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THE REAL EFFECTS OF THE EURO: EVIDENCE FROM CORPORATE INVESTMENTS

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ABSTRACT

The Real Effects of the Euro: Evidence from Corporate Investments*

Existing evidence shows that the Economic and Monetary Union (EMU) has reduced the cost of capital for firms in the euro area. We study the impact of the adoption of the euro in January 1999 by 11 countries in Europe on the firms' investment rates, and show that the investment results are consistent with reduction in cost of capital. Using corporate data from the 11 EMU countries, as well as from a control sample of 5 non-EMU, European countries, our paper shows that: (i) investments for EMU-firms have grown 2.5% more than for non-EMU firms, after 1999; and (ii) the benefits of the euro accrue especially to small, domestic firms from countries with previously weak currencies.

JEL Classification: F33, F36 and G32
Keywords: cost of capital, currency union, economic and monetary union (EMU), investments and the euro

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I Introduction

When a firm is maximizing its profits, its investments are determined by the interaction between expected cash flows and the cost of capital. Everything else constant, a reduction in the firm's cost of capital enlarges the set of profitable investment opportunities and thus increases investments. Similarly, investments increase when the expected cash flows from those investments increase, given the cost of capital. Expected cash flows and cost of capital jointly determine a firm's internal rate of return, and ultimately how much the firm is worth to its shareholders.

The empirical research on the relationship between cost of capital, cash flows, and investments has typically focused on cross-sectional regressions of investment on measures of cash flows, thus largely ignoring the possibility that cost of capital may have had an independent impact (see Lamont, 1997). The method to identify an economic relationship between investment and cash flows has consisted of comparing the coefficient of the cash flow measure for groups of firms with different characteristics (Fazzari, Hubbard, and Petersen, 1988; Whited, 1992; Hoshi, Kashyap, and Scharfstein, 1991) or else for the same firms, in different subperiods (Gertler and Hubbard, 1988; Kashyap, Lamont, and Stein, 1994).

Alternatively, several papers have analyzed the relationship between cash flow and investment by identifying an exogenous shock to cash flows, and comparing the change in investments for different firms as a reaction to the shock. In particular, Blanchard, López de Silanes, and Shleifer (1994) show that firms that receive cash windfalls tend to invest in negative NPV projects, particularly acquisitions. Lamont (1997) analyzes the investment response of oil companies to a drop in oil prices, and shows that firms reduce investments in both their oil and non-oil business segments.

In the previous papers, an increase in expected cash flows causes a reduction in the cost of capital, and vice versa. In Blanchard, López de Silanes, and Shleifer (1994), the cash windfall increases the collateral value of the firm, and therefore makes outside financing cheaper. Lamont (1997) shows that the lower profitability of the oil business segments increases the cost of capital in the non-oil segments. Therefore to what extent the positive correlation between cash flows and investment is due to a reduction in the cost of capital remains an open empirical question.[1]

In this paper we study the impact of the adoption of the euro on firms' investment rates in Europe. In January 1, 1999 the Economic and Monetary Union (EMU) entered its final phase

[1] More recently, Massa, Peyer, and Tong (2004) use the addition to the S&P500 as an exogenous shock to the cost of equity, and find a negative correlation between cost of equity and investment.

when the euro became the common currency for 11 European countries. The common currency was an exogenous event that arguably resulted in lower cost of capital and higher expected cash flows for the firms in countries that adopted the euro. We build on our previous research that showed that an increase in firm valuations in euro countries was caused mainly by a reduction in cost of capital, not by an increase in expected cash flows (see Bris, Koskinen, and Nilsson, 2003). The main idea in our strategy in that paper - and also in this paper - is that expected cash flows should increase in the same way for all firms within the group of countries that adopted the euro. However, the reduction in the cost of capital should be more important for certain firms: firms in countries with weak currencies, small firms, and firms exposed to foreign markets. We are able to quantify the economic magnitudes of such an effect by using a control sample of firms representing five European countries that did not adopt the euro.

Our sample consists of firms from 16 European countries in the period 1994-2002. In particular, we use corporate-level data from eleven countries that adopted the euro[2], the three EU countries that did not (Denmark, Sweden, and the U.K.), as well as Norway and Switzerland. The last five countries constitute our control sample, that allows us to compute differences-in-differences estimators to measure the impact of the euro both cross-sectionally, as well as in the time-series domain. We measure investments as the growth rate in non-cash assets. We find that firms in EMU countries[3] increase investments 2.5 percent more than non-EMU firms during 1999 to 2002. This result is statistically as well as economically significant. The increase in investments associated to the euro represents 0.1 standard deviations of the investments measure. The industry's Q, which is theoretically a fundamental determinant of investment growth, has an economic significance of 0.1 standard deviations; firm's profitability has an economic significance of 0.18 standard deviations.[4] When we split the sample of EMU firms between firms in weak-EMU countries–countries that suffered a currency crisis in the decade before the introduction of the euro–and strong-EMU countries, we find that investments increase by 4.5 percent in the former group, and do not increase significantly in the latter. Because the elimination of currency risk is more important for the

[2] We exclude Greece because it adopted the euro in January 1, 2001. All the other euro countries are in the sample.

[3] We use the terms "euro" and "EMU" interchangeably.

[4] These results are from Table 2.

weak-EMU countries, we deem this evidence as supportive of an increase in investments resulting from a reduction in firm's cost of capital. The increase in investments is significant after we control for changes in interest rates, fluctuations of the domestic currency with respect to the dollar, macroeconomic variables, firm-specific control variables, and time-fixed effects. We further show that the effect of the euro is larger for small firms in weak–EMU countries, relative to large firms in weak–EMU countries. However, there is no significant difference between large and small firms in strong-EMU countries.

Having established that firms in the euro area invest more after 1999, we characterize such investments. We separate our investment measure into organic, internal growth, and growth through acquisitions. We calculate a measure of internal investment as total investment, minus investment in acquisitions. Our results are similar to the ones for total investment: the euro has increased internal investment by firms in EMU countries by 0.1 standard deviations, and especially by firms in weak–EMU countries (0.16 standard deviations). In addition, we estimate a probit regression on the probability of a firm engaging in acquisitions in a given year, and show that the probability of a weak–EMU firm making an acquisition has increased by five percent, after 1999. Similarly, the probability of a strong–EMU firm making an acquisition has increased by three percent, after 1999. Both probabilities are relative to the probability of a non–EMU firm making an acquisition.

When we classify firms depending on their level of foreign sales before 1999, we find that investments increase significantly only in firms with low foreign sales. Indeed, for firms in weak-EMU countries with a low level of foreign sales, the euro explains around one-third of the standard deviation of the investment growth measure. The increase in investments for this group of firms is significantly different from the increase in weak-EMU, high-foreign sales firms. However there is no difference between firms in strong-EMU countries. In our sample, firms in weak-EMU countries, with low levels of foreign sales, are ex ante the ones that benefit the most from the elimination of currency devaluations. Therefore we find evidence in favor of a reduction of the cost of capital in the EMU area, and point towards a tangible, economically meaningful effect of eliminating risks of large devaluations: an increase in firm's investments.

Finally, we show that our results are robust to different definitions of the post–euro period. We additionally identify a significant reduction in investments in the IT–Telecommunications industry in the EMU countries, and show that our findings persist–despite a drop in statistical significance—after excluding France, Germany, and the U.K. from the analysis. These are the countries which contribute the most to our sample.

Our paper proceeds as follows. In the next section we discuss the literature on the effects of the EMU on corporations. Section III describes our data sources and the main variables used throughout the paper. Section IV describes our methods and main results. In section V study organic growth and acquisitions. In section VI we classify firms depending on their size and level of foreign sales. In section VII we provide some additional robustness tests, and section VIII concludes.

II The effects of the euro

There is growing evidence that the Economic and Monetary Union (EMU) has reduced firms' cost of capital and increased firms' expected cash flows. Regarding the effects of the EMU on the cost of capital, Bartram and Karolyi (2003) show that the market risk has been reduced for euro firms with significant exports to the euro area. In addition, Hardouvelis et al. (2002a, 2002b) show that deepening financial integration in Europe prior to the introduction of the euro already resulted in lower cost of capital. Consistent with this view, Bris, Koskinen, and Nilsson (2003) find that the Tobin's Qs of firms in euro countries that experienced significant currency depreciations in the early 1990's increased by 16.7 percent compared to firms coming from European countries that did not adopt the euro. They argue that this result is driven by a reduction in the cost of capital, and not by an increase in expected cash flows.

There is also evidence that euro may have increased expected cash flows for firms in euro countries. Perhaps the most important benefit of common currencies cited in the literature is the increase in trade between the members of the currency area (Rose, 2000; Rose and van Wincoop, 2001; Frenkel and Rose, 2002; Glick and Rose, 2002). Micco et al. (2003) estimate that the euro has increased trade between 4 percent and 16 percent among euro countries without any evidence of diverting trade from other countries. Barr et al. (2003) obtain a higher estimate, 29 percent, for the increase in trade among euro countries, whereas Bun and Klaassen (2002) find that the euro has increased trade by 4 percent initially and the estimated increase in the long-run would be 40 percent. However, increased trade does not necessarily increase firms' expected cash flows, since the benefits of integration may accrue to consumers due to increased competition.

All in all, the previous evidence confirms the existence of better investment opportunities by firms in euro countries due to cheaper access to financing and higher expected cash flows. The question that remains is whether such potential benefits have translated into more investments.

An exogenous shock like the euro should intuitively induce EMU firms to increase investments compared to non-EMU firms after 1999. There are, however, some potential reasons why the euro may not have produced any clear positive economic effects.

First of all, the EMU has effects on macroeconomic volatility, because central banks lack independence to deal with country-specific shocks. Moreover, while the euro has eliminated intra-European currency risks, it may have made countries more vulnerable to movements in other currencies, like the dollar. Also, the euro may have had adverse effects on investments for domestic firms that presumably do not benefit as much from common currency as larger firms do. For example, the HM Treasury report on the *EMU and the Cost of Capital* argues that[5]

> "Some commentators have highlighted the reduction in uncertainty within EMU for the UK resulting from the elimination of the exchange rate against euro area countries. By itself, this would boost investment in industries which trade with the euro area. But this effect needs to be offset against the impact on investment targeted on domestic sales, and the effect on exchange rate volatility against other currencies."

Secondly, if currency risk is economically insignificant or small (see Griffin and Stulz, 2001 for the U.S., and De Santis et al., 2003, for European markets), or if firms can easily hedge their currency exposures, then the adoption of the common currency could turn out to be much ado about nothing.

Finally, the process for the formation of single market in Europe was started already in the mid-1980's. The White Paper outlining the regulatory changes needed for the creation of the single market was adopted in 1985. The adoption of the White Paper resulted in significant increases in foreign direct investments and mergers in Europe in the latter half of the 1980's (European Economy, 1997). Hence the improvement in investment opportunities due to creation of single market was over when the new currency was introduced. Therefore, to what extent there have been any real effects of the euro on firms remains an empirical question.

[5] UK membership of the single currency: an Assessment of the five economic tests (CM 5776, 2003, page 144).

III Description of data

A Sample selection and data sources

In order to investigate the effects of the euro on corporate investments we collect firm-level data from all countries that adopted the euro, except Greece, as well as from five Western European countries that did not adopt the euro (Denmark, Sweden, the U.K. , Norway, and Switzerland). The latter five countries are either part of the EU (Denmark, Sweden, and the UK) or have bilateral agreements with the EU (Norway and Switzerland) that give them more or less full access to the inner market of the EU. Thus, by using this group of countries as a benchmark we are likely to keep effects from general increased market integration in Europe fixed across firms over time, and thus we are able to better isolate the effects of the euro on corporate investments. The sample of firms is drawn from Worldscope and covers the time period 1994-2002. We exclude Greece, because Greece did not adopt the euro until January 2001 and is hard to classify as either a euro or a non-euro country in the time period from the introduction of the euro until they actually adopted the common currency.

For our 16 sample countries, we include all firms that have relevant data available for at least the period 1997–1999.[6] We impose this requirement because we want to analyze within–firm changes following the introduction of the euro and thus need firms to exist both before and after the introduction of the euro (January 1, 1999). Furthermore, we exclude firms that report (i) sales and/or total assets of less than 1M euro, (ii) negative earnings after interest and taxes in excess of the book value of assets, and (iii) negative book values of equity. These exclusions are done to ensure that speculative or severely distressed firms do not have an undue influence on our results. Our final sample consists of 2,549 firms (19,550 firm-year observations): 1,302 firms (10,108 firm–year observations) from the euro countries and 1,247 firms (9,442 firm–year observations) from the non–euro countries.[7]

[6] In particular we require firms to have data on the growth rate of non-cash assets, lagged leverage (i.e., book value of liabilities divided by the book value of total assets), and lagged cash flow-to-assets ratio for each of the years 1997-1999.

[7] See Table A1 in the Appendix for a breakdown of the number of firms in the sample by individual country. As a comparison, 8,199 firms from the sample countries have some data available for at least one year during the sample period in Worldscope.

All firm-level data in this study is from Worldscope unless otherwise stated. All macroeconomic variables that we employ as control variables in our analyses are from OECD's statistical databases, except for the USD exchange rates, which are gathered from EcoWin.

We use the official adoption of the euro in year 1999 as the benchmark year for post-euro time. Bris, Koskinen and Nilsson (2003) use the year 1998 as the benchmark year for adoption of the euro, because that paper focused on the valuation effects of the new common currency and valuation measures based on market values are forward looking. Arguably, real variables like investments react more slowly to exogenous shocks than stock prices do. In Section VII.A we check the robustness of our assumption.

B Corporate investment measure

As a measure of corporate investment, we use the yearly real log growth rate in non-cash assets (= log[inflation–adjusted, non–cash assets$_t$ / inflation–adjusted, non–cash assets$_{t\text{-}1}$]. Non-cash assets are calculated as total assets (Worldscope item #2999) minus cash and marketable securities (Worldscope item #2001) and they are measured in domestic currency. We use this measure instead of a measure based on net property, plant and equipment (fixed capital stock) because of two reasons: (i) the growth rate in NPPE doesn't take into account investment in intangible assets, which are likely to be important in high-tech industries, and (ii) the growth rate in NPPE ignores investments in inventories which are likely to be important for wholesale firms and retailers. Thus, our measure of investments is less industry–specific compared to an investment measure based on the growth in NPPE. Note that the growth rate in non-cash assets should be interpreted as a net investments measure, since it excludes depreciation. The log growth rate in non-cash assets can obviously be negative, which in that case rate reflects that the firm is divesting. Because there are some firms that are growing or shrinking at extreme rates, we winsorize the real log growth rate of non-cash assets at the first and $99th$ percentile values for the whole sample in order to reduce the influence of these extreme observations. If we do not winsorize the investment measure, our results on the effects of the euro are even stronger. Thus, we take here a conservative approach.

As a first indication of the impact of the euro on corporate investments, Table 1 reports the mean and median level of investments in the pre-euro time period (1994-1998) and the post-euro time

period (1999-2002) split by euro and non-euro firms.[8] Table 1 also presents mean and median pre- and post-euro investments for euro countries split into weak- and strong-euro countries, respectively, depending on the strength of their home countries currencies prior to the introduction of the common currency. Weak–euro countries are defined as those that suffered a currency crisis in the years before the introduction of the euro (Finland, Ireland, Italy, Portugal, and Spain).[9] The other euro countries (Austria, Belgium, Germany, France, Luxembourg, and Netherlands) did not experience significant currency depreciations during the European Monetary System crisis in early 1990s, hence the label strong-euro countries. The classification into weak– and strong–euro countries is important, because Bris, Koskinen, and Nilsson (2003) show that weak-euro firms experience a significant increase in their valuations after the introduction due to lower capital costs, as opposed to strong-euro firms which do not show any significant increase in their valuations. Lower capital costs should of course in turn lead to increased investments. Notice that the labels of weak– and strong–euro countries only apply to the weakness and strength of the currencies prior to the introduction of the euro, and not to the overall economic performance of the respective countries.

[Insert Table 1]

In the pre-euro period, real investments in the non-EMU area grow 10.6 percent on average (median=6.4 percent) per year, rates which are significantly higher than in the EMU area (7 percent mean growth, 4.1 percent in median). Within EMU, investments grow more in strong countries (7.3 percent mean growth, 4.4 percent median growth) than in weak countries (6.3 percent mean growth, 2.9 percent median growth), although the difference between the two groups is not statistically significant from zero.

In the post-euro period, we find only slight differences between EMU and non-EMU countries, with growth rates of 5.3 percent (median=3 percent) and 4.3 percent (median=1.4 percent) respectively. Such differences are significantly different from zero. However, after 1998 investments in the weak-EMU countries grow more compared to strong-EMU countries: 6.6 percent in mean

[8] For a yearly breakdown of average investments in euro countries and non-euro countries, see Table A2 in the Appendix

[9] In the autumn of 1992 a wave of speculative attacks hit the European exchange rate mechanism (ERM) and its periphery. Before the end of the year, five countries (Finland, Italy, Norway, Sweden, and the U.K.) had floated their currencies. Despite attempts by a number of countries to remain in the ERM with the assistance of devaluations (Ireland, Portugal, and Spain), the system was unsalvageable.

(median=3.3 percent) vs. 4.8 percent (median=2.9 percent). Such differences are significantly different from zero at the 5 and 10 percent levels, respectively. Of course these numbers ignore cross-sectional differences in firm size, profitability, and investments opportunities, which can only be uncovered in panel regressions.

IV Firm investments and the introduction of the euro

A Method

In order to analyze the effects of the introduction of the euro on corporate investments, we estimate a fixed-effects panel regression model for the 1994-2002 time period. The dependent variable is investments, measured as the real log growth rate in non-cash assets. The impact of the euro is measured using three different dummy variables. The first dummy variable, "Euro country × post-euro time period", takes the value one for firms in the euro countries, during years 1999-2002, and zero otherwise. Similarly, we construct two dummy variables indicating firms in the strong- and weak-euro countries, respectively, in the post-euro time period ("Strong-euro country × post-euro time period" and "Weak-euro country × post-euro time period"). More formally, let I_{ict} be the real log growth rate of non-cash assets for firm i in country c at time t, and $EURO_{ct}$ be the dummy variable(s) indicating whether the euro was adopted or not by country c at time t. We then estimate the following regression model with OLS:

$$I_{ict} = Y_t + F_i + \beta \cdot X_{ict} + \gamma \cdot Z_{ct} + \delta \cdot EURO_{ct} + \varepsilon_{ict}, \tag{1}$$

where Y_t is the fixed time effect for year t, F_i is the fixed firm effect for firm i, X_{ict} represent firm characteristics, and Z_{ct} represents country characteristics. The estimated effect of the euro is captured by $\widehat{\delta}$.

The fixed year effects capture common time trends across both euro– and non–euro firms. By using firm–specific fixed effects, we simultaneously control for both constant country factors (e.g., taxation, accounting rules, legal environment) and for constant firm factors (e.g., industry effects). Furthermore, because we use fixed effects, estimators will be based on the time–series, within–firm variation in variables. Thus, since the objective of our study is to investigate whether there is a regime–switch in firms' investment activities after the introduction of the euro, fixed effects regressions seem particularly suitable.

The regression model outlined above is a typical example of a differences-in-differences (DD) estimation, where we identify a causal relationship between a treatment (the introduction of the euro) and an endogenous variable for a large number of firms from both affected and unaffected countries. Bertrand et al. (2004) point out the weakness of results based on the DD methodology because of the strong bias in the standard errors created by serial correlation. In our setting this problem is particularly important, since the intervention date is the same for all observations in the sample. Bertrand et al. (2004) suggest several methods to address this problem, and test their effectiveness.[10] For a small number of countries, such as our sample, Bertrand et al. (2004) suggest either bootstrapping or an arbitrary variance-covariance matrix as a remedy. In this paper we use the latter methodology as our approach. We estimate robust standard errors that are adjusted for clustering of observations by country. In particular we use the following variance–covariance estimator:

$$V_{\text{CLUSTER}} = (X'X)^{-1} \cdot \sum_{j=1}^{N_c} u_j' \cdot u_j \cdot \left(X'X\right)^{-1}, \tag{2}$$

where

$$u_j = \sum_{t=1}^{T} e_{jt} \cdot x_{jt} \tag{3}$$

and N_c is the total number of clusters—the number of countries in the sample, X is the matrix of explanatory variables, e_{jt} is the residual for country j in year t, and x_j is the vector of corresponding values for the explanatory variables.

B Main results

In Table 2 we report the results of panel regressions of our measure of investment growth (non-cash assets growth) on a set of explanatory variables. We first control for firm-specific characteristics that are well-known to determine a firm's investment policy: profitability, measured by cash flow divided by total assets (Kaplan and Zingales, Fazzari et al., 1988, McConnell and Servaes, 1990); and leverage, measured by total debt to total assets (Myers and Majluf, 1984). Both variables are lagged. Ideally we would also like to control for the firm's market-to-book ratio, because according

[10] These methods are: parametric methods, block bootstrap, within-firm time series aggregation of the data, estimation of an empirical variance-covariance matrix, and the use of an arbitrary variance-covariance matrix.

to the Q theory of investments Tobin's Q (proxied by the firm's market-to-book ratio) is the main determinant of corporate investments. However, Q and investments are jointly determined. In order to avoid serious endogeneity problems we use lagged median industry–level market-to-book ratios estimated from all available firms in our sample countries, for each year in the sample. Finally, our regressions control for the ratio of cash holdings to total assets. Several papers have shown a positive relationship between cash holdings and investment (Lamont, 1997; Gertler and Hubbard, 1988; Kashyap, Lamont, and Stein, 1994). However, Blanchard, López de Silanes and Shleifer (1994) find that, on average, firms that receive a one-dollar cash windfall increase their investment by only 6 cents. The firms in their sample have in general low Qs.

One of the most important trends in Europe in the 1990's is a reduction in real interest rates, especially for the weak-EMU countries. Prior to the introduction of the euro, the weak-EMU countries suffered from credibility problems in their monetary policies resulting in high real interest rates. In addition, the Maastricht Treaty of 1992 established criteria to join EMU, which included reduction in inflation rates, interest rates, and government deficit. Therefore we estimate investment regressions excluding and including the changes in interest rates. When we estimate the investment regression including the interest rates we use the lagged level and change in 6-month risk free rate in our regressions for each country. In addition, we include the previous year term spread (10 year government bond rate minus the 6-month t-bill rate) and its change from $t = -1$ to $t = 0$ as explanatory variables.

We control for a set of macroeconomic variables. In order to capture the catching up effect, we control for the lagged growth rate in real GDP, and the lagged log of GDP per capita (in constant euros). Additionally, we control for the relative change in domestic currency with respect to the U.S. dollar. The reason is that one argument for the U.K. not joining EMU was that U.K. firms are more exposed to risks with the dollar than with the euro. By controlling for the domestic currency / dollar exchange rate, we capture the level of firm investment that is driven by the exposure to the dollar. Our regressions also include firm- and year-fixed effects.

Table 2 provides regression results for two specifications, depending on whether we control for interest rate variables, or not. In model (1) we show that EMU firms increase investments after 1998 by 2.5 percent. The coefficient is statistically and economically significant. To gauge the economic significance of the coefficient, note that the euro dummy explains $0.023 \ / \ 0.238 = 0.096$ standard deviations of the endogenous variable. This compares to $0.069 \times 0.347 \ / \ 0.238 = 0.10$ standard deviations for the lagged industry's Q, or $0.568 \times 0.076 \ / \ 0.238 = 0.18$ standard deviations

for the lagged cash flow to total assets. Leverage is negatively related to investments (economic significance of 0.23 standard deviations). The significance of the macroeconomic variables is slightly lower (0.056 standard deviations for the real GDP growth, and 0.11 standard deviations for the domestic currency / USD exchange rate).

[Insert Table 2]

In model (2) we additionally control for interest rate variables. We find that the coefficient for the euro dummy does not change, and we find economically significant negative coefficients for the interest rate variables.

We now analyze the effect of the euro for the subgroup of countries with weak currencies ("weak-EMU countries") and strong currencies ("strong-EMU countries"). The increase in investments for weak-EMU firms is 4.5 percent (significantly different from zero at the 1 percent level), compared to an increase of 1.3 percent for strong-EMU firms (insignificantly). The coefficient for the weak–EMU countries is still significant after controlling for changes in interest rates (model [4]).

C Discussion

The previous results show that, relative to non-EMU firms, firms in the Euroland invest more after 1998. There are several interpretations of this finding. First of all, and consistent with Table 1, it may reflect, not an increase in investments for EMU firms, but a relative reduction in investments for non-EMU firms. Such explanation is however not consistent with the different behavior of strong– and weak–EMU firms.

Alternatively, the euro effect may simply be a transaction cost effect, rather than an effect on firm's cost of capital. In the next sections we test this hypothesis, by classifying firms depending on their size, and their percentage of foreign sales. Transaction costs are intuitively more important for large firms with exposure to foreign markets.

The strength of the previous result comes from the fact that all countries in our sample had access to the European product and financial markets both before and after 1999. Therefore, to the extent that we find differences between EMU– and non–EMU countries, such differences are the result of the common currency only. The direct effect of the common currency was a severe convergence process that brought down interest rates, public deficits, and government debt in the affected countries. We find such process to partly explain investment increases. However, after we control for macroeconomic convergence (measured mainly by changes in the credit spreads, see

Hardouvelis et al., 2002a), there is a significant increase in investment that we deem is caused by a reduction on firms' cost of capital.

In the next section we analyze the characteristics of the new investments. In particular, we classify investments into internal, organic growth, and growth via acquisitions.

V Organic growth vs. growth through acquisitions

There are two ways how companies can generate growth. In investment opportunities are abundant, and when funds are easily available, firms will generate growth internally by investing funds in positive–NPV projects. When companies have excess funds, but positive–NPV projects are scarce, firms tend to make more acquisitions (Harford, 1999).

In this section we decompose our investment measure into organic growth, and growth through acquisitions. We obtain data on the acquisition activity of all companies in our sample from Securities Data Corporation. Because we are not interested in any particular type of acquisition, we include leveraged buyouts, tender offers, minority stake purchases, and acquisitions of remaining interest. We only consider completed deals. For each deal, we obtain the date of completion, as well as the transaction value, in constant millions of euros.[11] There are 13,865 acquisitions in the sample with data available. Then we aggregate, for each year, the euro value of the acquisitions made by each particular firm, and irrespective of whether it is a domestic or a cross-border transaction. We then compute a measure of organic growth as the real log change in non–cash assets minus acquisitions, by firm.

[Insert Table 3]

In Table 3 we report the results of similar regressions to the previous one, where the endogenous variable is organic growth (panel A). The coefficients, as well as their economic significance, are similar to the ones reported in Table 2. In particular, firms in the euro area invest internally 0.09 standard deviations more than non–EMU firms, after 1999. The classification into weak– and strong–EMU countries shows that only in the former group the euro has a significant effect (economic significance 0.16 standard deviations).

[11] The value of the transaction is the total value of consideration paid by the acquiror, excluding fees and expenses. Liabilities assumed are included in the value if they are publicly disclosed. Therefore the value of the transaction is, under purchase of asset accounting, the increase in the acquiror's assets resulting from the acquisition.

To quantify the effect of the common currency on acquisition activity we estimate a probit model on an indicator that equals one whenever the firm is engaged in an acquisition in the year, and zero otherwise. We do not estimate a linear model because the volume of acquisitions is zero for most firm–year observations.[12] Results are reported in Table 3, panel B. We report the marginal effect of each explanatory variable. In model (2) we show, after controlling for interest rates, that the probability of an EMU firm making an acquisition after 1999 is 0.024 higher than the probability of a non–EMU firm investing in acquisitions (significant at the one percent level). In models (3) and (4) we show that, relative to non–EMU firms, firms in weak–EMU countries are five percent more likely to make an acquisition, after 1999 (significant at the one percent level). The probability for strong–EMU firms is three percent higher (significant at the five percent level).

To conclude this section, we have shown that the euro has spurred investments, both internal and through acquisitions, in firms in the Euroland.

VI The euro, investments, and firm characteristics

A Results by size

Our next step is to determine which firms benefit the most from the euro. Bartram and Karolyi (2003) show that large firms have benefitted more from European monetary integration in terms of reduction in market risk. Dahlquist and Robertsson (2001) and Kang and Stulz (1997) also show that large firms benefit more from financial market integration because foreigners tend to invest in large firms.

We classify firms in our sample depending on the value of total sales in 1997, and comparing that value to the median sales for the overall sample. There are 9,177 firm-year observations in the group of small (below-median) firms, and 10,373 firm-year observations in the group of large firms. We replicate our investment regressions in Table 4.

[Insert Table 4]

We find that the effect of the euro is larger for small firms. This finding contradicts the hypothesis that the effects of the euro should be larger for large firms. Investments in the group of

[12] We have also estimated a Heckman regression, with the volume of acquisitions to total assets as the dependent variable. The results are qualitatively similar to the one presented here. We prefer the simplicity of the probit.

small firms increase by 6.3 percent (significant at the one percent level) in the weak–EMU firms. The euro dummy explains about one-fourth of the standard deviation of the endogenous variable. In contrast, large firms in weak–EMU firms increase investments by 2.9 percent after 1999 (significant at the five percent level). Such coefficient becomes insignificant once we control for interest rate variables. For small firms, a reduction in the cost of capital has a stronger effect because small firms find it relatively more costly to engage in risk management, or alternatively, are less skilled at it. In sum, the results of this section show that firms that are expected to benefit the most from the euro invest more: small firms from weak-EMU countries, which are the ones for which the elimination of the possibility of large devaluations is a priori valuable.

B Results by exposure to foreign markets

The previous results are consistent with an increase in expected cash flows of investments of EMU firms, as well as a reduction in EMU firms' cost of capital. In this section and the next we try to disentangle the two effects. Our first approach is based on the observation that an increase of investment opportunities should be equal for all firms in the Euroland, irrespective of their exposure to currency risks. However a reduction of the cost of capital should benefit those firms with exposure to the foreign markets more.

There are several ways of measuring exchange rate exposure. Jorion (1990), Bodnar and Gentry (1993), Amihud (1994), and Bris, Koskinen, and Nilsson (2003b) measure exposure based on stock returns. With variations, they all estimate a market model regression with returns in domestic currency on the left-hand-side, and market returns and exchange rates on the right hand side. The coefficient of the latter variable represents a measure of exposure to currency movements, that is independent of market–wide effects. Claessens et al. (1998) and Allayannis (1996) use the percentage of exports on sales, and the ratio of net exports to sales as a measure of a firm's exposure to currency risk. We follow such an accounting–based approach. The reason is that market-based exposure is economically difficult to interpret.[13] We obtain the ratio of foreign sales to total sales for the firms in our sample (Worldscope item #8731), and classify firms depending on their ratio relative to the overall median in 1997. Firms with a high ratio benefit from currency depreciations. Therefore these are the firms for which the elimination of devaluation risk should be the least

[13] Exchange rate betas require a subjective judgement on significance levels, and can be interpreted only depending on their sign.

valuable. We repeat our investment regressions separating the effect of foreign sales into the euro dummy. Results are in Table 4, Panel B.

Our findings can be summarized as follows: among strong-EMU firms, the effect of the euro is significant only in those firms with a large percentage of foreign sales. The increase in investment for this group of firms is 2.2 percent (significant at the 10 percent level) when we do not control for interest rate changes, and 2.9 percent when we do. Among weak-EMU firms, firms with low foreign sales increase investments (6.1 percent) more than firms with high foreign sales (2.9 percent), and the difference in coefficients is statistically significant. Therefore, reinforcing the results in section VI.A, the increase in investments is larger for firms that we expect ex ante to benefit the most from the elimination of the possibility to devalue: firms in weak–EMU countries, and especially those firms which do not benefit from currency depreciations (firms with low foreign sales); and firms in strong–EMU countries with an significant foreign exposure. The latter group corresponds to firms for which currency risks may not have been priced or currency risks may not have been economically significant (because their currencies were relatively stable), but which operate in foreign markets. This result can be explained by the fact that now weak-EMU countries could not recur to competitive devaluations any more and steal market share from export-oriented companies in strong-EMU countries.

In Panel C of Table 4 we interact foreign sales with firm size. Among weak–EMU countries, with find that only small firms invest significantly more after 1999, relative to non-EMU firms. Among small firms, the increase in investments is significantly larger for firms with lower percentage of foreign sales. Within the group of strong–EMU firms, we find, after controlling for interest rate changes, that it is only the firms with a large percentage of foreign sales the ones that increase investments. Among these, small firms invest more, although the difference with large firms is not statistically significant. It also worth noting that these results are partially consistent with the assertion made by the U.K. treasury: firms with low foreign sales do experience lower growth in investments. However this result is only true for countries with strong currencies. When the probability of a currency depreciation is high, the euro, by eliminating currency risk, induces investment growth in the most domestically-oriented firms. Consistent with our findings, Bris and Koskinen (2002) show theoretically that currency devaluations are ex-post optimal for exporting firms in small, export-oriented countries, because the government has an incentive to bail out financially-distress companies when there is an exchange rate shock.

VII Robustness tests

A Time effects

The data we use in this paper consist primarily of end-of-year accounting information. Considering 1999 as the year of introduction of the euro implies that the data for 1999 already reflects the real effects of the actual introduction of the common currency. However, already on May 2, 1998 the European Council decided on which countries were allowed to enter the final phase of the EMU. Thus, choosing (the end of) 1998 as the first year of the euro seems also reasonable. Even this choice can be considered too conservative, given that forward looking markets are likely to have taken into account the effects of the introduction of the euro already at the end of 1997, or even earlier.

In this section we perform robustness tests pertaining the date of introduction of the euro, as well as the time persistence of the effects we identify in the previous section. Table 5 reports the results. In Panel A we exclude all observations in year 1998. The reason is that, if the markets had already anticipated the effects of the common currency in 1998, then our previous results understate the true effect of the euro. The new regression shows that the coefficients of the euro dummy remain practically unchanged.

[Insert Table 5]

In Panel B, we redefine the post-euro period as the period 1998-2002. After controlling for interest rate variables, Table 5 shows that the euro dummy is significant for firms in strong–EMU countries, whereas it is insignificant in Table 2. This means that markets anticipated the effects of the euro in 1998, and particularly in those countries—Germany, France—where the probability of joining the EMU was high.

In Panel C we test the hypothesis that the effects of the euro are only temporary. To do so, we split the post–euro period into two: the two years 1999–2000, and the longer term, years 2001 and 2002. We find that the effects of the euro are mostly long term: there is no significant difference in investments between EMU– and non–EMU firms in the years 1999 and 2000. However, the effects of the common currency on investments are concentrated in the years 2001 and 2002. After controlling for interest rate changes, we find that investments in the strong–EMU firms grow 3.9 more than in non–EMU firms, after 2000. Similarly, investments in weak–EMU firms grow 4.3 percent more than in non–EMU firms, also after 2000. This is an important finding that prove,

first, that the effect of the euro on firm investments has taken time to materialize, and second, that it has been a long-term, permanent effect after 2000.

B Results by industry

Our final robustness test analyzes whether the effects we identify in the previous sections are driven by firms in a particular industry. The existing evidence supports the view that the effects of the euro have been widespread across industries. Hardouvelis et al. (2002b) study the impact of EMU on the cost of equity capital. They find that the cost of equity has been reduced in Europe in all industries, except for information technology and cyclical consumer goods. Bris, Koskinen, and Nilsson (2003), with a similar methodology to ours, find that the positive valuation effects of the euro are significant in all sectors, except non-cyclical services.

Rather than reporting the effects of the euro on investments in different industries, as we did in an earlier version of the paper,[14] we show in this section the distinctive effects we find for the IT and Telecommunications Industry. Table 6 interact the post–euro dummy with an indicator that equals one when the firm belongs to the IT and Telecommunications Industry. We find that, after excluding firms in this industry, strong–EMU firms significantly increase investments after 1998, relative to non–EMU firms (2.4 percent increase, significant at the 10 percent level). In contrast, firms in the IT–Telecommunications industry in strong–EMU countries reduce investments 9.2 percent relative to non–EMU firms (significant at the one percent level). The industry effect is not significant in weak–EMU countries.

[Insert Table 6]

C Are the results driven by a particular country?

Table A1 in the Appendix shows that most of the firms in our sample of EMU firms (734 out of 1,302, or 56 percent) are either French or German, while most of the firms in the sample of

[14] We classified firms in our sample into five industry groups: Manufacturing; Transportation, Communications and Utilities; Wholesale and Retail Trade; Services; and Agriculture, Forestry, Mining, and Construction. This classification was based on SIC codes reported by Worldscope. We found significant effects in all sectors but Agriculture, Forestry, Mining, and Construction. Only in Wholesale and Retail Trade results were significant for strong-EMU countries. For weak-EMU firms, we find positive and significant effects in Services; Manufacturing; and Transportation, Communications, and Utilities.

non–EMU firms (823 out of 1,247, or 66 percent) are from the U.K. As a last robustness check, we replicate our regressions after excluding firms from France, Germany, and the U.K., from the sample. Results are in Table 7.

[Insert Table 7]

The number of firm–year observation reduces to 7,716. The effect of the euro dummy is still significant in model (1), when we do not control for changes in interest rates. Although the effect of the euro is now statistically insignificant in model (2), the magnitude and sign of the coefficients remain. The lack of significance is certainly due to the sample size being reduced by two thirds.

VIII Conclusion

The introduction of the euro in January 1999 has led to a whole body of literature devoted to analyzing the effects of the common currency on countries and firms. At the macroeconomic level, we have evidence regarding the effects of the euro on: trade, inflation, transmission of monetary shocks, yield spreads, fiscal policy harmonization, among others.[15] At the corporate level, there are studies that analyze the impact on market risk (Bartram and Karolyi, 2003), and the cost of capital (Sentana, 2002; Hardouvelis et al. 2002; Bris et al., 2003). This paper contributes to this growing literature by documenting a significant effect of the euro on the real economic activity at the corporate level. We show that the common currency has resulted in an increase in the investment rates, which is consistent with the positive valuation effects reported in previous studies.

Our results show that the euro has benefitted companies in the EMU countries. However, the received wisdom among European pundits seem to be that the common currency has not resulted in any positive economic effects. Is there a contradiction between our results and the general opinion that the euro-area has performed poorly? We do not think so. First of all, the macroeconomic performance in the EMU countries has not been as bad as commonly believed. Over the ten year period 1994-2003 GDP per capita has grown as much in EMU countries as in the U.S., if we exclude Germany. Even including Germany, the GDP per capita growth is not much lower (1.8 percent in EMU countries, compared to 2.1 percent in the U.S.)[16]. Moreover, since we control for the

[15] See EMU: Assessing the Impact of the Euro, special issue of Economic Policy, October 2003.

[16] See the special report on Europe vs. America in the Economist, June 19th, 2004.

macroeconomic performance for our sample countries, we measure the effect of the euro after the direct macroeconomic effects have been taken into account.

We deem our contribution important not only for academics interested in the effects of common currencies. The euro is by itself a natural experiment that represented a shock to firms in its area: because of an elimination of currency risks, firms face a lower cost of capital, and better investment opportunities. Therefore, by measuring the impact of the euro on firms' investment, we contribute to the corporate finance literature in general with the following results:

- The reduction in the cost of capital that results from an elimination of currency risks is economically meaningful. This finding is in contrast with Griffin and Stulz (2001), who argue that currency risk, although statistically significant, is economically unimportant. However, they only analyze U.S. firms in a free floating exchange rate environment, for which the ability to hedge is high, and for which currency risk may then not matter. The situation in Europe before the introduction of the euro was very different: most of the currencies were pegged to each other and the changes in exchange rates were large devaluations, for which hedging was impossible or at least very expensive. Thus it is not elimination of currency risks that matter per se, but elimination of major devaluations.

- Together with the results in Bris, Koskinen, and Nilsson (2003), we find that increases in Tobin's Q result in significant increases in investments. Tests of the Q theory of investment rely on cross-sectional regressions of investment on Q, or else time-series studies, which are severely biased because of endogeneity problems (see Erickson and Whited, 2000; Fazzari et al., 1988). To our knowledge, ours is the first paper that provides results based on a differences-in-differences estimator identifiable from an external shock, and which is free of endogeneity problems.

Our paper gives rise to several possible extensions. After looking at value and investment changes driven by the introduction of the euro, the next question is how this investments have been financed. As Stulz (1999) points out, a reduction in the cost of capital entails a reduction in the cost of equity as well as in the cost of debt. Therefore, whether financial integration and cost of capital reductions lead to a preference of equity over debt, or vice versa, remains an open question[17]. Moreover, our

[17] Our preliminary results in Bris, Koskinen, and Nilsson (2002) suggest, that the investments have been financed with debt.

paper does not analyze the geography of investment. Even thought it would be possible, from our data, determine how much growth through acquisitions is gained abroad, Worldscope does not provide reliable information on firm–level foreign investment.[18] It would be, however, extremely interesting to study whether the additional investments that we identify in this paper are mainly, foreign, domestic, or both.

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[18] Worldscope reports firm-level data on foreign sales and assets, classified by target region. However there are several problems with this data. First of all the definition of *region* is firm-specific, so some firms report investments in "Scandinavia", while other firms report investments in "Western Europe". Therefore it is difficult to distinguish investment in the EMU area, investment in the EU, non-EMU area, investment in Switzerland and Norway, and the rest. Secondly, we found that the sum of all reported investments was in many cases higher than the total investments reported in Worldscope as a single item.

References

Allayannis, George (1996), Exchange-rate exposure revisited, DSWP 97-06, Darden School, University of Virginia.

Amihud, Yakov (1994), Exchange rates and the valuation of equity shares, in Y. Amihud and R M. Levich (eds.), *Exchange rates and corporate performance*, pp. 49-59, Irwin, New York.

Barr, David, Francis Breedon, and David Miles (2003), Life on the outside: Economic conditions and prospects outside Euroland, *Economic Policy* 18, 573-613.

Bartram, Söhnke and G. Andrew Karolyi (2003), The impact of the introduction of the euro on foreign exchange risk exposures, working paper.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan (2004), How much should we trust differences-in-differences estimates?, *Quarterly Journal of Economics*, forthcoming.

Bodnar, Gordon M., and W. Gentry (1993), Exchange rate exposure and industry characteristics: Evidence from Canada, Japan, and the US, *Journal of International Money and Finance* 12, 29-45.

Blanchard, Oliver, Florencio López de Silanes, and Andrei Shleifer (1994), What do firms do with cash windfalls?, *Journal of Financial Economics* 36, 337-360.

Bris Arturo, and Yrjö Koskinen (2002), Corporate leverage and currency crises, *Journal of Financial Economics,* 63, 275-310.

Bris, Arturo, Yrjö Koskinen, and Mattias Nilsson (2002), The euro is good after all: Corporate evidence, SSE/EFI working paper no. 510.

Bris, Arturo, Yrjö Koskinen, and Mattias Nilsson (2003), The euro and corporate valuations, SSE/EFI working paper no. 525.

Bun, Maurice J.G., and Franc J.G.M. Klaassen (2002), Has the euro increased trade?, working paper.

Claessens Stijn, Simeon Djankov and Larry Lang (1998), East Asian corporates: Growth, financing and risks over the last decade, working paper, World Bank.

Dahlquist, Magnus, and Göran Robertsson (2001), Direct foreign ownership, institutional investors, and firm characteristics , *Journal of Financial Economics* 59, 413-440.

De Santis, Giorgio, Bruno Gerard, and Pierre Hillion (2003), The relevance of currency risk in the EMU, *Journal of Economics and Business* 55, 427-462.

Erickson, Timothy, and Toni M. Whited (2000), Measurement error and the relationship between investment and "Q", *Journal of Political Economy* 108, 1027-1057.

Fazzari, Steven, R. Glenn Hubbard, and Bruce Petersen (1988), Financing constraints and corporate investment, *Brookings Papers on Economic Activity*, 141-195.

Frankel, Jeffrey, and Andrew Rose (2002), An estimate of the effect of common currencies on trade and income, *Quarterly Journal of Economics* 117, 437-466.

Gertler, Mark, and R. Glenn Hubbard (1988), Financial factors in business fluctuations, in *Financial Market Volatility,* Federal Reserve Bank of Kansas City, Kansas City, Mo.

Glick, Reuven, and Andrew Rose (2002), Does a currency union affect trade? The time-series evidence, *European Economic Review* 46, 1125-1151.

Griffin, John, and René Stulz (2001), International competition and exchange rate shocks: A cross-country industry analysis, *Review of Financial Studies* 14, 215-241.

Hardouvelis, Gikas A., Dimitrios Malliaropoulos, and Richard Priestley (2002a), EMU and European stock market integration, working paper.

Hardouvelis, Gikas A., Dimitrios Malliaropoulos, and Richard Priestley (2002b), The impact of globalization on the equity cost of capital, working paper.

Harford, Jarrad (1999), Corporate cash reserves and acquisitions, *Journal of Finance* 54, 1969-1997.

Hoshi, Takeo, Anil Kashyap, and David Scharfstein (1991), Corporate structure, liquidity, and investment: Evidence from Japanese industrial groups, *Quarterly Journal of Economics* 56, 33-60

Jorion, Philippe (1990), The exchange rate exposure of US multinationals, *Journal of Business* 63, 331-345.

Kaplan, Steven N., and Luigi Zingales (1997), Do investment-cash flow sensitivities provide useful measures of financing constraints?, *Quarterly Journal of Economics* 112, 169-216.

Kashyap, Anil K., Owen A. Lamont, and Jeremy C. Stein (1994), Credit conditions and the cyclical behavior of inventories, *Quarterly Journal of Economics* 109, 565-592.

Lamont, Owen (1994), Cash flow and investment: Evidence from internal capital markets, *Journal of Finance* 52, 83-109.

Massa, Massimo, Urs Peyer, and Zhenxu Tong (2004), Limits of arbitrage and corporate financial policy, working paper, INSEAD.

Micco, Alejandro, Ernesto Stein, and Guillermo Ordóñez (2003), The currency union effect on trade: Early evidence from EMU, *Economic Policy* 18, 315-356.

Myers, Stewart, and Nicholas Majluf (1984), Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221.

Rose, Andrew (2000), One money, one market: Estimating the effect of common currencies on trade, *Economic Policy* 15, 9-48.

Rose, Andrew, and Eric van Wincoop (2001), National money as a barrier to trade: The real case for monetary union, *American Economic Review* 91, 386-390.

Sentana, Enrique (2002), Did the EMS reduce the cost of capital?, *Economic Journal* 112, 786-809.

Stulz, René (1999), Globalization of capital markets and the cost of capital, *Journal of Applied Corporate Finance*, Fall , 8-25.

Whited, Toni M. (1992), Debt, liquidity constraints, and corporate investment: Evidence from panel data, *Journal of Finance* 47, 1425-1470.

Table 1. Mean and median corporate investments before and after the introduction of the euro: Euro countries vs. non-euro countries

The table displays mean and median investment rates for the pre-euro time period (1994-1998) and the post-euro time-period (1999-2002), respectively, for all firms from the Euro-countries (except Greece) and five Non-euro countries (Denmark, Norway, Sweden, Switzerland, and UK) with valid data available in Worldscope for at least the time period 1997-1999. The euro-countries classified as weak (i.e., countries with a recent currency crisis) are: Finland, Italy, Ireland, Portugal and Spain. Corporate investments is measured by the real log growth rate of non-cash assets (=log[inflation adjusted non-cash $assets_t$ / inflation-adjusted non-cash $assets_{t-1}$]). The real growth rate of non-cash assets is winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. All data is collected from Worldscope. The tests of differences are based on standard t-tests for the mean values and Wilcoxon rank-sum tests for the median values.

		Corporate investments	
		Pre-euro time period (1994-1998)	Post-euro time period (1999-2002)
Euro countries (excluding Greece):			
Mean		0.070	0.053
Median		0.041	0.030
Number of firm-year observations		5,682	4,426
Strong-euro countries:			
Mean		0.073	0.048
Median		0.044	0.029
Number of firm-year observations		4,194	3,263
Weak-euro countries:			
Mean		0.063	0.066
Median		0.029	0.033
Number of firm-year observations		1,488	1,163
Non-euro countries:			
Mean		0.106	0.043
Median		0.064	0.014
Number of firm-year observations		5,361	4,081
Tests of differences (p-values)			
Euro vs. non-euro countries:	Mean	-6.83 (0.000)	1.76 (0.079)
	Median	-9.00 (0.000)	4.38 (0.000)
Strong-euro vs. non-euro countries:	Mean	-5.32 (0.000)	0.78 (0.435)
	Median	-7.13 (0.000)	3.37 (0.001)
Weak euro vs. non-euro countries:	Mean	-6.05 (0.000)	2.60 (0.009)
	Median	-8.19 (0.000)	4.21 (0.000)
Strong- vs. weak-euro countries:	Mean	2.69 (0.007)	-2.48 (0.013)
	Median	3.54 (0.000)	-1.87 (0.061)

Table 2. The introduction of the euro and corporate investments: Regression analysis

The sample covers the time period 1994-2002 and includes all firms from the euro-countries (except Greece) and five non-euro countries (Denmark, Norway, Sweden, Switzerland, and UK) with valid data available in Worldscope for at least the time period 1997-1999. Estimation by OLS with fixed firm and year effects. Corporate investments are measured by the real log growth rate of non-cash assets (=log[inflation-adjusted non-cash $assets_t$ / inflation-adjusted non-cash $assets_{t-1}$]). The dependent variables, as well as the firm specific characteristics that are used as controls, have been winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. The post-euro time period is defined as the years 1999-2002. The euro-countries classified as weak (i.e., countries with a recent currency crisis) are: Finland, Italy, Ireland, Portugal and Spain. Reported *t*-statistics are based on robust standard errors adjusted for dependence across firms within countries. *, **, and ***, denotes significance at the 10%, 5%, and 1%-levels, respectively.

Panel A: Total investments

			Dependent variable: Corporate investments							
			(1)		(2)		(3)		(4)	
	Mean	St Dev	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Euro country x post-euro time period dummy	0.226	0.419	0.023 **	2.16	0.025 **	2.18				
Strong euro country x post-euro time period dummy	0.167	0.373					0.013	1.24	0.019	1.52
Weak euro country x post-euro time period dummy	0.059	0.237					0.045 ***	4.38	0.039 ***	2.85
Lagged industry Q	1.360	0.347	0.069 ***	9.55	0.069 ***	9.48	0.069 ***	9.68	0.068 ***	9.54
Lagged cash flow/total assets	0.090	0.076	0.568 ***	7.71	0.563 ***	7.54	0.566 ***	7.62	0.562 ***	7.5
Lagged cash holdings/total assets	0.109	0.115	0.613 ***	9.59	0.616 ***	9.70	0.613 ***	9.51	0.615 ***	9.66
Lagged leverage	0.598	0.175	-0.307 ***	-3.68	-0.305 ***	-3.69	-0.305 ***	-3.67	-0.305 ***	-3.71
Lagged GDP growth	0.026	0.015	0.891 **	1.79	0.646	1.21	0.961 **	1.98	0.729	1.38
Lagged log[GDP/capita]	10.148	0.278	0.003	0.03	-0.077	-1.37	-0.081	-0.66	-0.121	-1.55
Relative change in domestic currency/USD exchange rate	0.015	0.094	0.287 ***	4.86	0.229 ***	3.15	0.285 ***	4.75	0.236 ***	3.22
Lagged short-term interest rate	0.052	0.018			-1.735 ***	-3.83			-1.417 ***	-3.01
Lagged term spread	0.011	0.013			-1.831 **	-2.17			-1.567 *	-1.78
Change in short-term interest rate	-0.004	0.011			-1.855 **	-2.44			-1.844 **	-2.45
Change in term spread	0.001	0.012			-2.858 **	-2.04			-2.821 **	-2.06
Dependent variable	0.070	0.238								
Fixed firm effects			YES		YES		YES		YES	
Year dummies			YES		YES		YES		YES	
Adjusted R^2			0.236		0.237		0.236		0.237	
Number of firm-year observations			19,550		19,550		19,550		19,550	

Table 3. Organic Growth vs. Growth through Acquisitions

The sample covers the time period 1994-2002 and includes all firms from the euro-countries (except Greece) and five non-euro countries (Denmark, Norway, Sweden, Switzerland, and UK) with valid data available in Worldscope for at least the time period 1997-1999. Panel A analyze the effect of the euro on organic firm growth. The dependent variable is the real log growth rate of non-cash assets (=log[inflation-adjusted non-cash $assets_t$ / inflation-adjusted non-cash $assets_{t-1}$]) after removing increases in assets due to any form of acquisition .Estimation by OLS with fixed firm and year effects. The dependent variable, as well as the firm specific characteristics that are used as controls, have been winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. Panel B analyze the effect of the euro on firm growth through acquisitions. The dependent variable is equal to 1 if a firm has made any form of acquisition in any given year, and is equal to 0 otherwise. Estimation by probit with fixed country and year effects. The firm specific characteristics that are used as controls, have been winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. Panel B reports the marginal effects (dF/dx) from the probit models rather than the underlying coefficient estimates, where the effects are evaluated at the discrete change of going from 0 to 1 for dummy variables and at the sample means for continuous variables. In both Panels, the post-euro time period is defined as the years 1999-2002. The euro-countries classified as weak (i.e., countries with a recent currency crisis) are: Finland, Italy, Ireland, Portugal and Spain. Reported *t*- and z-statistics are based on robust standard errors adjusted for dependence across firms within countries. *, **, and ***, denotes significance at the 10%, 5%, and 1%-levels, respectively.

Panel A: Organic Growth

			Dependent variable: Corporate investments excluding M&A activity							
			(1)		(2)		(3)		(4)	
	Mean	St Dev	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat
Euro country x post-euro time period dummy	0.226	0.419	0.022 **	2.24	0.024 **	2.32				
Strong euro country x post-euro time period dummy	0.167	0.373					0.013	1.21	0.019	1.58
Weak euro country x post-euro time period dummy	0.059	0.237					0.045 ***	5.27	0.037 ***	2.74
Lagged industry Q	1.360	0.347	0.049 ***	6.72	0.049 ***	6.53	0.049 ***	6.85	0.049 ***	6.56
Lagged cash flow/total assets	0.090	0.076	0.528 ***	8.14	0.524 ***	7.94	0.526 ***	8.03	0.523 ***	7.89
Lagged cash holdings/total assets	0.109	0.115	0.535 ***	16.28	0.538 ***	16.69	0.535 ***	16.01	0.537 ***	16.60
Lagged leverage	0.598	0.175	-0.289 ***	-3.36	-0.288 ***	-3.35	-0.287 ***	-3.35	-0.287 ***	-3.36
Lagged GDP growth	0.026	0.015	0.840 *	1.74	0.524	1.09	0.911 **	1.96	0.600	1.25
Lagged log[GDP/capita]	10.148	0.278	-0.026	-0.27	-0.084	-1.57	-0.112	-0.90	-0.124	-1.57
Relative change in domestic currency/USD exchange rate	0.015	0.094	0.291 ***	5.49	0.228 ***	3.54	0.289 ***	5.34	0.234 ***	3.63
Lagged short-term interest rate	0.052	0.018			-1.669 ***	-3.88			-1.379 ***	-2.75
Lagged term spread	0.011	0.013			-1.492 *	-1.87			-1.252	-1.44
Change in short-term interest rate	-0.004	0.011			-1.908 **	-2.53			-1.898 **	-2.55
Change in term spread	0.001	0.012			-2.696 **	-2.02			-2.662 **	-2.04
Dependent variable	0.052	0.233								
Fixed firm effects			YES		YES		YES		YES	
Year dummies			YES		YES		YES		YES	
Adjusted R^2			0.201		0.202		0.201		0.202	
Number of firm-year observations			19,550		19,550		19,550		19,550	

Table 3. continued

Panel B: Growth through Acquisitions (Probit model)

			Dependent variable: Acquisition activity (=1 if firm is making acquisition in year t; =0 otherwise)							
			(1)		(2)		(3)		(4)	
	Mean	St Dev	dF/dx	*z*-stat	dF/dx	*z*-stat	dF/dx	*z*-stat	dF/dx	*z*-stat
Euro country x post-euro time period dummy	0.226	0.419	0.024 ***	2.75	0.034 ***	3.54				
Strong euro country x post-euro time period dummy	0.167	0.373					0.010	0.90	0.030 **	2.09
Weak euro country x post-euro time period dummy	0.059	0.237					0.052 ***	6.12	0.044 ***	3.72
Lagged industry Q	1.360	0.347	0.029 **	2.53	0.028 **	2.53	0.029 **	2.54	0.028 **	2.53
Lagged cash flow/total assets	0.090	0.076	0.425 ***	9.46	0.425 ***	9.35	0.424 ***	9.34	0.425 ***	9.33
Lagged cash holdings/total assets	0.109	0.115	0.071 **	2.19	0.072 **	2.22	0.071 **	2.21	0.072 **	2.22
Lagged leverage	0.598	0.175	0.190 ***	10.36	0.192 ***	10.49	0.191 ***	10.43	0.192 ***	10.51
Lagged GDP growth	0.026	0.015	0.311	1.06	0.296	0.81	0.410	1.60	0.351	0.95
Lagged log[GDP/capita]	10.148	0.278	-0.117 *	-1.87	-0.164 ***	-3.77	-0.215 ***	-3.83	-0.190 ***	-3.00
Relative change in domestic currency/USD exchange rate	0.015	0.094	0.014	0.30	-0.013	-0.24	0.010	0.22	-0.011	-0.20
Lagged short-term interest rate	0.052	0.018			-1.547 ***	-2.94			-1.359 **	-2.16
Lagged term spread	0.011	0.013			-1.683 **	-2.28			-1.509 *	-1.73
Change in short-term interest rate	-0.004	0.011			-0.664	-0.93			-0.654	-0.92
Change in term spread	0.001	0.012			-0.391	-0.42			-0.351	-0.37
Fixed country effects			YES		YES		YES		YES	
Year dummies			YES		YES		YES		YES	
Psuedo R^2			0.106		0.106		0.105		0.106	
Number of firm-year observations			19,550		19,550		19,550		19,550	

Table 4. The introduction of the euro and corporate investments: Size and foreign sales effects

The sample covers the time period 1994-2002 and includes all firms from the euro-countries (except Greece) and five non-euro countries (Denmark, Norway, Sweden, Switzerland, and UK) with valid data available in Worldscope for at least the time period 1997-1999. Estimation by OLS with fixed firm and year effects. Corporate investments are measured by the real log growth rate of non-cash assets (=log[inflation-adjusted non-cash $assets_t$ / inflation-adjusted non-cash $assets_{t-1}$]).The dependent variable, as well as the firm specific characteristics that are used as controls, have been winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. The post-euro time period is defined as the years 1999-2002. The euro-countries classified as weak (i.e., countries with a recent currency crisis) are: Finland, Italy, Ireland, Portugal and Spain. In Panel A, a firm is classified as small if its sales are at or below its country median value of sales in 1997; otherwise it is classified as large. In Panel B, a firm is classified as having large foreign sales if its fraction foreign sales of total sales are above its country median value of fraction foreign sales in 1997; otherwise it is classified as having small foreign sales. The same control variables and interest rate variables as in Table 2 have been included where indicated, but their coefficient estimates are not reported. Reported *t*-statistics are based on robust standard errors adjusted for dependence across firms within countries. *, **, and ***, denotes significance at the 10%, 5%, and 1%-levels, respectively.

	Dependent variable: Corporate investments			
	(1)		(2)	
	Coefficient	*t*-stat	Coefficient	*t*-stat
Panel A: Size effects				
Strong euro country x large firm x post-euro time period	0.017	1.29	0.023	1.62
Strong euro country x small firm x post-euro time period	0.009	0.91	0.015	1.23
Weak euro country x large firm x post-euro time period	0.029 **	2.51	0.021	1.36
Weak euro country x small firm x post-euro time period	0.063 ***	6.11	0.058 ***	4.59
Interest rate variables	NO		YES	
Control variables	YES		YES	
Fixed firm effects	YES		YES	
Year dummies	YES		YES	
Adjusted R^2	0.236		0.237	
Number of firm-year observations	19,550		19,550	
Panel B: Foreign sales effects				
Strong euro country x large foreign sales x post-euro time period	0.022 **	2.17	0.029 **	2.40
Strong euro country x small foreign sales x post-euro time period	0.003	0.28	0.009	0.67
Weak euro country x large foreign sales x post-euro time period	0.029 **	2.12	0.023	1.55
Weak euro country x small foreign sales x post-euro time period	0.061 ***	4.26	0.055 ***	3.04
Interest rate variables	NO		YES	
Control variables	YES		YES	
Fixed firm effects	YES		YES	
Year dummies	YES		YES	
Adjusted R^2	0.236		0.237	
Number of firm-year observations	19,550		19,550	
Panel C: Interaction between size and foreign sales				
Strong euro country x large firm x large foreign sales	0.018	1.38	0.024 *	1.73
Strong euro country x large firm x small foreign sales	0.015	0.99	0.022	1.30
Strong euro country x small firm x large foreign sales	0.030 **	2.12	0.037 **	2.37
Strong euro country x small firm x small foreign sales	-0.005	-0.47	0.001	0.07
Weak euro country x large firm x large foreign sales	0.027	1.51	0.019	1.13
Weak euro country x large firm x small foreign sales	0.030	1.13	0.023	0.73
Weak euro country x small firm x large foreign sales	0.033 ***	3.75	0.027 **	2.12
Weak euro country x small firm x small foreign sales	0.083 ***	6.86	0.078 ***	5.67
Interest rate variables	NO		YES	
Control variables	YES		YES	
Fixed firm effects	YES		YES	
Year dummies	YES		YES	
Adjusted R^2	0.236		0.237	
Number of firm-year observations	19,550		19,550	

Table 5. The introduction of the euro and corporate investments: Individual year and other time effects.

The sample covers the time period 1994-2002 and includes all firms from the euro-countries (except Greece) and five non-euro countries (Denmark, Norway, Sweden, Switzerland, and UK) with valid data available in Worldscope for at least the time period 1997-1999. Estimation by OLS with fixed firm and year effects. Corporate investments are measured by the real log growth rate of non-cash assets (=log[inflation-adjusted non-cash $assets_t$ / inflation-adjusted non-cash $assets_{t-1}$]). The dependent variable, as well as the firm specific characteristics that are used as controls, have been winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. The post-euro time period is defined as the years 1999-2002 in Panel A. In Panel B, the post-euro time period is defined as the years 1998-2002. In Panel C, the post-euro time period is divided into two sub periods: the years 1999-2000, and the years 2001-2002, respectively. The euro-countries classified as weak (i.e., countries with a recent currency crisis) are: Finland, Italy, Ireland, Portugal and Spain. The same control variables and interest rate variables as in Table 2 have been included where indicated, but their coefficient estimates are not reported. Reported *t*-statistics are based on robust standard errors adjusted for dependence across firms within countries. *, **, and ***, denotes significance at the 10%, 5%, and 1%-levels, respectively.

	Dependent variable: Non-cash assets growth rate			
	(1)		(2)	
	Coefficient	*t*-stat	Coefficient	*t*-stat
Panel A: Excluding all observations in year 1998				
Strong euro country x post-euro time period dummy	0.016	1.21	0.024	1.59
Weak euro country x post-euro time period dummy	0.046 ***	4.18	0.043 ***	2.60
Interest rate variables	NO		YES	
Control variables	YES		YES	
Fixed firm effects	YES		YES	
Year dummies	YES		YES	
Adjusted R^2	0.205		0.205	
Number of firm-year observations	17,001		17,001	
Panel B: Post-euro time period defined as 1998-2002				
Strong euro country x post-euro time period dummy	0.018	1.46	0.023 **	2.02
Weak euro country x post-euro time period dummy	0.041 ***	3.29	0.028 *	1.66
Interest rate variables	NO		YES	
Control variables	YES		YES	
Fixed firm effects	YES		YES	
Year dummies	YES		YES	
Adjusted R^2	0.201		0.202	
Number of firm-year observations	19,550		19,550	
Panel C: Short-term vs. longer-term effects of the euro				
Strong euro country x indicator for years 1999-2000	-0.005	-0.29	0.003	0.19
Strong euro country x indicator for years 2001-2002	0.034 ***	2.64	0.039 ***	2.84
Weak euro country x indicator for years 1999-2000	0.035 **	2.53	0.026	1.44
Weak euro country x indicator for years 2001-2002	0.059 ***	4.68	0.043 **	2.46
Interest rate variables	NO		YES	
Control variables	YES		YES	
Fixed firm effects	YES		YES	
Year dummies	YES		YES	
Adjusted R^2	0.202		0.202	
Number of firm-year observations	19,550		19,550	

Table 6. The introduction of the euro and corporate investments: The effect of telecommunications and IT-services industries

The sample covers the time period 1994-2002 and includes all firms from the euro-countries (except Greece) and five non-euro countries (Denmark, Norway, Sweden, Switzerland, and UK) with valid data available in Worldscope for at least the time period 1997-1999. Estimation by OLS with fixed firm and year effects. Corporate investments are measured by the real log growth rate of non-cash assets (=log[inflation-adjusted non-cash $assets_t$ / inflation-adjusted non-cash $assets_{t-1}$]). The dependent variable, as well as the firm specific characteristics that are used as controls, have been winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. The post-euro time period is defined as the years 1999-2002. The euro-countries classified as weak (i.e., countries with a recent currency crisis) are: Finland, Italy, Ireland, Portugal and Spain. Firms are classified as IT or Telecommunication firms based on industry classification provided by Datastream. The same control variables and interest rate variables as in Table 2 have been included where indicated, but their coefficient estimates are not reported. The reported *t*-statistics are based on robust standard errors adjusted for dependence across firms within countries. *, **, and ***, denotes significance at the 10%, 5%, and 1%-levels, respectively.

	Dependent variable: Corporate investments					
	(1)			(2)		
	Coefficient		*t*-stat	Coefficient		*t*-stat
Strong euro country x post-euro time period	0.018		1.56	0.024	*	1.78
Strong euro country x IT or Telecom-firm x post-euro time period	-0.093	***	-5.06	-0.092	***	-5.04
Weak euro country x post-euro time period	0.042	***	4.09	0.036	***	2.83
Weak euro country x IT or Telecom-firm x post-euro time period	0.038		0.83	0.037		0.81
Interest rate variables	NO			YES		
Control variables	YES			YES		
Fixed firm effects	YES			YES		
Year dummies	YES			YES		
Adjusted R^2	0.237			0.237		
Number of firm-year observations	19,550			19,550		

Table 7. The introduction of the euro and corporate investments: Regression analysis excluding France, Germany and the UK.

The sample covers the time period 1994-2002 and includes all firms from the euro-countries, except France and Germany (and Greece), and four non-euro countries (Denmark, Norway, Sweden, and Switzerland,) with valid data available in Worldscope for at least the time period 1997-1999. Estimation by OLS with fixed firm and year effects. Corporate investments are measured by the real log growth rate of non-cash assets (=log[inflation-adjusted non-cash assets$_t$ / inflation-adjusted non-cash assets$_{t-1}$]). The dependent variable, as well as the firm specific characteristics that are used as controls, have been winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. The post-euro time period is defined as the years 1999-2002. The euro-countries classified as weak (i.e., countries with a recent currency crisis) are: Finland, Italy, Ireland, Portugal and Spain. The same control variables and interest rate variables as in Table 2 have been included where indicated, but their coefficient estimates are not reported. The reported *t*-statistics are based on robust standard errors adjusted for dependence across firms within countries. *, **, and ***, denotes significance at the 10%, 5%, and 1%-levels, respectively. .

			Dependent variable: Corporate investments			
			(1)		(2)	
	Mean	St Dev	Coefficient	*t*-stat	Coefficient	*t*-stat
Strong euro country x post-euro time period dummy	0.103	0.304	0.023	0.83	0.027	1.08
Weak euro country x post-euro time period dummy	0.151	0.358	0.050 **	1.96	0.033	1.25
Lagged industry Q	1.329	0.318	0.073 ***	3.41	0.074 ***	3.45
Lagged cash flow/total assets	0.092	0.067	0.525 ***	5.84	0.512 ***	5.71
Lagged cash holdings/total assets	0.114	0.112	0.522 ***	10.69	0.528 ***	11.16
Lagged leverage	0.604	0.166	-0.357 ***	-5.48	-0.361 ***	-5.36
Lagged GDP growth	0.028	0.019	1.114 *	1.70	0.869	1.47
Lagged log[GDP/capita]	10.225	0.360	-0.177	-1.16	-0.148 *	-1.69
Relative change in domestic currency/USD exchange rate	0.020	0.107	0.023	0.83	0.569 ***	7.55
Lagged short-term interest rate	0.050	0.022			-1.475 **	-1.99
Lagged term spread	0.013	0.011			-0.766	-0.48
Change in short-term interest rate	-0.005	0.012			-2.499 **	-2.44
Change in term spread	0.002	0.011			-2.433	-1.39
Dependent variable	0.067	0.229				
Fixed firm effects			YES		YES	
Year dummies			YES		YES	
Adjusted R^2			0.215		0.217	
Number of firm-year observations			7,716		7,716	

APPENDIX

Table A1. Total number of firms and firm-year observations per country

	Number of firms	Number of firm-year observations
Euro countries (excluding Greece):		
Austria	56	430
Belgium	53	430
Finland	70	552
France	371	2,787
Germany	363	2,833
Ireland	30	242
Italy	101	792
Luxemburg	4	34
Netherlands	117	943
Portugal	50	367
Spain	87	698
TOTAL	1,302	10,108
Non-euro countries:		
Denmark	114	866
Norway	79	550
Sweden	109	812
Switzerland	122	1,000
United Kingdom	823	6,214
TOTAL	1,247	9,442

Table A2. Mean and median corporate investments, 1994-2002: Euro vs. non-euro firms

The table displays mean and median investment rates over the time-period 1994-2002 for all firms from the Euro-countries (except Greece) and five Non-euro countries (Denmark, Norway, Sweden, Switzerland, and UK) with data available in Datastream for at least the time period 1995-1998. Corporate investments are measured by the real log growth rate of non-cash assets (=log[inflation-adjusted non-cash $assets_t$ / inflation-adjusted non-cash $assets_{t-1}$]). The growth rate of non-cash assets is winsorized at the 1st and 99th percentile values of the total sample to reduce the influence of outliers. All data is collected from Worldscope.

	Year								
Corporate investments	1994	1995	1996	1997	1998	1999	2000	2001	2002
Euro countries (excluding Greece):									
Mean	0.040	0.002	0.098	0.132	0.061	0.106	0.098	0.012	-0.040
Median	0.014	-0.024	0.081	0.091	0.025	0.073	0.074	-0.002	-0.043
Number of firms	955	1,018	1,105	1,302	1,302	1,302	1,187	1,066	871
Strong euro countries:									
Mean	0.047	0.015	0.104	0.128	0.056	0.097	0.092	0.010	-0.041
Median	0.019	-0.010	0.085	0.088	0.026	0.071	0.071	0.001	-0.043
Number of firms	702	750	814	964	964	964	882	788	629
Weak euro countries:									
Mean	0.020	-0.033	0.079	0.144	0.075	0.133	0.118	0.018	-0.038
Median	-0.002	-0.061	0.061	0.096	0.018	0.084	0.086	-0.005	-0.043
Number of firms	253	268	291	338	338	338	305	278	242
Non-euro countries:									
Mean	0.112	0.038	0.109	0.151	0.107	0.078	0.135	-0.055	-0.018
Median	0.078	0.002	0.066	0.112	0.054	0.037	0.097	-0.051	-0.023
Number of firms	886	937	1,044	1,247	1,247	1,247	1,077	961	796