DIVIDEND POLICY IN THE EUROPEAN UNION

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Abstract

Using a unique database of over 3400 listed industrial companies, we examine the evolution of dividend policy from 1989 to 2003 in the fifteen nations that were members of the European Union before May 2004. As in the United States, the fraction of European firms paying dividends declines dramatically over this period, from 91 to 62 percent of listed companies, while total real dividends paid and dividend payments as a fraction of total corporate profits increase significantly. Dividends and earnings are also concentrating sharply among European companies, and similar company characteristics increase both the propensity to pay and the amount of dividends paid. Increasing fractions of retained earnings to total equity do not increase payouts, but company age does. We find neither systematic dividend catering effects in Europe nor conclusive evidence of continent-wide convergence in dividend policy.

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1. Introduction

Dividends are both pervasive and perplexing. They are pervasive in that companies have been paying regular cash dividends since the dawn of the modern limited liability company over three centuries ago, and publicly traded companies in all market economies have been paying out large fractions of their earnings ever since.[1] Dividends are perplexing (especially to financial economists) because it is not obvious why investors should demand cash dividends. Since the seminal paper by Miller and Modigliani (1961), a vast literature has examined the payout policies of U.S. companies.[2] However, relatively little research has yet been published examining the payout polices of non-U.S. companies.

This study examines dividend policies of companies headquartered in the 15 member nations of European Union, the world's second largest economy, over the period 1989-2003. Despite the EU's global importance, very little published research has examined dividend policy on a continent-wide basis. Denis and Osobov (2006) examine three European countries in their sample of the six largest economies, but the only other recent studies we find are single-country analyses. British dividend policies are examined by Ang, Blackwell, and Megginson (1991), Lasfer (1997), Bell and Jenkinson (2002), Bank, Cheffins, and Goergen (2004), and Renneboog and Trojanowski (2006), while Goergen, Renneboog, and Da Silva (2005) examine why and when German companies change dividend payouts, and Renneboog and Szilagyi (2006) study the role of dividend policy in the stakeholder-oriented governance regime of the Netherlands. This relative dearth of continental research primarily results from difficulties in obtaining comprehensive and representative data prior to the 1999 adoption of the Euro.

We ask and answer a series of basic questions about European dividend policies. Are payout ratios higher or lower than in the United States? Are these payout ratios the same for different European countries? Do European companies show the same declining propensity to pay dividends as Fama and French (2001) document so dramatically for U.S. listed firms? Are dividends and earnings also

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[1] Dewing (1953, page 93) notes that an act of Parliament in 1697 formalized the restriction that cash dividends could only be paid out of a company's profits, not its capital, clearly indicating that dividends were important even then. A similar provision appeared in the Massachusetts Land Bank's charter, granted in 1739.

[2] The theoretical and empirical literature from the first forty years of modern dividend policy research is summarized in Allen and Michaely (2003). More recently, Koch and Sun (2004) show that investors interpret dividend changes as credible signals of the sustainability of past earnings changes, Morck and Yeung (2005) explore how American tax policy relating to inter-corporate dividend payments has promoted dispersed stock ownership in the United States, Grinstein and Michaely (2005) examine how corporate payout policy (dividends and repurchases) impacts institutional share ownership, and Brav, Graham, Harvey and Michaely (2005) present survey evidence on the factors that drive managerial decisions regarding dividend payments and share repurchases. Intriguingly, DeAngelo and DeAngelo (2006a) reexamine the original M&M dividend irrelevance theorem—which has served for four decades as the theoretical touchstone for payout research--and find that it does not hold, even in frictionless markets. In DeAngelo and DeAngelo (2006b), these same authors advocate an alternative method of teaching dividend policy to students that does not begin with an irrelevance assumption.

concentrating in EU firms, as DeAngelo, DeAngelo, and Skinner (2004) show is happening in the United States? Are dividend payouts as highly correlated with the fraction of retained earnings (versus contributed equity) in the equity capital structures of European firms as DeAngelo, DAngelo, and Stulz (2006) find for U.S. dividend-paying firms? Are dividend payments and share repurchases in Europe complementary policies, pursued by the same companies, as in the United States? How have European dividend policies developed as Western Europe has evolved into the European Union? Have these policies converged between EU nations, and has the convergence been more or less pronounced for countries that have adopted the Euro? Finally, do the patterns observed in Europe support any of the competing theories explaining dividend payments—especially the agency cost model, which is the current mainstream favorite, or the catering theory proposed by Baker and Wurgler (2004a)?

We find that dividend policies of EU companies are similar in many ways to those of American firms. For example, the fraction of European firms paying dividends has also declined dramatically in recent years, while total real dividends paid and dividend payments as a fraction of total corporate profits have increased. Additionally, dividends and earnings are concentrating as sharply among European as among American companies. We also find that company characteristics that explain the propensity to pay dividends in the United States--like size and asset growth-- influence the propensity to pay in Europe as well as European payouts, though the effects of profitability is not always consistent with the US experience. Though fewer European than American firms repurchase shares, dividend payments and repurchases are also complements in Europe.

In addition to showing how American and EU firms are similar, we also make unique new contributions by either documenting differences between Europe and America or by examining factors not considered in the U.S. context. We find that older companies and those headquartered in a common law country are more likely to pay dividends, while higher leverage and more liquid company stocks reduce the propensity to pay. On the other hand, companies with more liquid stocks pay more dividends, and higher dividends are paid when these are subject to favorable tax treatment. We study whether the ongoing integration of EU product and factor markets is causing a spillover convergence in EU dividend policies—and determine that it is not. We further find that the fraction of retained earnings in a European firm's total equity is not significantly correlated with dividend payout, which contrasts sharply with U.S. evidence recently documented in DeAngelo, DeAngelo, and Stulz (2006). Finally, we see no systematic effects of catering by EU companies, also contradicting some U.S. evidence.

This study is organized as follows. Section 2 motivates our research by summarizing recent theoretical and empirical advances in corporate dividend policy, while section 3 presents our data and sample selection criteria. Section 4 describes patterns we observe in European dividend policies, and traces the evolution of these policies over time. Section 5 presents multivariate analyses of the propensity

of EU firms to pay dividends, and disentangles the effects of company characteristics and the effects of changes to within-firm characteristics. Section 6 does the same for the amount of dividends paid. Section 7 provides robustness tests using alternative (or rearranged) variables and tests whether the major findings change if we add information on new variables that were available in a more recent period. This section also formally tests for convergence in EU dividend policies since 1989. Finally, section 8 concludes.

2. Motivation and literature review

2.1 What we have recently learned about U.S. payout policy

Recently published research on dividend payments in the United States has documented six important new results. First, Fama and French (2001) show that the fraction of U.S. industrial firms paying cash dividends has dropped sharply over the past five decades, from 66.5 percent of listed firms in 1978 (and over 80 percent during the 1950s) to 20.8 percent in 1999. Fama and French show this dramatic decline is due to two influences: changing firm characteristics and a declining propensity to pay. In the first instance, the financial characteristics of the "typical" publicly-traded company have changed dramatically since 1978, with many new listings of firms with low (or negative) profits, high growth opportunities, and an asset base tilted heavily towards intangible rather than fixed assets. These companies are most prevalent on NASDAQ, but the characteristics of the typical NYSE-listed firm have also changed similarly. The second, roughly equally important influence, has been the declining propensity of all types of companies to pay dividends.

Second, Grullon and Ikenberry (2000) and Grullon and Michaely (2004) document a massive increase in the number (and total value) of U.S. industrial firms repurchasing their own shares since 1982, when a key SEC ruling first provided a legal safe harbor for managers implementing open-market repurchases. This method of distributing corporate cash to shareholders is both tax-favored and far more flexible than paying regular cash dividends, and multiple academic studies—including Dann (1981), Vermaelen (1981), Ikenberry, Lakonishok, and Vermaelen (1995), Guay and Harford (2000), Jagannathan, Stephens, and Weisbach (2000), Weston and Siu (2003), Maxwell and Stephens (2003) and Grullon and Michaely (2004)--document positive repurchase announcement effects, comparable to dividend increases or initiations. However, the rise of share repurchase programs does not explain the decline in cash dividends, since Grullon and Ikenberry and others find that similar types of firms pay dividends and repurchase shares. In other words, empirical evidence shows that repurchases and dividends are complements, not substitutes.

The third, seemingly aberrant major recent finding is that the total value (nominal and real) of cash dividends paid by U.S corporations has been rising inexorably for several decades, and now often approaches 100 percent of aggregate corporate profits. Weston and Siu (2003) document that the U.S.

corporate sector's cash dividend payout ratio increased from 40 percent in 1971 to around 60 percent in 1990—where it remained throughout the 1990s--and finally to 81 percent in 2001. Including repurchases with dividends had little effect on the aggregate payout ratio in 1971, but adding in repurchases brought the payout ratio to 105 percent in 1998 and to 116 percent in 2001.

The fourth major dividend policy finding essentially "squared the circle," explaining how the three results cited above—declining fractions of listed firms paying dividends, increasing propensities to repurchase by companies paying dividends, and rising aggregate dividends payments—could all occur simultaneously. DeAngelo, DeAngelo, and Skinner (2004) show that both dividends and earnings have become increasingly concentrated among a relative handful of U.S. corporations over the past quarter-century. A mere 25 firms now account for over 50 percent of industrial earnings and dividends, and the hugely increased dividends of these "high payers" swamp the declining tendency of small and mid-sized firms to pay dividends. Further, there has been a decline only in the number of industrial payers since 1978; the number of financial and utility payers has increased, as have their total real dividend payments.

Fifth, DeAngelo, DeAngelo, and Stulz (2006) document a heretofore unconsidered influence on dividend policy—the mix of earned versus contributed capital in a firm's equity capitalization. Young, rapidly growing companies that have recently executed an IPO have mostly "contributed" equity capital and pay few or no dividends. On the other hand, the equity capitalization of mature, highly profitable firms will consist mostly of retained earnings, and these public companies pay the bulk of cash dividends each year. This life-cycle explanation of dividend payments, while intuitive, is nonetheless a radical departure from received theory, which has long been based on dividend irrelevance theorems. DDS also show that, had these 50 high-dividend companies not paid dividends over the past quarter-century, their cash holdings would equal one-seventh of America's GDP, they would be debt-free, and their managers would be totally insulated from capital market discipline.

Finally, there is some evidence that dividends may be "reappearing." Julio and Ikenberry (2005) document a small, but significant, five percentage point increase in the fraction of U.S. industrial firms paying cash dividends since 2001. They also describe a greater tendency for large firms to pay dividends since 1999. This rebound in dividend payments is partly accounted for by the 2003 Bush Tax Cut, and partly due to the natural maturation of IPO firms that went public during the 1990s. It is unclear whether the dividend reappearance Julio and Ikenberry document is permanent or temporary.[3]

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[3] In addition to these published studies, two unpublished working papers are worth noting. Banerjee, Gatchev and Spindt (2005) suggest that the Fama and French model of a firm's ability to pay dividends fails to predict future dividend payers, especially when it is applied to larger, more profitable, and more liquid firms. When several measures of firm liquidity are included, the predictive ability of the FF model improves and the improvements are particularly prominent for large firms and firms with more liquid shares. They conclude that improved liquidity in the US stock market may have made investors in need of income less sensitive to dividends as they might now more easily sell their own stocks in liquid firms. Officer (2006) shows that dividend payments can be a substitute for weak

In addition to the empirical contributions discussed above, there has been a major addition to the theoretical literature on dividends. Baker and Wurgler (2004a,b) develop a catering theory of dividends to explain observed U.S. payout patterns. They assert that companies supply dividends to meet investor demand. Their measure of demand, the dividend premium, is the logarithm of the ratio of average market-to-book ratios of dividend-payers to non-payers. When this premium is high, non-paying firms try to cater to the demand of investors by initiating dividends. Baker and Wurgler (2004a,b) and Li and Lie (2006) find empirical support for the catering model, but unfortunately this model does not explain *why* investors demand dividends in the first place.

2.2 What we know about dividend policies of non-US companies

There has been no recent international analog to the success of researchers explaining U.S. dividend payments, though several single-country studies have been published. Three published articles—Ang, Blackwell, and Megginson (1991), Lasfer (1997), and Bell and Jenkinson (2002)--examine how British tax policies affect payouts of U.K. firms, while Lee, Liu, Roll, and Subrahmanyam (2004), Cannavan, Finn, and Gray (2004), and Christoffersen, Géczy, Musto, and Reed (2005) present similar analyses of taxation's impact on, respectively, Taiwanese, Australian, and Canadian firms. Additionally, Dewenter and Warther (1998) contrast dividend policies of Japanese and U.S. companies. However, only two studies present truly cross-sectional analyses of global payouts. First, LaPorta, López-de-Silanes, Shleifer, and Vishny (LLSV, 2000) offer a "Law and Finance" [LLSV (1997), (1998), (2002)] explanation for observed dividend patterns, predicting that dividends exist to overcome agency problems. In common law countries, with legal systems that protect investors, shareholders are able to force managers to pay out free cash flow, whereas they cannot do this in civil law countries. LLSV examine payout policies using cross-sectional data for 4000+ companies from 33 countries, during the single year 1995, and find strong support for the agency cost model. Dividends are economically and statistically significantly higher in common law countries.

Second, Denis and Osobov (2006) examine the dividend policies of companies headquartered in six major countries using data from 1989-2002. They study the United States, United Kingdom, Canada, France, Germany, and Japan—and document declining propensities to pay (PTP) in all six countries. These authors also test whether the patterns observed support either the agency cost or the catering theory models of dividend payments. They find the propensity to pay is negatively related to growth opportunities in common law countries, but positively related in civil law countries, and conclude this supports the agency cost model over the catering theory.

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internal and external governance by documenting that predicted U.S. dividend-payers with weak governance are significantly more likely to pay dividends than are predicted payers with strong governance.

Finally, a small corner of the empirical privatization literature also examines how ownership changes influence propensities to pay dividends. Megginson, Nash, and van Randenborgh (1994), Boubakri and Cosset (1998), and D'Souza and Megginson (1999) show that formerly state-owned companies typically pay much higher dividends after their first share issue privatization than they did under state ownership. In most cases, the first, partial privatization prompts firms to *initiate* dividend payments. Given the size and importance of many privatized firms, this tendency to initiate dividend payments appears to have a bell-weather effect on other firms in the national market, though it is unclear whether privatized companies adopt national or global payout standards. We hope to examine privatization's impact on dividends in a follow-on study.

3. Data and sample selection

We examine the evolution of dividend policies in the European Union over the period 1989-2003. We start our analysis in 1989 for two reasons. First, this is a historically logical date to begin, since this was when the Plan Delors was adopted. This plan presaged creation of the European Monetary Union, which became official EU policy with the signing (1991) and ratification (1992) of the Maastricht Treaty. The second reason for beginning in 1989 is empirical; prior to that date, the database used (described below) provides less than comprehensive coverage of European listed firms. We conclude the study with data from 2003, since this was the final year that the EU consisted of 15 historically capitalist, democratic nations. The May 2004 expansion of the European Union brought its ranks to 25 members with the addition of ten new, mostly central and eastern European members.

We use information on listed companies from the 15 member countries that belonged to the European Union before May 2004 (EU15). Of the 4,272 listed companies in the Amadeus database, we find SEDOL numbers for 4059 companies in 2003. After entering these codes in *Datastream*, we clean the data for unrecognized codes and for companies that reported in non-European currencies. This yields 3430 companies, for which we find total cash dividends paid in 2003. Of these, 2220 companies pay cash dividends in 2003. We find 1323 companies with data for 1989, of which 1201 pay dividends.

Because most existing empirical studies delete utilities and financials, we also focus primarily on industrial firms (including transportation)—and for similar reasons. We present regression analyses with financial explanatory variables which differ substantially between financial and non-financial companies. There are 1077 companies in our database in 1989, of which 977 are cash dividend payers. This grows to 2760 companies in 2003, of which 1709 are payers. The final sample contains 29,253 firm-year observations, of which 21,448 firm years are for payers and 7805 firm-years are for non-payers.

Most of the dividend payments after 1998 are available in Euros, except for those paid by companies headquartered in Great Britain, Denmark and Sweden. For these countries we recalculate all

amounts in Euros or pseudo-Euros using exchange rates presented on the Federal Reserve Bank of St. Louis' website [http://research.stlouisfed.org/fred2/categories/95]. The values for currencies listed in British pounds and in Danish and the Swedish Kroners are transformed into Euros for the period 1999-2003. We use the algorithm presented by Werner Antweiler [http://fx.sauder.ubc.ca/euro/euro.html] to calculate pseudo-Euro values for the period before 1999 for those countries that subsequently adopted the Euro. This also allows us to translate the exchange rates of the British pound and the Danish and Swedish Kroners into pseudo-Euros for the years before 1999. We use January 1 exchange rates for discounting the data of the non-Euro denominated companies in the preceding year.[4] All nominal values are then transformed to real values for the year 2000. We deflate the data with the consumers' price index for all items in the individual countries during the period 1989 to 1998. Starting in 1999, we use the consumers' price indexes for all items in the EU15.[5] Based on the evidence presented in Joumard (2001), we conclude that there were no major changes in continent-wide dividend taxation policies during our study period, though Bell and Jenkinson (2002) show that Britain did reduce the attractiveness of dividends to institutional investors in 1997.

Figure 1 shows the geographical distribution of companies in our overall sample of listed industrial companies. British companies are the largest single cohort in every year's sample, representing 37 percent of the 1077 listed companies in 1989. This falls to 27 percent of the 2779 companies in 2000, but rises back to 30 percent of the 2760 listed companies in 2003. French companies are the second largest cohort every year, accounting for 15-17 percent of the total during 1989-95 and 2000-03. During the 1997-99 glory years of the Nouveau Marche, when several hundred young French companies executed IPOs, their nation's share reached almost 19 percent of the total, but the virtual collapse of the Nouveau Marche (and many of the newly public companies) after March 2000 accounted for the late sample contraction. Companies from Southern Europe—Italy, Spain, Greece, and Portugal—briefly gained a large market share during the study's early and middle years, rising from barely 11 percent of the total in 1989 to 16 percent in 2001, before falling back to 13 percent in 2003. Germany is the only country to steadily increase its sample share throughout the study period. German companies account for 14 percent of listed EU companies in 1989 and 17 percent in 2003. Benelux companies account for a stable 7-9 percent of the sample for all fourteen years, while companies headquartered in Scandinavia, Austria and Ireland (grouped together as "Other" Europe) represent an equally stable 14-16 percent of the sample throughout the study period. It bears mentioning that while privatization IPOs dramatically increased the

[4] We decide not to differentiate income statement data (which preferably should be discounted by yearly average exchange rates) from balance sheet data (that should be discounted by end of the year discount rates). In later regressions we combine income statement data with balance sheet data and we do not want our regression outcomes to be influenced by distortions caused by a different treatment of the two types of financial variables.

total market capitalization of all continental European markets during 1989-2003, there were but a few dozen such issues, so these do not materially impact average or national values in an equally-weighted sample of listed companies.

****** Insert Figure 1 about here ******

4. Dividend payment patterns of EU 15 companies

4.1. Declining fractions of dividend paying companies

Figure 2 indicates the total number of industrial companies with dividend data available for the period 1989 to 2003, showing the rise from 1077 companies in 1989 to the peak of 2900 in 2001, and 2760 in 2003. This figure also presents the number of dividend payers and non-payers, as well as the number of companies that once paid dividends but have stopped (Did_Pay) and those that have never paid at all (Never_Paid). This figure shows a large increase in the number of listed companies over time, due mostly to new listings but also partly to improved data coverage. Both the total number of listed companies and the number of listed dividend-payers peak in 2001, after which the total number falls slightly and the number of payers falls sharply. There is a steady increase in non-payers over this period, with the sharpest increase for companies that once paid dividends but have now stopped, as opposed to companies that have never paid dividends.

****** Insert Figure 2 about here ******

Figure 3 presents similar information for 1989-2003, but showing the percentage of all listed companies currently paying and not paying dividends, plus a breakdown of non-payers between those companies that once paid and have now stopped and those which have never paid. This figure shows the fraction of European listed companies paying dividends declined from 91 percent in 1989 and 1990 to 62 percent only thirteen years later. While this is the same pattern that Fama and French (2001) document for listed U.S. companies, the decline in European dividend payments started much later in time (1990 versus 1952) and was proportionately more rapid once it began.

****** Insert Figure 3 about here ******

This assertion, that the decline in European dividend payouts began in 1991, is supported by work we performed previously using data from a longer time period, 1980-2002. As noted above, we decided to begin our study period in 1989 for data consistency reasons—specifically, because we observed that companies often entered the database prior to this simply because of better data collection practices, rather than because of new listings, but from 1989 onwards the vast majority of new companies entering the database were actually newly listed. However, all of our cohort-year and aggregate samples from

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[5] The consumer price indices for all items are from the OECD's *Main Economic Indicators*. For Greece, we also use the consumers' price index for the period 1999 and 2000, because Greece adopted the Euro only in January 2001.

1980-1989 showed very stable payout ratios, and the fraction of listed companies that were dividend-payers fluctuated in a narrow range of 90-94 percent throughout the 1980s.

Figure 4 presents a geographical breakdown of the percentage of listed industrial companies that pay cash dividends. The fraction of industrial companies paying dividends declines steadily—if not always continuously--in every country (or region) from 1989 through 1999, but the decline becomes truly precipitous and monotonic thereafter. The decline is especially dramatic and, after 1991, continuous in Germany. The fraction of listed German companies paying regular cash dividends falls from 92 percent in 1991 to only 44 percent in 2003. The reason for this disproportionate decline in one of the largest EU countries is not obvious, though the rapid increase in the number of entrepreneurial growth companies going public via the Neuer Markt probably plays an important role.[6]

****** Insert Figure 4 about here ******

4.2. Declining propensity to pay, but rising total real dividend payments

As noted in section 2, one striking feature of recent U.S. dividend payout policy is that the total real value of cash dividends paid has increased significantly over the past quarter-century, even as the fraction of all listed industrial companies that pay dividends has been cut more than in half. Figure 5 shows a similar pattern of sharply increased total dividend payments, coupled with declining propensity to pay, for European companies—though in Europe the change happened much more rapidly. After remaining fairly constant at around €25 billion (€30 billion) from 1989 to 1994, total nominal (real) dividends paid by EU15 listed companies roughly *tripled* between 1994 and 1999. Total dividends then stabilized at €82-100 billion per year between 2000 and 2003, largely due to the recession and stock market collapse after March 2000. The sharp rise in dividends during the late-1990s is not caused as much by an increase in dividend paying companies, but is mainly due to increased dividends paid by the original 974 dividend payers of 1989. This is in line with DeAngelo, DeAngelo, and Skinner's (2004) finding of increasing concentration of dividends amongst payers for the United States.

****** Insert Figure 5 about here ******

Intriguingly, almost all of the growth in total dividend payments between 1994 and 1999 results from dramatically increased payments by relatively few companies. Average real dividends of listed payers rise from €26 million in 1994—close to where it had been for five years—to over €50 million in 1999, and then remain near this level through 2003. On the other hand, median real dividends of industrial payers show no growth whatsoever between 1989 and 1997, after which median dividend payments

[6] In unreported results, we examine whether the changes presented in Figure 4 for the various regions can be found in the individual countries by testing the propensity to pay by industrial companies in the 15 EU countries between 1989 and 2003. The propensity to pay declines significantly in all countries. In 1989 the propensity to pay was largest in Ireland, Greece, Luxembourg and the United Kindom (above 0.95) and smallest in Spain (below 0.80). In 2003 it was still relatively large in Ireland and Greece (above 0.80) and smallest in Luxembourg.

increase incrementally from €3 million in 1999 to €4.4 million in 2003.[7] The divergence between the mean and median total dividends of listed EU industrial payers also widens sharply, from a mean-to-median ratio of roughly 10-to-1 in 1989 to over 30-to-1 in 2003. Again, this suggests that dividends are concentrating among a relative handful of highly profitable EU15 industrial companies. We present additional supporting evidence of this below, in section 4.4, and examine it econometrically in section 5.

4.3. Payout ratios of EU15 listed companies

Thus far, we have shown that the fraction of EU15 listed industrials paying dividends has declined sharply since 1989, even as total real dividends paid and average total dividend payments by listed payers have increased sharply. But what trend is observed for payout ratios—of all listed firms and of listed payers? Figure 6 details median and average payout ratios for all industrials and all payers.[8] Except for showing that payouts increase naturally during recessions (1990-92 and 2000-02) and decline during expansions, we find no significant changes between the mean payout ratios of all industrial payers between 1989 and 2003. Average (median) payout ratios for listed payers increase from 39 percent of profits in 1989 to almost 60 percent (51 percent) in 1992, then fall to 47 percent (36 percent) in 1994 and 42 percent in 1996 (34 percent). On the other hand, the mean (median) payout ratio for all listed firms—payers and non-payers—falls almost continuously after peaking at 49 percent (42 percent) in the recession year of 1992. By 2000, average (median) payout ratios for all listed firms have fallen to 31 percent (21 percent), and only a very slight uptick in payout ratios occurs during the 2001-02 recession. The decline in median payout ratios between 1989 and 2003 is significant, according to the chi-square test. Comparing the evolution of mean and median payout ratios of dividend payers discloses both a cyclical pattern and a structural increase between 1989 and 2003. In 1989 the mean (median) payout ratios for payers is 39 percent (32 percent) and in 2003 it is 58 percent (51 percent). The increases in mean and median payout ratios are both highly significant.

****** Insert Figure 6 about here ******

Figure 7 presents a geographic breakdown of the trends in average payout ratios of EU15 industrial payers. For the European Union as a whole, and for most of the individual countries (except for Belgium, Finland, Ireland, Greece and Luxemburg), mean payout ratios of dividend-paying firms increase significantly, while the average ratio declines insignificantly for Spain. The range in average payout ratios

[7] The increase in average payment amounts made by payers between 1989 and 2003 is not significant in any of the individual countries, according to the t-test, though it is significant at the one percent level for all companies in the European Union collectively. The median amount of dividends paid by payers increases significantly between 1989 and 2003, according to the Pearson Chi-squared test, in France, Germany, Italy and the United Kingdom, as well as for the European Union as a whole.

[8] The payout ratios are calculated as described in Julio and Ikenberry (2004, p. 92, footnote 16), who set the payout ratio equal to one if it was actually negative because of negative income. Moreover, they also set the payout ratio to

is 22 percentage points in 1989 (between 29 percent for France and 51 percent for Britain), but declines to a much narrower 13 percentage point range in 2003, with French industrial payers disbursing an average 49 percent of profits and British, German and "Other Europe" payers disbursing 60 or 61 percent of earnings. Median payout ratios (not reported) of EU15 payers show trends that are generally similar to those of mean payout ratios. The median ratios of payers increase significantly, from 39 percent to 58 percent, between 1989 and 2003 for the European Union as a whole, and for a majority of the individual countries (except Austria, Belgium, Finland, Greece, Italy and Luxemburg). The median ratio again declines for Spain, but this time significantly so.

****** Insert Figure 7 about here ******

For a final take on trends in EU15 payouts, we examine the evolution in median payout ratios of all listed industrial companies, payers and non-payers, by country or region. These trends are presented in Figure 8, and the story they tell is striking. Median payout ratios of all industrial companies fall sharply after the recession year of 1991, when they range between 23 and 53 percent, and—with the important exception of Germany--have apparently converged to a range of 20-33 percent in 2003. After 2001, the median German listed company pays no dividends whatsoever.

****** Insert Figure 8 about here ******

4.4. Concentrating earnings and dividends in EU15 companies

The evidence presented above suggests that dividends may be concentrating among a few highly profitable companies. We examine this further, and also assess whether assets are concentrating, by breaking down the distribution of real assets and dividends, by deciles, for listed EU15 companies in 1989 and 2003. Table 1 shows real dividends are highly concentrated among the largest firms, and that concentration increases between 1989 and 2003. In 1989 the smallest 10 percent of the listed companies pay no dividends and the smallest 10 percent of the dividend payers pay only 0.1 percent of the total. In the same year the largest decile firms pay 80.7 percent of the dividends of all listed companies and 78.9 percent of total dividends paid by listed payers. By 2003, the smallest *40 percent* of listed companies still pay no dividends and the smallest decile of payers pay less than 0.1 percent. In that same year the largest decile of listed companies pay 88.5 percent of total dividends, while the largest decile of payers pay 80.9 percent. It is clear from these figures that payouts concentrate amongst all listed firms more than they do among dividend payers. If we use the Herfindahl index, we thus find in both years greater dividend

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one if firms paid more than 100 percent of their earnings as dividends. We applied their approach to our figures 7, 8 and 9. The results are qualitatively similar—though more volatile--using a standard payout ratio.

[10] If all value was concentrated in one decile, the Herfindahl index would be 1.000. If all deciles accounted for 10 percent each, and therefore the distribution was fully equal, the Herfindahl index would be 0.100.

concentration among larger listed firms than among payers.[10] Moreover, the increase in the Herfindahl index was also larger for the listed firms. Nevertheless, dividend payments also concentrate in larger payers between 1989 and 2003, as the Herfindahl index for payers increases from 0.637 to 0.667.

****** Insert Table 1 about here ******

Table 2 shows that real assets are also highly concentrated among the largest firms, and that the concentration increases between 1989 and 2003. In 1989, the smallest 10 percent of listed companies own 0.1 percent of the assets and this group of small firms distributes 0.1 percent of all dividends. The largest decile firms own 76.6 percent of all assets and pay 76.4 percent of all dividends. In 1989 the distribution of dividends over asset deciles does not differ much from the distribution of assets. In 2003 firms in the smallest asset decile again own 0.1 percent of the assets and distribute 0.1 percent of the dividends, while the largest decile owns 83.8 percent of the assets and distributes 81.1 percent of the dividends. The development in asset concentration surpasses that in dividends, as can also be seen from the development in the Herfindahl index. However, even if the distribution of dividends is measured in asset deciles, we still find that dividends become more concentrated between 1989 and 2003.

****** Insert Table 2 about here ******

5. Measuring the propensity to pay

5.1. Expected and actual changes

Since we have shown that the relative number of EU15 dividend payers has declined steadily since 1989, we now examine whether this is caused by a change in company characteristics or by a decline in the propensity to pay. We use two procedures--first, the portfolio approach of Fama and French (2001) and, second, the logistic approach applied by Fama and French and by Denis and Osobov (2005). With the Fama and French method, a total of 27 portfolios are formed at the beginning of the observation period. These portfolios are derived from three size classes, each divided into three earnings ratio classes, and the resulting nine portfolios subdivided into three (low, middle and high) categories based on growth characteristics.[11] The resulting portfolios define the original company characteristics and these define the portfolios of companies in the subsequent years. We then estimate expected propensities to pay dividends for all 27 portfolios over the period 1989-1993, and repeat these estimations for every subsequent year through 2003. Changes in this variable indicate a change in firm characteristics. Then we compare the expected propensity to pay with the actual percentage of firms paying dividends. If the difference between the expected and actual propensity to pay increases systematically we can conclude that there is an autonomous decline in the propensity to pay. The results of these estimations are presented in table 3.

[11] Fama and French (2001) distinguish between two growth variables, the relative change in assets and the market to book value of the firm. We use only the market to book ratio as this ratio gave results that are more significant.

****** Insert Table 3 about here ******

It is clear that the observations on the propensity to pay in the United States by Fama and French (2001) are also relevant for the European Union. First, the characteristics of the companies change over time and result in a relatively small decline in the propensity to pay, from an average 87 percent of all listed firms in 1989-1993 to 83.2 percent in 2003. Second, the actual percentage of dividend payers declines more dramatically, from an average 87 percent in 1989-1993 to 81.4 percent in 1999, before plunging to 62.5 percent in 2003. The change in actual payers is more pronounced than the decline expected based on changing characteristics, and this difference between expected and actual payers increases sharply (from 5.8 percent to 20.8 percent) between 1999 and 2003.

In order to corroborate these results, we also calculate the expected propensity to pay from the coefficients of the logistic regression equations of the period 1989-1993. We use the same variables as Fama and French (2001) but here we take both growth variables--DAA, the relative change in total assets, and MBF, the market to book value of the firm--together in one equation. For these variables we expect a negative sign. The other two variables, market capitalization (MCX) and the earnings-to-assets ratio (EA) are expected to have a positive impact on the propensity to pay. Table 4 shows the results of logistic cross-sectional regressions for the whole period as well as for three five-year sub-periods, 1989-1993, 1994-1998, and 1999-2003. The t-values of the regression coefficients are calculated accounting for potential autocorrelation according to Fama-MacBeth (1973). Over the full period all regression coefficients have the correct sign and are significant at the 5 percent level, based on a one-sided test. The coefficients of the independent variables also show the correct signs throughout the study, but in the sub-period 1989-1993 the coefficients of the growth opportunities variables (DAA and MBF) are not significant, while in the sub-period 1994-1998 the coefficient of the relative change in assets is insignificant. Generally, the market to book ratio shows greater significance than does the relative change in assets.

****** Insert Table 4 about here ******

We now use the logistic approach of Fama and French (2001) and Denis and Osobov (2005) to measure the differences between expected and actual propensities to pay. In contrast to the portfolio procedure, the logistic approach accounts for characteristics of individual companies, rather than portfolios. Moreover, the portfolio approach accounts for the impact of only three variables, namely size, profit ratio and market to book value of the firm. When using regression analysis, we also examine a constant term and assess the impact of the second growth variable, the change in assets. The results of the logistic approach are presented in Table 5.

****** Insert Table 5 about here ******

The expected propensities to pay in Table 5 are larger than those of Table 3, and the differences between the expected and actual propensities to pay are also larger. It is nevertheless clear, when comparing the information from Tables 3 and 5, that the development over time is the same. The expected propensity to pay declines because of changing company characteristics, from 97.5 percent in 1994 to 88.6 percent in 2003, but again the actual propensity to pay declines much faster than could be expected from the change in company characteristics—especially since 2000.

5.2. Further explanations for the propensity to pay

To further investigate the propensity to pay (PTP), we include additional variables in our estimations. First, we assume that higher income risk, measured as the standard deviation of net income during the past five years in relation to the actual sales in a year, negatively influences the propensity to pay. Second, we assume that older companies may be better able to accumulate funds than younger firms, while at the same time having fewer growth opportunities, so we include the year of incorporation. This is in line with Salas and Chahyadi (2006) who attribute five percent of the decline in the propensity of U.S. firms to pay dividends to firm characteristics related to age, measured as years since incorporation. This variable is also suggested by the life-cycle model of DeAngelo, DeAngelo and Stultz (2006).

Third, we follow Jensen (1986) in assuming that leverage may help control agency costs, as do dividends. In this view, companies might not need to pay dividends to discourage managers from pursuing their own interests, unless leverage is already high. Leverage and dividends are then substitutes for checking managers and a negative relationship between dividends and debt ratios might be expected.[12] Alternatively, higher leverage might imply older, larger, more stable and profitable companies that are able to afford to pay dividends more easily. In this view, leverage and paying dividends are statistically complementary and a positive relationship between cash and dividends might be expected.

Fourth, we test whether shareholder protection influences the propensity to pay by studying the differences between common law and civil law countries. We introduce a proxy for shareholder protection by entering a dummy variable for the common law countries--assuming that a company operating under common law has a higher propensity to pay.[13] We also examine whether, if the countries in the European Union are becoming more economically integrated over time, the difference between the common law and the other countries might be declining over our study period.

Fifth, we follow Baker and Wurgler (2004b) in calculating a European dividend-catering measure for each year by taking the log of the equally weighted market-to-book value of payers and subtracting from this variable the log of the equally weighted market-to-book value of non-payers, then multiplying

[12] A negative relation might also exist if a company takes on additional debt and then is prohibited by debt covenants from paying additional dividends.

[13] Though we do not apply the terminology of La Porta et al. (2000), a positive sign would be in line with their outcome model and a negative relation with their substitution model.

the difference by 100. We expect that this variable influences the propensity to pay positively. Sixth, we introduce a dummy variable for the countries that adopted the Euro as a currency in 1999 (plus Greece, which adopted it in 2001), to examine whether monetary union has promoted financial convergence among firms from EMU countries. We do not have strong priors regarding the sign of this variable. Seventh, we study whether transportation companies show different propensities to pay, compared to industrial firms, by introducing a dummy variable for firms in the transportation sector. We again assume no pre-specified sign. Finally, we include a time variable to account for a possible secular trend.

We check the correlation of coefficients between the variables and find the market to book value of the firm is highly correlated with the leverage ratio in some years (particularly 1993 and 1998). We therefore also use the ratio of market value of equity to book value of equity as a substitute variable for the market to book value of the firm and apply this variable in various regressions. Since this variable is generally insignificant in regressions that also incorporate the relative change in assets, we only use the growth rate in assets as a variable indicating the growth potential of a company.

In this set of explanatory variables, we have two variables that are measured over time, namely the catering variable and the time variable itself. To test the impact of these variables together with the other firm characteristics, we make use of the longitudinal character of our dataset by employing panel regressions. Thus we do not use the technique applied by Fama and French (2001). Instead, panel regression allows different intercepts for individual firms, so can account for unobserved variables that determine these intercepts. Since we have known since Lintner (1956) that dividend payments are sticky, companies that paid dividends last year may have a much higher probability to pay dividends this year than do companies that did not pay dividends. Panel regression techniques account for company related unobserved variables, like the tendency to be sticky in paying dividends, by allocating each company its own intercept. A second advantage is that we may now distinguish between both between- and within-firm effects. We therefore measure the means of the variables for each company and the differences between the original observations and the means for the full time period and for each five-year sub-period. Both types of variables are then taken into account in a random effects panel regression equation.

The means of the firm variables indicate the explanatory power of the firm characteristics and the deviations from the mean represent the impact of within firm developments over time. In this way we find, for example, both the impact of firm size and the impact of changes in firm size over time. For the change variables we test the impact of changes in firm size, changes in firm earnings, changes in growth of assets, and changes in income risk and in leverage, as we think evolutions in these variables might be the most important determinants of dividend policies. A third advantage of using this approach is that the Fama and French approach assumes that the coefficients of the independent variables are invariant over time. This approach was well suited to explain the reduction in the propensity to pay, but it assumes at the

same time that the coefficients of the independent variables do not change over time. Our panel approach allows us to measure the changing impact of several variables over time, while still studying whether--now with changed coefficients--the propensity to pay cash dividends is still declining.

We again measure correlations and find that the average leverage ratio is highly correlated with the average relative change in real assets. We therefore leave out leverage as a between-firm characteristic and only incorporate the within-firm change in leverage in our estimates. We also test whether there are differences between sub-periods, and we estimate the panel regressions for both the whole period with the variables pertaining to the whole period and for sub-periods 1989-1993, 1994-1998 and 1999-2003 with the concomitant sub-period variables. The results of the logistic random effects panel regressions for the propensity to pay are presented in table 6, while results for random effects panel regressions of amounts paid by dividend paying firms are in table 7.

****** Insert Table 6 about here ******

Table 6 first shows the cross-sectional propensity to pay results for various periods. The size variable (ASIZE) is significant, with the expected positive sign, for the full period and all sub-periods. This is in line with the repeated logistic regression approach employed in section 4. The earnings-to-assets ratio (AEA) always has a large and significantly positive impact. Average asset growth rate (ARA) has the expected negative sign and the coefficient is significant during the whole period as well as in the most recent period, 1999-2003. The average standard deviation of income in relation to sales (ASTDS) has overall the expected negative sign but is never significant. Older companies, those that incorporated earlier (YINC), are more inclined to pay dividends, though not significantly so in the first two sub-periods. This means that we find also aspects of a life-cycle approach amongst listed companies in the European Union, as we discuss further in section 7. As expected, the propensity to pay dividends is significantly greater in common law countries (COM: United Kingdom and Ireland) than in civil law countries, though the common law coefficient declines steadily over time. The dummy indicating countries that adopted the Euro as a common currency is significantly negative in the latter period when the Euro is in effect. Finally, transportation companies (T) are generally less inclined to pay dividends, though the coefficient is not significant in the most recent period.

The coefficients found here give a partial explanation for the unexplained and puzzling decline in the propensity to pay detailed in Tables 3 and 5. Examining only between company characteristics--as is customary in analyses of the propensity to pay--and discarding the impact of country and industry (through the dummy variables COM, EUR and T), we find that the influence of the earnings ratio declines by 43 percent (from 34.7 in the period 1989-1993 to 19.8 in 1999-2003). Moreover, the coefficient of the assets growth is insignificantly positive in 1989-1993 (0.232) but becomes significantly negative (-0.635) in 1999-2003.

We next test whether changes in the above variables influence the propensity to pay, after correcting for characteristics of the company. These results are presented in the latter part of table 6 (below the heading "Within firm and time related variables"), where the impact of the difference between each observation and the average for each company in the relevant period is analyzed. An increase in size class (DSIZE) significantly increases the propensity to pay. The coefficients are also always larger than the size coefficients that characterize a company. This suggests that a change in a company's size percentile over time has a larger impact on the propensity to pay than does the difference in percentiles between companies in a certain period. As expected, DEA is positively related to PTP for the full period and for 1994-1998, but DEA is negatively related to PTP during 1989-2003 and significantly so in 1999-2003. Taken together, these results suggest that the cross section effects of income (with much larger coefficients) generally dominate the impact of changes in earnings ratios, but that one may not necessarily conclude that an increase (decrease) in the earnings ratio within companies automatically increases (decreases) the propensity to pay. A change in assets over time (DARA) generally does not influence the propensity to pay significantly, except for the latest period. The change in the standard deviation of income in relation to sales (DSTDS) is insignificant during the full study period and all subperiods. In all periods an increase in firm leverage (DLR) reduces the propensity to pay and significantly so since 1994. The European catering variable (DCAT) is significantly positive in the period 1994-1998, but is insignificant for the other periods. Finally, we indeed find a decline in the propensity to pay dividend over time as the time variable (DYEAR) is negative during the full period and the first and final sub-periods. This implies that, even when all firm characteristics and within firm (change) variables are taken into account, there still remains an "unexplained" decreasing trend in the propensity to pay dividends in the European Union.

6. Explaining dividend amounts

We now investigate what factors influence the amounts of dividends paid, using the same explanatory variables as we used for the propensity to pay. We only study the amounts paid by dividend payers corrected for inflation, and exclude the non-payers from our analysis. We make full use of our dataset and once more apply panel regressions, again distinguishing between effects between companies and effects within companies within the same equation for amounts of real dividends paid.

****** Insert Table 7 about here ******

Firm size is significantly positively related to the amount of dividends paid, with coefficients that are always significant and quite stable over time. Companies with a high earnings-to-assets ratio also distribute more dividends, though this is only significant in the whole sample and in the final sub-period. High asset growth companies that pay dividends pay significantly less than do slower growing firms over

the whole period and since 1994. A relatively large standard deviation of income (ASTDS) results in significantly less dividends paid, but only in the sub-period 1994-1998. Table 7 further shows that the earlier in time companies were incorporated, the larger amounts of dividends are paid, and this relation is significant for the full period and for the two most recent sub-periods. Dividend payers in the common law countries of Ireland and the United Kingdom (COM) generally pay more than the companies headquartered in the other countries, though this variable is significant only for the full period. Interestingly, Euro-zone companies consistently pay significantly smaller dividends than do British, Swedish, and Danish companies. This implies that the simple fact of being a member of the EU does not promote dividend payments.[14] The dummy for the transportation sector is never significant, implying that transportation companies do not pay different dividend amounts than do industrial firms.

When considering changes in the explanatory variables over time, we again find that increasing a firm's size percentile increases the amount paid by payers. This is also true for the change in the earnings ratio, but only in the first period. As with the propensity to pay, rapid growth in a company's assets (DRA) reduces the amount of dividends paid, though significantly so only in the most recent period. Changes in the standard deviation of net income related to sales (DSTDS) are significant during 1994-1998. Dividend paying companies that increase leverage reduce dividend payments for the full period and for 1994-1998. The catering variable always has the expected positive sign, but it was only significant in the first sub-period. It is, finally, quite interesting to see that companies that pay dividends pay more with the passage of time (DYEAR is positive), though there is a significant switch in sign in the latter sub-period. The European trend thus does not mirror the findings for the United States of Julio and Ikenberry (2004), who find that dividends might be reappearing.

We now compare the results for the main variables in tables 6 and 7, generally limiting our discussion to the impact of the significant variables for the whole period 1989-2003. Firm size positively and significantly influences the propensity to pay as well as the amount of dividends paid. Nevertheless, the size change variable (DSIZE) has more effect than the size characteristic (ASIZE) in the propensity to pay, while in the amounts paid equation we find the opposite. The earnings ratio as a firm characteristic (AEA) is very important in explaining both the propensity to pay as well as the amount of dividends paid. The impact of a change in the earnings ratio (DEA), is for both the propensity to pay as well as for the amount of dividends paid much smaller than the effect of the firm characteristic AEA. The growth characteristic (ARA) reduces both the propensity to pay and the amount paid, though increases in firm growth rate (indicated by DARA) are not significant in these equations. Firm growth is thus only relevant

[14] We also cannot document any convergence in the amount of dividends paid. Moreover, separate (unreported) regression results with dummies for separate countries (but leaving out the common law and the euro dummies) do not indicate convergence for the United Kingdom as the average of Non-UK country-dummy coefficients becomes more negative over time.

as a cross-sectional variable (as a firm characteristic). The standard deviation of net income in relation to sales is generally not significant. Company age (measured as the year of incorporation, YINC) increases both the propensity to pay dividends and the amount of dividends paid.

Companies from the common law countries of Ireland and the United Kingdom (COM = 1) have a higher propensity to pay and pay more dividends than do firms headquartered in civil law countries (COM=0). Since we also find a negative relation between firm growth rate and dividend payments, our results support La Porta et al.'s (2000) outcome model of dividend payments for common law countries in Europe. Companies in countries that participate in the Euro (EURO=1) do not have significantly lower propensities to pay than do firms headquartered in the United Kingdom, Denmark and Sweden (EURO=0). However, firms that are located in the Euro-zone and that pay dividends do pay less than British, Danish and Swedish companies. Taken together, these results suggest that dividend policies within the European Union have not converged in any meaningful way, though this will be tested further in the next section. An increase in leverage (DLR) reduces both the propensity to pay (but only at a 5.5 percent significance level), and the amount of dividends paid. This suggests substitution effects between leverage and dividends in resolving agency problems, as predicted by Jensen (1986), though it may also partly reflect additional debt restrictions set by creditors. While the catering variable (DCAT) coefficient is always positive, it is unstable and is significant only in the 1989-93 sub-period. Finally, the propensity to pay declines significantly with time (DYEAR) for the full study period and for all sub-periods save 1994-1998, while the amount of real dividends paid by payers increases with time for the full period and for every sub-period except 1999-2003. During this final period, real dividend payments decrease with time—while also far fewer companies actually pay.

7. Robustness and tests for convergence

7.1. Robustness checks for the propensity to pay

This section examines in more detail how the factors discussed above and in other empirical studies impact dividend policy of EU firms. We focus on the final sub-period 1999-2003, since this period offers data on variables that were recently measured or that may not be relevant for previous periods. First, we test whether the independent variables presented above remain significant or change if we combine cross-sectional (firm-specific) characteristics and within firm (time-series) variables in a panel data analysis. Second, we test whether the relevance of the independent variables remains or changes if we add additional variables. We thus study the impact on the main variables and in particular on the signs of the common law (COM), European Monetary Union (EUR) and age (DYEAR) variable as these address whether dividend policies within the EU have converged since 1989.

We start by measuring the effects of the variables, without distinguishing between firm characteristics and within firm changes. This can be seen as a robustness test on the combined effects of the independent variables that were split between mean values and within firm changes. We add other variables for completeness and to evaluate whether the impact of the original variables remain significant. First, we add a variable that indicates the cash dividend tax preference (CTP) in each country. We find the values for this variable in LaPorta, Lopez-de-Silanes, Shleifer and Vishny (2000, p. 28-29). We assume that the propensity to pay and dividend amounts paid will be higher in countries where the tax laws relatively favor cash dividends. Because this variable is not available for Greece and Luxembourg, we exclude these countries from the panel regressions. Second, we test the impact of share liquidity by including the number of stock market transactions per day in December 2003, divided by the number of outstanding shares at the end of 2003, multiplied by one thousand. This variable, taken from the Amadeus database, characterizes how easily investors can make their dividends "at home," as suggested by Banerjee, Gatchev and Spindt (2005). In line with their arguments, we hypothesize that relative liquidity will reduce the propensity to pay. Third, we add a dummy variable measuring the occurrence of share repurchases (SREP) that takes the value of 1 if the relative change in the number of common outstanding shares declines. If the effect of this variable is positive, we will conclude that share repurchases and dividend payouts are complements, in line with Grullon and Ikenberry (2000). If it is negative, dividends will decrease if stock repurchases increase and cash dividends and stock repurchases will be substitutes.

Fourth, we incorporate a new variable introduced by DeAngelo, De Agelo and Stultz (2006) in their analysis of the propensity to pay and in dividend initiations and omissions. This is the fraction of retained earnings relative to total equity (RETE), and is interpreted as a measure of life cycle effects. As data are available, this variable is measured for all companies during the period 1999-2003. We test whether this variable explains life cycle effects by seeing whether the significant impact of the year of incorporation that we found in Tables 7 and 8 disappears. If the YINC and DYEAR variables are no longer significant, but RETE is, we will conclude that the DeAngelo, DeAngelo and Stultz (2006) variable is a stronger measure of life cycle effects. If the YINC and DYEAR variables remain significant, there are two possibilities. First, if the RETE variable is not significant, this would mean that life cycle effects are better measured with the year of incorporation and firm age. If RETE is also significant, then both life cycle and age effects significantly positively affect firms' propensity to pay and the amount of dividends paid.

Fifth, we add a variable from the Amadeus database measuring the dependence of a company on a large shareholder (DEP). We classify a company as dependent if there is a shareholder with total ownership of over 50 percent. We have no strong priors regarding the sign of this variable, which is suggested by Johnson, La Porta, Lopez-de-Silanez and Schleifer (2000) as a measure of tunneling. Since

dividends are generally paid to outsiders, as well as to blockholders, cash dividends payments by more dependent companies may indicate that EU corporate governance systems prevent blockholder from more directly tunneling cash out the firms they control.

****** Insert Table 8 about here ******

The first part of table 8 summarizes the impact of the variables on the propensity to pay by aggregating the effects of the firm characteristics with the within firm changes to the variables. Comparing the first two columns of table 8 with the final two of table 6 shows that all coefficients that were relevant as firm characteristics in 1999-2003 remain relevant in the aggregated table, except for the impact of adopting the Euro (EURO). The newly added variables generally have the expected signs, though the coefficients are not always significant. The preferred tax treatment of cash dividends variable (CTP) is positive, but insignificant, suggesting that preferential taxation does not influence a firm's propensity to pay. The relative number of transactions (RELTR) is negative and significant, corroborating the U.S. findings of Banerjee, Gatchev and Spindt (2005) that more liquid companies may feel less need to pay cash dividends, as investors needing cash can easily sell shares themselves. The share repurchases dummy variable (SREP) has a positive and highly significant coefficient, suggesting that European companies that repurchase stock are also inclined to pay cash dividends. The life cycle variable of DeAngelo, DeAngelo and Stultz (2006), retained earnings as a fraction of total equity (RETE), is positive but insignificant. Interestingly, including this variable has hardly any effect on the coefficient of the year of incorporation, meaning that RETE may not proxy for the same life cycle or age effect in Europe that is does in America.[15] Finally, companies that have a majority shareholder (DEP) are not significantly more likely to pay dividends.

On balance, including five additional variables makes the earnings to assets ratio insignificant, while all the other previously-estimated variables retain their signs and significance levels. Two of the new variables, the relative number of transactions and the repurchasing of shares, prove to be significantly related (positively and negatively, respectively) to the propensity to pay dividends, while the other three variables are insignificant. The addition of new variables does not affect the impact of having a headquarters in a common law country on the propensity to pay. In fact, the positive coefficient of this variable becomes even larger and more significant. However, being headquartered in a Euro-zone country does not impact the propensity to pay, suggesting that sharing a common law system may be more influential than sharing a new currency in prompting companies to pay dividends.. Finally, inclusion of additional variables does not affect the significance of the time variable (DYEAR), suggesting an autonomous decline in the propensity to pay continues during the period 1999-2003.

[15] The RETE variable may be even more related to the earnings ratio of a company, as the inclusion of RETE reduces the effect of the earnings ratio for the propensity to pay in a non-reported stepwise equation.

7.2. Robustness checks for the amount of dividends paid

For the real amount of dividends paid by payers, we find that aggregating the between and within firm variables makes the earnings ratio insignificant, while leverage becomes significantly positive. Higher leverage thus increases the amount of dividends paid by European companies, even as it decreases their propensity to pay. The catering variable becomes significant, but *negative*, implying that firms reduce the amount of dividends paid when the market expresses a relative desire for higher payments. Including the five new variables again makes the coefficient on the common law country significantly positive, but makes the EURO coefficient positive—though still insignificant. This supports the conclusions from the propensity to pay estimations: being headquartered in a common law country significantly increases the amounts of dividends paid, whereas being headquartered in a Euro-zone country has no effect. Three of the five new variables are significantly related to payment amounts. The preferential taxation variable is positive, indicating that favorable tax treatment significantly increases total dividends paid. Also, companies with more liquid shares (RELTR) and those that repurchase stock (SREP) are likely to pay significantly more dividends. On the other hand, retained earnings to total equity (RETE) and dependence on a major shareholder (DEP) do not significantly influence dividend payments.

7.3. Is there convergence between countries in dividend policies?

The economic integration of the European Union following ratification of the Maastricht Treaty in 1992 has resulted in significant convergence in product, factor, and labor markets across the continent. In this section we examine whether this economic convergence has also caused convergence in the dividend policies of EU firms. Though European integration has doubtless been a powerful force, finance theory and empirical research suggest that dividend policies are quite stable. Therefore, if national dividend determinants do not change, one might expect only minor coincident changes between countries and no systematic convergence. We use two measures to test whether dividend policies are converging over the 1989-2003 study period: the coefficient of variation (also known as σ-convergence), as Friedman (1992) suggests, and Kendall's measure of concordance (W), suggested by Boyle and McCarthy (1997; 1999). Both measures test whether the ranking of countries changes over the study period.[16] We measure convergence between the 15 EU countries for the propensity to pay, the real amount of dividends paid (in prices of 2000), and the payout ratio of industrial firms. Table 9 presents estimation results.

****** Insert Table 9 about here ******

[16] Kendall's W is known as a measure of agreement among raters. Each case is a judge or rater and each variable is an item or person being judged and for each variable, the sum of ranks is computed. Kendall's W ranges between 0 (no agreement) and 1 (complete agreement), and a significant result means agreement. In our case a significant result means that no significant evidence of convergence (or divergence) is found.

Table 9 shows that the coefficient of variation of the propensity to pay increased from 0.077 in 1989 to 0.229 in 2003, suggesting *divergence* amongst countries in the propensity to pay dividends. For the amounts paid by payers the coefficient of variation declines from 0.985 in 1989 to 0.635 in 2003, suggesting convergence. The coefficient of variation in payout ratios also declines, from 0.466 in 1989 to 0.259 in 2003, indicating some convergence in dividend policies. The Kendall's measure of concordance (W) suggests no significant relation between the base year 1989 and 2003 with respect to the propensity to pay, but concordance for the amounts of dividends paid by industrial payers in 2003 and the base period (1989) as well as for the propensity to pay. This suggests the absence of any significant dividend policy convergence or divergence.

Table 9 also shows whether evolutions in the convergence measures can be attributed to gradual processes. This is what one would expect if the dividend policies of EU companies were being driven by gradual European economic integration. The σ-measure for the propensity to pay indeed develops quite gradually, but its *increase* implies divergence. Kendall's W is smallest in 1992 and gradually increases afterwards, which suggests that the original ranking amongst the countries restores gradually. The amounts of dividends paid by industrial payers in the 15 European countries converges gradually according to the σ-measure (with the exception of 1999) and the Kendall's W, though the ranking of countries is still not significantly different according to Kendall's W value in 2003. The σ-measure for the payout ratios of the various countries is smaller in 2003 than in 1989, but the smallest value is found in 1999 and suggests divergence after that year. The pay-out ratio in 1999 was least related to the ranking of countries in 1989, but after that year Kendall's W gradually develops again in the direction of the ranking of 1989. When we measure average annual changes in the convergence measures, table 9 shows that none is significant, implying that there is no clear pattern of dividend policy convergence. Table 9, finally, presents the convergence measures using mean values of the variables during the five-year sub-periods 1989-1993, 1994-1998, and 1999-2003. This corrects for possible outliers early and late in the study period. We again find σ-divergence and a different ranking of countries for the propensity to pay. For the amount of cash dividends paid, we find σ-convergence, but no different ranking of countries between the first and final periods. Finally, we find no consistent convergence in payout ratios over time.

On balance, these tests reveal little or no systematic convergence in the dividend policies of EU firms between 1989 and 2003. The measures for the propensity to pay even suggest some divergence amongst countries, with larger (unreported) standard deviations in 1989 than in 2003, increasing coefficients of variation and different country rankings over time. The measures for the amount of dividends paid in the various countries suggest a slight convergence according to the σ-measure but relatively stable positions according to Kendall's W. The measures for the payout ratios suggest no real

convergence. These outcomes suggest that the gradual economic integration of the European Union has not lead to significant convergence in dividend payout patterns among EU firms, at least not yet.[17]

8. Summary and conclusions

Using a unique database of over 3400 listed industrial companies, we examine the evolution of dividend policy from 1989 to 2003 in the fifteen nations that were members of the European Union before May 2004. As in the United States, the fraction of European firms paying dividends declines dramatically over this period, from 91 to 62 percent of listed companies, while total real dividends paid and dividend payments as a fraction of total corporate profits increase significantly. Dividends and earnings are concentrating as sharply among European as among American companies, and similar factors are driving the declining propensity of listed firms to pay dividends.

We also compare the impact of firm-specific variables on the propensity to pay and on the amount of dividends paid by payers. Firm characteristics like size, firm age and being headquartered in a common law country significantly increase both the propensity to pay and amount paid. On the other hand, rapidly growing companies are less likely to begin paying dividends or to make large payments. Increasing a company's relative size percentile increases both the propensity to pay and the amounts of dividends paid, while higher leverage reduces both. Preferential taxation of cash dividends has no effect on the propensity to pay, but significantly increases the amount of dividend paid. Stock market liquidity reduces the propensity to pay, but increases the amount paid. As in the United States, share repurchases and dividends are complements: both the propensity to pay and amounts paid increase with repurchases.

Surprisingly, we find that the fraction of retained earnings in a European firm's total equity is not significantly related to dividend payout, which contrasts sharply with U.S. evidence recently documented in DeAngelo, DeAngelo, and Stulz (2006). We also find very little evidence supporting dividend catering theories—the catering variable's coefficient in the propensity to pay estimations fluctuates dramatically over time and is only significantly positive during one sub-period. Finally, we find little evidence that EU dividend policies are converging over time, even as European economic integration progresses.

[17] In an unreported transition matrix, we measure the number of companies in each decile (calculated for the amounts of dividends paid) for the period 1989-1993 and the period 1999-2003. The 918 observations in this matrix, reveal a concentration of companies on the diagonal, suggesting relatively stable dividend policies over time.

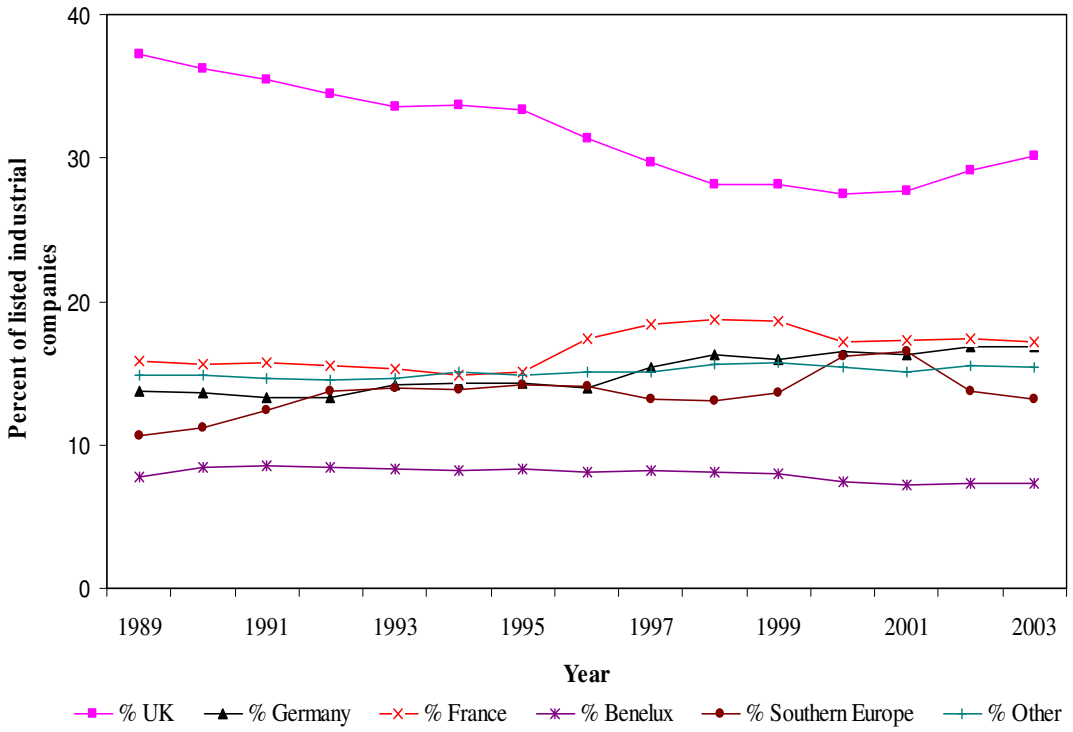

Figure 1. Percent of listed EU15 industrial companies, by country

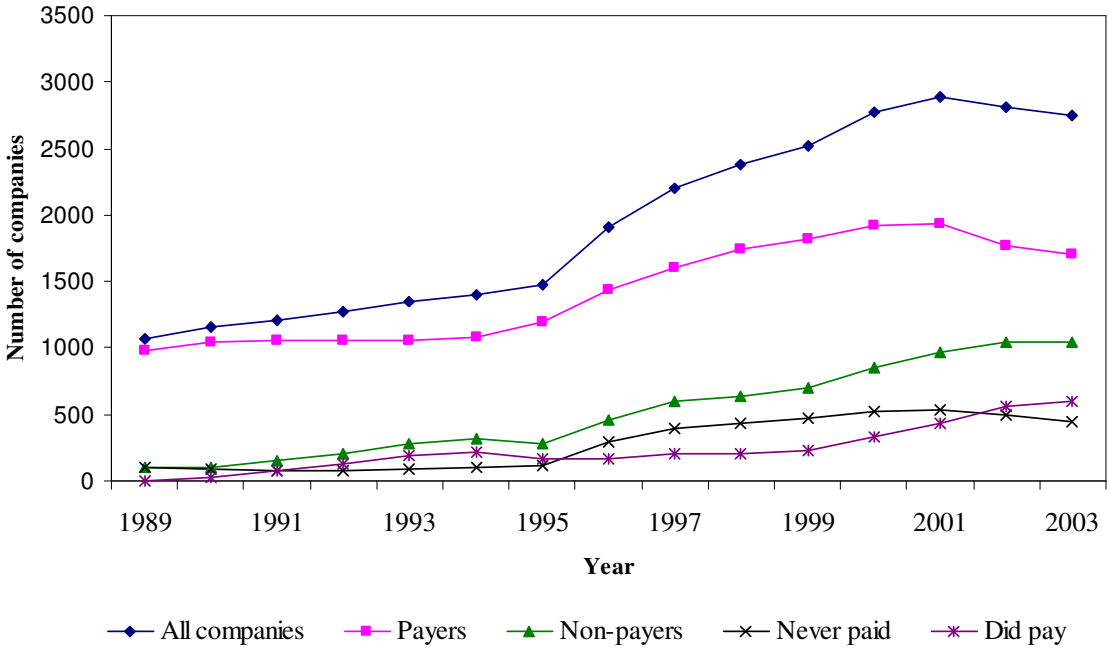

Figure 2. Listed EU 15 industrial payers and non-payers

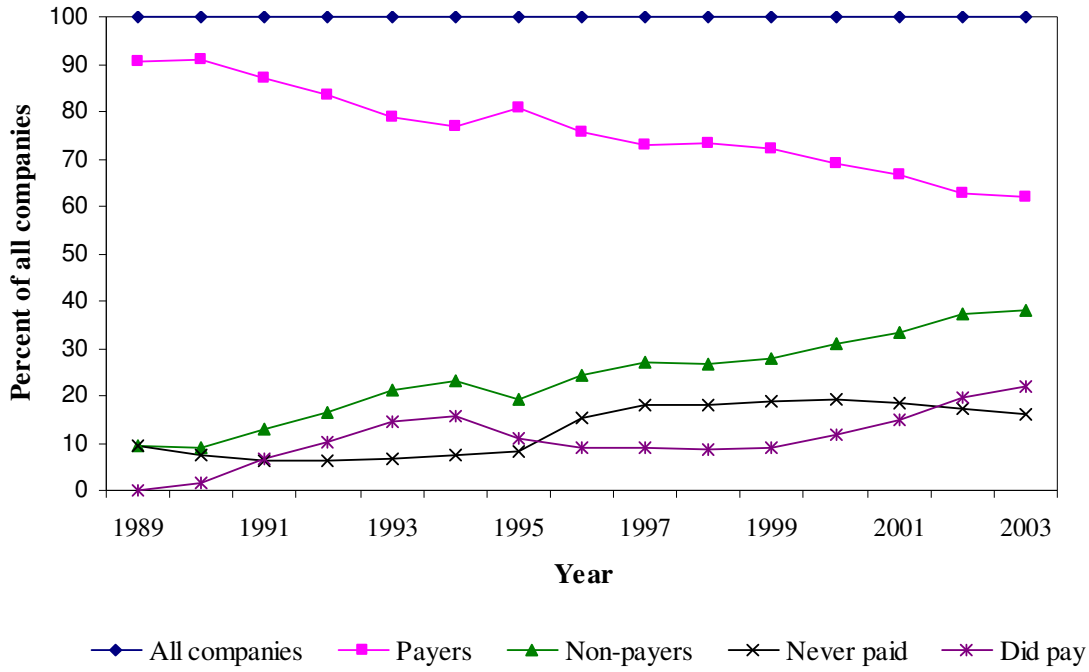

Figure 3. Percent of EU15 industrial payers and non-payers

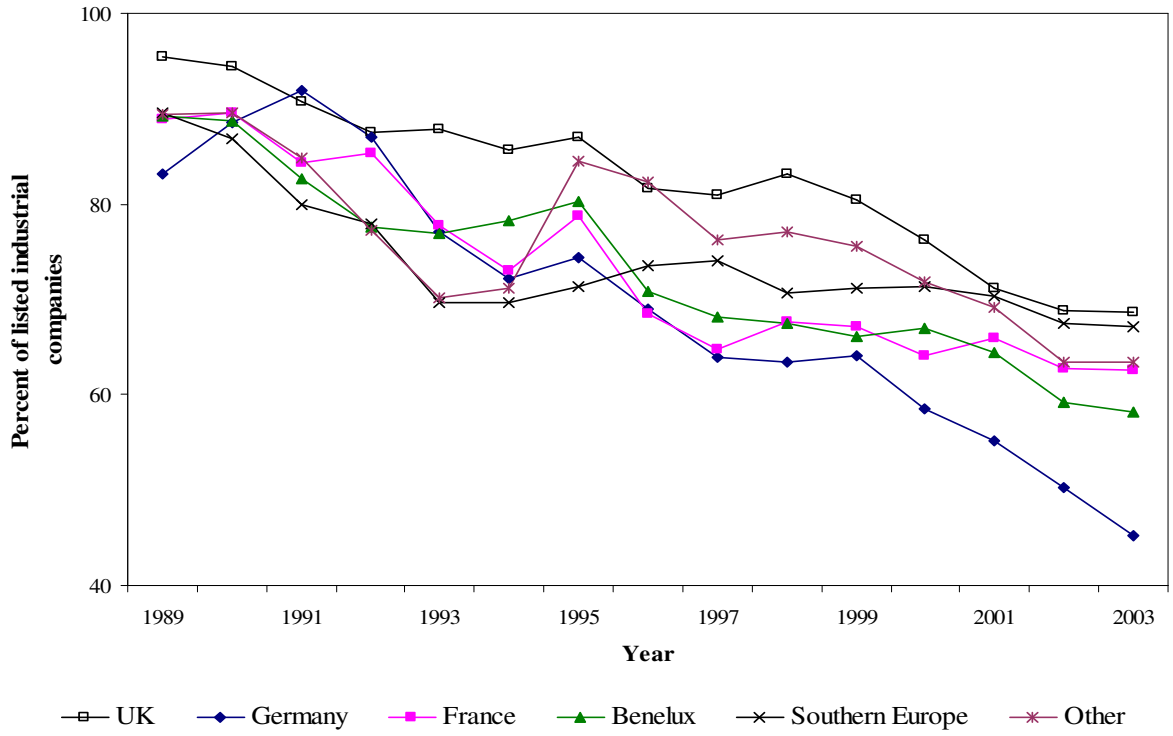

Figure 4. Percent of EU15 industrial cash dividend payers, by country

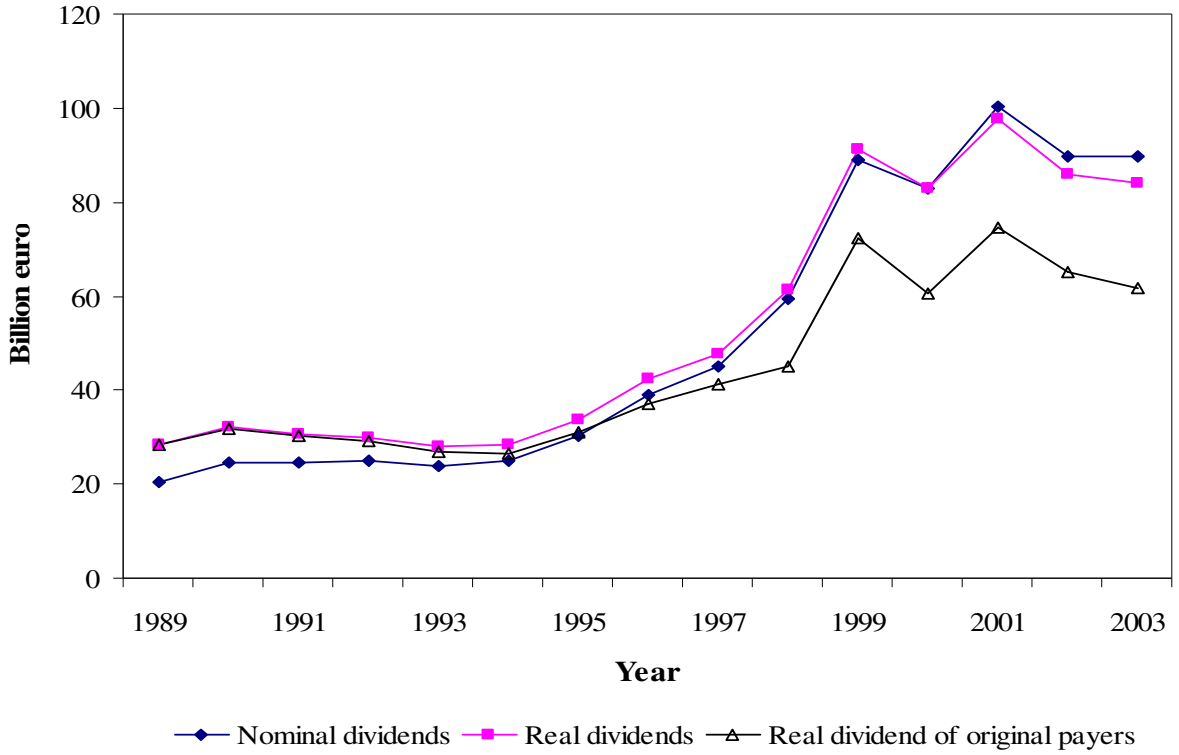

Figure 5. Total nominal and real (year 2000) cash dividend payments by EU15 industrial companies

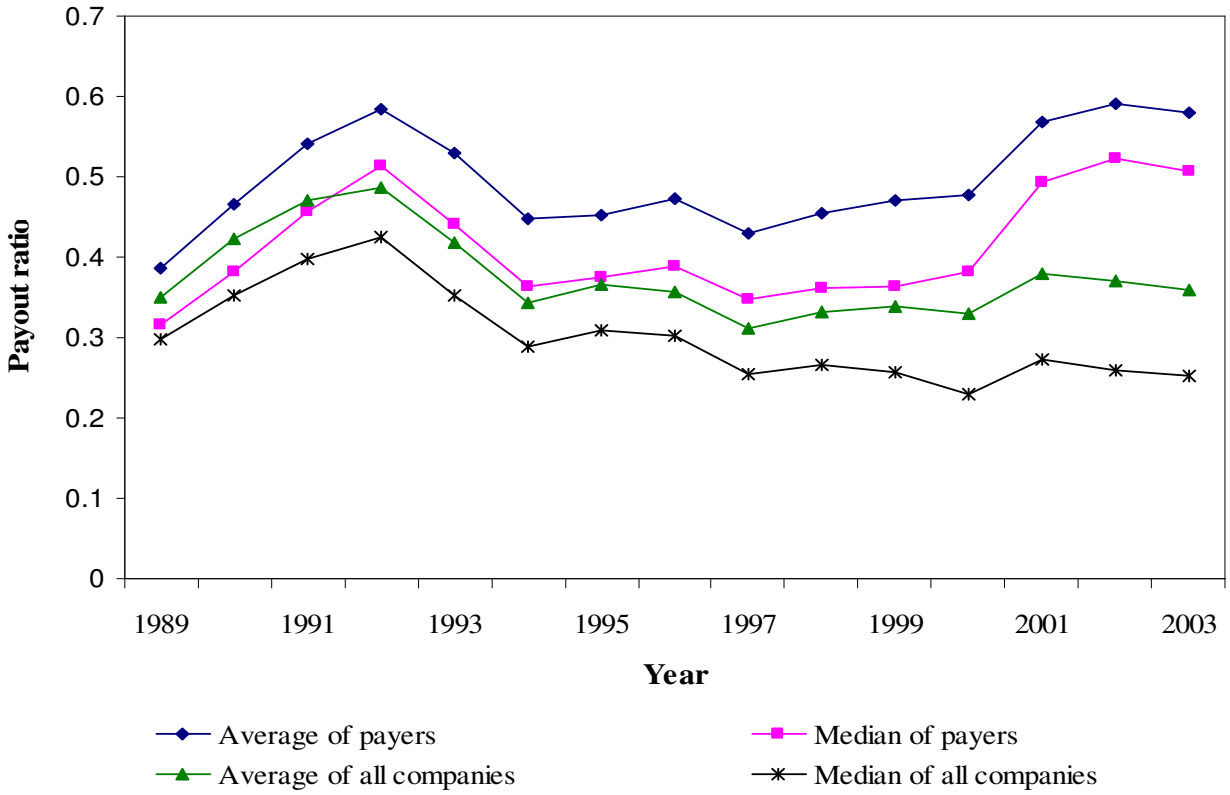

Figure 6. Average and median payout ratios of all EU15 industrial companies and all EU15 payers

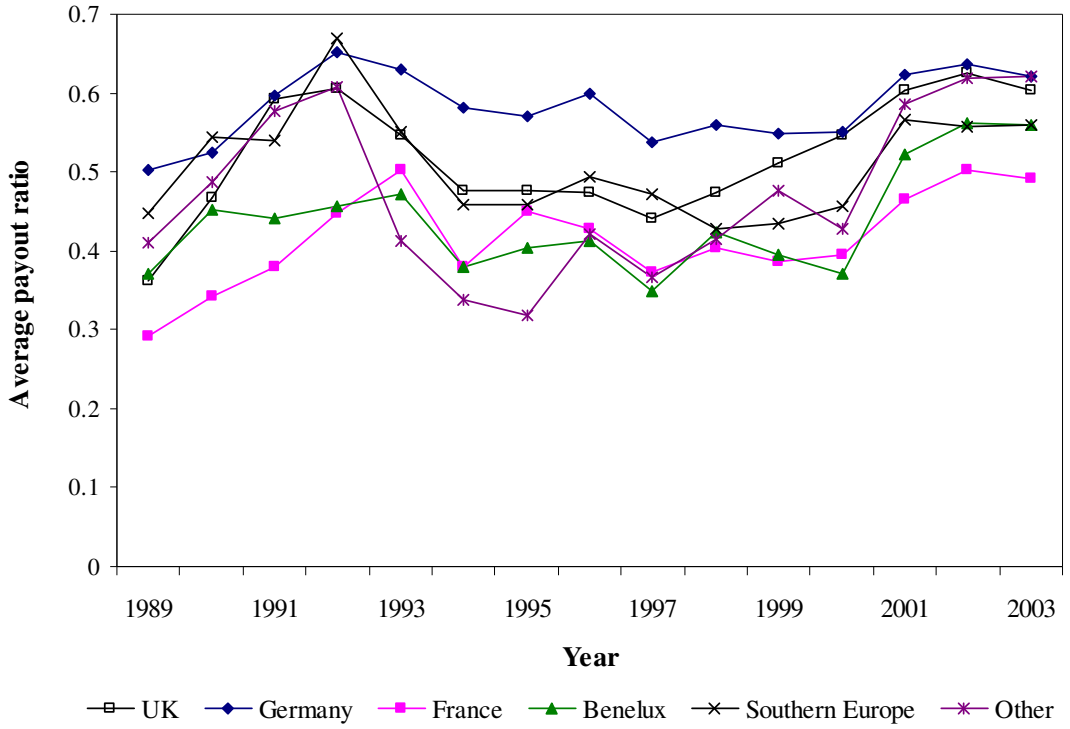

Figure 7. Average payout ratios of EU15 industrial payers, by country

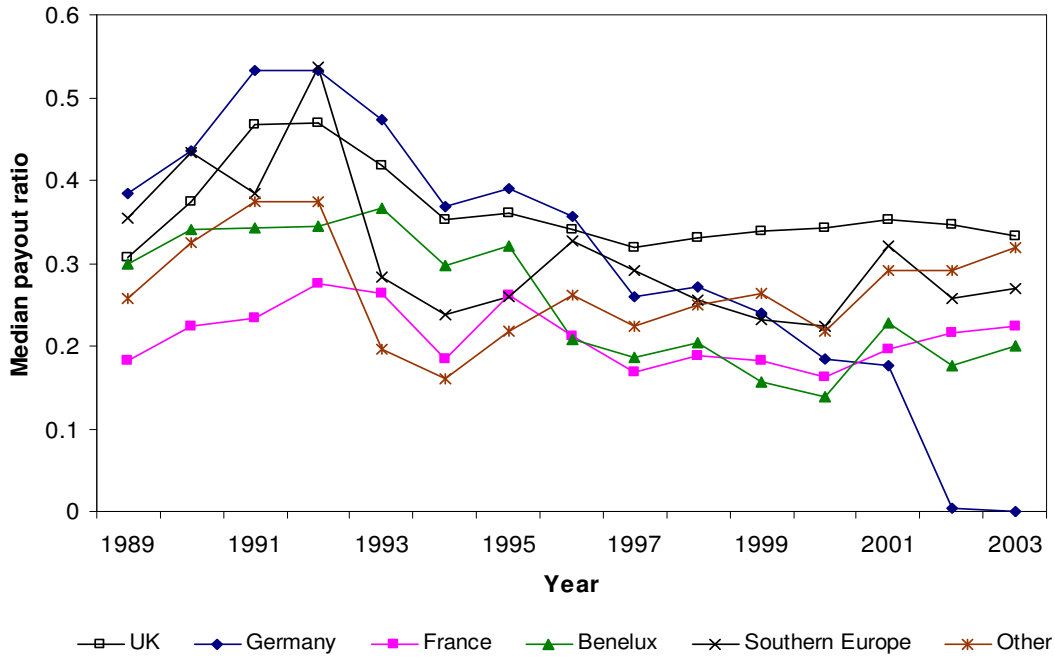

Figure 8. Median payout ratios of all EU15 industrial companies, by country

Table 1
The distribution of real dividends of industrial companies in deciles of real dividends for listed companies and for dividend payers in EU15 in 1989 and 2003

	Real dividend amounts in percentages of the total amount of real dividends in deciles calculated from the real dividend deciles of listed companies in the relevant year		Real dividend amounts in percentages of the total amount of real dividends in deciles calculated from the real dividend deciles of dividend paying companies in the relevant year	
	1989	2003	1989	2003
1st	0.0%	0.0%	0.1%	0.0%
2nd	0.1%	0.0%	0.2%	0.1%
3rd	0.2%	0.0%	0.3%	0.3%
4th	0.4%	0.0%	0.5%	0.4%
5th	0.7%	0.2%	0.8%	0.7%
6th	1.1%	0.5%	1.3%	1.1%
7th	2.0%	1.1%	2.2%	2.0%
8th	4.1%	2.4%	4.4%	4.1%
9th	10.7%	7.4%	11.4%	10.4%
10th	80.7%	88.5%	78.9%	80.9%
total	100.0%	100.0%	100.0%	100.0%
Herfindahl index	0.665	0.790	0.637	0.667
Amounts (billion €)	28.4	84.0	28.4	84.0
Number of observations	1077	2760	977	1709

Table 2
The distribution of real dividends of industrial companies in deciles of real total assets in EU15 in 1989 and 2003.

	Real asset amounts in percentages of the total amount of real assets in deciles calculated from the real asset amount deciles of listed companies in the relevant year		Real dividend amounts in percentages of the total amount of real assets in deciles calculated from the real asset amount deciles of listed companies in the relevant year [a)]	
	1989	2003	1989	2003
1st	0.1%	0.1%	0.1%	0.1%
2nd	0.2%	0.2%	0.3%	0.1%
3rd	0.3%	0.3%	0.4%	0.2%
4th	0.5%	0.4%	0.6%	0.4%
5th	0.8%	0.6%	0.9%	0.5%
6th	1.3%	1.0%	1.5%	2.2%
7th	2.4%	1.7%	2.4%	2.3%
8th	5.3%	3.3%	5.0%	4.4%
9th	12.5%	8.5%	12.3%	8.7%
10th	76.6%	83.8%	76.4%	81.1%
total	100.0%	100.0%	100.0%	100.0%
Herfindahl index	0.606	0.711	0.602	0.668
Amounts (billion €)	1803.3	4699.2	28.4	84.0
Number of observations	1108	2840	1077	2760

[a)] In this table the percentages and distributions for the real dividends of listed companies are by definition equal to those for the real dividends of the dividend payers

Table 3
The effects of changing characteristics and the propensity to pay based on the group approach of Fama and French (2001)

Companies is the number of companies in the relevant year (averaged for 1989-1993) Actual is the number of payers divided by the number of companies multiplied by 100. Expected is the percentage of payers calculated from the number of companies in each of 27 portfolios for the year times the proportion of dividend payers in the portfolio during the period 1989-1993 summed over the 27 portfolios, divided by the total number of companies in the 27 portfolios for the year and multiplied by 100. Portfolios are based on size, earnings ratio and the market to book value of the company. For each year the companies are classified into small, medium and large companies based on whether a company belongs to the first 20 percentiles, the 21 to the 50^{th} percentile or the 50^{th} to the 100^{th} percentile. The earnings ratio is computed by dividing the earnings before interest but after tax (E) by the assets (A) of the companies, and measures the average values of the 33.3 percentile and the 66.7 percentile from the five year period 1989-1993. The average values of the (E/A) breakpoints are then used as cut-off values for classifying the companies in low, middle or high earning companies in the years 1994-2003. The breakpoints used for the earnings ratio are 0.050 and 0.087, respectively. The same procedure is also used for the market to book value of the company (V/A), defined as assets minus book value of equity plus market value of equity (V) divided by assets (A). The breakpoints for the market to book value are 1.088 and 1.436, respectively. Expected – Actual Fama and French are the coefficients found by Fama and French (2001, Table 10) for a comparable method in comparable years, though starting from base calculations in a different period.

Year(s)	Number of companies	Actual (%)	Expected (%)	Expected % - Actual %	Expected % – Actual % Fama and French
1989-1993	1108	87.0			
1994	1332	77.8	87.0	9.2	26.3
1995	1399	82.6	86.7	4.2	27.5
1996	1474	82.6	87.3	4.6	28.4
1997	1552	82.0	87.5	5.6	28.2
1998	1715	82.8	87.9	5.1	32.0
1999	1795	81.3	87.1	5.8	NA
2000	2290	73.4	86.4	13.0	NA
2001	2444	70.8	85.0	14.2	NA
2002	2695	64.0	84.2	20.1	NA
2003	2703	62.5	83.2	20.8	NA

Table 4
Logistic regressions explaining industrial dividend payers in the European Union

This table displays the average of the logistic regression coefficients periods and the concomitant t-values in the periods indicated. The averages are calculated from annual logistic regressions for companies that paid dividend (value =1) or that did not pay dividend (value=0). The t-values are calculated by taking the averages from the relevant regression coefficients and dividing them by the standard error (standard deviation divided by the square root of the number of years). The explanatory variables are the market capitalization percentile of the company (MCX), the earnings before interest and tax divided by the assets of the company (EA), the change in company assets corrected for inflation (DAA) and the market to book value of the company (MBF).

	Average coefficients					t-statistics				
Years	MCX	EA	DAA	MBF	Int	MCX	EA	DAA	MBF	Int
1989-2003	0.022	8.331	-0.121	-0.205	0.469	16.136	10.906	-2.373	-4.390	3.024
1989-1993	0.019	11.011	-0.029	-0.143	0.860	7.803	8.429	-0.240	-1.399	2.895
1994-1998	0.023	6.912	-0.080	-0.202	0.471	17.705	6.664	-1.381	-3.024	3.411
1999-2003	0.024	7.070	-0.254	-0.270	0.076	8.920	8.781	-5.031	-3.488	0.291

Table 5
Effect of changing characteristics and the propensity to pay on the percentage of companies paying dividends in the industry sector of the European Union.

Companies indicate the number of companies for which full observations of the variables are available. Expected is the out of sample calculated propensity to pay based on the coefficients of the variables of Table4 calculated for the period 1989-1993. Actual is the actual percentage of payers in the concomitant year, but corrected for missing values in the calculated observations if compared to Table 3. Expected – Actual Fama and French are the coefficients found by Fama and French (2001, Table 6) for a comparable method in comparable years, though starting from base calculations in a different period.

Year	Number of companies	Actual (%)	Expected (%)	Expected % - Actual %	Expected % – Actual % Fama and French
1994	1306	78.2	97.5	19.4	21.7
1995	1374	83.1	96.7	13.5	21.2
1996	1425	83.4	97.0	13.5	21.1
1997	1525	82.4	97.3	15.0	21.5
1998	1696	83.1	95.2	12.0	23.3
1999	1765	81.9	94.8	12.9	NA
2000	2209	74.9	93.9	19.0	NA
2001	2409	71.2	91.2	19.9	NA
2002	2683	64.1	87.0	22.9	NA
2003	2691	62.7	88.6	26.0	NA

Table 6
Logistic random effects panel regression coefficients for the propensity to pay in the EU and significance levels for the whole period and three five-year sub-periods.

The dependent variable is the propensity to pay, a dummy that takes the value of 1 if a company paid dividend, and zero if its dividends were zero. Coeffic indicates the coefficient of the variable in the logistic regression equation, and p-value indicates the level of significance of the z-value of the coefficient based on bootstrapping 500 times. The variables are calculated for various periods, namely for the whole period (1989-2003) en for three sub-periods (1989-1993, 1994-1998, and 1999- 2003). We incorporate in the regression equation both company characteristics calculated from company means (variables preceded with the letter A), as well as within company change variables (calculated as differences from the company mean). The change variables are preceded by the letter D. ASIZE is calculated as the mean percentile ranking of a company in the range of market values in the respective years, AEA is the mean earnings ratio of a company, ARA is the mean relative change in assets of a company, ASTDS is the mean standard deviation of net income during the past five years related to actual annual sales, YINC is the year of incorporation of the company, COM is a dummy indicating whether a company originates from a common law country (COM=1), else zero. Euro is a dummy that takes the value 1 if a country originates from a country that accepted the euro as its currency, and zero in the case of the United Kingdom, Denmark and Sweden. T is a dummy variable equal to 1 if the company is a transportation company, and else zero. DLR is the difference between the leverage ratio observed for a company in a certain year and the average leverage ratio of a company in the relevant period. CAT is the catering variable calculated for each year from the difference between the natural logarithm of the equally weighted market to book value of European dividend paying companies and the natural logarithm of the equally weighted market to book value of European companies that paid no dividends. DCAT is then measured as the difference between its value and the mean in the relevant period multiplied by 100, YEAR is the observation year (1989, 1990,…,2003) and DYEAR is measured as the difference with the mean of the relevant period. Constant is the intercept of the regression equation. Observ. is the number of observations for which all information was available, Groups is the number of groups for which observations were available, Wald is the Wald chi-square of the equation for 15 independent variables and Prob. indicates the significance of the equation.

	1989-2003		1989-1993		1994-1998		1999-2003	
	Coeffic	p-value	Coeffic	p-value	Coeffic	p-value	Coeffic	p-value
			Between company variables (characteristics)					
ASIZE	0.030	0.000	0.035	0.000	0.037	0.000	0.040	0.000
AEA	25.326	0.000	34.809	0.000	19.644	0.000	18.566	0.000
ARA	-0.771	0.010	0.232	0.727	-0.182	0.650	-0.635	0.006
ASTDS	-0.452	0.662	0.041	0.956	-1.096	0.445	-2.002	0.344
YINC	-0.010	0.000	-0.006	0.087	-0.002	0.409	-0.016	0.000
COM	1.484	0.000	1.906	0.000	1.595	0.001	1.382	0.000
EURO	-0.374	0.164	0.038	0.934	-0.625	0.178	-0.598	0.042
T	-0.654	0.093	-1.680	0.003	-1.890	0.001	-0.369	0.460
			Within company and time related variables					
DSIZE	0.066	0.000	0.072	0.000	0.039	0.000	0.053	0.000
DEA	0.625	0.160	-2.380	0.131	0.542	0.647	-1.448	0.010
DRA	0.003	0.918	0.059	0.872	0.003	0.973	-0.147	0.033
DSTDS	-0.031	0.975	-0.014	0.985	-0.343	0.796	-1.668	0.385
DLR	-1.121	0.055	-0.977	0.118	-2.644	0.001	-1.962	0.001
DCAT	-0.081	0.144	0.390	0.398	0.405	0.000	-0.160	0.275
DYEAR	-0.103	0.000	-0.479	0.003	0.056	0.246	-0.389	0.000
Constant	19.974	0.000	11.368	0.105	5.066	0.370	32.211	0.000
Observ.	19670		3523		6245		9902	
Groups	2598		1059		1420		2584	
Wald	991.6		259.3		296.7		817.3	
Prob.	0.000		0.000		0.000		0.000	

Table 7
Random effects panel regressions for the real amounts paid by dividend payers in the EU and the concomitant significance levels for the whole period and three sub-periods of five years.

The dependent variable is the natural logarithm of the amount of real dividends paid by dividend payers. C indicates the coefficient of the variable in the regression equation. P indicates the level of significance of the robust z-value of the coefficient. The variables are calculated for whole period (1989-2003) and for three sub-periods (1989-1993, 1994-1998, and 1999- 2003). The four regression equations incorporate both company characteristics calculated from company means (variables preceded by the letter A), as well as within company change variables (calculated as differences from the company mean). The change variables are preceded by the letter D. ASIZE is calculated as the mean percentile ranking of a company in the range of market values in the respective years, AEA is a firm's mean earnings ratio, ARA is the mean relative change in assets, ASTDS is the mean standard deviation of net income during the past five years related to actual annual sales, YINC is the year of incorporation, COM is a dummy indicating a company is headquartered in a common law country (COM=1), else zero. Euro is a dummy that takes the value 1 if a company is headquartered in a country that adopted the Euro, and zero in the case of the United Kingdom, Denmark and Sweden. T is a dummy variable equal to 1 if the firm is a transportation company, else zero. DLR is the difference between the leverage ratio observed for a certain year and the average leverage ratio of a company in the relevant period. CAT is the catering variable calculated for each year from the difference between the natural logarithm of the equally weighted market to book value of European dividend paying companies and the natural logarithm of the equally weighted market to book value of European companies that pay no dividends. DCAT is the difference between this value and the mean in the relevant period multiplied by 100. YEAR is the observation year (1989, 1990, …, 2003) and DYEAR is the difference with the mean of the relevant period. Constant is the intercept of the regression equation. Observ. is the number of observations for which all information was available, Groups is the number of groups for which observations were available, Wald is the Wald chi-square of the equation for 15 independent variables and Prob. indicates the significance of the equation. R^2 within is the within group R-square, R^2 between is the between groups R-square and R^2 overall is the overall R-square.

	1989-2003		1989-1993		1994-1998		1999-2003	
	C	P	C	P	C	P	C	P
	Between company variables (characteristics)							
ASIZE	0.063	0.000	0.064	0.000	0.062	0.000	0.061	0.000
AEA	1.039	0.004	-0.556	0.308	-0.682	0.120	1.086	0.001
ARA	-0.341	0.000	-0.034	0.298	-0.247	0.000	-0.662	0.000
ASTDS	-0.016	0.742	0.011	0.563	-0.326	0.000	-0.063	0.342
YINC	-0.004	0.000	0.000	0.660	-0.002	0.015	-0.005	0.000
COM	0.237	0.004	0.205	0.071	0.014	0.895	0.185	0.059
EURO	-0.184	0.021	-0.227	0.042	-0.293	0.004	-0.234	0.013
T	-0.134	0.253	-0.069	0.653	-0.196	0.178	-0.104	0.450
	Within company and time related variables							
DSIZE	0.027	0.000	0.013	0.000	0.019	0.000	0.019	0.000
DEA	0.143	0.093	1.079	0.000	-0.027	0.863	0.231	0.052
DRA	-0.001	0.641	0.000	0.984	0.004	0.002	-0.175	0.000
DSTDS	-0.010	0.051	-0.004	0.363	-0.170	0.000	-0.066	0.128
DLR	-0.251	0.000	-0.077	0.130	-0.234	0.000	-0.166	0.159
DCAT	0.003	0.712	0.167	0.000	0.016	0.218	0.052	0.128
DYEAR	0.046	0.000	0.000	0.966	0.121	0.000	-0.056	0.000
Constant	6.600	0.000	-1.354	0.285	1.223	0.314	7.244	0.000
Observ.	15555		3087		5199		7269	
Groups	2077		960		1279		1996	
Wald	11464		5341		6526		5947	
Prob.	0.000		0.000		0.000		0.000	
R^2 within	0.231		0.050		0.246		0.046	
R^2 between	0.764		0.843		0.802		0.735	
R^2 overall	0.755		0.811		0.784		0.716	

Table 8
Robustness tests on the significance of the coefficients of dividend policy in the EU 15 for 1999-2003.

The dependent variables are the propensity to pay and the natural logarithm of the amount of real cash dividends paid by payers. The propensity to pay is a dummy that takes the value of 1 if a company paid dividend, and zero if its dividends were zero. C indicates the coefficient of the variable in the regression equations. P indicates the level of significance of the z-value of the coefficient, where the z-values are calculated from bootstrapping 500 times with the propensity to pay equation and from robust estimates for the real cash dividends equation. The variables refer to the period 1999-2003. SIZE is calculated as the percentile ranking of a company in the range of market values in the respective years, EA is the earnings ratio of a company, RA is the relative change in assets of a company, STDS is the standard deviation of net income during the past five years related to actual annual sales, YINC is the year of incorporation of the company, COM is a dummy indicating whether a company originates from a common law country (COM=1), else zero. Euro is a dummy that takes the value 1 if a country originates from a country that accepted the euro as its currency, and zero in the case of the United Kingdom, Denmark and Sweden. T is a dummy variable equal to 1 if the company is a transportation company, and else zero. LR is the leverage ratio for a company. CAT (not in table) is the catering variable calculated for each year from the difference between the natural logarithm of the equally weighted market to book value of European dividend paying companies and the natural logarithm of the equally weighted market to book value of European companies that paid no dividends. DCAT is measured as the difference between the CAT value and the mean CAT value over 1999-2003 multiplied by 100, DYEAR is measured as the difference between the relevant year and 2001. CTP is the cash dividend tax preference characteristic of the country found in LaPorta, Lopez-de-Silanes, Shleifer and Vishny (2000, p. 28-29). This variable is absent for Greece and Luxemburg. RELTR is the number of transactions per trading day in December 2003 divided by the number of outstanding shares at the end of 2003 and the outcome multiplied by 1000. SREP is a dummy indicating for each year if the number of outstanding shares declined, else zero. RETE is the amount of retained earnings divided by the total amount of equity measured for each year. DEP is a dummy indicating that the company has a recorded shareholder with a total or a calculated ownership of 50% or more. Constant is the intercept of the regression equation. Observ. is the number of observations for which all information was available, Groups is the number of groups for which observations were available, Wald is the Wald chi-square of the equation for the relevant number of independent variables. Greece and Luxembourg are excluded.

	Propensity to pay				Cash dividends paid by payers			
	C	P	C a)	P	C	P	C a)	P
SIZE	0.047	0.000	0.049	0.000	0.049	0.000	0.049	0.000
EA	2.809	0.001	1.696	0.178	-0.133	0.394	-0.212	0.168
RA	-0.357	0.000	-0.393	0.000	-0.276	0.000	-0.237	0.000
STDS	-4.138	0.093	-4.340	0.391	-0.016	0.756	0.030	0.478
YINC	-0.021	0.000	-0.020	0.000	-0.006	0.000	-0.006	0.000
LR	-1.106	0.003	-1.007	0.047	0.413	0.000	0.318	0.009
COM	1.446	0.000	1.580	0.000	0.110	0.162	0.330	0.002
EURO	-0.163	0.550	-0.415	0.252	-0.272	0.000	0.110	0.351
T	-0.234	0.649	-0.123	0.836	0.036	0.839	0.235	0.111
DCAT	-0.167	0.248	-0.205	0.252	-0.078	0.024	-0.093	0.015
DYEAR	-0.344	0.000	-0.356	0.000	-0.055	0.000	-0.053	0.002
CTP			0.917	0.183			0.989	0.000
RELTR			-0.095	0.047			0.031	0.006
SREP			0.619	0.000			0.154	0.000
RETE			0.033	0.291			0.003	0.120
DEP			0.373	0.079			-0.092	0.201
Constant	42.421	0.000	38.584	0.000	9.611	0.000	8.469	0.000
Observ.	9902		7043		7269		5259	
Groups	2584		1837		1996		1433	
Wald	735.6		524.5		3870.3		2819.6	
Prob.	0.000		0.000		0.000		0.000	

a) Greece and Luxembourg are excluded.

Table 9
Measures of convergence for dividend characteristics of industrial companies in 15 countries of the European Union, between 1989 and 2003 as well as for three five-year sub-periods

The measures of convergence are the coefficient of variation (CV) and Kendall's measure of concordance (W) measured for the propensity to pay, the mean amounts paid and the payout ratios of the 15 countries of the EU. CV is the coefficient of variation calculated for the values for the relevant variable in the 15 countries of the European Union. W is Kendall's measure of concordance calculated from the rank of the country in the relevant period in comparison to the country rank in the base period.

	Convergence measures for the industrial propensity to pay		Convergence measures for the mean amounts paid by industrial payers		Convergence measures for the payout ratio of industrial payers	
Year/period	CV	W	CV	W	CV	W
1989	0.077	1.000 a)	0.985	1.000 a)	0.466	1.000 a)
1990	0.057	0.861**	0.961	0.991**	0.347	0.930**
1991	0.100	0.550	0.942	0.984**	0.219	0.768*
1992	0.107	0.499	0.974	0.970**	0.236	0.555
1993	0.140	0.533	0.990	0.948**	0.271	0.395
1994	0.130	0.629	0.963	0.925**	0.283	0.498
1995	0.101	0.610	0.863	0.961**	0.283	0.580
1996	0.109	0.627	0.862	0.948**	0.254	0.598
1997	0.163	0.687	0.809	0.936**	0.295	0.586
1998	0.206	0.720	0.818	0.946**	0.197	0.816*
1999	0.178	0.667	1.237	0.945**	0.195	0.539
2000	0.153	0.667	0.617	0.902**	0.204	0.771*
2001	0.206	0.678	0.797	0.839**	0.205	0.725
2002	0.233	0.753*	0.757	0.909**	0.249	0.782*
2003	0.229	0.676	0.635	0.875**	0.260	0.818*
	Mean annual change of the convergence measures					
1990-2003	0.011	-0.023	-0.025	-0.008	-0.015	-0.013
	Convergence measures calculated from the mean values of the original variables measured in three periods of five years					
1989-1993	0.054	1.000 a)	0.964	1.000 a)	0.184	1.000 a)
1994-1998	0.127	0.598	0.834	0.968**	0.226	0.630
1999-2003	0.192	0.466	0.788	0.966**	0.190	0.789*

a) Theoretical value
*, **, *** indicates 10%, 5% and 1% significance respectively.

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