables, the regression results in Table 5 are estimated with a subset of the data on a shorter time span.

dividend growth equation. These results reinforce findings in Rangvid et al. (2014) where dividend growth was predictable in smaller markets. In contrast to their study where the focus was on predictability, we observe a positive size and activity effect on expected dividend growth. For relatively larger stock markets in civil law countries, therefore, the channel of distribution is mostly dividend growth. This is reinforced by the large coefficient of 0.094 for the Size variable in the expected dividend growth equation for the civil law countries. Such a significant relationship is not present in the case of common law countries.

Overall, Efficiency does not have a strong association with either expected dividend growth or expected returns according to the results in Table 5. By contrast, in both types of markets, the larger the activity levels, the higher the expected returns and the higher the expected dividend growth. The high expected returns and high expected dividend growth may encourage investors to be more active in their trading of securities. However, the magnitude of the coefficients for the Activity variable are much larger for civil law countries, which implies that the more liquid a stock market within the civil law grouping, the higher the higher the expected returns and the expected dividend growth.

We also examined the influence of corporate profitability and gearing on these variables. The role of corporate measures of performance are also considered in explaining the variation in expected returns, expected divided growth rate and the price-dividend ratio is considered. The following model is estimated:

$$y_{it} = \beta_1 NDTA_{it} + \beta_2 ROE_{it} + \beta_3 IC_{it} + \alpha_i + \epsilon_{it} \quad (20)$$

Where $NDTA$ is the net debt to total assets for listed companies within a country and is an assessment of the average gearing within the corporate sector, ROE is the return on equity ratio and provides a measure of a measure of corporate profitability and IC is the interest cover,

which is the ratio of earnings to interest payments for companies. The results are reported in Table 6. One might expect that profitable companies with high levels of liquidity and low levels of gearing would have higher expected dividend growth. By contrast, if expected returns are the main influence on the price-dividend ratio, companies may be characterised by high levels of gearing and relatively low interest cover.

Expected returns appear to be negatively associated with the net debt to total assets ratio of companies in common law countries. However, such a relationship is not present in civil law countries. There appears to be no evidence of interest cover and return on equity influencing expected returns in countries with either legal origin. However, we note that the return on equity influences expected dividend growth positively in both Common and civil law countries. The more profitable the corporate sector in both groups of countries, the higher the expected dividend growth. However, surprisingly, the impact is stronger for civil law countries where the coefficient on ROE at 0.292 is over 7 times the size of the coefficient for common law countries. A significant negative relationship is uncovered between the net debt to total assets ratio and expected dividend growth in common law countries; for these countries, gearing impacts negatively the expected dividend growth, presumably because cash paid out in interest payments reduces the amount of liquid funds available to raise dividends in the future. No significant association between the NDTA variable and expected dividend growth for civil law countries.

4. Robustness Check

The alternative to the state space approach in the asset pricing literature is to use a vector autoregression. The standard unconstrained VAR attempts to explain movements in returns

and dividend growth through the price-dividend ratio. In this case, the VAR can be stated as follows:

$$r_{t+1} = a_r + b_r dp_t + u_{r,t+1}, \quad (21)$$

$$\Delta d_{t+1} = a_d + b_d dp_t + u_{d,t+1,} \quad (22)$$

$$pd_{t+1} = a_{pd} + b_{pd} dp_t + u_{pd,t+1.} \quad (23)$$

In this case, the expected returns and expected dividend growth are fitted values from the dividend yield (or the price-dividend ratio). As an empirical exercise, the VAR model typically works well to estimate these variables. For details of the VAR, results are available in the appendix.

The assumption of the present value can be applied to the VAR. As shown in Cochrane (2008), the present value sets a constraint on at least one parameter. One such constraint can be that $b_r = 1 - \rho b_{pd} + b_d$. In this case, the VAR constrains the returns parameter to be a function of the estimated parameters and the log-linearization parameter.

The estimates of the expected returns and expected dividend growth from the unconstrained and constrained VAR model are plotted for each country (see Appendix). The expected returns from the constrained VAR appear to be smoother than the expected returns from the other models in these plots. In the case of Switzerland, Germany and Italy, the expected returns from the constrained VAR show little volatility, and contrasts with the state space and the unconstrained model. Such a finding may be attributable to the price dividend ratio being moved more by the dividend growth component. In such a case, the solved b_r is small such that $b_r dp_t$ contributes little to the intercept term. Consistent and stronger correlations are noted for the expected dividend growth.

One of the issues with the state space model is weak identification through the low signal to noise ratio explained in Ma and Wohar (2014a, 2014b). In this case, a combination of high persistence in the autoregressive parameter from equations (7) and (8) and a low signal to noise ratio $\left(\frac{\sigma_\mu}{\sigma_r}\right)$ would imply that the standard errors may be inaccurate due to weak identification. This feature will mainly affect the findings in Table 3 (Decomposition of Stock Market Movements). In this case, following Ma and Wohar (2014a), confidence intervals are derived from a bivariate VARMA (Ma and Wohar 2014a, p. 2468). Residuals from the VARMA are used as a regressor to explain the price-dividend ratio. From this estimation procedure, the associated t-values for a given range of $\phi_{\mu 1}$ can be numerically inverted to produce valid confidence intervals. We illustrate the confidence for each country in **{** HYPERLINK "https://www.tandfonline.com/doi/full/10.1080/1351847X.2017.1335649?scroll=top&needAccess=true&instName=University+of+Dundee" \l "F0005" **}**.

The results show that the intervals implied by the state space model are wider than the 95 % confidence interval. Results must therefore be interpreted with care noting that the decomposition of prices into dividend movements and expected returns may be subject to inference problems. Based on Figure 5, movements due to the discount rate for Switzerland and Belgium in particular may be overestimated.

5. Conclusion

This paper sheds light on the relationship between present value time series and the legal and financial environment. The two main variables considered were expected returns and expected dividend growth. The analysis was conducted on a sample of 8 countries in Europe. Three important conclusions are shown.

Firstly, both expected returns and expected dividend growth rate are persistent across Europe. The determinants from stock fluctuations depend on the autoregressive parameters of both expected returns and expected dividend growth. Expected returns are more persistent than expected dividend growth. While expected returns persistence is similar across countries, expected dividend growth tends to vary more across the different countries. Decomposition of stock market movements shows that expected dividend growth is nearly inexistent towards moving stock markets. On the other hand, they play a more significant role in civil law countries. Expected and Unexpected dividend growth shocks are of similar magnitude, and much lower for expected returns shocks. The legal origin of the country gives a host of factors, which can impact on the intermediation process through either creditors or shareholders. Examples of such factors include protection of shareholder rights, creditor rights, legal protection and institutional index. Countries, which score a high rating in the latter, tend to have their stock markets driven by dividend growth.

Thirdly, corporate factors have some impact on the persistence of both series, but predominantly on expected dividend growth. Profitability of firms are directly imparted on expectations of dividend growth. This is very common in civil law countries. While, although significant, common law countries do not have such effects of ROE on expected dividend growth as smoothing of dividends is more common in these countries. High gearing levels also reduces expectations of future dividend growth in common law countries.

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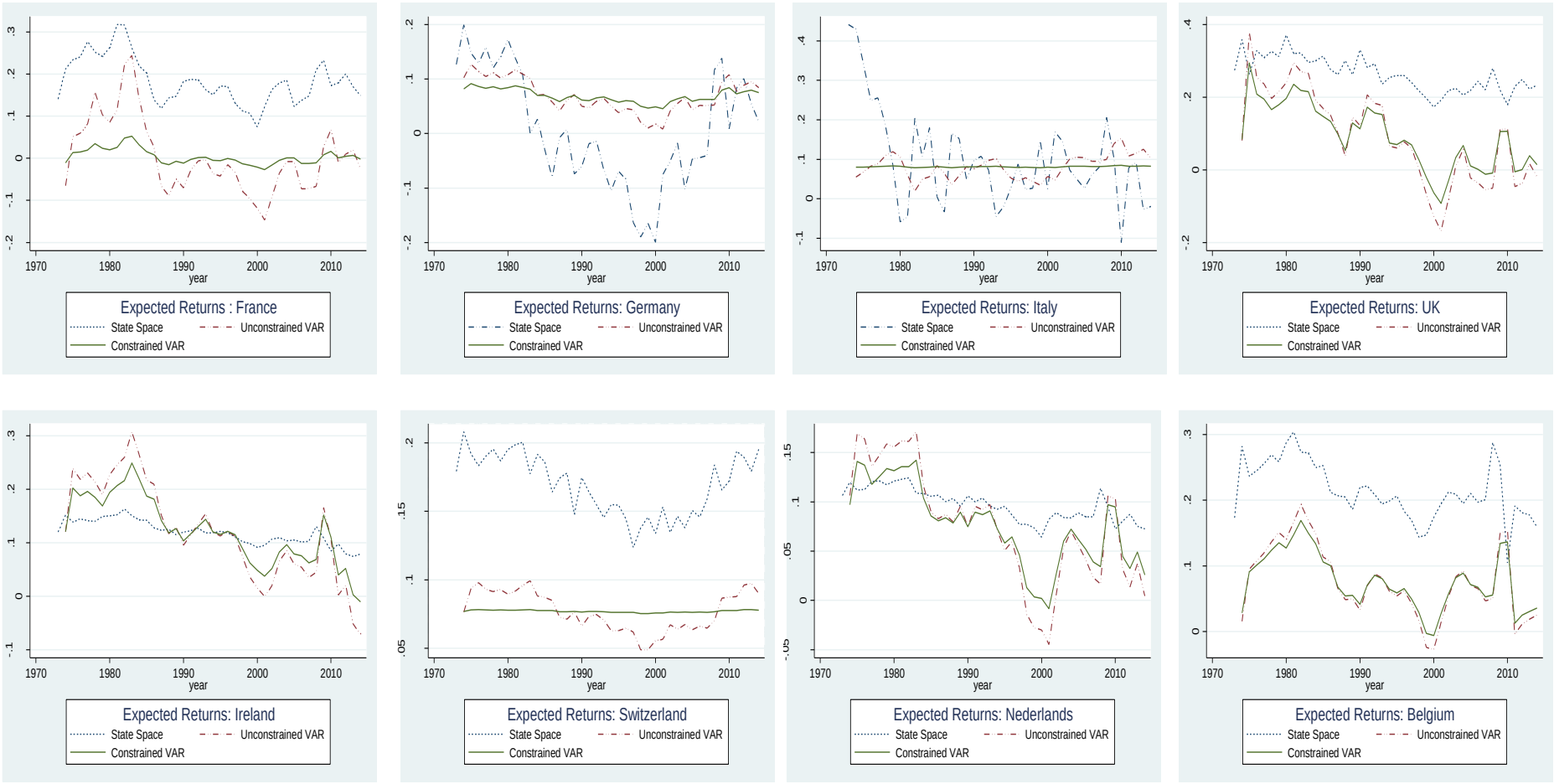
Appendix A: Data Sources and sample:

Variable	Sample	Source
Price-Dividend Ratio	1973-2014	Datastream
Dividend Growth	1973-2015	Datastream
Price-Earnings Ratio	1973-2015	Datastream
Net Profit Margin	1981-2014	Datastream
Interest cover	1981-2014	Datastream
ROE	1981-2014	Datastream
Net Debt to total assets	1981-2014	Datastream
Price-Cash Flow ratio	1981-2015	Datastream
Stock Market Capitalization as a percentage of GDP:	1989-2012	Global Financial Development Database
Stock Market value traded as a % of GDP:	1999-2012	Global Financial Development Database
Stock Market turnover:	1989-2012	Global Financial Development Database
Bank Deposits to GDP	1975-2012	Global Financial Development Database.
Bank credit ratio	1975-2012	Global Financial Development Database.
Bank overhead costs	1999-2012	Global Financial Development Database.
Rule of Law	2015	Levine et al. (2015)
Creditor Rights	2007	Djankov et. al. (2007)
Anti self-dealing index	2008	La Porta et. al. (2008)
Legal Protection and Institution	2015	Levine et al. (2016)

B. Plot of Expected Returns Series from State Space, Constrained VAR and Unconstrained VAR



Plot C. Plot of Expected Dividend Growth from State Space, Constrained VAR and Unconstrained VAR

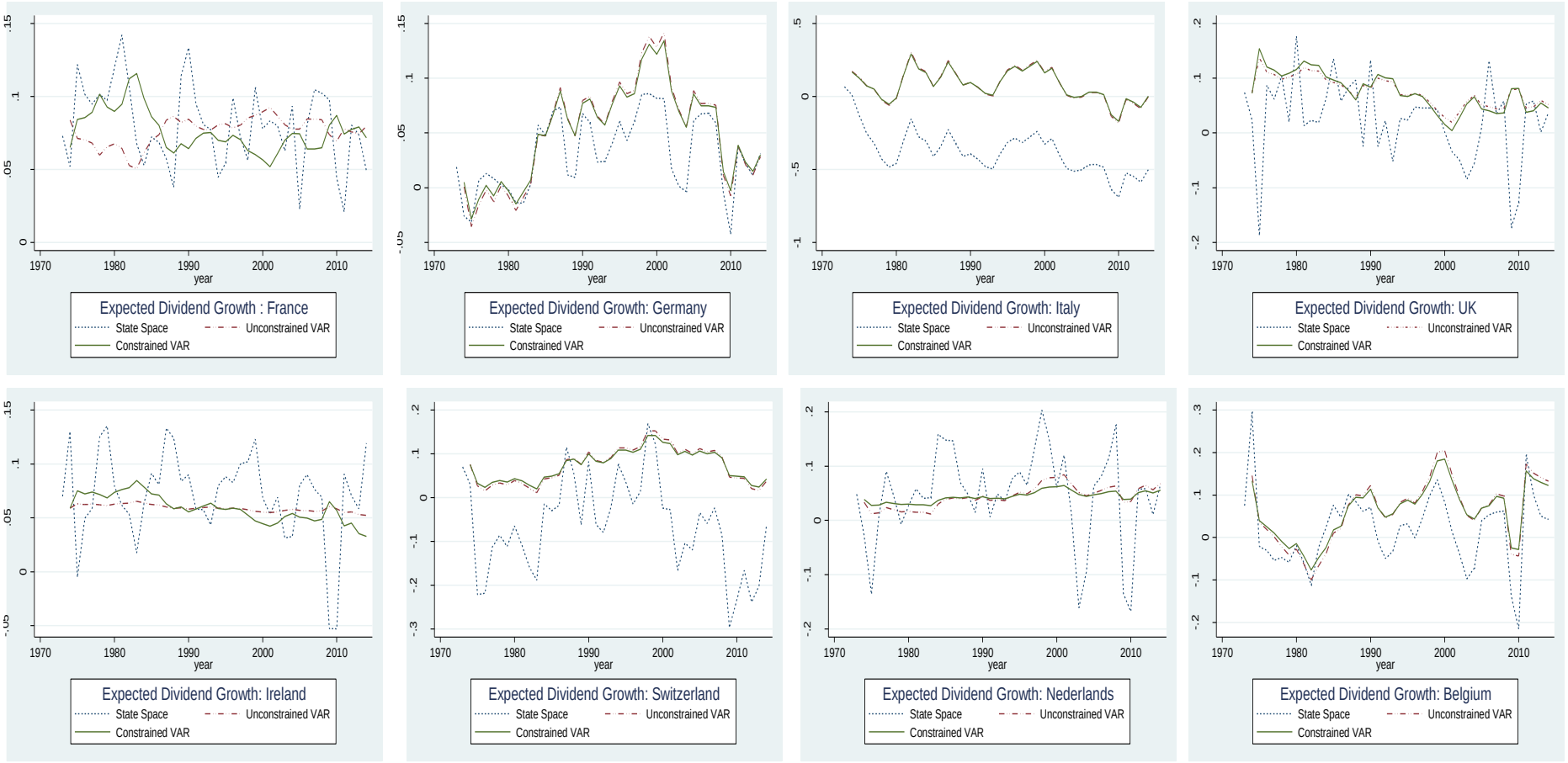


Table 1: Sample Details

Country	Legal Origin	Stock Market Size	Stock Market Activity	Structure-Size	Structure-Efficiency
Belgium	Civil Law	42.55	-1.73	-0.32	-1.45
France	Civil Law	45.81	-0.94	-0.54	-0.34
Germany	Civil Law	29.83	-0.94	-1.04	-0.27
Ireland	Common Law	54.76	-1.73	-0.93	-3.26
Italy	Civil Law	18.34	-1.31	-1.00	-0.09
Netherlands	Civil Law	64.08	-0.58	-0.45	0.07
UK	Common Law	90.68	-0.44	-0.09	0.78
Switzerland	Civil Law	145.9	-.025	0.04	1.34

Note: The legal origin measure uses the classification of countries' legal systems from La Porta et al. (1998). The figures for stock market size, activity, size and efficiency are averages from 1974 to 2014. Details about the stock market size, activity, relative size and efficiency of each country are also supplied. Stock market size is computed as market capitalization as a percentage of GDP. The stock market Activity, Relative Size and Efficiency variables are defined in the text.

Table 2: Estimation of the Present Value Model.

	France		Germany		Italy		UK		Ireland		Switzerland		Netherlands		Belgium	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
ϕ_{g0}	0.073	0.027	0.019	0.008	0.067	0.030	0.074	0.022	0.070	0.035	0.070	0.025	0.048	0.013	0.075	0.031
$\phi_{\mu 0}$	0.089	0.046	0.047	0.026	0.051	0.047	0.062	0.101	0.030	0.175	0.062	0.072	0.041	0.240	0.066	0.083
ϕ_{g1}	0.319	0.293	0.120	0.084	0.714	0.271	0.399	0.179	0.391	0.367	0.081	0.295	0.219	0.108	0.326	0.268
$\phi_{\mu 1}$	0.859	0.103	0.654	0.176	0.719	0.149	0.872	0.109	0.992	0.069	0.934	0.092	0.990	0.068	0.907	0.087
σ_d	0.077	0.035	0.047	0.024	0.141	0.062	0.012	0.016	0.150	0.064	0.095	0.041	0.043	0.031	0.130	0.069
σ_g	0.050	0.053	0.080	0.039	0.084	0.044	0.070	0.017	0.089	0.057	0.068	0.038	0.099	0.030	0.119	0.016
σ_μ	0.028	0.018	0.071	0.041	0.008	0.030	0.017	0.027	0.006	0.006	0.003	0.006	0.005	0.005	0.018	0.069
$\rho_{g\mu}$	0.503	0.424	-0.038	0.231	0.438	0.407	0.437	0.220	0.452	0.480	0.072	0.397	0.076	0.359	0.146	0.555
$\rho_{d\mu}$	-0.418	0.636	0.044	0.222	-0.058	0.402	-0.075	0.839	-0.026	0.434	-0.181	0.775	-0.28	0.611	-0.363	0.671

Note: The table illustrates the optimised parameters and their corresponding standard errors from the state space model for eight European countries using the sample 1974-2014. The estimates (Est) and the standard errors (SE) were computed using 100 draws of initial values from a uniform distribution

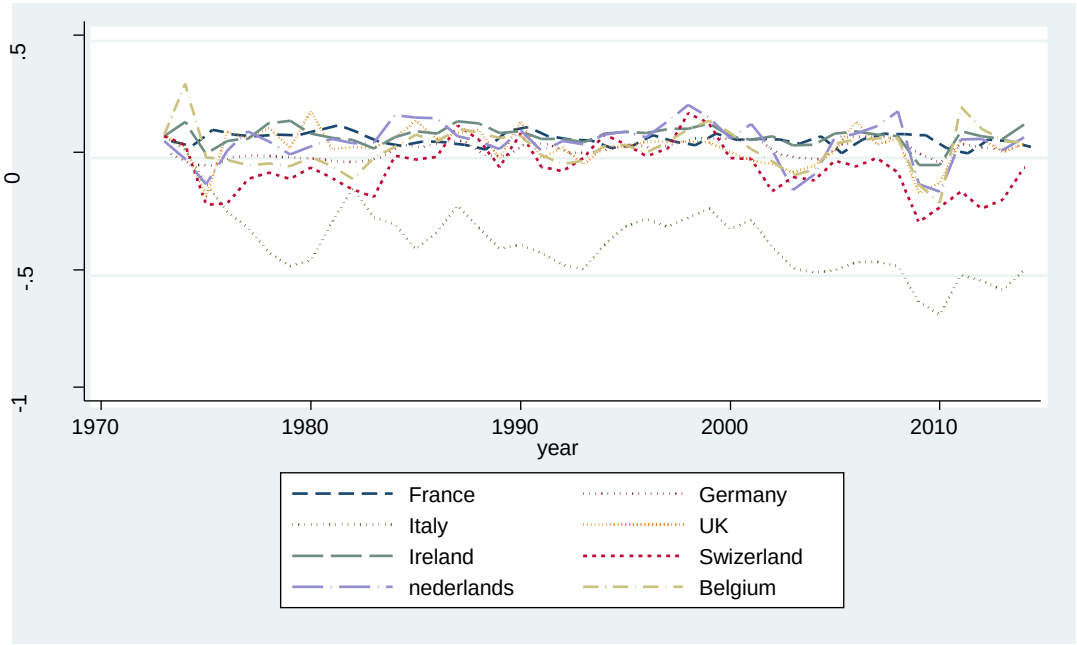


Figure 1: Time Series of Expected Dividend Growth from 1973 to 2014.

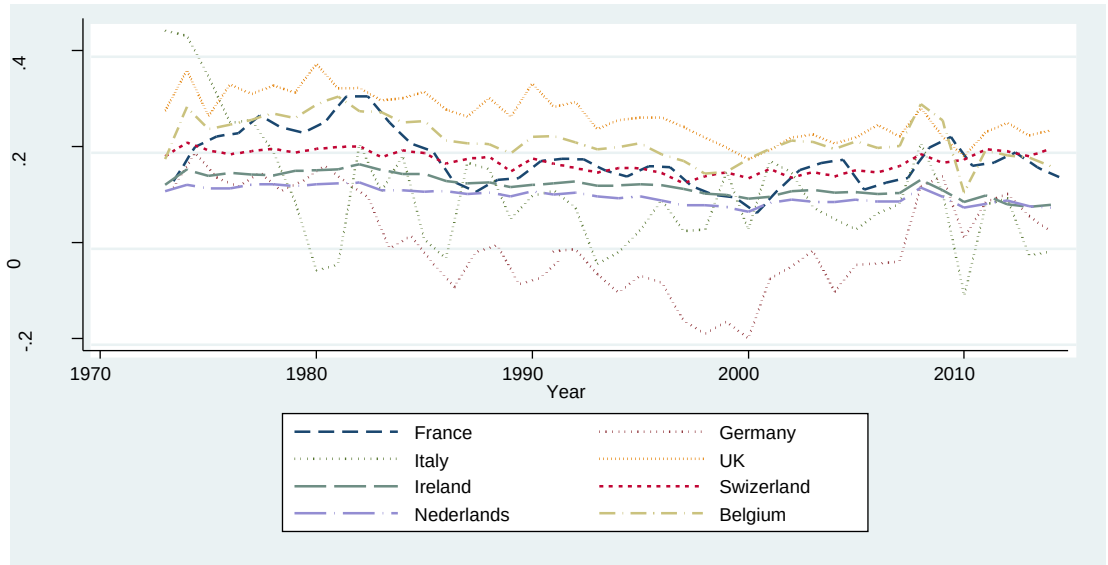


Figure 2: Time Series of Expected Returns from 1973 to 2014.

Table 3: Decomposition of Stock Market Movements

	France	Ger-many	Italy	UK	Ireland	Switzer-land	Nether-lands	Bel-gium
				Decomposition of price-dividend ratio				
Discount Rate	133.8	75.00	66.22	118.31	101.78	99.86	99.55	98.91
Dividend Growth	1.01	19.28	37.21	0.02	0.01	0.16	0.79	2.61
Both	-34.81	5.73	-3.44	-18.34	-1.78	-0.02	-0.34	-1.52

Note: This table shows the decomposition of stock market movements due to discount rate news and dividend growth news. The figures are presented in percentage terms (%), and illustrate the percentage to which movements can be attributed to the discount rate news, the dividend growth news or both.

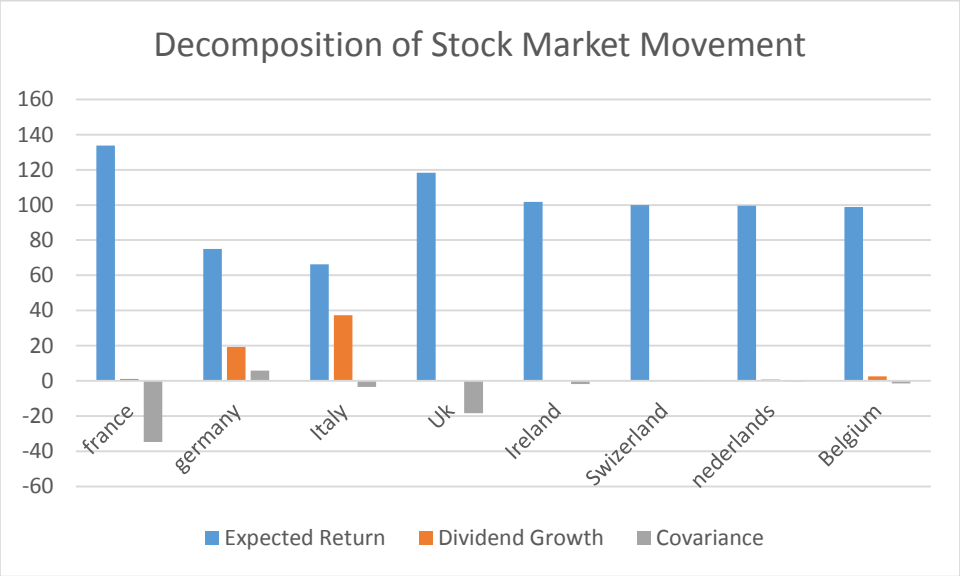
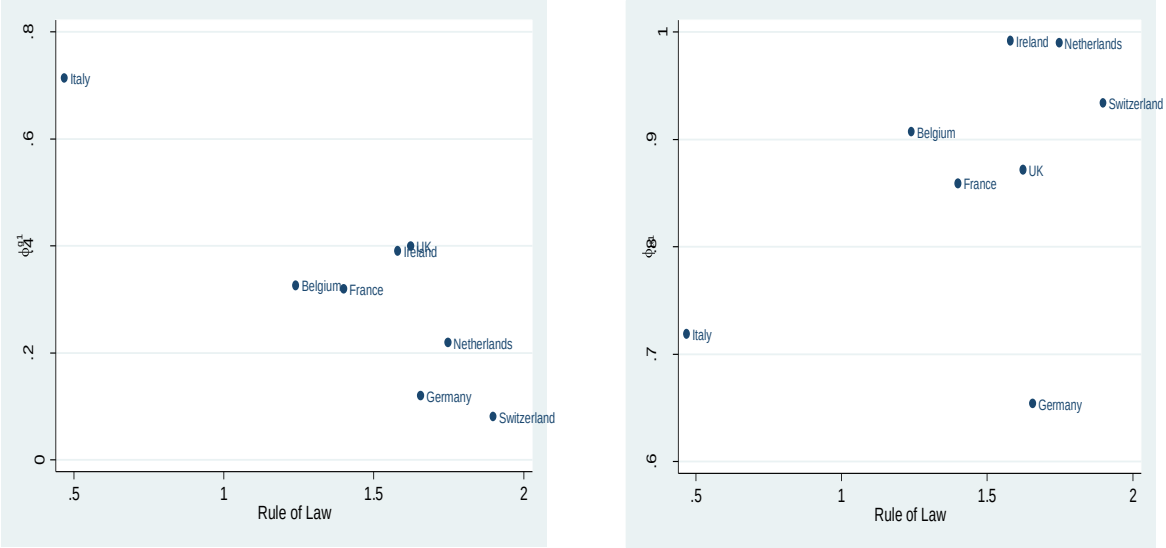


Figure 3: Decomposition of Discount Rates and Dividend Growth News. The figure shows the percentage of movements attributed to discount rates, dividend growth and the covariation between both.



Panel A Panel B

Figure 4: Panel A illustrates expected dividend growth persistence (ϕ_{g1}) against the Rule of Law measure. Panel B illustrates the expected returns persistence ($\phi_{\mu 1}$) against the Rule of Law measure.

Table 4: An Analysis of Parameters According to Legal Origin

	Common Law	Civil Law
Panel A: State Space parameters		
ϕ_{g1}	0.395	0.296
$\phi_{\mu 1}$	0.932	0.843
σ_d	0.081	0.089
σ_g	0.079	0.083
σ_μ	0.011	0.022
Panel B: Decomposition of Price Movements		
Discount Rate	110.05	95.57
Dividend Growth	0.014	10.17
Covariance	-10.06	-5.733

Note: Panel A displays illustrates the average of selected state space parameters. Panel B illustrates the decomposition of the price-dividend ratio based on legal origin.

Table 5: Estimates of Expected Returns and Expected Dividend Growth using a Fixed Effects Model

	Expected Returns		Expected Dividend Growth	
	Common Law	Civil Law	Common Law	Civil Law
Efficiency	-0.002	0.013	-0.001	0.008
	(0.593)	(0.684)	(0.499)	(0.755)
Relative Size	-0.047	-0.036	0.001	0.094
	(0.000)	(0.298)	(0.366)	(0.000)
Activity	0.033	0.111	0.006	0.072
	(0.000)	(0.010)	(0.000)	(0.040)
R^2	0.52	0.17	0.92	0.42
N	26	75	26	75

Note: Estimates of equation (19) are shown were expected returns and expected dividend growth rates are estimated using Efficiency, Size and Activity as control variables, for common law and civil law. The figures in brackets are the p-values. N refers to the total number of observations in the regression.

Table 6: Estimates of the Within Effects Panel Data Model.

	Expected Returns		Expected Dividend Growth	
	Common Law	Civil Law	Common Law	Civil Law
ROE	0.1151	0.184	0.039	0.292
	(0.242)	(0.148)	(0)	(0.008)
NDTA	-0.141	-0.032	-0.0173	0.0157
	(0)	(0.726)	(0)	(0.842)
IC	-0.255	-0.079	0.002	-0.029
	(0.491)	(0.898)	(0.91)	(0.955)
R^2	67	203	67	203
N	0.179	0.007	0.267	0.0543

Note: Estimates of equation (20) are shown were expected returns and expected dividend growth rates are estimated using Return on Equity, Net Debt to Total Assets and Interest Cover as control variables, for common law and civil law. The figures in brackets are the p-values.

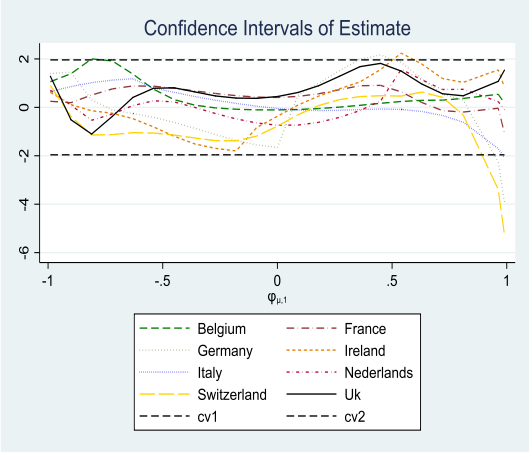


Figure 5: The figure illustrates the 95 % Confidence interval for expected return persistence based on the Ma and Wohar (2014a,2014b) reduced form test.