

Does stock market beta pick up accounting information published by companies? Study with panel data from the Spanish Capital Market 1992-2004

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Purpose of this work is: to take another step in the search for an objective procedure for quantifying risk in the Spanish Capital Market.

This work is in the same line of research started by Ball and Brown (1968/69) and Beaver, Kettler and Scholes (1970)

We decide to do this research for different reasons:

- 1- The majority decisions on finance need use a discount rate reflecting the risk
- 2- How to quantify the risk (with objectivity) is still today a big important problem for the firms are not in the Capital Market.
- 3- The Spanish Capital Market is a constantly growing market and to find the accounting information that explain the Beta (the risk of the shares that give the Capital Market) help to improve its efficiency.
- 4- The relationship between the market risk and the accounting information can differ by country.



The big necessity to have an objectivity measure of risk and the lack of homogeneity in the results of previous studies give us a reason to continue in the same line.

This research has various innovative factors:

- 1- The length of the period under study: 1992 to 2004
- 2- Full range of dependent and independent variables : 7 dependent variables and 19 independent variables (that transform in 41 that we use 4 different denominators for transforming the information to relative values)
- 3- Three different samples: financial business, non-financial business and the overall sample
- 4- Two different market portfolios : IGBM and IBEX-35
- 5- Techniques of panel data regression
- 6- Combine ARM, cash flow, productivity measures and macroeconomic indicators.

The results of the research can have important applications:

- a) To the small firms
- b) To accounting information

Hypotheses:

H₁: The cash flow variables explain the systematic risk of the stocks better than the book profit indicators

H₂: Added value is a significant variable in the determination of systematic risk

H₃: There is a significant and positive relationship between the beta and operating leverage

H₄: Productivity of the firm is a significant and explicative variable in the relationship between market beta and the firms' account information

H₅: Combines the traditional accounting measurements of risk and cash low with measures of productivity and with measurements of macroeconomics improves the explicative capacity of the model

H₆: The beta of Spanish Capital Market collected the accounting and market information



Sample : 69 firms on the Spanish capital market, 14 are financial in nature and the rest are representative of different sectors of the economy.

Period: 1992 to 2004,

Dependent variables: market beta, total risk, specific risk and asset risk

Independent variables:

- a) Balance variables (liquidity, leverage, size, payout, growth, gross added value, net added value, operating leverage, financial leverage, Income after taxes, earnings before interest and taxes
- b) Cash Flow variables (CF) : CF1, CF2, CF3
- c) Productivity variables (PR): PR1,PR2,PR3,PR4,PR5
- d) Macroeconomic variables : Euribor, the Type of Legal Interest, the Consumer Price Index, the Unemployment Rate, the variation in the Gross Domestic Product Index, Dow-Jones and Standard and Poor's stock indexes

Data: all the data are half-year period



Technique: data panel models

Model

$$R_{it} = \alpha_0 + \sum_{j=1}^k \alpha_j (VB_{ijt}) + \sum_{f=1}^k \alpha_f (VCF_{ift}) + n \sum_{p=1}^k \alpha_p (VPR_{ipt}) + \sum_{m=1}^k \alpha_m (VM_{mt}) + \mu_i + \varepsilon_{it}$$

Dependent
Variables

Variables Balance

Variables Cash Flow

Variables
Productivity

Variables
Macroeconomic

1- We have used two different techniques to determine the independent variables:

- a) Analysis factorial
- b) Simple regression


We obtained the best results with the second technique

2- The Hausman test determine in general that the fixed effect is better

3- The problems of contemporaneous correlation, heteroskedasticity and autocorrelation have been solved through the estimation of Panel Corrected Standard Errors


v.depen.		Model 1	Model 2	Model 3	Model 4	Model 5
v.indepen.	Expected signe	β_{IGBM}	$\beta_{IBEX-35}$	ξ	$\beta_{A(IGBM)}$	$\beta_{A(IBEX-35)}$
α_0		-0,015/(-0,38)	-0,024/(-0,17)	0,04/(15,78)	0,237/(5,02)	0,153/(14,95)
EBIT/BVE	-	0,077/(4,10)	-0,069/(-2,47)			
CF2/BVE	-	-0,015/(-2,19)				
CF1/SAL	-	0,007/(2,39)				
GAV/BVE	+/-	-0,033/(-1,35)			-0,016/(-1,65)	
UR	+	0,0088/(4,27)		0,0005/(6,89)		
CPI	+	-0,026/(-2,17)		-0,002/(-3,90)		
S-P 500	+	0,634/(5,47)			0,246/(7,23)	
PR2	+	0,015/(1,82)	0,008/(0,72)			
EBIT/FE	-		-0,001/(-1,38)			
SZ	+/-		0,046/(3,85)	-0,003/(-14,76)		
PA	-		-0,017/(-2,90)			
LEV1	+			0,009/(5,73)		
LEV2	+					-0,303/(-25,16)
GAV/TA	+/-				0,108/(3,03)	
EUR	+					0,021/(12,75)
DJ	+		0,312/(1,58)			0,337/(7,02)
R ²		0,067	0,07	-	-	-
N		1793	1425	1794	1794	1794

Results: total sample



v.depen.		Model 1	Model 2	Model 3	Model 4	Model 5
v.indepen.	Expected signe	β_{IGBM}	$\beta_{IBEX-35}$	ξ	$\beta_{A(IGBM)}$	$\beta_{A(IBEX-35)}$
α_0		0,006/(0,19)	0,533/(17,26)	0,039/(14,44)	0,050/(10,20)	0,013/(0,82)
EBIT/BVE	-	0,078/(4,14)				
CF2/BVE	-	-0,034/(-2,23)				
CF1/SAL	-	0,009/(2,30)				
GAV/SAL	+/-	-0,035/(-2,85)				
GAV/FE	+/-		-0,001/(-2,65)			
IAT/BVE	-		-0,025/(-2,49)			
OL	+		-0,022/(-1,16)			
UR	+			0,001/(6,91)		
CPI	+			-0,001/(-3,23)		
S-P500	+	0,953/(8,04)			0,442/(9,45)	
PR2	+	0,015/(1,95)	-0,006/(-0,54)			
SZ	-			-0,003/(-14,56)		
LEV1	+			0,011/(5,97)		
LEV2	+					-0,012/(-0,33)
GAV/BVE	+/-			0,002/(2,18)	-0,009/(-1,39)	
EUR	+	0,017/(3,30)				0,04/(15,86)
DJ	+		0,392/(1,98)			0,747/(9,77)
R ²		0,073	0,055	-	-	-
N		1429	1425	1430	1430	1430

Results: non-financial firms sample



v.depen.	Expected signe	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
v.indepen.		β_{IGBM}	$\beta_{IBEX-35}$	σ	ξ	$\beta_{A(IGBM)}$	$\beta_{A(IBEX-35)}$
α_0		0.212/(1.20)	0.944/(8.83)	0.012/(59.59)	0.0144/(1.42)	-0.004/(-0.55)	-0.018/(-2.35)
UR	+	0.014/(3.55)		-0.001/(-3.52)			
CPI	+	-0.064/(-2.80)					
PR5	-	-0.239/(-1.70)					
PR1	+	-0.000/(-0.01)	-0.46/(-8.76)				
LEV3	+	0.005/(0.57)					
GAV/TA	+/-		7.77/(2.96)	-0.022/(-2.79)			
IAT/TA	-		-4.22/(-1.88)				
IAT/BVE	-						
EBIT/BVE	-			-0.002/(-1.94)			-0.016/(-0.64)
GAV/BVE	+/-			0.001/(1.70)			
GR	+			0.000/(0.13)			
EUR	+				-0.002/(-2.05)		
PR2	+				0.01/(1.91)	0.009/(1.89)	
LINT	+						0.006/(6.09)
DJ	+		0.346/(1.22)				
R ²		0.056	0.23	-	0.024	-	-
N		364	364	364	364	364	364

Results:
financial
sample

Observations (overall sample):

- The results do not allow us to state a clear connection between the accounting information (divulged by Spanish firms) and the risk measurements from the Spanish Capital Market
- The best model is obtained when the risk measurement is the systematic risk calculated from IGBM ($R^2 = 6.7\%$). Six independent variables are significant
- There are an important difference between the model 1 and the model 2 when IBEX-35 is, theoretically, a representative portfolio of the IGBM
- Three macroeconomics variables explain the β_{IGBM} .
- The most significant variable is S-P500
- The leverage indicator is only significant when the dependent variable is no systematic risk
- The traditional accounting risk measures (ARM) are not significant when the dependent variable is stock beta

Observations: non-financial sample

- The results are a little better than overall sample but not very different. We find 7 independent variables significant, with $R^2 = 7.3\%$ when the risk is β_{IGBM}
- Only in this sample the productivity 2 and the Gross Value Added are significant when the risk is β_{IGBM}
- Again the S-P500 is the most significant variable
- The leverage and the size are the only significant variables, with expected sign, when the dependent variable is no systematic risk.

Observations: financial sample

- The results are even worse than the other sample. Therefore, to separate the samples doesn't mean an improvement in the results
- In this sample the best model is number 2, when the dependent variable is $\beta_{IBEX-35}$, R^2 is the highest in all of the research
- $\beta_{IBEX-35}$ provides better results than β_{IGBM} , although the correlation coefficient between the two betas is very low. Its possible due to the high weight that usually banks have in the IBEX-35
- S-P500 not is a significant variable
- The productivity 1 is highly significant indicator that explain the beta of stock
- Only 2 accounting ratio explains the systematic risk in Spanish Market

Conclusions

The research to permit us to say:

- a) The results are in a similar line as those obtained in previous studies. Spanish market does not proportion better results
- b) There isn't a strong relationship between the market beta and accounting information
- c) Not only the strictly accounting information explains stock beta. Macroeconomics and productivity variables are explicative of systematic risk.
- d) The choice of the market portfolio is important for the results

Future extension of the line of research

1- To investigate if the International Accounting Regulations used by companies on the Spanish Capital Market since 2005 improve the relationship between beta and accounting information

2- To investigate what extent the accounting information revealed is of quality, studying the phenomenon of creative accounting as a way for manipulating results, and their link to the risk of stocks

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