

DID FINANCIAL PERFORMANCE OF EUROPEAN FIRMS IMPROVE AND CONVERGE AFTER INTRODUCTION OF THE EURO?

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ABSTRACT

This paper examines the effect of the Euro on financial performance of companies in the European countries. The main objective is to study the impact of the financial liberalization on firm performance in individual countries, and on cross-country convergence of firms in different aspects of financial performance, including profitability, investment, leverage, and firm valuation. This research finds evidence of improvements in financial performance for European companies after the introduction of the Euro. Furthermore, evidence points at significant convergence in financial performance for countries that implemented the common currency. Overall, financial liberalization had a positive effect on firm performance in Europe.

JEL: F36, G15

KEYWORDS: financial liberalization, Euro, firm performance

INTRODUCTION

The purpose of this paper is to examine the effect of the Euro on financial performance of European companies. I study the changes in profitability, capital investment, leverage, dividend policies, and market valuation of European firms around the introduction of the common currency, and perform cross-country convergence analysis of these performance measures. Theory suggests that the common currency should reduce transaction costs and lead to improvements in firm performance and to business cycle convergence. The paper uses financial statements data from the Datastream between 1980 and 2006 and analyzes median performance measures using quantile regression analysis. Existence of additional evidence of improvements in financial performance is discovered, as well as evidence of convergence in performance for European countries.

I conduct a study of changes in company financial performance related to introduction of the Euro. Present analysis investigates financial liberalization in the European countries and its effect on the company performance around the introduction of the Euro in 1999, and on convergence in performance in the European countries. To the best of my knowledge, this research is the first comprehensive study of convergence in firm financial performance related to the introduction of the common currency in Europe.

The paper is organized as follows. The next section outlines relevant literature, the following section describes the data, hypotheses and methodology. Section four presents the results and is followed by the conclusion.

LITERATURE REVIEW

The introduction of the common currency in Europe in 1999 presents researchers with a chance to study the influence of financial liberalization on companies in different countries. Current literature suggests that deregulation should increase firm performance. For example, Errunza and Senbet (1981) offer theory that links international corporate diversification to imperfections in the financial markets resulting from international barriers to capital flows; they find evidence that links excess market value and degree of

international involvement for firms. Morck and Yeung (1991) discover evidence that multinational firms enjoy positive impact of spending on research and development (R&D) and advertising, but the international involvement alone does not create market value. Rose (2000) uses a gravity model framework and finds a large positive effect of a currency union on international trade. Rose and van Wincoop (2001) argue that there exist very large benefits to currency unions from increased international trade, and that the benefits of improvements in trade should outweigh the costs of abandoning independent monetary policies by individual countries. Efthymios et al (2003) study technical and allocative efficiency of Greek banking system during 1993–1998 and find efficiency improvement for the medium-sized banks and technical change improvement for larger banks.

Several studies find that currency risk is significant risk factor, and thus elimination of the currency risk because of the Euro should make company cash flows more stable and increase market valuation, *ceteris paribus*. Dumas and Solnik (1995) examine the effect of foreign exchange risks on pricing in the international financial markets, and find evidence of foreign exchange risk premia for equities and currencies. De Santis and Gerard (1998) use a framework of the conditional International Capital Asset Pricing Model and uncover evidence of significant currency risk premia in returns. Carrieri (2001) examines the effects of financial liberalization on the pricing of market and currency risk in the European Union (EU) and observes a decline in all prices of risk. De Santis et al (2003) investigate the dynamics of international financial markets. They find that the currency risk is indeed a significant component in asset returns.

Financial liberalization should lead to an increased degree of capital market integration, which subsequently changes company cost of capital and leverage. Many studies present evidence linking financial liberalization to increased integration of the capital markets. For example Errunza and Losq (1989) study the effect of barriers to international capital flows on security pricing, and on optimal portfolio choice and monetary gains for investors in different countries. They argue that elimination of capital flow controls should lead to improvements in market valuations for securities and in welfare of investors. Bekaert and Harvey (1995) propose a measure of capital market integration based on a time varying regime-switching model. They find that the degree of market integration varies through time for many emerging countries, and discover cross-country differences in the degree of integration. Hardouvelis et al. (2006) study stock market integration in Europe during the 1990s. They find evidence that the European markets converged toward full integration after the introduction of the Euro.

Adler and Dumas (1983) study equilibrium pricing, risk-return trade-offs, and optimal portfolio choice in international financial markets. They offer a theory, which implies that capital market integration should lead to a reduction in the cost of capital. Empirical evidence found by De Santis and Gerard (1998) and Carrieri (2001), among others, provides support to the theory. The cost of capital, among other factors, should lead to increases in market valuations. Bris et al (2004) study changes in corporate valuations that followed after the introduction of the Euro and find that the common currency resulted in higher firm valuation as measured by Tobin's Q.

Some studies suggest that financial liberalization is not the only factor that should lead to changes in firm performance. La Porta et al (1998) discover that legal system and law enforcement may have an effect in determining corporate governance practices within specific countries. Stulz (1999) examines the effect of liberalization on the cost of equity capital and argues that the cost of equity capital should decrease due to decreases in risk and agency costs. Empirical evidence supports the theory but the effects are lower than expected. Stulz (2005) finds that the result of systematic reductions in cross-border capital flow restrictions is surprisingly small. He argues that agency problems and inefficient ownership concentration may be inhibiting economic growth and financial development in individual countries.

Research of business cycle convergence in the countries that undergo financial liberalization produced mixed results. Davis (1998) studies the effect of national market size on industrial structure and suggests that countries should converge in business cycle after liberalization. Many empirical studies mostly support this theory. In particular, Frankel and Rose (1998) investigate the relationship between international trade and correlation of a domestic business cycle with those of other countries in a context of determining a country's suitability for entry into a currency union. They discover that countries with closer trade links have more tightly correlated business cycles. Artis and Zang (1999) study business cycle in several European countries and find that they converged in business cycle to Germany in recent years. Babetskii (2005) studies supply and demand shocks in a group of transition countries and finds evidence supporting that liberalization should lead to greater synchronization of business cycles between countries. Conversely, Krugman (1991) and Kalemli-Ozcan et al. (2001) suggest that economic integration should lead to greater specialization and subsequently lower convergence, and Massmann and Mitchell (2004) find periods of both convergence and divergence in business cycles of European companies.

DATA, HYPOTHESES, AND METHODOLOGY

This paper uses firm-level panel data for European corporations and tests whether companies in the dataset display improvements and convergence in performance. Implications of several theories related to liberalizations are examined using quantile regression analysis. This section first describes the data, then summarizes the hypotheses and testable implications, and finally presents the methodology.

Data

This study examines annual financial reporting of European corporations between 1980 and 2006 in order to investigate whether or not introduction of the Euro resulted in material performance gains for European companies, and whether companies in different countries converged in their financial performance. The dataset includes the following eleven countries that implemented the euro: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, and Spain. As a benchmark, firms from Denmark, Sweden, and the U.K. are included, as these three EU countries are not EMU members, as well as firms from non-union countries Norway and Switzerland. Even though Luxemburg also implemented the Euro, it is omitted from the analysis due to lack of data.

The company specific information is obtained from the Datastream. Data on Net Income, Sales, Total Assets, Shareholders' Equity, Capital Expenditures, Total Debt, and Cash Dividends are collected for the firms. These data are utilized to construct firm performance measures for profitability, investment, leverage, dividends, and firm valuation. Some country datasets are relatively small and have a lot of missing observations. Therefore, the research uses companies for which it is possible to construct at least one performance proxy during 1980-2006.

I use company balance sheet and income statement data to construct performance proxies. Performance measures are constructed for profitability (return on sales, return on assets, return on equity), capital investment (capital expenditure to sales, capital expenditure to total assets), leverage, dividends (cash dividends to sales and dividend payout ratios), and Tobin's Q as a measure of market valuation. In constructing variables, local currency data are used.

In order to obtain aggregate measures of firm performance for each country, median performance measures are computed. Median is good measure of the center of the distribution because it is less sensitive to outliers in the data than the mean, and medians are routinely used in corporate finance studies such as Megginson et al (1994) or Hartford et al (2008), among others.

Industry composition for firms whose data were used in computing performance measures is presented in Table 1. The U.K. has 2284 firms, the largest number of companies per country in this dataset. Austria, Belgium, Germany, Italy, Spain, Denmark, the U.K., and Switzerland are dominated by firms in Financials sector. Finland, France, Portugal, Sweden, and Norway have majority of their firms in Industrials. Greece has the most of their firms in Consumer Goods sector. Ireland has a bimodal industry composition, it has 13 firms in Industrials and 13 firms in Consumer goods sector out of 71 companies.

The final dataset includes nine median performance measures for each of the sixteen countries in the sample. It has 27 annual observations, between 1980 and 2006, for all countries except Greece and Portugal. The data for Greece are available only starting from 1984 and the data for Portugal are available from 1985; therefore, there are only 23 annual data points for Greece and 22 annual data points for Portugal.

Table 1: Industry Composition

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecommunications	Utilities	Financials	Technology	Total
Austria	3	7	30	22	1	14	1	4	55	6	143
Belgium	5	26	56	36	18	27	2	13	93	29	305
Finland	1	12	44	19	8	19	2	1	23	27	156
France	17	47	223	182	51	169	16	22	197	184	1108
Germany	4	64	268	151	73	138	13	37	311	207	1266
Greece	2	26	69	85	10	49	3	6	43	29	322
Ireland	6	6	13	13	5	10	2	0	10	6	71
Italy	7	11	81	76	9	37	7	20	86	33	367
Netherlands	3	6	45	20	5	20	3	0	38	23	163
Portugal	1	6	22	13	1	15	2	2	7	4	73
Spain	5	24	32	25	8	16	5	14	98	4	231
Denmark	3	4	42	22	18	16	2	2	92	13	214
Sweden	13	37	129	51	54	57	12	6	76	85	520
UK	134	203	470	135	139	357	36	27	560	223	2284
Norway	62	12	66	29	15	10	1	4	40	34	273
Switzerland	11	42	73	48	38	30	5	16	105	39	407

This table shows industry structure for firms whose data were used in computing median performance measures for present study.

Hypotheses

The study examines whether firms change their financial performance, including profitability, capital expenditure, dividend policies, capital structure, and Tobin's Q after the introduction of the Euro. In particular, I investigate whether the performance improved after financial liberalization, and whether firms in European countries display convergence in performance.

Economic theory suggests that liberalization process should lead to reduction of risk, increasing use of comparative advantage, economies of scale, technology transfer, and subsequent economic growth. See

for example Rivera-Batiz and Romer (1991), Obstfeld (1994), Lee et al (1997), Kao et al (1999), and Kutan and Yigit (2007). It implies that we should expect to see improvements in financial performance, including profitability and firm valuation. Opponents of liberalization, on the other hand, argue that reduction of import tariffs should hurt local companies because it will expose them to harsher competition from overseas.

A reduction in transaction costs following implementation of the common currency should in theory lead to better investment opportunities offered by the comparative advantage and economies of scale. Thus, one would expect investment increases for the firms whose competitive position improved in the foreign markets and they need to produce more, or firms that need to re-allocate productive resources in order to become more competitive in the home markets because of increased foreign competition at home. Alternatively, some firms may be unable or unwilling to increase investment, especially if these firms have liquidity problems and are very vulnerable to foreign competition.

Table 2: Summary of Testable Implications

Characteristics	Financial Ratios	Predicted relationship
Profitability	Return on sales (ROS) = Net Income/Sales	$ROS_A > ROS_B$ ROS converge in EMU
	Return on assets (ROA) = Net Income/ Total Assets	$ROA_A > ROA_B$ ROA converge in EMU
	Return on equity (ROE) = Net Income/Shareholders Equity	$ROE_A > ROE_B$ ROE converge in EMU
Capital Investment	Capital expenditure to sales (CESA) = Capital expenditure / Sales	$CESA_A > CESA_B$ CESA converge in EMU
	Capital expenditure to total assets (CETA) = Capital expenditure / Total assets	$CETA_A > CETA_B$ CETA converge in EMU
Leverage	Debt to assets (TDTA) = Total debt / Total assets	$TDTA_A < TDTA_B$ Leverage converge in EMU
Dividends	DIVSAL = Cash dividend / Sales	$DIVSAL_A > DIVSAL_B$ DIVSAL converge in EMU
	Payout = Cash dividend / Net Income	$Payout_A > Payout_B$ Payout converge in EMU
Company valuation	Tobin's Q = (Market value of equity + Total Debt)/ Total assets	$Q_A > Q_B$ Tobin's Q converge in EMU

This table presents firm characteristics that we expect to change as a result of the liberalization process in Europe, and empirical proxy variables used to measure these characteristics. Subscriptions A and B denote firm characteristics after and before, respectively.

The common currency reduces transaction costs in the financial markets. Adler and Qi (2000) and Mittoo (2003), among others, discuss the effect of liberalization on stock market integration in North America. Stulz (1999) and Bris et al (2004) argue that stock market integration reduces cost of equity capital and leverage. Alternatively, a greater degree of risk sharing and comparative advantage that in theory come with liberalization should reduce cash flow volatility for businesses. More stable cash flows lower probability of financial distress and allow companies to use greater financial leverage. See for example Opler and Titman (1994) for the discussion of the relationship between financial distress and leverage.

The dividends may increase after the introduction of the Euro, especially if private investors see greater profitability for companies benefiting from the financial liberalization, and subsequently demand greater cash distributions. Alternatively, firms most vulnerable from foreign competition may find it difficult to sustain pre-liberalization payout levels, and may decrease dividends. In addition, if firms identify great investment opportunities resulting from the reduction in transaction costs, then there will be less cash available for distribution and thus dividends may decrease. Finally, companies may keep their dividends stable and it is possible to see no effect of the Euro on dividend payout.

An interesting question is whether there has been any business cycle convergence as a result of European integration. Davis (1998) offers a theoretical model where economic integration should lead to a diversified industrial structure. This implies that output in different countries should be more correlated if these countries enter a monetary union such as EMU. On the other hand, Krugman (1991) and Kalemli-Ozcan et al. (2001), among others, suggest that economic integration should lead to greater specialization and subsequently lower output synchronization across countries. Several recent studies examine business cycle convergence among European countries. For example, Artis and Zang (1999), Frankel and Rose (1998), and Babetskii (2005) find evidence of business cycle convergence. At the same time, Massmann and Mitchell (2004) discover that European countries were undergoing periods of economic convergence followed by periods of divergence and that the convergence test results are sensitive to the way business cycle is measured. This study uses several measures to examine whether firms in different European countries converge in their financial performance.

Table 2 summarizes the hypotheses investigated in this study. This research checks whether the Euro led to improvements in profitability, investment, and dividends. It is also investigated whether European firms display significant changes in capital structure and firm valuation, and whether there is any cross-country evidence of convergence after the introduction of the Euro.

Methodology

To detect changes in performance the following equation is estimated using quantile regression for 50th percentile of the distribution of the dependent variable:

$$y_t = c_1(1 - D_{Euro}) + c_2 D_{Euro} + \varepsilon_t \quad (1)$$

where y_t is the median performance measure in question, D_{Euro} takes value of 1 after the introduction of the Euro in 1999 and zero otherwise, c_1 and c_2 are regression coefficients, and ε_t is residual. Equation (1) estimates medians of the performance proxies before and after the introduction of the Euro. Coefficient equality test is used for inference whether the performance proxy median changed. The equality test involves computing Wald test statistics for the null hypothesis that $c_1 = c_2$. The data used in this study are annual medians (50th percentiles) for performance proxies. Therefore, the choice of quantile regression modeling 50th percentile of the response variable seems more appropriate than least squares regression that models mean of the dependent variable, see Koenker and Bassett (1978). Furthermore, the quantile regression approach does not require strong distributional assumptions, which provides more robust estimates.

In order to find evidence of convergence or divergence in a performance proxy across different countries, mean absolute deviations between country i 's performance proxy and corresponding performance proxies for all the other countries are computed:

$$\hat{y}_{i,t} = \frac{1}{n_j} \sum_{j \neq i} |y_{i,t} - y_{j,t}| \quad (2)$$

where $\hat{y}_{i,t}$ is the mean absolute deviation in a performance proxy for year t and n_j is the number of the other countries (excluding country i). Mean absolute deviation are computed between any country and three subsets which include EMU, EU but not EMU, and non-EU countries. Next, the following equation is estimated using quantile regression for the 50th percentile of the dependent variable:

$$\hat{y}_{i,t} = c_1 + c_2 D_{Euro} + \varepsilon_t \quad (3)$$

In equation (3) coefficient c_1 estimates median of the dependent variable before the introduction of the Euro in 1999, and coefficient c_2 estimates change in the median after 1999. Therefore, a negative and statistically significant coefficient c_2 will imply convergence, and positive coefficient will imply divergence from the corresponding group of countries.

EMPIRICAL RESULTS

Performance Changes

A reduction in transaction costs produced by the common currency in the EMU countries in theory should improve profitability and market valuation for companies. It could also lead to increased investment and dividend payout, and to lower financial leverage. In addition, the EMU may result in positive externalities for the rest of the Europe. For example, firms in neighboring countries may enjoy increased performance because they are linked with the firms in the EMU countries.

Table 3 presents test results for the hypotheses that introduction of the Euro should lead to improvements in financial performance for European companies. Panel A of Table 3 shows significant evidence of improvements in profitability for firms in Austria, Finland, Denmark, Spain, and Switzerland. For example, median ROS increased in Austria from 0.0213 in pre-1999 to 0.0437 in post-1999 years, and the increase is significant at 10%. At the same time Greece and the U.K. display signs of decreases in firm profitability. For example, median ROA for the U.K. decreased from 0.0539 to 0.0128 and the decrease is significant at 1% level.

Table 3 Panel B shows estimated changes in capital investment and leverage. The study discovers evidence pointing that the investment in European countries declined after the introduction of the common currency, contrary to expected. For example, CESA in France declined from median 0.0482 to 0.0290, and the decline is statistically significant at 1% level. This decline in investment is not specific to EMU countries only, since investment proxies CESA or CETA significantly drop in Belgium, Finland, France, Germany, Italy, the Netherlands, Denmark, Sweden, the U.K., Norway, and Switzerland.

The results for leverage are country-specific. Median leverage significantly decreased in Finland, Sweden, and Norway, and increased in Ireland, Italy, the Netherlands, Portugal, Spain, and Denmark. For example, median leverage for Portugal is 0.2688 before the Euro and 0.3802 after the Euro, and the difference is significant at 1% level. Therefore, little evidence is found to suggest that the companies reduced leverage due to lower cost of equity in the integrated European equity market. It appears that the increase in leverage may have been caused by increased stability of cash flows that are less subject to exchange rate uncertainty after the common currency is implemented.

Table 3 Panel C shows test results for dividend payout variables DIVSAL and PAYOUT, and for Tobin's Q. Evidence points that only in Finland firms significantly increased their dividend payout, with median DIVSAL increasing from 0.0078 to 0.0191. Test results show that either one or both dividend payout proxies decreased for Belgium, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Denmark, Sweden, the U.K., Norway, and Switzerland. For example, the tests indicate that for France median DIVSAL decreased from 0.0070 to 0.0045 with median change significant at 10%, and PAYOUT decreased from 0.2110 to 0.0782 with median change significant at 1%. Hence, the hypothesis that dividends increase with financial liberalization is strongly rejected.

Table 3: Estimated Performance Changes

PANEL A: PROFITABILITY									
	ROS			ROA			ROE		
	Median before	Median after	Equality test	Median before	Median after	Equality test	Median before	Median after	Equality test
Austria	0.0213***	0.0437***	(0.052)	0.0075*	0.0181***	(0.142)	0.0697***	0.0787***	(0.628)
Belgium	0.0383***	0.0422***	(0.708)	0.0342***	0.0340***	(0.971)	0.1076***	0.0923***	(0.398)
Finland	0.0116*	0.0522***	(0.001)	0.0100*	0.0445***	(0.001)	0.1070***	0.1264***	(0.522)
France	0.0331***	0.0338***	(0.934)	0.0263***	0.0273***	(0.861)	0.1131***	0.0905***	(0.221)
Germany	0.0196***	0.0198***	(0.974)	0.0199***	0.0145**	(0.384)	0.0843***	0.0623***	(0.225)
Greece	0.0555***	0.0313***	(0.056)	0.0469***	0.0188**	(0.013)	0.1327***	0.0489*	(0.021)
Ireland	0.0459***	0.0416***	(0.706)	0.0432***	0.0370***	(0.491)	0.1324***	0.1524***	(0.343)
Italy	0.0313***	0.0327***	(0.890)	0.0130***	0.0119***	(0.843)	0.0706***	0.0614***	(0.646)
Netherlands	0.0436***	0.0346***	(0.254)	0.0543***	0.0404***	(0.125)	0.1463***	0.1142***	(0.312)
Portugal	0.0355***	0.0290**	(0.650)	0.0212***	0.0104	(0.221)	0.0925***	0.0553*	(0.353)
Spain	0.0607***	0.0774***	(0.085)	0.0237***	0.0333***	(0.145)	0.0813***	0.1311***	(0.048)
Denmark	0.0355***	0.0547***	(0.095)	0.0249***	0.0206***	(0.385)	0.0010***	0.0009***	(0.784)
Sweden	0.0351***	0.0332**	(0.890)	0.0242***	0.0307**	(0.663)	0.1535***	0.1111***	(0.324)
UK	0.0541***	0.0248***	(0.003)	0.0539***	0.0128*	(0.000)	0.1338***	0.0563***	(0.001)
Norway	0.0230**	0.0323*	(0.648)	0.0162***	0.0116	(0.596)	0.0013***	0.0008***	(0.185)
Switzerland	0.0368***	0.0536***	(0.064)	0.0259***	0.0326***	(0.353)	0.0798***	0.0991***	(0.235)

PANEL B: INVESTMENT ABD LEVERAGE									
	CESA			CETA			LEVERAGE		
	Median before	Median after	Equality test	Median before	Median after	Equality test	Median before	Median after	Equality test
Austria	0.0545***	0.0520***	(0.773)	0.0475***	0.0418***	(0.405)	0.2259***	0.2805***	(0.115)
Belgium	0.0422***	0.0379***	(0.353)	0.0489***	0.0335***	(0.012)	0.1890***	0.2133***	(0.234)
Finland	0.0850***	0.0381***	(0.007)	0.0827***	0.0422***	(0.006)	0.3554***	0.2262***	(0.000)
France	0.0482***	0.0290***	(0.000)	0.0593***	0.0289***	(0.001)	0.1976***	0.1896***	(0.599)
Germany	0.0523***	0.0299***	(0.004)	0.0732***	0.0286***	(0.000)	0.1576***	0.1551***	(0.949)
Greece	0.0319***	0.0380***	(0.568)	0.0304***	0.0244**	(0.643)	0.2076***	0.2496***	(0.299)
Ireland	0.0379***	0.0316***	(0.367)	0.0385***	0.0273***	(0.126)	0.1944***	0.2376***	(0.032)
Italy	0.0540***	0.0398***	(0.085)	0.0304***	0.0252***	(0.384)	0.2337***	0.2832***	(0.069)
Netherlands	0.0412***	0.0255***	(0.001)	0.0641***	0.0312***	(0.000)	0.1587***	0.2366***	(0.000)
Portugal	0.0567***	0.0496***	(0.588)	0.0442***	0.0340***	(0.165)	0.2688***	0.3802***	(0.002)
Spain	0.0553***	0.0560***	(0.956)	0.0342***	0.0283***	(0.452)	0.2013***	0.2666***	(0.044)
Denmark	0.0676***	0.0327***	(0.002)	0.0728***	0.0222**	(0.001)	0.1684***	0.2196***	(0.010)
Sweden	0.0505***	0.0234***	(0.001)	0.0567***	0.0234***	(0.000)	0.2159***	0.1508***	(0.056)
UK	0.0420***	0.0273***	(0.018)	0.0539***	0.0256***	(0.000)	0.1326***	0.1140***	(0.355)
Norway	0.0948***	0.0621***	(0.117)	0.0796***	0.0440***	(0.034)	0.3369***	0.2548***	(0.065)
Switzerland	0.0482***	0.0330***	(0.059)	0.0503***	0.0268***	(0.004)	0.2546***	0.2079***	(0.111)

This table present quantile regression results for equation (1), $y_t = c_1(1 - D_{Euro}) + c_2D_{Euro} + \varepsilon_t$, and the results of Wald coefficient test for the null hypothesis that $c_1=c_2$. Column "Median before" presents estimation results for coefficient c_1 , column "Median after" present coefficient estimates for c_2 , and column "Equality tests" presents p-values (in parentheses) for the Wald test statistic with the null hypothesis that $c_1=c_2$ and an alternative hypothesis that $c_1 \neq c_2$. *** indicates 1% significance, ** indicates 5% significance, * indicates 10% significance

Table 3: Estimated Performance Changes (continued)

PANEL C: DIVIDENDS AND MARKET VALUATION									
	DIVSAL			PAYOUT			TOBIN'S Q		
	Median before	Median after	Equality test	Median before	Median after	Equality test	Median before	Median after	Equality test
Austria	0.0094***	0.0092***	(0.961)	0.2926***	0.1863***	(0.243)	0.6589***	0.6675***	(0.872)
Belgium	0.0118***	0.0104***	(0.636)	0.3800***	0.1895***	(0.000)	0.8093***	0.8779***	(0.528)
Finland	0.0078***	0.0191***	(0.001)	0.4812***	0.3568***	(0.330)	0.8266***	1.0252***	(0.178)
France	0.0070***	0.0045***	(0.051)	0.2110***	0.0782***	(0.000)	0.7172***	0.8545***	(0.200)
Germany	0.0074***	0.0000	(0.000)	0.4258***	0.0000	(0.000)	0.7908***	0.8588***	(0.623)
Greece	0.0252***	0.0109***	(0.004)	0.3939***	0.2187***	(0.017)	1.0169***	0.8485***	(0.431)
Ireland	0.0097***	0.0069***	(0.278)	0.2310***	0.0447	(0.002)	0.8207***	1.1610***	(0.019)
Italy	0.0142***	0.0104***	(0.157)	0.3438***	0.2145***	(0.015)	0.6077***	0.7707***	(0.055)
Netherlands	0.0097***	0.0071***	(0.230)	0.2943***	0.1525***	(0.000)	0.7422***	0.9860***	(0.096)
Portugal	0.0064***	0.0056**	(0.822)	0.2002***	0.0590	(0.060)	0.6599***	0.7078***	(0.612)
Spain	0.0219***	0.0158***	(0.100)	0.3513***	0.2577***	(0.013)	0.6780***	0.8204***	(0.336)
Denmark	0.0097***	0.0089***	(0.548)	0.1747***	0.1154***	(0.069)	0.6117***	0.7070***	(0.245)
Sweden	0.0107***	0.0031	(0.008)	0.2843***	0.0000	(0.006)	0.6634***	1.1238***	(0.007)
UK	0.0184***	0.0000	(0.000)	0.3032***	0.0000	(0.000)	0.9416***	1.1119***	(0.245)
Norway	0.0088***	0.0000	(0.002)	0.1148***	0.0000	(0.060)	0.8908***	0.9210***	(0.834)
Switzerland	0.0111***	0.0099***	(0.486)	0.3436***	0.1639***	(0.000)	0.6983***	0.8373***	(0.122)

This table present quantile regression results for equation (1), $y_t = c_1(1 - D_{Euro}) + c_2D_{Euro} + \varepsilon_t$, and the results of Wald coefficient test for the null hypothesis that $c_1=c_2$. Column "Median before" presents estimation results for coefficient c_1 , column "Median after" present coefficient estimates for c_2 , and column "Equality tests" presents p-values (in parentheses) for the Wald test statistic with the null hypothesis that $c_1=c_2$ and an alternative hypothesis that $c_1 \neq c_2$. *** indicates 1% significance, ** indicates 5% significance, * indicates 10% significance

Test results provide support for the hypothesis that the Euro resulted in greater firm valuations. Empirical tests show that Tobin's Q significantly increased in Ireland, Italy, the Netherlands, and Sweden. For example, in Ireland median Tobin's Q prior to the introduction of Euro is estimated at 0.8207 and after the introduction of the Euro it is 1.1610, the change in medians is significant at 5%. There is no evidence pointing at significant decrease in market valuation for any country in the dataset. Thus, evidence suggests that the market value effect of the common currency was positive.

Convergence in Performance

To examine the convergence hypothesis, I estimate equation (3) and present the results in Table 4. Panel A of Table 4 presents the results of convergence tests for profitability measures ROS, ROA, and ROE. The study finds evidence pointing at profitability convergence in many EMU countries. For example, the convergence with EMU parameter for Netherlands is -0.0038 and 5% significant for ROS, -0.0090 and 1% significant for ROA, and -0.0226 and 10% significant for ROE. This indicates that firms in the Netherlands display convergence in profitability with the other EMU countries. Overall, the research uncovers evidence of profitability convergence with the EMU countries for Austria, Belgium, Finland, France, Greece, Italy, the Netherlands, and the U.K.

Table 4 Panel B presents empirical results for convergence tests in CESA, CETA, and Leverage. The evidence shows that investment as a proportion of total assets CETA converged throughout Europe to the investment rates in the EMU, regardless whether a particular country belongs to EMU or EU. In particular, the estimated parameters of convergence to EMU for CETA are negative for all countries. For example, the CETA convergence coefficient for France with respect to EMU is -0.0099, significant at 1%. The EMU coefficients are significant at 1% for Belgium, Finland, France, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, the U.K., and Switzerland, significant at 5% for Germany, and

Norway, and significant at 10% for Austria. Similarly, the study finds evidence of CETA convergence to non-EMU countries for Germany, Italy, Spain, Denmark, U.K., Sweden, Norway, and Switzerland. Overall, the results indicate a great deal of investment convergence in Europe that followed the introduction of the Euro.

The estimation results for Leverage are country-specific. Finland displays convergence in Leverage to the other EMU countries, significant at 1% level. France, Portugal, and the U.K. diverge from the EMU, with the corresponding coefficients significant at 10%, 5%, and 1%, respectively. Austria, Italy, the Netherlands, and Portugal diverged from the EU but non-EMU countries. The reported coefficient is positive and significant, for example the non-EMU coefficient for Leverage in Portugal is estimated 0.1796 and significant at 1% level, hence we conclude mean absolute deviation in Leverage for these countries increased after the introduction of the Euro. It is interesting to see that many EMU countries converged in Leverage to non-EU countries; for example, France converged to non-EU countries with the estimated coefficient of -0.1238, significant at 5% level. Thus, the convergence hypothesis for Leverage in the EMU countries is not supported by the data.

Table 4 Panel C presents test results for dividend payout variables DIVSAL and PAYOUT, as well as for Tobin's Q. There is little evidence to suggest any convergence in the European countries in dividend proxies DIVSAL and PAYOUT. Empirical tests do not indicate significant changes in deviation in dividend proxies for many countries. Finland displays signs of divergence from all groups of countries, for example, the DIVSAL coefficient for EMU is 0.0045 and significant at 10%. The evidence shows U.K. converges to non-EU countries in DIVSAL, because its non-EU coefficient is -0.0075 and significant at 5%, and the U.K. diverges from the EU countries in PAYOUT, since the EMU coefficient is estimated at 0.0810 and significant at 5% level. Thus, it does not appear that there is any regularity with respect to common dividend policies across European countries resulting from financial liberalization.

Test results for convergence in Tobin's Q across European countries also do not yield much systematic evidence. It is discovered that Italy converged to the EMU countries, since the coefficient for EMU is -0.0959 and significant at 5% level. The rest of the countries do not display any signs of convergence and divergence. Thus, the evidence does not support the convergence hypothesis for Tobin's Q.

As a robustness check, a series of nonparametric median equality tests is conducted for the performance proxy variables using company-level data, including Wilcoxon/Mann-Whitney, Wilcoxon/Mann-Whitney (tie-adjusted), Median Chi-square, Adjusted Median Chi-square, Kruskal-Wallis, Kruskal-Wallis (tie-adjusted), and van der Waerden median equality test. Also, equations (1) and (3) are estimated using least squares regression. All tests produce similar results.

CONCLUSION

This study explored the effect of the Euro on financial performance of companies in the European countries by studying changes in various performance measures. I carried out tests based on quantile regression analysis to evaluate changes in median performance measures before and after the introduction of the common currency, and analyzed whether European companies converged in their financial performance.

Table 4: Estimated Convergence in Financial Performance

PANEL A: PROFITABILITY									
	ROS			ROA			ROE		
	EMU	non EMU	non EU	EMU	non EMU	non EU	EMU	non EMU	non EU
Austria	-0.0025	-0.0117	-0.0207*	-0.0079**	-0.0291***	-0.0185**	-0.0158**	-0.0361*	0.0132
Belgium	-0.0007	0.0030	0.0025	-0.0014	-0.0033	0.0026	-0.0072**	-0.0209	-0.0258
Finland	-0.0112*	-0.0058	-0.0091	-0.0038	0.0038	0.0182**	-0.0122	0.0090	0.0098
France	-0.0032*	-0.0009	0.0046	-0.0034**	-0.0076	0.0016	-0.0058	-0.0035	-0.0290
Germany	0.0040	-0.0014	0.0253	-0.0003	-0.0096	0.0014	0.0041	-0.0303	0.0094
Greece	-0.0048	0.0102	-0.0201	-0.0114*	-0.0188**	-0.0304	-0.0082	-0.0356	-0.0654
Ireland	-0.0034	0.0096	0.0000	-0.0053	0.0003	-0.0138	0.0033	0.0424***	0.0176
Italy	-0.0060**	-0.0009	-0.0110	-0.0024	-0.0050	0.0033	-0.0071	-0.0409**	0.0094
Netherlands	-0.0038**	0.0047	0.0022	-0.0090***	0.0046	-0.0075	-0.0226*	0.0127	-0.0191
Portugal	-0.0036	-0.0050	-0.0104	-0.0005	-0.0143*	-0.0097	-0.0118	-0.0284	0.0055
Spain	0.0094	0.0066	-0.0008	-0.0023	0.0008	0.0028	0.0108	0.0255	0.0744**
Denmark	0.0027	0.0154***	0.0016	-0.0021	-0.0062	0.0040	-0.0197	-0.0401	0.0182
Sweden	-0.0004	0.0041	0.0133	-0.0019	-0.0066	0.0041	-0.0204	-0.0117	-0.1002**
UK	-0.0008	0.0025	0.0077	-0.0117*	-0.0128	-0.0273*	-0.0064	-0.0250	-0.0782**
Norway	-0.0071	0.0036	-0.0007	-0.0047	-0.0001	0.0041	-0.0193	-0.0388	0.0182
Switzerland	0.0024	0.0114***	-0.0007	-0.0023	-0.0059	0.0041	-0.0079	-0.0224	0.0182

PANEL B: INVESTMENT AND LEVERAGE									
	CESA			CETA			LEVERAGE		
	EMU	non EMU	non EU	EMU	non EMU	non EU	EMU	non EMU	non EU
Austria	-0.0038	0.0092	-0.0236	-0.0060*	0.0054	-0.0211***	0.0068	0.0855***	-0.0914
Belgium	-0.0047	-0.0060	-0.0347	-0.0099***	-0.0011	-0.0262	0.0043	0.0066	-0.1205**
Finland	-0.0223	-0.0336*	-0.0450*	-0.0314***	-0.0044	-0.0399*	-0.1167***	-0.1496***	-0.0905***
France	-0.0040	-0.0113***	-0.0382*	-0.0099***	-0.0041	-0.0260*	0.0151*	-0.0029	-0.1238**
Germany	-0.0027	-0.0109**	-0.0235	-0.0153**	-0.0120***	-0.0198	0.0231	-0.0463**	-0.2185**
Greece	-0.0102	-0.0041	-0.0305	-0.0115	-0.0147	-0.0233	0.0028	0.0345	-0.1056
Ireland	-0.0070	-0.0176*	-0.0494**	-0.0109***	-0.0209**	-0.0369*	0.0036	0.0070	-0.1430***
Italy	-0.0057	-0.0022	-0.0345*	-0.0142***	-0.0282***	-0.0323*	0.0040	0.0931***	-0.0540
Netherlands	-0.0012	-0.0129**	-0.0450**	-0.0168***	-0.0054	-0.0191	-0.0171	0.0412*	-0.1987***
Portugal	-0.0082	-0.0026	-0.0139	-0.0109***	-0.0198	-0.0259	0.0635**	0.1796***	0.1255
Spain	-0.0024	0.0066	-0.0219	-0.0182***	-0.0279***	-0.0497***	0.0075	0.0429	-0.1054*
Denmark	-0.0109*	-0.0142**	-0.0302	-0.0086	-0.0145***	-0.0180	-0.0030	0.0169	-0.1583***
Sweden	-0.0034	-0.0076**	-0.0165	-0.0078***	-0.0101***	-0.0212	0.0212	-0.0320*	0.0267
UK	-0.0038	-0.0119**	-0.0390*	-0.0084***	-0.0082***	-0.0225	0.0632***	-0.0113	-0.0762
Norway	-0.0241*	-0.0277	-0.0187	-0.0211**	-0.0158	-0.0139	-0.0223	-0.1200*	-0.0245
Switzerland	-0.0107*	-0.0144***	-0.0187	-0.0106***	-0.0188***	-0.0139	-0.0249	-0.0539***	-0.0245

This table present quantile regression results for equation (3), $\hat{y}_{i,t} = c_1 + c_2 D_{Euro} + \varepsilon_t$. Column "EMU" presents estimation results for coefficient c_2 when the dependent variable is mean absolute deviation from the EMU countries, column "non EMU" presents estimation results for coefficient c_2 when the dependent variable is mean absolute deviation from the countries that are EU but not the EMU members, column "non EU" presents estimation results for coefficient c_2 when the dependent variable is mean absolute deviation from countries in our sample that are not the EU members. *** indicates 1% significance, ** indicates 5% significance, * indicates 10% significance

Table 4: Estimated Convergence in Financial Performance (continued).

PANEL C: DIVIDENDS AND MARKET VALUATION									
	DIVSAL			PAYOUT			TOBINS Q		
	EMU	non EMU	non EU	EMU	non EMU	non EU	EMU	non EMU	non EU
Austria	-0.0015	-0.0019	0.0019	-0.0131	-0.0647	-0.1276	-0.0024	0.1434	0.0467
Belgium	-0.0012	0.0004	0.0048	-0.0188	0.0021	-0.0839	-0.0157	0.0183	-0.1115
Finland	0.0045*	0.0131***	0.0204***	0.0244	0.1610	0.1849	0.0432	0.0086	0.0620
France	0.0001	-0.0027*	0.0010	-0.0006	-0.0263	-0.0966	-0.0290	0.0916	-0.0969
Germany	0.0032**	0.0011	0.0028	0.0520*	-0.1718***	-0.1356	-0.0341	0.0500	-0.0365
Greece	-0.0049*	-0.0076	-0.0119	-0.0313	0.0028	-0.0577	-0.0516	0.0111	-0.0544
Ireland	-0.0008	-0.0018	0.0009	-0.0052	-0.0015	-0.0376	0.0199	-0.0404	0.1248
Italy	-0.0011	0.0016	0.0002	0.0058	0.0161	-0.0385	-0.0959**	0.0158	0.0028
Netherlands	-0.0006	-0.0004	0.0008	0.0073	0.0269	0.0181	-0.0371	0.0152	-0.1535
Portugal	-0.0004	-0.0037	-0.0060**	0.0017	-0.0254	-0.0250	-0.0389	0.0501	0.1162
Spain	-0.0009	0.0040	-0.0017	0.0210	0.1027*	0.0684	-0.0257	0.0179	-0.0280
Denmark	-0.0004	0.0013	0.0028	-0.0455	-0.0280	-0.0473	-0.0333	0.1299	-0.0306
Sweden	0.0017	0.0017	0.0008	0.0200	-0.0217	-0.1068	0.1421	0.0577	0.0875
UK	-0.0005	-0.0022	-0.0075**	0.0810***	-0.0564	-0.0436	-0.0325	-0.0043	-0.1095
Norway	0.0016	0.0001	0.0046*	-0.0637	-0.0996	-0.0376	-0.0300	-0.0382	0.0539
Switzerland	-0.0004	0.0001	0.0046*	-0.0018	-0.0078	-0.0376	-0.0395	0.0865	0.0539

This table present quantile regression results for equation (3), $\hat{y}_{i,t} = c_1 + c_2 D_{Euro} + \varepsilon_t$. Column "EMU" presents estimation results for coefficient c_2 when the dependent variable is mean absolute deviation from the EMU countries, column "non EMU" presents estimation results for coefficient c_2 when the dependent variable is mean absolute deviation from the countries that are EU but not the EMU members, column "non EU" presents estimation results for coefficient c_2 when the dependent variable is mean absolute deviation from countries in our sample that are not the EU members. *** indicates 1% significance, ** indicates 5% significance, * indicates 10% significance.

The analysis revealed a number of interesting results. Evidence points that implementation of the Euro corresponds with increases in profitability and leverage, and decreases in investment and dividend payout for many European countries. In addition, significant increases in market valuation are detected for Ireland, Italy, the Netherlands, and Sweden. The tests showed that the EMU countries exhibit convergence in profitability, and all European countries converged to the EMU countries in the amount of capital investment as a proportion of total assets.

This investigation exposed several surprising findings, for example empirical tests did not support hypotheses of increase in dividends and investment. Tests also revealed a decrease in profitability for Greece and the U.K., and suggested that France converged to non-EU countries in leverage. These results may be due to weaknesses of economic theory that was employed to form testable hypotheses, or due to data limitations, including lack of data on important parameters such as degree of firm internationalization or managerial skills, or due to measurement problems, or estimation technique. Future research may resolve each of these issues and expand our understanding of the effect of financial liberalization on firm performance.

After considering all test results, I conclude that the common currency is beneficial for financial performance of companies in the European countries. The findings are consistent with economic theory suggesting that financial liberalization should improve firm performance and lead to convergence in performance across countries.

REFERENCES

- Adler, Michael and Bernard Dumas (1983): “International Portfolio Choice and Corporation Finance: A Synthesis”, *Journal of Finance* vol. 38 (3), p. 925-984.
- Adler, Michael, and Rong Qi (2000) “Mexico’s integration in the North American capital market”, *Emerging Markets Review* vol. 4, p. 91-120.
- Artis, M., & Zang, W (1999). “Further evidence on the international business cycle and the ERM: Is there a European business cycle?”, *Oxford Economic Papers*, vol. 51, p.120–132.
- Babetskii, I. (2005). “Trade integration and synchronization of shocks: Implications for EMU enlargement”, *Economics of Transition*, vol. 13(1), p.105–138.
- Bekaert, G., and C. Harvey (1995) “Time-Varying World Market Integration”, *Journal of Finance*, vol. 50, p. 403-444.
- Bris, A., Y. Koshkien, and M. Nilsson (2004) “The Euro and Corporate Valuation”, *Yale University working paper*.
- Carrieri, F. (2001) “The effects of liberalization on market and currency risk in the European Union”, *European Financial Management*, vol. 7, p. 259-290.
- Davis, Donald (1998), “The Home Market, Trade, and Industrial Structure,” *American Economic Review*, vol. 88(5), p.1264-1276.
- De Santis, G., and Gerard, B. (1998) “How big is the premium for currency risk”, *Journal of Financial Economics*, vol. 49, p. 375-412.
- De Santis, G., Gerard, B., and P. Hillion, (2003) “The relevance of currency risk in the EMU”, *Journal of Economics and Business*, vol. 55, p. 427–462.
- Dumas, B., and Solnik, B (1995) “The world price of foreign exchange risk”, *Journal of Finance*, vol.50 (2), p. 445-479.
- Efthymios, G T., S. E G Lolos, D. K Christopoulos (2003) "The performance of the Greek banking system view of the EMU: Results from a non-parametric approach", *Economic Modelling*, vol. 20 (3), p. 571-592.
- Errunza, V., and E. Losq (1989) “Capital flow controls, international asset pricing, and investors’ welfare: a multi-country framework”, *Journal of Finance*, vol. 44 (4), p. 1025-1037.
- Errunza, V. R & Senbet, L. W, (1981). "The Effects of International Operations on the Market Value of the Firm: Theory and Evidence" *Journal of Finance*, vol. 36(2), p.401-417.
- Frankel, Jeffrey and Rose, Andrew, (1998), “The Endogeneity of the Optimum Currency Area Criteria,” *The Economic Journal*, vol. 108(449), p.1009-1025.
- Hardouvelis, G. A., Malliaropulos, D., and R. Priestley (2006) “EMU and European stock market integration”, *The Journal of Business*, vol. 79, p. 365–392.

Harford, J., Sattar A. M., Maxwell W.F. (2008). "Corporate governance and firm cash holdings in the US." *Journal of Financial Economics*, vol. 87, p. 535-555.

Kalemli-Ozcan, Sebnem; Sørensen, Bent and Yosha, Oved, (2001), "Economic Integration, Industrial Specialization, and the Asymmetry of Macroeconomic Fluctuations," *Journal of International Economics*, vol. 55(1), p.107-137.

Kao, C., Chiang, M., Chen, B. (1999). "International R&D spillovers: an application of estimation and inference in panel cointegration." *Oxford Bulletin of Economics and Statistics*, vol. 61, p.691–709.

Koenker, Roger and Gilbert Bassett, Jr. (1978). "Regression Quantiles," *Econometrica*, vol. 46(1), p.33-50.

Krugman, Paul, (1991), "Increasing Returns and Economic Geography," *Journal of Political Economy*, vol. 99(3), p.483-99.

Kutan, A. M., and Yigit, T. M. (2007). "European integration, productivity growth and real convergence." *European Economic Review*, vol. 51, p.1370–1395

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and R. W. Vishny, (1998) "Law and Finance", *Journal of Political Economy*, p.1113-1155.

Lee, K., Pesaran, M.H., Smith, R., (1997). "Growth and convergence in multi-country empirical stochastic Solow model." *Journal of Applied Econometrics*, vol. 12 (4), p.357–392.

Massmann, M., & Mitchell, J. (2004). "Reconsidering the evidence: Are Euro area business cycles converging?" *Journal of Business Cycle Measurement and Analysis*, vol. 1(3), p.275–307.

Meggison, W., R. Nash, and M. Randenborgh. (1994). "The financial and operating performance of newly privatized firms: An international empirical analysis." *Journal of Finance*, vol. 49, p. 403-452.

Mittoo, U. (2003). "Globalization and the Value of U.S. Listing: Revisiting Canadian Evidence." *Journal of Banking and Finance*, vol. 27, p. 1629-1661.

Morck, R. and B. Yeung, (1991), "Why Investors Value Multinationality," *Journal of Business*, University of Chicago Press, vol. 64(2), 1991, p. 165-187.

Obstfeld, M. (1994) "Risk-taking, global diversification, and growth", *American Economic Review*, vol. 84 (5), p. 1310-1329.

Opler, T.C. and Titman, S., (1994). "Financial Distress and Corporate Performance", *Journal of Finance*, vol. 49, p. 1015-1040.

Rivera-Batiz, R.A., Romer, P.M., (1991). "Economic integration and growth." *Quarterly Journal of Economics*, vol. 56, p. 531–555.

Rose, A. (2000) "One Money, One Market: Estimating the Effect of Common Currencies on Trade", *Economic Policy*, vol. 15, p. 9-48.

Rose, A., van Wincoop, E. (2001), "National Money as a Barrier to Trade: The Real Case for Monetary Union", *American Economic Review*, vol. 91, p. 386-390.

Stulz, R., (1999) “Globalization of Capital Markets and the Cost of Capital”, *Journal of Applied Corporate Finance*, p. 8-25.

Stulz, R. (2005) “The Limits of Financial Globalization”, *The Journal of Finance*, vol. 60, p. 1595-1638.

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