

IBEX

Original written by professor Pablo Pedro Melero Perlado at IE Business School.

Original version, 14 January 1998. Last revised, 29 May 2008.

Published by IE Business Publishing, María de Molina 13, 28006 – Madrid, Spain.

©1998 IE. Total or partial publication of this document without the express, written consent of IE is prohibited.

The investment analysis company Analistas Cuantitativos de Inversiones, S.A. (ACISA) advises its clients on the best investment alternatives available at each moment for each of a number of markets, based on models describing their future behaviour.

On this occasion ACISA wants to create a regression model capable of estimating the future value of the IBEX stock-market index, based on explanatory variables whose future value can be predicted with reasonable accuracy.

The first thing they thought of was to include interest rates, a classic variable, given that fixed-income interest rates influence the progress of variable income, although it is not known if the long-term rates or short-term rates are a better explanatory variable. As a representative short-term rate they used the 90-day Madrid interbank rate (MIBOR), and as a long-term rate they took the 10-year bond rate.

Also, it seems that international capital flows can have an important influence on changes in the stock-market indexes, and so a variable related to these flows of foreign capital was included, namely the €/€ exchange rate.

In order to create the regression model the average data for the last 109 weeks, which are considered to be representative of the future behaviour of the variables, have been taken. These are given in the table below.

Although the explanatory variables chosen are believed to be related to the development of the IBEX index, a number of doubts exist:

- It is possible that the IBEX is cyclical, and this needs to be examined.
- It is possible that short and long-term interest rates are interrelated (multi-collinearity problem) and this could affect the quality of a regression model including both.
- The validity of the basic linear regression model presupposes fulfilment of prior hypotheses concerning the residues and these have to be checked (heterocedasticity problem).
- Stock.-market indexes behave in such a way that their trends have an influence, i.e. today's value depends in part on preceding values (autocorrelation problem).

Create a regression model which avoids these problems, if they exist, and allows a prediction of the value of IBEX on a date where the long-term interest rates stand at 10.76%, short-term rates at 7.6% and the exchange rate at 0.781 €/€.

	IBEX	Exchange rate €/€	Short term rate MIBOR 90 days	Long term rate 10 year bond
Week	I	tc	lc	IL
1	2664	0,59	12,7	11,5
2	2610	0,585	12,8	11,6
3	2571	0,58	12,8	11,6
4	2411	0,569	13	11,9
5	2293	0,584	13,6	12,6
6	2338	0,573	13,6	12,5
7	2333	0,571	13,7	12,2
8	2240	0,573	13,8	12,3
9	2276	0,567	13,8	12,4
10	2214	0,557	14,1	13
11	2342	0,555	13,9	12,5
12	2266	0,575	14	12,8
13	2337	0,647	13,7	12,5
14	2145	0,635	14,2	13
15	1999	0,611	15	13,4
16	2092	0,647	14,7	13,4
17	2094	0,648	14,3	13,3
18	2191	0,664	13,5	12,5
19	2155	0,669	13,6	12,6
20	2164	0,697	13,9	12,7
21	2221	0,687	13,9	12,5
22	2371	0,699	14	12,5
23	2414	0,703	15,1	12,7
24	2362	0,698	15,3	12,8
25	2367	0,688	15,7	12,6
26	2410	0,678	14,4	12,4
27	2444	0,691	14,2	12,4
28	2394	0,702	14,1	12,4
29	2465	0,713	14,4	12,5
30	2568	0,707	13,9	12,1
31	2612	0,687	13,5	11,7
32	2582	0,699	13,6	11,8
33	2701	0,718	13,3	11,5
34	2678	0,721	13,1	11,5
35	2635	0,717	13,5	11,5
36	2630	0,72	14,3	11,8
37	2700	0,724	14,6	11,5

	IBEX	Exchange rate €/€	Short term rate MIBOR 90 days	Long term rate 10 year bond
Week	I	tc	lc	IL
38	2678	0,725	15,1	11,5
39	2661	0,713	13	11,4
40	2688	0,713	12,8	11,5
41	2669	0,696	12,9	11,5
42	2650	0,703	13,1	11,7
43	2691	0,713	12,8	11,6
44	2775	0,715	12,9	11,6
45	2742	0,707	13,5	11,8
46	2693	0,71	13,9	11,7
47	2848	0,745	12,3	11,3
48	2860	0,756	11,2	11,2
49	2894	0,763	11,2	11,1
50	2921	0,774	11,4	11,2
51	2888	0,76	11,5	11
52	2976	0,783	10,1	10,5
53	2903	0,796	10	10,5
54	2897	0,79	10,2	10,4
55	2890	0,806	10,4	10,4
56	2890	0,823	10,5	10,4
57	2916	0,838	10,8	10,4
58	3044	0,883	10,2	10,2
59	3057	0,845	10,3	9,8
60	3178	0,865	10,4	9,6
61	3298	0,824	10,4	9,7
62	3434	0,822	10,4	9,2
63	3338	0,806	10,3	9,1
64	3250	0,775	10,1	9,3
65	3205	0,788	9,4	9,4
66	3167	0,8	9,5	9,4
67	3247	0,802	9,5	9,2
68	3328	0,797	9,6	9,1
69	3409	0,798	9,3	8,8
70	3551	0,818	9,1	8,6
71	3522	0,824	9,1	8,6
72	3419	0,829	9,4	9
73	3425	0,831	9,3	8,9
74	3488	0,842	9	8,7
75	3405	0,852	9,1	8,7
76	3489	0,866	9,1	8,8
77	3530	0,847	9,1	8,6
78	3526	0,857	8,4	8,6
79	3692	0,849	8,3	8,4
80	3691	0,872	8,3	8,4
81	3713	0,879	8,5	8,5

	IBEX	Exchange rate €/€	Short term rate MIBOR 90 days	Long term rate 10 year bond
Week	I	tc	lc	IL
82	3815	0,879	8,4	8,3
83	3870	0,873	8,5	8,2
84	3998	0,858	8,4	8,2
85	4030	0,866	8,5	8,2
86	3930	0,869	8,6	8,3
87	3888	0,854	8,6	8,5
88	3782	0,849	8,6	8,9
89	3766	0,858	8,4	8,9
90	3742	0,842	8,4	9,1
91	3783	0,849	8	9,2
92	3686	0,837	8	9,4
93	3562	0,841	8	9,3
94	3631	0,845	7,9	9,2
95	3533	0,852	7,8	9,2
96	3532	0,839	7,8	9,5
97	3595	0,821	7,8	9,6
98	3519	0,835	7,9	10
99	3645	0,845	7,7	9,8
100	3741	0,828	7,7	9,6
101	3636	0,825	7,7	9,9
102	3581	0,838	7,8	10,3
103	3569	0,83	7,8	10
104	3365	0,813	8	10,9
105	3256	0,799	8,2	11
106	3249	0,802	8,1	11,2
107	3184	0,789	8,2	11,5
108	3302	0,783	8,1	10,8
109	3357	0,803	8	10,8

■ ■ ■