



Abnormal Returns in Privatization Public Offerings: The Case of Portuguese Firms

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resumo

Neste trabalho analisamos a evidência sobre o comportamento dos retornos das acções das empresas privatizadas em Portugal entre 1989 e 2001. O objectivo do nosso trabalho foi de recolher evidência sobre o desempenho em bolsa de uma amostra abrangente de operações públicas de privatização e avaliar os factores determinantes do desempenho observado. Os resultados obtidos confirmam a existência de retornos anormais positivos no dia e mês após a venda das acções em bolsa, mas os retornos são de reduzida magnitude e com reduzida significância estatística. Além disso, os retornos observados para as acções das empresas privatizadas são inferiores aos observados para empresas privadas que realizaram Ofertas Públicas Iniciais. No longo prazo, o desempenho é negativo mas superior ao observado para as acções de empresas privadas que efectuaram OPIs. Os resultados sugerem assim que há reversão parcial dos retornos iniciais e ainda que os investidores exigem retornos mais elevados para acções de empresas que são privatizadas parcialmente.

résumé / abstract

La présente étude analyse les rendements excédentaires des émissions relevant de privatisations au Portugal dans le période de 1989 à 2001. Nous étudions les performances boursières, initiale et à moyen et long terme, pour un échantillon qui comporte l'ensemble des privatisations portugaises (ouverture initiale et ventes subséquentes), et les facteurs qui expliquent cette performance. Les offres des entreprises publiques observent un rendement initial positif mais modeste, vis-à-vis le rendement de référence et, en moyenne, sont moins rentables que celles achevées par les entreprises au capital privé. Les rendements excédentaires cumulésregistrent une performance négative pendant une période de 3 à 5 ans, mais la perte est inférieure à celle générée par les émissions initiales de entreprises au capital privé. Les résultats suggèrent donc que le rendement initial est partiellement reversé et que les actionnaires demandent des rendements supérieurs pour les privatisations partielles.

This paper provides evidence on abnormal returns of Portuguese privatization public offerings for the period from 1989 to 2001. This study explores the abnormal performance of a comprehensive sample of Portuguese privatization transactions and investigates the determinants of the observed price behavior. We find some evidence of the underpricing phenomenon for privatized offerings but initial returns are low and barely significant. The results show further that privatization IPOs underperform private sector IPOs. In the long run, we observe negative abnormal returns. While in early event months, privatization public offerings yield more negative returns than private sector offerings, this effect is reversed in longer horizon periods. Initial underpricing is thus partially reversed and investors seem to require higher returns in partial privatizations.

JEL Classification: G38; G32

1. Introduction



A considerably high number of studies document the phenomenon of underpricing of privatized firms in the short run and positive abnormal performance in the long run. This study measures short- and long-term abnormal returns to investors in Portuguese privatization public offerings and investigates the determinants of the observed price behavior. The empirical analysis is based on a comprehensive sample of privatization transactions that took place on the Portuguese stock exchange for the period from 1989 to 2001.

Documenting and understanding the short- and long-term market performance of privatization public offerings in different countries can shed light on the debate upon the impact of privatization programs on the firm's value and on whether the performance is tied to particular characteristics of a privatization program (aims, strategies and methods). The contribution of this paper is to extend the analysis of the literature on privatization public offerings providing additional evidence regarding a single country program. Previous empirical studies are mainly multi-country studies that analyze transactions across markets or single-country studies that focus on "voucher" privatization programs of economies in transition (countries from Central and Eastern Europe).

Our paper tests several theoretical predictions that have been put forward in the literature. In particular we investigate the role of political strategies and dual listing in the short and long run performance of privatization public offerings.

Our results are not supportive of the underpricing phenomenon except when we exclude the very extreme observations. Our results show further that privatization IPOs underperform private sector IPOs. These results contradict most of the previous evidence¹. The degree of underpricing seems to reflect uncertainty and not a strategic political policy to retain power.

In the long run, we observe negative abnormal returns contradicting the most recent evidence². While in early event months, privatization public offerings yield more negative returns than private sector offerings, this effect is reversed in longer horizon periods³. Initial underpricing is thus partially reversed and investors seem to require higher returns in partial privatizations.

This paper is organized as follows: Section 2 provides a brief overview of the Portuguese privatization program. Section 3 describes the sample. In Sections 4 and 5 we review the relevant literature, describe the tests and variables and present the results for, respectively, the short and long run market performance. Section 6 concludes our study.

2. The Portuguese Privatization Program

The Portuguese privatization program started in 1989, well after the privatization wave in developed European countries initiated by Margaret Thatcher's British government back in the early 1980's. The late launch of the program was due to the political and legal environment created by the 1974 Revolution and the massive process of nationalizations that followed⁴. Only in 1998 as a part of a broad set of economic reforms, was the transfer of state holdings to the

¹ See for example Choi and Nam (1998) that look at 185 PIPOs from 30 countries over the period from 1981 to 1997. Yet some studies on Central and Eastern European privatization offerings also find that the difference in initial returns between IPOs and Private IPOs is insignificant.

² Megginson, Nash, Netter and Schwartz (2000) find positive and statistically positive long-run (1-5 years) returns for a sample of 158 PIPOs from 33 countries from 1981 to 1997.

³ This result is consistent with recent empirical literature that finds Privatization Initial Public Offers (PIPOs) outperforming private IPOs. Moreover, there is worldwide evidence of negative long-term returns for private IPOs (see for example Jenkinson and Ljungqvist, 2001).

⁴ The nationalization process in Portugal started in 1975 and was extensive to all sectors in the economy: banks, insurance companies, oil, transport, energy, telecommunications, pulp and paper, beverages, etc.



private sector begun. Initially only sales of minority shareholding positions were allowed but that was changed in 1990, when the Law of Privatization was approved. The main stated objectives of the privatization program therein, were similar to those announced in most European countries. Besides the reduction of state ownership in itself, the program aimed at raising cash to reduce public debt and budget deficits; improving economic efficiency through the use of markets to allocate resources; submitting companies to transparent corporate governance rules; developing domestic capital markets; and disseminating share ownership⁵.

The privatization methods used by the Portuguese government changed over time but the preferred method was sales through Public Offerings held in the Portuguese stock exchange. The method of Direct Sales was used, exceptionally, for small companies, and supposedly when national political and economic interests were at stake⁶.

Table 1 shows the annual proceeds of the privatization public offerings over the period from 1989 to 2001. Sales were spread over time but 1992, 1997 and 1998 were important years with sales amounting to respectively, 1.3, 2 and 2.2 billion Euros. Total capital raised amounted to 8.8 billion Euros in 66 transactions. There was a predominance of partial privatizations and over time, there were important differences in the transactions, in particular regarding the industries of the privatized firms⁷. By 2001, privatized firms accounted for more than 50% of total market capitalization.

3. Sample

We have identified the transactions in Dathis, a financial database compiled by the Portuguese stock exchange and that is the most comprehensive data set on Portuguese stocks. We have collected data on offer size, initial offer prices, offer dates and quotes.

Table 2 shows the descriptive statistics for gross proceeds of the transactions that constitute our sample. The sample includes 42 privatization transactions, of which 19 are initial offers (Privatization Initial Public Offers – PIPOs) and 23 are secondary (seasoned) offers (Privatization Seasoned Public Offers – PSPOs). Inevitably PSPOs are more common in later years, and after 1998, the Portuguese government only launched subsequent offers. The proceeds of the 42 privatization transactions in the sample represent 96% of the total proceeds of all privatization public offers in Portugal for the period analyzed. The remaining transactions refer to sales of small firms that were sold on the stock exchange but were not listed on the main regular market⁸.

As documented in other privatization studies (see for example Jelic and Briston, 2003), the effective open market trading of the shares of privatized firms after the official IPO date is often a long process and there is a substantial variance in time to listing across firms. This delay results from the design of the operation, in particular legal constraints on trading⁹. For the PIPOs in the sample, the median time to listing was 43 days.

5 By the end of 1988, the Portuguese stock market was short-lived, illiquid and tiny. Aggregate market capitalization was then below 4 000 million Euros. By the end of 2001, aggregate market capitalization was above 73 thousand million Euros (down from 116 thousand million Euros by the end of 2000).
6 This was the case of GALP, the Portuguese oil refinery and distribution company.
7 The initial transactions involved banks, insurance companies and brewers.
8 In April 1991, the new Capital Markets law (Lei Sapateiro) set up three market segments in the Portuguese stock exchange. Regular firms, i.e. those firms meet all exchange requirements (in terms of capital dispersion, market capitalization and solvency), are listed on Mercado de Cotações Oficiais (Market with Official Quotations). Small and medium firms list on Segundo Mercado (Second Market). The firms that do not meet the exchange requirements are traded on Mercado Sem Cotações (Market Without Quotations). From 2005 on, all stocks listed either on Mercado de Cotações Oficiais or Segundo Mercado became listed on Euronext Lisbon.
9 For example, in Portugal, buying shares of privatized companies allowed tax allowances subject to a minimum required holding period. The same applies for special tranches reserved to employees, immigrants, small investors and even clients, placed at a discount relative to the offer price but again required a minimum holding period.

Table 1 – Summary Statistics for Portuguese Privatizations Public Offerings			
Year of Privatization	Nr. Privatizations	Gross Proceeds (€ thousand)	% of Partial Privatizations
1989	4	353 327	100%
1990	5	692 795	80%
1991	5	553 478	60%
1992	12	1 283 477	42%
1993	7	327 628	29%
1994	4	344 058	75%
1995	7	550 590	71%
1996	6	491 154	83%
1997	6	1 989 737	100%
1998	4	2 192 530	100%
1999	2	2 718	100%
2000	2	5 258	100%
2001	2	610	100%
Total	66	8 787 360	

Source: Dathis.
Notes: This table reports information concerning the 66 privatizations that occurred in Portugal from 1989-2001.

Table 2 – Gross Proceeds of Portuguese Privatization Public Offerings				
	Total	Mean	Median	Std. Dev.
All (n=42)	8 475 096	201 788	124 529	276 135
PIPOs (n=19)	3 917 192	206 168	142 634	224 305
PSPOs (n=23)	4 557 887	198 169	66 289	317 660

Notes: This table presents the gross proceeds (in thousand Euros) of Portuguese privatization public offerings, as well as its breakdown in Initial (PIPOs) and Secondary Offers (PSPOs).

Table 3 – Gross Proceeds of Portuguese Private IPOs				
	Total	Mean	Median	Std. Dev.
Private IPOs (n=15)	419 535	27 969	16 959	29 216

Notes: This table presents the main descriptive statistics for the Gross Proceeds (thousand Euros).

Table 3 shows the summary statistics for the gross proceeds of Portuguese private sector IPOs. The sample comprises 15 IPOs and represents the universe of private sector transactions in the sample period. PIPOS are on average much larger than private IPOs (10 times larger) and this is similar to what has been reported in previous studies. The median time to listing for these offerings was 3 days.





4. Short Run Market Performance

4.1. Theoretical Predictions and Previous Findings

Previous evidence has shown that companies underprice their shares when they go public. The underpricing has been also documented for PIPOs, in different countries and over different time periods. The evidence from single country studies, in particular referring to Central and Eastern European countries, is sometimes conflicting. Yet more recent studies, that use comprehensive samples of operations across countries, show overwhelming evidence of positive and superior initial returns for PIPOs compared with private IPOs¹⁰. Seasoned offerings are underpriced as well, though much less so than PIPOs.

Different theoretical arguments have been put forward to account for the observed privatization initial returns.

According to asymmetric information theories, and as described by Huang and Levich (2003), it is reasonable to expect that there should be less uncertainty about larger and mature firms, operating in stable industries, as they are likely to be followed by more analysts, produce more information about their activities, and possibly have longer periods of operation, than smaller and younger firms established in new industries. If so, a more significant underpricing should be observed for privatizations of smaller state-owned firms. Given that companies involved in private IPOs are younger and in more dynamic industries, privatization IPOs should be less underpriced and thus yield lower initial returns. Yet limited demand in small capital markets may dictate greater underpricing for larger issues to ensure the success of the operation. Therefore a higher degree of underpricing may be observed in larger privatization offerings. Asymmetric information theories would also predict that underpricing is greater for transactions where the length of time between offer price setting and first trade date is greater, and for initial privatization offerings. As the scope and implications of the privatization program are revealed, uncertainty about offer characteristics is reduced yielding diminishing initial returns over time¹¹.

Political economic theories argue that governments pursue above all political objectives as demonstrated by Perotti (1995) and Biais and Perotti (2002). This view argues, for example, that shares are allocated for purchase at a discount by firm employees to gain employee political support to the process of privatization. This suggests that initial returns in privatizations for which a share tranche is reserved for employees, should exceed initial returns observed when there is no such reserved tranche. Similarly, governments try to build political support during the early stages of a privatization program by underpricing first privatization offers, which satisfies investors and increases their confidence in the next offers. Higher initial returns should also be expected whenever a privatization offer occurs on a year of parliamentary elections, before these elections take place, to avoid shifting voting preferences among the population. Finally, according to Biais and Perotti (2002), strategic privatization, by allocating significant share ownership to a targeted section of the population, is mainly used by right-wing political parties. If so, higher initial returns should be observed when right-wing parties are leading the country.

As for foreign participation, it is plausible to assume that governments that are concerned with building domestic electoral support, bar foreigners from purchasing any part of the offer. If underpricing occurs, a privatization program represents a wealth transfer from the state to investors, and the government will be more subject to criticism the greater the foreign allocation. The prediction is thus that higher initial returns should be observed in offers where there is no share tranche reserved for foreigners and should be lower when foreign allocation increases. Yet

10 The Megginson and Netter (2001) survey article in the Journal of Economic Literature presents a number of studies examining initial returns in PIPOs that find positive significant initial performance. Yet some authors show contradictory results. See for example Dewenter and Malatesta (1997).

11 In Baron (1982).

international diversification benefits would dictate that offer prices are higher in offerings with foreign international investors due to extended capital supply and the presence of more sophisticated investors¹². In addition, the cross-listing of the shares of a privatized firm may be seen as a signal of quality and government's commitment to it through the privatization program. This could resolve part of the uncertainty regarding firm value and result in higher initial offer prices and therefore lower underpricing for those offers with a listing in foreign markets.

Agency theory models argue that managerial incentives and market monitoring are ineffective in partial sales because the control shift to the private sector is incomplete, given the likelihood of a government intervention later after the sale, and this impacts expected economic performance. This is also true for sales of firms in regulated industries. The prediction is that partial privatization offerings are riskier and therefore a greater underpricing is required to reassure and convince investors to buy shares. Yet a government that is mainly concerned with revenue maximization will be unwilling to underprice and will prefer total privatization.

Finally, the degree of underpricing depends on how the offer price was chosen. More and more offer prices are set after a process of book building, in order to gather information on the demand prices and orders. In such a setting, investors reveal their opinions and therefore underpricing should be lower due to uncertainty resolution when such processes are used.

Evidence suggests that underpricing is more severe for state-owned firms in regulated industries, consistent with the agency arguments (see for example Dewenter and Malatesta, 1997). Yet there are conflicting results regarding the effect of partial privatization: several studies show returns are positively related to the stake sold (see for example Jones, Megginson, Nash and Letter, 1999, and Choi and Nam, 1998), suggesting governments choose above all to maximize revenues.

In this paper we empirically investigate the arguments outlined above.

4.2 Methodology and Variables

We investigate if Portuguese privatization public offerings have positive initial returns. We use the traditional event-study methodology (see for example Dewenter and Malatesta, 1997) to measure privatization total and market-adjusted returns over one-day, seven-day and thirty-day holding periods following the offer date¹³.

Raw returns are given by:

$$r_{it} = \log(P_{i,t}) - \log(P_{i,0}) \quad (1)$$

where

r_{it} : raw, unadjusted return for stock i on day t ;

$P_{i,t}$: closing price for stock i on day t following initial trade ($t = 1, 7, 30$); and

$P_{i,0}$: initial offer price for stock i (time index 0 refers to the issue date).

Abnormal returns are defined as market-adjusted returns:¹⁴

$$r_{it}^* = r_{it} - r_{mt} \quad (2)$$

¹² Higher offer prices are due to an increase in demand for shares (demand effect).

¹³ For simplification, we use calendar day intervals and not trading days.

¹⁴ Alternative risk adjustment methods are not used because there is no pre-listing period concerning privatized firms.





where

r_{it}^* : market-adjusted return for company i on day t ;

r_{mt} : market return on day t , defined as $\log(I_t) - \log(I_0)$;

I_t : stock market index level on day t ; and

I_0 : stock market index level on the date the offer price was set.

To ensure that results are robust, market-adjusted returns were computed with reference to two different indices.¹⁵ The indices used were PSI Geral (the reference index of Portuguese stocks) and S&P 500. Stock market indices data is from Datastream International.

The use of offer prices for the calculation of initial returns creates some problems. In particular, the time difference observed in the process of introducing shares into trading is, in some cases, very long and as such, abnormal returns should be interpreted with caution.

Significance is assessed on the basis of Student's t -test¹⁶. To check robustness, we performed a Sign Test¹⁷.

We also investigate whether Portuguese PIPOs are more underpriced than Portuguese private sector IPOs. We perform a difference t -test and Wilcoxon Mann-Whitney-U test to evaluate the differences between initial returns of state-owned IPOs and private IPOs¹⁸.

15 Results using FTSE 100 are also available upon request.

16 The test statistic assumes that abnormal returns are independently, identically and normally distributed and is distributed as t -Student with degrees of freedom equal to the sample size minus one. The t -statistic is given by

$$t = \frac{\sum_i r_i^*}{\sqrt{N \cdot \hat{\sigma}^2}}$$

where N is the number of companies in the sample. Given that there is no available data prior to the event, the standard deviation of abnormal returns ($\hat{\sigma}^2$) is estimated from the cross-section of event date abnormal returns. See Serra (2004) for more details.

17 The Sign test is a non-parametric test used as an alternative to the t -test. The Sign test is a simple binomial test of whether the fraction of positive abnormal residuals (p) equals 50%. The statistic

$$GS = \frac{|p_0 - p|}{\sqrt{p(1-p)/N}}$$

has an approximate unit normal distribution. p_0 is the observed fraction of positive returns across firms in one particular event period. If abnormal returns are independent, under the null hypothesis the number of non-negative values of abnormal returns has a binomial distribution with parameter p . The alternative hypothesis, for any level of abnormal performance, is that the proportion is different than that prior to it.

18 The Wilcoxon-Mann-Whitney test is a non-parametric test for comparing two population means (or medians) based on independent samples. The statistic for the test is given by:

$$T = \sum K_i$$

where K_i is the rank of the absolute value of abnormal returns of the first sample (PIPOs). It is assumed that none of the absolute values are equal and that each is different from zero. Asymptotically, for $N, M > 10$, the distribution of T , under the null hypothesis of equally likely superior or inferior abnormal returns, will be normal with

$$E(T) = N(N + M + 1) / 2$$

$$\sigma^2(T) = N(N + M + 1)M / 12$$

N and M are, respectively, the number of firms of state-owned IPOs (19 observations) and private IPOs (15

Finally, in order to evaluate the importance of the several theoretical arguments reviewed above, we perform a multivariate analysis. We use the following specification:

$$r_i^* = a + \beta_1 \text{DAYS}_i + \beta_2 \text{SIZE}_i + \beta_3 \text{EMP}_i + \beta_4 \text{FOR}_i + \beta_5 \text{ORDER}_i + \beta_6 \text{PARTIAL}_i + \beta_7 \text{GOV}_i + \beta_8 \text{ELECTION}_i + \beta_9 \text{ADR}_i + \varepsilon_i$$

(3)

where

r_i^* : market-adjusted one, seven or thirty-day initial return for privatization offering i ;

DAYS: number of days between the date of price setting and the first trade date;

SIZE: (log) total value of the privatization offer;

EMP: dummy variable that equals one for employee participation and zero otherwise;

FOR: dummy variable that equals one for foreign participation and zero otherwise;

ORDER: order of the privatization offering i within the country's privatization program, that equals one for the first share privatization offer sale, two for the second offer, and so forth;

PARTIAL: dummy variable that equals one if the privatization offering i is partial (fraction of equity sold by the government inferior to 100%) and zero if 100% of the company is sold;

GOV: dummy variable that equals one if the privatization offering i occurred while a right-wing party was governing the country and zero otherwise;

ELECTION: dummy variable that equals one if the privatization offering i occurred on a year of parliamentary elections before elections took place, and zero otherwise; and

ADR: dummy variable that equals one if the stocks were listed in the form of ADRs in an international capital market and zero otherwise.

According to asymmetric information theories it is reasonable to expect a lower degree of underpricing for larger and more mature firms, operating in stable industries, as they are likely to be followed closely by more analysts, produce more information about their activities, and possibly have longer periods of operation, than smaller and younger firms established in new industries. This effect is captured by the variable SIZE. Yet many privatizations occur in small capital markets and a higher degree of underpricing may be required to warrant the placement of the entire offer. Information asymmetry would also predict that the greater the length of time between offer price setting and first trade date (DAYS), the higher the degree of underpricing. The order of the offer (ORDER) may also affect initial returns: the degree of uncertainty about the first privatization issue is much higher than other subsequent privatizations (in a sector or in industry, in case of banks, beverages, insurance, pulp). Asymmetric information theories would predict that – for subsequent offers – as the scope and the implications of the privatization program are revealed, underpricing should be less severe. Finally, governments may list the privatized shares in international exchanges (through ADRs), to signal quality and government's commitment to it through the privatization program. Therefore, initial returns should be higher for those offers that were listed in foreign markets¹⁹.

To investigate political economic arguments we use several different variables. If governments are concerned with building political support, initial returns in privatizations where a share

observations). If the underlying distribution is normal, the relative efficiency of this test against the t-test is 0.955 and is thus less powerful for smaller samples. This is no longer true if the abnormal returns are not normally distributed.

19 Yet this effect may be mitigated by the way the offer price was determined. More and more offer prices are set after a process of book building involving large international institutional investors, reducing the degree of underpricing.



tranche is reserved to employees (EMP) should exceed initial returns where there is no such reserved tranche. The variables GOV and ELECTION are also included to assess if privatization is used by governments to retain political power: higher initial returns should be observed when right-wing parties are leading the country, and when privatization occurs just before parliamentary elections. Again if governments' main concern is to assure political support, one should observe that when foreign participation (FOR) is allowed, one should observe lower initial returns as a result of higher offer prices to bar wealth transfers to foreigners. Yet one could observe this same effect driven by greater demand for shares, improved risk sharing and lower risk aversion that would enhance offer prices. Governments may also try to build political support during the early stages of a privatization program by underpricing first offers (ORDER), which satisfies investors and increases their confidence for subsequent offers. If the privatization offer is partial (PARTIAL) a higher degree of underpricing may also be used as a means to assure and convince investors to buy in subsequent offers. Partial sales may also require higher underpricing to compensate for the fact that the control shift to the private sector is not effective and therefore the impact on the firm's expected economic performance is lower.

Data regarding governments in power in Portugal for the sample period, as well as information concerning the parliamentary electoral dates, were obtained from the Portuguese Elections National Commission²⁰. Table 4 presents this information.

Information concerning Portuguese privatized companies Depository Receipts listed in the US was obtained in DR Directory of the Bank of New York. Table 5 summarizes this information.

Table 4 – Portuguese Parliamentary Elections for the Period 1989-2002		
Date of the Election	Winner party	Right/Left wing
19-07-1987	PSD	Right-wing
06-10-1991	PSD	Right-wing
01-10-1995	PS	Left-wing
10-10-1999	PS	Left-wing
17-03-2002	PSD	Right-wing

Source: Comissão Nacional de Eleições.

Notes: This table reports summary information concerning the dates and the winners of parliamentary elections occurred in Portugal during 1989-2002. PSD: Partido Social Democrata; PS: Partido Socialista.

Table 5 – Depository Receipts of Portuguese Privatized Firms Shares					
DR Issue	Exchange	Ratio ADR:ORD	Industry	Deposit	Date
PTelecom	NYSE	1:1	Fixed Line Comm.	BNY	01-06-1995
Portucel	PORTAL	1:1	Forest Products & Paper	CIT	28-06-1995
Cimpor	PORTAL	1:2	Building Materials	CIT	18-10-1996
EDP	NYSE	1:10	Electric Utilities	CIT	19-06-1997

Source: Bank of New York DR Directory.

Notes: This table reports summary information concerning Portuguese privatized companies depository receipts listed in the US.

4.3. Results

Table 6 shows the summary statistics of the raw and market-adjusted returns for the 42 Privatization Public Offerings in our sample. Average and median unadjusted and market-adjusted returns over one- and seven-day periods are positive but statistically insignificant.

20 "Comissão Nacional de Eleições".

Considering a holding period of 30 days, average market-adjusted returns become lower and are even negative when we use the S&P 500 as the market benchmark. The parametric t-tests for all periods in the analysis show that there is no significance at the 5% level. As such we cannot reject the null hypothesis that initial returns of Portuguese Privatization Public Offerings are equal to zero. These results do not confirm the findings reported in the literature for other countries.



Table 6 – Initial Returns for Portuguese Privatization Public Offerings

n = 42	Unadjusted Returns (%)			Market-Adjusted PSI GERAL Returns (%)			Market-Adjusted Returns (%) S&P 500		
	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR
Average	1.10	1.24	0.47	1.49	1.39	0.69	0.50	0.60	-0.45
Median	2.60	2.68	1.87	2.81	2.64	2.34	1.87	2.24	1.95
t-statistic	(0.812)	(0.874)	(0.312)	(1.024)	(0.921)	(0.454)	(0.342)	(0.399)	(-0.275)
% Positive	76.19%	73.81%	64.29%	80.95%	76.19%	59.52%	73.81%	73.81%	61.90%
Sign Test	3.395 ^a	3.086 ^a	1.852	4.012 ^a	3.396 ^a	1.234	3.086 ^a	3.086 ^a	1.543

Notes: This table presents the average and median unadjusted and market adjusted initial returns for 42 Portuguese Privatization Public Offerings. Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-tests refer to two-tailed tests. ^a denotes significance at the 5% level.

Yet, using a non-parametric test, the test statistical values obtained for the Sign Test allow us to reject the null hypothesis of no abnormal returns at a 5% significance level for one and seven days periods. For thirty-day periods results are consistent with the ones obtained from parametric tests.

As described above, some of these initial returns refer sometimes to very long periods because for some stocks, trading is initialized months after the offer date. The variable Time to listing ranges from a minimum of 1 day to a maximum of 476 days. To check if the most extreme observations were affecting the returns we re-calculate the average abnormal return over one-, seven- and thirty-day periods, excluding from the sample those companies that had a Time to listing outside the third quartile of the distribution. We excluded 11 observations. The results obtained for the remaining 31 Privatization Public Offerings are presented in Table 7. Average unadjusted and market-adjusted returns over one-, seven- and thirty-day periods are now higher than the ones obtained for the full sample of 42 Privatization Public Offerings, and the t-tests and sign test are significant at the 5% level. Therefore, after deleting extreme observations, we reject the null hypothesis that initial returns of these 31 Portuguese Privatization Public Offerings are equal to zero, and confirm the phenomenon of underpricing in the short run.

As initial and subsequent offerings have different nature, we removed the 23 subsequent offerings from the sample to check if these transactions had influence on the results. Table 8 shows summary statistics of the initial returns for the 19 Portuguese PIPOs included in the sample. Average and median unadjusted and market-adjusted returns are now higher than the ones obtained with the initial sample of 42 transactions. In any case, initial returns are low and barely significant, except for market-adjusted one-day returns using the PSI GERAL as the market benchmark and the sign test over one- and seven-day periods. In addition to that, sample size is very small affecting statistic inference.

We performed a comparative analysis by considering two sub-samples: PIPOs and private IPOs. We compute initial returns to investors for the sub-sample of 19 PIPOs and compare these returns with the ones observed for the control sample of private IPOs. Table 8 shows the raw and market-adjusted returns for PIPOs and private IPOs.

Table 7 – Initial Returns for 31 Portuguese Privatization Public Offerings Excluding Outliers									
n = 31	Unadjusted Returns (%)			Market-Adjusted Returns (%) PSI GERAL			Market-Adjusted Returns (%) S&P 500		
	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR
Average	3.81	3.98	3.59	3.49	3.42	3.06	3.42	3.69	3.36
Median	3.63	3.25	3.16	2.95	2.71	2.83	3.43	3.19	3.36
t-statistic	(3.816) ^a	(3.875) ^a	(3.127) ^a	(3.697) ^a	(3.255) ^a	(2.797) ^a	(3.472) ^a	(3.634) ^a	(3.051) ^a
% Positive	90.32%	90.32%	80.65%	90.32%	87.10%	70.97%	83.87%	83.87%	77.42%
Sign Test	4.490 ^a	4.490 ^a	3.413 ^a	4.490 ^a	4.131 ^a	2.335 ^a	3.772 ^a	3.772 ^a	3.053 ^a

Notes: This table presents the average and median unadjusted and market adjusted initial returns for 31 Portuguese Privatization Public Offerings. Returns (AR and CAR) are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-tests refer to two-tailed tests. ^a denotes significance at the 5% level.

Table 8 – Initial Returns for Portuguese PIPOs and Private IPOs									
PIPOs n = 19	Unadjusted Returns (%)			Market-Adjusted Returns (%) PSI GERAL			Market-Adjusted Returns (%) S&P 500		
	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR
Average	3.31	3.04	1.64	3.38	3.11	1.41	2.69	2.43	-0.02
Median	3.00	2.83	1.35	2.95	2.71	1.85	2.76	2.61	1.45
t-statistic	(1.814)	(1.628)	(0.787)	(2.137) ^a	(1.769)	(0.766)	(1.442)	(1.188)	(-0.010)
% Positive	73.68%	68.42%	57.89%	73.68%	73.68%	52.63%	68.42%	68.42%	57.89%
Sign Test	2.065 ^a	1.606	0.688	2.065 ^a	2.065 ^a	0.229	1.606	1.606	0.688

Private IPOs n=15	Unadjusted Returns (%)			Market-Adjusted Returns (%) PSI GERAL			Market-Adjusted Returns (%) S&P 500		
	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR
Average	8.55	9.38	9.93	7.83	8.62	8.21	8.24	9.35	9.51
Median	7.74	7.37	6.12	6.69	5.25	6.03	6.27	6.72	7.27
t-statistic	(4.195) ^a	(3.499) ^a	(3.467) ^a	(3.841) ^a	(3.685) ^a	(3.769) ^a	(4.077) ^a	(3.614) ^a	(3.423) ^a
% Positive	93.33%	93.33%	93.33%	93.33%	100.00%	86.67%	93.33%	93.33%	80.00%
Sign Test	3.357 ^a	3.357 ^a	3.357 ^a	3.357 ^a	3.873 ^a	2.840 ^a	3.357 ^a	3.357 ^a	2.324 ^a

Notes: This table presents the average and median unadjusted and market adjusted initial returns for PIPOs and private IPOs. Returns (AR and CAR) are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-tests refer to two-tailed tests. ^a denotes significance at the 5% level.

The sub-sample of PIPOs shows higher average and median unadjusted and market-adjusted returns than those observed for the entire sample of Privatization offerings (initial and subsequent) separately from subsequent offers. As for the 15 private IPOs, and for every holding period considered in the analysis, the returns are positive and statistically significant.

As above, we re-calculated returns for PIPOs excluding from the sample those firms that had a Time to listing outside the third quartile of the range (dropping 5 observations). The results, shown in Table 9, are very similar to those above: abnormal returns are low and barely significant.

Table 9 – Initial Returns for the Sub-Sample of PIPOs Excluding Outliers									
PIPOs n = 14	Unadjusted Returns (%)			Market-Adjusted Returns (%) PSI GERAL			Market-Adjusted Returns (%) S&P 500		
	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR	1 day AR	7 days CAR	30 days CAR
Average	3.06	3.13	2.89	3.20	3.13	2.41	2.47	2.79	1.74
Median	3.12	2.88	2.26	2.89	2.74	2.64	3.07	2.70	2.36
t-statistic	(1.766)	(1.613)	(1.333)	(1.724)	(1.516)	(1.098)	(1.556)	(1.620)	(0.883)
% Positive	78.57%	78.57%	64.29%	78.57%	78.57%	57.14%	71.43%	71.43%	64.29%
Sign Test	2.138 ^a	2.138 ^a	1.069	2.138 ^a	2.138 ^a	0.535	1.604	1.604	1.069

Notes: This table presents the average and median unadjusted and market adjusted initial returns for 14 PIPOs. Returns (AR and CAR) are measured over intervals of 1, 7 and 30 calendar days following initial trading of the shares. Market index data refers to PSI GERAL and S&P 500. t-test refers to two-tailed tests. ^a denotes significance at the 5% level.

Table 10 shows the test statistics for the difference t- and Mann Whitney U-tests. The results indicate that we reject the null hypothesis that the average initial returns for PIPOs are equal to the average initial return in private IPOs for a 30-day holding period. Student t and Mann-Whitney U tests are consistent and significant at a 5% level. As for the one- and the seven-day analyses, the statistics for the difference t-tests are insignificant. Yet the non-parametric test allows us to reject the null hypothesis that the price impact of PIPOs and private IPOs is the same.

Overall, results suggest that privatizations yield, on average, lower initial returns than private new offerings, which contradicts previous research reporting that PIPOs tend to be more underpriced than other IPOs. In Almeida and Duque (2005), the average initial return for the 24 IPOs analyzed (that include PIPOs) is positive (7.27%) and statistically significant. We find a lower underpricing effect. This may stem from the fact that we use a more extensive sample period that includes more recent offerings for which underpricing was lower. Our result could either reflect uncertainty resolution as the privatization process evolved or lower demand for later offerings or both.

To identify the factors that may affect the short-term price behavior in privatization offerings, we run univariate tests to check for differences in market-adjusted one-day returns for several sub-samples formed on the basis of the dummy variables. These are employee participation (EMP), foreign participation (FOR), partial or total privatization (PARTIAL), political party of the government that leads the country (GOV), date of the parliamentary elections (ELECTION) and ADR listing (ADR). Results are presented in Table 11.

The results are very weak except for the dummy variable GOV. The results suggest that whenever the privatization offering occurs with a left-wing party governing the country, (one-day market adjusted returns using the S&P 500 as the market benchmark) initial returns are higher, which contradicts the hypothesis that right-wing parties are more populist and make more use of privatization offers to attract voters political support as a strategic policy to retain power.



Table 10 – Tests of Differences Between PIPOs and Private IPOs Average Initial Returns

	PIPOs			Private IPOs			Difference in Returns		
Period	Raw Return (1)	Market Adjusted Return PSI GERAL (2)	Market Adjusted Return S&P 500 (3)	Raw Return (1)	Market Adjusted Return PSI GERAL (2)	Market Adjusted Return S&P 500 (3)	Raw (1)	PSI GERAL (2)	S&P 500 (3)
One-day	3.31	3.38	2.69	8,55	7,83	8,24	-5,24	-4,45	-5,55
						t-stat	(-1.914)	(-1.728)	(-2.017)
						t-stat	(-2.098) ^a	(-2.029) ^a	(-2.064) ^a
Seven-day	3.04	3.11	2.43	9,38	8,62	9,35	-6,34	-5,51	-6,92
						t-stat	(-1.939)	(-1.881)	(-2.100) ^a
						t-stat	(-1.856)	(-1.994) ^a	(-2.168) ^a
Thirty-day	1.64	1.41	-0.02	9,93	8,21	9,51	-8,29	-6,80	-9,53
						t-stat	(-2.342) ^a	(-2.378) ^a	(-2.634) ^a
						t-stat	(-2.168) ^a	(-2.029) ^a	(-2.341) ^a

Notes: This table reports the average difference in initial returns of state-owned (19 observations) and privately-owned offerings (15 observations). Returns are in %. t- and z-tests refer to two-tailed (t-Student and Wilcoxon Mann-Whitney U) tests. ^a denotes significance at the 5% level.

Table 11 – Tests of Differences in Market-Adjusted One-day Returns for Sub-Samples of Portuguese Privatization Offerings

Variable	Difference in Returns (PSI GERAL) (%)	Difference in Returns (S&P 500) (%)
EMP	-2.201	1.857
	t-stat (-0.227)	(0.192)
FOR	3.153	0.326
	t-stat (0.335)	(0.036)
PARTIAL	0.102	1.535
	t-stat (0.043)	(0.517)
GOV	-3.514	-5.165
	t-stat (-1.440)	(-2.166) ^a
ELECTION	-3.558	-4.249
	t-stat (-0.820)	(-0.867)
ADR	5.541	6.698
	t-stat (1.616)	(1.997)

Notes: This table reports the average difference in market-adjusted one-day returns for sub-samples of the 42 Portuguese privatization public offerings formed on the basis of six dummy variables: employee participation (EMP), foreign participation (FOR), partial or total privatization (PARTIAL), party of the government that leads the country (GOV), date of the parliamentary elections (ELECTION) and ADR listing (ADR). Returns are in %. t-tests refer to two-tailed tests. ^a denotes significance at the 5% level.

We also performed this univariate analysis considering just the sample of 19 PIPOs. Results are shown in Table 12.

The results obtained from the tests continue to be very weak and lack statistical significance. In fact, when considering only the 19 PIPOs in the sample the dummy variable GOV is no longer statistically significant, despite its negative sign.

In order to test the impact of the firm belonging or not to the financial sector (banks and insurance companies), we divided the sample of 42 observations into transactions of financial firms (23 observations) and non-financial firms (19 observations). The results are presented in Table 13. The results suggest the underpricing of financial firms is greater but the results are not statistically significant.

Results of the multivariate analysis are presented in Table 14. The fit of the model is extremely poor and the individual parameter estimates are not significant²¹. The signs of the coefficients of

Table 12 – Tests of Differences in Market-Adjusted One-day Returns for Sub-Samples of Portuguese Privatization Initial Public Offerings (PIPOs)

Variable	Difference in Returns (PSI GERAL) (%)	Difference in Returns (S&P 500) (%)
EMP	-N/A	N/A
t-stat	*	*
FOR	-4.930	-6.413
t-stat	(-1.148)	(-1.275)
PARTIAL	2.679	4.814
t-stat	(0.737)	(1.146)
GOV	-7.717	-8.261
t-stat	(-1.557)	(-1.394)
ELECTION	-1.065	-2.517
t-stat	(-0.289)	(-0.583)
ADR	4.443	5.334
t-stat	(1.027)	(1.045)

Notes: This table reports the average difference in market-adjusted one-day returns for sub-samples of the 19 Portuguese privatization initial public offerings formed on the basis of six dummy variables: employee participation (EMP), foreign participation (FOR), partial or total privatization (PARTIAL), party of the government that leads the country (GOV), date of the parliamentary elections (ELECTION) and ADR listing (ADR). Returns are in %. t-tests refer to two-tailed tests. ^a denotes significance at the 5% level.

Table 13 – Tests of Differences in Market-Adjusted One-day Returns for Sub-Samples of Portuguese Privatization Initial Public Offerings (PIPOs)

Variable	Difference in Returns (PSI GERAL) (%)	Difference in Returns (S&P 500) (%)
FIN	4.048	4.048
t-stat	(1.402)	(1.402)

Notes: This table reports the average difference in market-adjusted one-day returns for sub-samples of the 42 Portuguese privatization public offerings formed on the basis of the dummy variable FIN that equals 1 if the firm is a bank or an insurance company (23 observations) and 0 otherwise (19 observations). Returns are in %. t-tests refer to two-tailed tests. ^a denotes significance at the 5% level. Results obtained for one and seven-day market-adjusted returns are available upon request.

²¹ The t-statistics after performing the White correction are very similar and are available upon request.

the explanatory variables SIZE, ORDER, PARTIAL and ADR are as predicted by the literature: the degree of underpricing is greater for initial offerings, when the privatization is partial and when shares are cross-listed. As for the variables DAYS, EMP, GOV and ELECTION the signs of the coefficients contradict the theoretical arguments. The underpricing is lower for large issues, with right-wing parties, and in the years elections took place. Results for the dummy variable FOR are also not significant, suggesting that the influence of foreign investors on the privatization initial returns is trivial²².

In sum, PIPOs seem to start trading below their market value as observed with IPOs. The results of univariate and the multivariate analyses performed to inform about the determinants of the observed underpricing are not conclusive. Yet even if, for several of the variables analyzed to account for the different arguments, the economic relationships are as predicted, the estimates lack statistical significance and this may stem in part from the small sample in our study. Overall results seem to be consistent with asymmetric information and agency arguments and do no support the claim that governments deliberately underprice privatization offerings for political factors as predicted by Biais and Perotti (2002).

Table 14 – Determinants for Privatization Market-Adjusted Initial Returns							
30 days Market-Adjusted Returns (Market index: PSI GERAL)				(Market index: S&P 500)			
	Coefficients		t-statistic		Coefficients		t-statistic
Constant	14.6404		(0.6856)	Constant	12.246		(0.5743)
DAYS	-0.01568		(-0.9088)	DAYS	-0.0285		(-1.6571)
SIZE	-1.2420		(-0.5405)	SIZE	-0.5183		(-0.2259)
EMP	-5.8615		(-0.5570)	EMP	-4.0329		(-0.3838)
FOR	3.1145		(0.5759)	FOR	-1.8506		(-0.3427)
ORDER	-3.3315		(-1.2774)	ORDER	-2.1245		(-0.8158)
PARTIAL	8.2210		(1.7938)	PARTIAL	7.7793		(1.7000)
GOV	-6.3272		(-1.1609)	GOV	-7.2024		(-1.3234)
ELECTION	-2.7529		(-0.6476)	ELECTION	-3.2026		(-0.7545)
ADR	2.0351		(0.3514)	ADR	2.4072		(0.4163)
F-statistic		1.3401		F-statistic		2.1048	
Adj.R ²		0.0695		Adj.R ²		0.1952	

Notes: This table shows the estimates of the regression of market-adjusted initial returns for 42 Portuguese Privatization Public Offerings against the number of days between price setting and first trade date (DAYS); the log of total value of the privatization offer (SIZE); Dummy variables for employee participation (EMP), foreign participation (FOR), partial or total privatization (PARTIAL), party of the government that leads the country (GOV), date of the parliamentary elections (ELECTION) and ADR listing (ADR); and a discrete variable that equals one for the first share sale privatization offer, two for the second offer, and so forth (ORDER). Parameters are estimated by ordinary least squares regression. t-tests refer to two-tailed tests. a denotes significance at the 5% level.

22 We run the regression for the sub-sample excluding the “outliers” as described above. The results are very similar except for the specification explaining one-day initial returns where the negative coefficient of the variable ORDER is now statistically significant at a 5% level.

5. Long Run Market Performance



5.1. Theoretical Predictions and Previous Findings

Several studies examine the long run returns from privatization offerings. While in private IPOs there seems to be strong evidence of negative long-term returns, in privatization offerings the international evidence, in particular studies based on large international samples, suggest that the long-term performance of privatization offerings is positive and that PIPOs outperform IPOs or firms from matching samples²³. The most recent studies cover a large number of countries (and offerings) and use several methods to control for several problems with estimates and test statistics of long run returns, and the positive performance is robust to these tests²⁴. Further the results suggest that PIPOs outperform IPOs²⁵. Yet some studies indicate that privatization offerings underperform in the long run. This underperformance is mainly observed for emerging markets and privatization-related ADRs²⁶. Altogether, there seems to be no manifest conflicting performance results regarding the long-term performance of privatization issues, given that the studies that found underperformance refer to the particular case of emerging markets offerings in foreign exchanges.

Most studies analyze the returns earned by investors who buy privatized shares at the first closing market prices and hold stocks up to 1, 3 and 5 years. In addition, a few studies investigate the determinants of the observed returns. Several explanations have been put forward to account for the long run performance of privatized shares. While some arguments are valid for any IPOs, privatization offerings have different characteristics that have to be accounted for.

Ibbotson, Sindelar and Ritter (1994) present three possible explanations for the long run performance of IPOs: divergence of opinion, the empresario hypothesis and windows of opportunities. Ritter (1991) tries to capture these effects with variables such as size, age, industry and initial underpricing²⁷. For the particular case of privatization offerings, additional variables that may affect long run performance are associated with management shifts resulting from the transfer of state to private ownership, and the resulting improvements in economic efficiency. Political risk is an obvious distinctive feature of privatization offerings that may play an important role in understanding the behavior of returns over time.

Boardman and Laurin (2000) use a variable to measure the timing of a particular offering within the process of privatization in a country. They also account for the portion of retained government ownership (and golden shares) and for different regulating and competitive environments. Perotti and Van Oijen (2001) also use a proxy for political risk and suggest that the progressive resolution of political risk as the privatization program evolves, leads to more positive returns. Yet, in the long run, after the initial correction, one should observe lower returns reflecting lower risk. Finally, and similarly to what happens with private IPOs, the decision to cross-list may impact on the returns of the privatized firm's shares in the long run²⁸.

In this paper we ask whether the arguments above can account for the long-term performance of Portuguese PIPOs. Very little is known about the determinants of the long run returns in privatizations. Further the explanatory variables that have been looked to in previous studies can account for several different theoretical arguments. For example, Boardman and Laurin (2000) find that privatizations, occurring later in the process, show greater excess positive returns but

23 For evidence regarding the long-term performance of IPOs and PIPOs respectively, please refer to table B2.2 in Jenkinson and Ljungqvist (2001) and table 9 in Megginson and Netter (2001).

24 See for example Barber and Lyon (1997) or Kothari and Warner (1997).

25 See for example Boardman and Laurin (2000), Dewenter and Malatesta (2001) and Jelic and Briston (2003).

26 See for example Foerster and Karolyi (2000), Aybar (2002) and, more recently, Jia, Sun and Tong (2005).

27 Boardman and Laurin (2000) report that privatization offerings are larger and older and operate in more mature industries and have therefore lower growth prospects than the typical IPO firm.

28 See Foerster and Karolyi (2000).



this effect could equally support agency, asymmetry or political risk arguments. Similarly, Aybar (2002) shows that emerging market PIPOs underperform developed markets issues. Yet this difference could validate political as well as agency risk arguments.

5.2. Methodology

To investigate long run performance we use the methodology proposed by Ritter (1991) as in several other single-country studies. We investigate the sign and magnitude of long run abnormal returns to investors in Portuguese privatization offerings. Further we analyse if there are statistically significant differences between PIPOs' and private IPOs' long run performance.

Abnormal returns are defined as in (2). The average market-adjusted return on a sample of N companies in event period t is the equally weighted arithmetic average of the benchmark-adjusted returns:

$$AR_t = \frac{1}{N} \sum_{i=1}^N R_{it}^* \quad (4)$$

The cumulative market-adjusted aftermarket performance from q to s is the summation of the average market-adjusted returns:

$$CAR_{q,s} = \sum_{t=q}^s AR_t \quad (5)$$

The parametric tests proposed in the literature rely on the important assumption that abnormal returns are normally distributed. We use the standard t-statistic to test the significance of abnormal returns²⁹.

To check the robustness of the results, we performed a procedure based on calendar-time portfolio returns. The use of this method is an attempt to eliminate the problem of cross-sectional dependence among sample firms once the returns of sample firms are aggregated into a single portfolio.

Considering the period from 1989 to 2001, we calculate, for each offering i, the six months abnormal return (AR_i) over the sample period. For each holding six-month period, we create an equally-weighted portfolio of the existing offerings for that particular period. The mean abnormal return – MAR_t – across firms in the portfolio is given by:

$$MAR_t = \frac{1}{n_t} \sum_{i=1}^{n_t} AR_{i,t} \quad (6)$$

where

n_t is the number of active firms in that six-month period (t).

Subsequently, we calculate the grand mean for the T six-month periods abnormal returns (MMAR), given by:

$$MMAR = \frac{1}{T} \sum_{t=1}^T MAR_t \quad (7)$$

²⁹ Please refer to footnote 16.

where

T is the number of six month periods over the total sample period.

To test the null hypothesis of zero mean six-month period abnormal returns, a t-statistic is estimated using the time-series standard deviation of the observed six-month abnormal returns:

$$t(MMAR) = \frac{MMAR}{\frac{\sigma(MAR_t)}{\sqrt{T}}} \quad (8)$$

To conduct the multivariate analysis we follow the model proposed by Boardman and Laurin (2000). They regress three-year CARs against (i) the relative size of the firm, measured by the market capitalization of the privatized firm divided by the total capitalization of the market; (ii) the percentage of ownership retained by the government; (iii) a dummy variable that equals one if the government retains a special share (Golden Share) and zero otherwise; (iv) the initial underpricing measured by the returns earned in the first days after listing; and (v) a dummy variable that equals one if the privatization occurred relatively late in the country's privatization program and zero otherwise. Hence our specification is:

$$CAR_{1,36i} = \beta_1 MR_i + \beta_2 SIZE_i + \beta_3 ORDER_i + \beta_4 PARTIAL_i + \beta_5 ADR_i + \beta_6 LATE_i + \varepsilon_i \quad (9)$$

where

$CAR_{1,36i}$: three-year cumulative abnormal returns for privatization offering i;

MR: market-adjusted (one-, seven- or thirty-day) initial return;

LATE: dummy variable that equals one if the privatization offering occurred relatively late in the country's privatization program and zero otherwise.

SIZE, ORDER, PARTIAL and ADR are defined as in section 4.2 above.

The variable MR that refers to the initial underpricing may be seen as a proxy for over optimism. Perotti (1995) shows that when the policy uncertainty is high, underpricing is seen as a sign for a government's commitment to the privatization program. Therefore, a higher degree of underpricing should have a positive effect on long run privatization returns. On the other hand, that kind of commitment may reduce the premium required by investors and yield lower required returns in the long run.

The effect of SIZE on long run stock price performance stems from asymmetric information theories. It is reasonable to expect that there should be less uncertainty about larger and mature firms, operating in stable industries, than in smaller and younger firms established in new industries. In fact, the existence of lower uncertainty implies lower risk and, subsequently, lower required returns for larger offerings. In that case, small size offerings would show higher long-term returns due to higher uncertainty. Yet several authors suggest that smaller firms should outperform larger firms due to greater improvement in economic efficiency.

The ORDER of the offer may also affect long run returns. If it is a first privatization offer, the government will retain some percentage of ownership to sell eventually in subsequent offerings. This might be interpreted as a signal that the government is still interested in the company, which would lead to a negative relationship between the order of the offer and long run performance. This effect may be better captured by the variable PARTIAL due to the fact that if governments decide not to sell immediately 100% of the shares of the companies, but prefer to do it slowly, investors may interpret this as a positive sign of commitment to the privatization program, having





a negative effect on long run performance due to the lower risk. Yet, partial privatizations may also reflect the interference of the government in the offerings and, therefore, higher risk leading to higher returns.

As for the explanatory variable ADR, listing the privatization offering on an international market may be seen as a sign of quality and the government's commitment to the privatization program, reflecting lower risk and lower required returns. In addition, one could expect that returns would be lower reflecting lower required returns due to the presence of sophisticated foreign investors.

Finally the variable LATE, motivated by Boardman and Laurin (2000), measures the effect of when a specific offer occurred in a particular country. This variable equals one if the privatization occurred relatively late in the country's privatization program and zero otherwise. In fact, early privatization offerings that had no previous track record, might have been considered riskier.

5.3. Results

Table 15 shows the six-month ARs and CARs for 6, 12, 18, 24, 30 and 36 months after the offering. ARs and CARs are negative for the first 6 and 12 months and for horizon periods over 30 months. Results are only statistically significant for the S&P 500 benchmark.

Table 15 – Long-Term Average Abnormal Returns (AR) and Average Cumulative Abnormal Returns (CAR) for Privatization Offerings					
PSI GERAL Months	Nr. firms	AR _t (%)	t-stat. (AR _t)	CAR _t (%)	t-stat. (CAR _t)
1-6	41	-2.213	(-1.303)	-2.213	(-1.303)
7-12	40	0.479	(0.349)	-1.794	(-0.804)
13-18	37	1.419	(1.204)	-0.375	(-0.192)
19-24	37	1.650	(1.247)	1.275	(0.378)
25-30	34	-1.081	(-0.541)	0.194	(0.040)
31-36	33	-2.059	(-1.269)	-1.865	(-0.446)

S&P 500 Months	Nr. firms	AR _t (%)	t-stat. (AR _t)	CAR _t (%)	t-stat. (CAR _t)
1-6	41	-4.242	(-2.347) ^a	-4.242	(-2.347) ^a
7-12	40	-0.898	(-0.574)	-5.140	(-2.150) ^a
13-18	37	1.123	(0.813)	-4.017	(-1.511)
19-24	37	-1.531	(-1.036)	-5.548	(-1.818)
25-30	34	-2.218	(-1.079)	-7.766	(-2.120) ^a
31-36	33	-3.238	(-1.788)	-11.004	(-2.650) ^a

Notes: This table shows the ARs and CARs for the 42 Portuguese privatization offerings. The number of firms varies over time due to de-listing and new firms. t-tests refer to two-tailed tests. a denotes significance at the 5% level.

Results of ARs using the calendar-time approach are presented in Table 16. As above, returns are not statistically significant and vary according to the market benchmark used in each case. The occurrence of both positive and negative signs in periodic returns over time could reflect the fact that we compute returns for the aggregate sample (initial and secondary offerings).

Table 16 – Long-Term Average Abnormal Returns Using Calendar-Time Portfolio Method for Privatization Offerings

PSI GERAL Period	Nr. firms	MAR _t (%)	Period	Nr. firms	MAR _t (%)
1989 0-6 months	1	14.892	1989 7-12 months	2	-5.181
1990 0-6 months	4	3.112	1990 7-12 months	5	7.495
1991 0-6 months	9	4.949	1991 7-12 months	12	2.093
1992 0-6 months	12	-2.588	1992 7-12 months	17	-0.086
1993 0-6 months	18	-5.152	1993 7-12 months	20	-2.563
1994 0-6 months	20	-2.935	1994 7-12 months	21	-1.808
1995 0-6 months	25	0.459	1995 7-12 months	23	1.327
1996 0-6 months	21	1.341	1996 7-12 months	22	-2.329
1997 0-6 months	22	-7.148	1997 7-12 months	24	-1.501
1998 0-6 months	26	0.449	1998 7-12 months	27	-1.126
1999 0-6 months	28	0.845	1999 7-12 months	29	-1.316
2000 0-6 months	26	4.050	2000 7-12 months	20	5.559
2001 0-6 months	20	4.556	2001 7-12 months	22	-1.998
MMAR (%)		0.592	t-stat. (MMAR)		(0.659)

S&P 500 Period	Nr. firms	MAR _t (%)	Period	Nr. firms	MAR _t (%)
1989 0-6 months	1	8.990	1989 7-12 months	2	5.948
1990 0-6 months	4	-0.733	1990 7-12 months	5	1.491
1991 0-6 months	9	-7.190	1991 7-12 months	12	-1.876
1992 0-6 months	12	-0.234	1992 7-12 months	17	-12.802
1993 0-6 months	18	-3.862	1993 7-12 months	20	2.443
1994 0-6 months	20	1.473	1994 7-12 months	21	1.305

(continua)



S&P 500 Period	Nr. firms	MAR _t (%)	Period	Nr. firms	MAR _t (%)
1995 0-6 months	25	-4.499	1995 7-12 months	23	-6.470
1996 0-6 months	21	3.376	1996 7-12 months	22	-2.661
1997 0-6 months	22	-5.754	1997 7-12 months	24	-1.029
1998 0-6 months	26	7.961	1998 7-12 months	27	-6.883
1999 0-6 months	28	-12.893	1999 7-12 months	29	2.828
2000 0-6 months	26	3.806	2000 7-12 months	20	4.017
2001 0-6 months	20	-5.319	2001 7-12 months	22	1.712
MMAR (%)		-1.033	t-stat. (MMAR)		(-0.933)

Notes: This table shows the six-month mean average returns (MAR) for the 42 Portuguese privatization offerings using the calendar-time portfolio method. The number of firms varies over time. t-tests refer to two-tailed tests. MMAR denotes the grand mean of six-month abnormal returns over the entire sample period.

Table 17 – Long-Term Average Abnormal Returns (AR) and Average Cumulative Abnormal Returns (CAR) for PIPOs

PSI GERAL Months	Nr. firms	AR _t (%)	t-stat. (AR _t)	CAR _t (%)	t-stat. (CAR _t)
6	19	-2.999	(-1.086)	-2.999	(-1.086)
12	18	-1.140	(-0.481)	-4.139	(-1.158)
18	18	3.048	(1.594)	-1.091	(-0.295)
24	18	0.662	(0.416)	-0.429	(-0.131)
30	17	-2.543	(-1.049)	-2.972	(-0.590)
36	17	-3.907	(-1.583)	-6.879	(-1.193)

S&P 500 Months	Nr. firms	AR _t (%)	t-stat. (AR _t)	CAR _t (%)	t-stat. (CAR _t)
1-6	19	-5.375	(-1.781)	-5.375	(-1.781)
7-12	18	-1.955	(-0.947)	-7.330	(-2.013)
13-18	18	0.367	(0.172)	-6.963	(-1.655)
19-24	18	-1.905	(-0.477)	-8.868	(-1.919)
25-30	17	-3.023	(-1.241)	-11.891	(-2.279)a
31-36	17	-5.308	(-1.990)	-17.199	(-2.914)a

Notes: This table shows the ARs and CARs for the 19 Portuguese PIPOs. The number of firms varies over time due to de-listing. t-tests refer to two-tailed tests. a denotes significance at the 5% level.

Table 17 presents the excess returns for the sub-sample of PIPOs. Abnormal returns are, as above, very negative for the first and last periods. CARs are consistently negative over the period. Yet the results are only statistically significant when considering S&P 500 as the benchmark and for longer holding periods of 30 and 36 months. When we compare these results with the evidence in table 15, we observe that in the long run, PIPOs seem to severely underperform later offerings. This could merely reflect a correction in prices that takes place after the initial price run-up that is observed in PIPOs.

We checked the robustness of the results, computing calendar-returns for the 19 PIPOs sub-sample. Results are shown in Table 18. For the sub-sample of PIPOs the grand mean is positive regardless of the chosen benchmark but long-term calendar returns are statistically insignificant.

Table 18 – Long-Term Average Abnormal Returns using Calendar-Time Portfolio Method for PIPOs

PSI GERAL Period	Nr. firms	MAR _t (%)	Period	Nr. firms	MAR _t (%)
1989 0-6 months	1	14.892	1989 7-12 months	2	-5.181
1990 0-6 months	4	3.112	1990 7-12 months	5	7.495
1991 0-6 months	6	4.482	1991 7-12 months	8	3.432
1992 0-6 months	8	-2.002	1992 7-12 months	11	0.693
1993 0-6 months	12	-8.142	1993 7-12 months	12	0.004
1994 0-6 months	12	-3.653	1994 7-12 months	13	-2.230
1995 0-6 months	16	-0.250	1995 7-12 months	15	0.158
1996 0-6 months	14	1.488	1996 7-12 months	13	-2.557
1997 0-6 months	13	-4.979	1997 7-12 months	14	-2.117
1998 0-6 months	14	-0.208	1998 7-12 months	14	-0.372
1999 0-6 months	14	2.878	1999 7-12 months	14	1.919
2000 0-6 months	12	2.688	2000 7-12 months	7	6.314
2001 0-6 months	7	3.542	2001 7-12 months	7	-0.301
MMAR (%)		2.331	t-stat. (MMAR)		(0.991)

(continua)



S&P 500 Period	Nr. firms	MAR _t (%)	Period	Nr. firms	MAR _t (%)
1989 0-6 months	1	8.990	1989 7-12 months	2	5.948
1990 0-6 months	4	-0.733	1990 7-12 months	5	1.491
1991 0-6 months	6	-5.544	1991 7-12 months	8	-0.424
1992 0-6 months	8	0.390	1992 7-12 months	11	-11.733
1993 0-6 months	12	-6.819	1993 7-12 months	12	5.098
1994 0-6 months	12	0.754	1994 7-12 months	13	0.915
1995 0-6 months	16	-4.901	1995 7-12 months	15	-7.639
1996 0-6 months	14	3.508	1996 7-12 months	13	-2.983
1997 0-6 months	13	-3.627	1997 7-12 months	14	-1.609
1998 0-6 months	14	8.062	1998 7-12 months	14	-6.221
1999 0-6 months	14	-11.229	1999 7-12 months	14	6.002
2000 0-6 months	12	2.445	2000 7-12 months	7	4.133
2001 0-6 months	7	-6.333	2001 7-12 months	7	3.598
MMAR (%)		1.275	t-stat. (MMAR)		(0.533)

Table 19 shows the long-term performance of private IPOs. ARs and CARs start being positive in the first 6 months, decreasing afterwards to negative values for up to three years. Yet, again, results are not statistically significant, except for ARs in the first half of the second year following the offering and when the S&P 500 is used as the market benchmark for CARs over longer horizon periods (24 months or more).

To evaluate if the Portuguese private IPOs and PIPOs show different long-term performance we use a difference t-test and a Mann-Whitney U test. Table 20 reports the results.

The null hypothesis that the average CAR for PIPOs is equal to the average CAR for private IPOs is not rejected for all event periods considered in the analysis. Privatizations seem to yield, on average, lower CARs than private offerings up to 1 year. Over longer horizon periods, private IPOs tend to underperform PIPOs³⁰. Please notice that the significance statistics are very alike for the two tests (parametric and non parametric).

We then analyze if the variables used as proxies for the different theoretical arguments discussed above could account for the long-term return behavior in Portuguese privatization offerings. First, we performed univariate analyses to check for differences in the three-year CARs

30 Almeida and Duque (2005) report that, on average, Portuguese offerings underperform after one year. Yet the value-weighted average excess return is positive.

Table 19 – Long-Term Average Abnormal Returns (AR) and Average Cumulative Abnormal Returns (CAR) for Private IPOs

PSI GERAL Months	Nr. firms	AR _t (%)	t-stat. (AR _t)	CAR _t (%)	t-stat. (CAR _t)
6	15	2.848	(0.713)	2.848	(0.713)
12	15	-5.171	(-0.945)	-2.323	(-0.341)
18	15	-8.675	(-2.288) ^a	-10.998	(-1.393)
24	15	-2.918	(-0.668)	-13.916	(-1.555)
30	14	-1.001	(-0.572)	-14.917	(-1.633)
36	12	-3.279	(-0.859)	-18.196	(-1.830)

S&P 500 Months	Nr. firms	AR _t (%)	t-stat. (AR _t)	CAR _t (%)	t-stat. (CAR _t)
6	15	3.513	(0.774)	3.513	(0.774)
12	15	-11.103	(-1.905)	-7.590	(-0.980)
18	15	-9.924	(-2.371) ^a	-17.514	(-1.986)
24	15	-3.322	(-0.620)	-20.836	(-2.034) ^a
30	14	-1.843	(-0.858)	-22.679	(-2.161) ^a
36	12	-5.044	(-1.506)	-27.723	(-2.475) ^a

Notes: This table shows the ARs and CARs for the 15 Portuguese private IPOs. The number of firms varies over time due to de-listing and new firms. t-tests refer to two-tailed tests. a denotes significance at the 5% level.

Table 20 – Tests of Differences in Long-Term Returns between PIPOs and Private IPOs CARs

Months		Difference in CARs (%) (PSI GERAL)	Difference in CARs (%) (S&P500)
6		-5.847	-8.888
	t-stat	(-1.204)	(-1.631)
	z-stat	(-1.093)	(-1.543)
12		-1.756	0.362
	t-stat	(-0.220)	(0.040)
	z-stat	(-0.087)	(-0.052)
24		13.352	12.151
	t-stat	(1.380)	(1.326)
	z-stat	(-1.162)	(-1.405)
36		11.138	10.452
	t-stat	(0.989)	(1.023)
	z-stat	(-0.954)	(-1.231)

Notes: This table reports the average difference in CARs of PIPOs (19 observations) and privately-owned companies IPOs (15 observations). Returns are in %. t- and z-tests refer to two-tailed (t-Student and Mann-Whitney U) tests. a denotes significance at the 5% level.



for sub-samples formed on the basis of the dummy variables PARTIAL, ADR and LATE. The first two variables have been defined This last variable measures if the privatization offering occurred relatively late in the country. We considered that an offer occurred late if it was launched three years after the first issue. Results are presented in Table 21. The differences in returns are consistent with the predictions explained above. Yet the tests are not statistically significant, except for the dummy variable PARTIAL (using as market benchmark the PSI GERAL).

Table 21 – Tests of Average Differences in Long-Term Returns for Sub-Samples		
Variable	Difference in Returns (PSI GERAL)	Difference in Returns (S&P500)
PARTIAL	24.362	19.563
t-stat	(2.790)a	(2.365)
z-stat	(-2.117)a	(-2.039)a
ADR	-11.755	-1.318
t-stat	(-1.104)	(-0.110)
z-stat	(-1.050)	(-0.122)
LATE	-4.813	5.670
t-stat	(-0.554)	(0.598)
z-stat	(-0.775)	(-0.286)

Notes: This table reports the average difference in three-year CARs for sub-samples of the 42 privatization offerings formed on the basis of the three dummy variables. t- and z-tests refer to two-tailed (t-Student and Mann-Whitney U) tests. a denotes significance at the 5% level.

We conducted the same univariate analysis for the sub-sample of 19 PIPOs. Table 22 shows the results. Overall results suggest that these variables cannot explain the observed performance.

Table 22 – Tests of Average Differences in Long-Term Returns for Sub-Samples: PIPOs		
Variable	Difference in Returns (PSI GERAL)	Difference in Returns (S&P500)
PARTIAL	22.556	19.885
t-stat	(2.073)	(1.735)
z-stat	(-1.944)	(-1.759)
ADR	-7.213	5.838
t-stat	(-0.585)	(0.804)
z-stat	(-0.447)	(-0.671)
LATE	-17.545	-2.572
t-stat	(-1.441)	(-0.292)
z-stat	(-1.715)	(-0.163)

Notes: This table reports the average difference in three-year CARs for sub-samples of the 19 privatization initial offerings formed on the basis of the three dummy variables. t- and z-tests refer to two-tailed (t-Student and Mann-Whitney U) tests. a denotes significance at the 5% level.

To assess the impact of the firm being or not being part of the financial sector on long run returns, we split the initial sample of 42 observations into financial firms and non-financial firms. The results in Table 23 are inconclusive.

Table 23 – Tests of Average Differences in Long-Term Returns for Sub-Samples: Financial and Non-Financial Firms

Variable	Difference in Returns (PSI GERAL) (%)	Difference in Returns (S&P500) (%)
FIN	-6.246	-8.832
t-stat	(-0.940)	(-1.277)
z-stat	(-1.023)	(-1.200)

Notes: This table reports the average difference in three-year CARs for sub-samples of the 42 privatization offerings formed on the basis of the dummy variable FIN that equals 1 if the firm is a bank or an insurance company (23 observations) and 0 otherwise (19 observations). Returns are in %. t- and z-tests refer to two-tailed (t-Student and Mann-Whitney U) tests. a denotes significance at the 5% level.

To further investigate the determinants of the observed performance, we obtained estimates of the OLS multivariate regression. Results are shown in Table 24. Most of the estimates lack statistical significance, except for the variable PARTIAL³¹. The positive and statistically significant coefficient obtained for the explanatory variable PARTIAL could suggest that, when a government privatizes partially, investors require higher returns anticipating government interference in the privatized firms and, therefore, higher political risk. The observed effect would thus contradict the argument that partial privatization signals government commitment and reduces uncertainty, and is inconsistent with arguments that predict higher returns for total privatizations for larger expected economic efficiency gains. The downward shift in returns, reflected in the intercept estimate, is thus offset (more than offset when we look at S&P 500 market adjusted returns) by the effect of partial privatization.

Table 24 – Determinants for Privatization Market-Adjusted Initial Returns

Three-Year CARs (Market index: PSI GERAL)			(Market index: S&P 500)		
	Coefficients	t-statistic		Coefficients	t-statistic
Constant	-42.6060	(-1.643)	Constant	-28.7055	(-0.975)
MR(30-day)	0.54987	(1.785)	MR(30-day)	0.26982	(0.772)
SIZE	4.60759	(1.064)	SIZE	-0.46232	(-0.094)
ORDER	5.36734	(1.215)	ORDER	6.20706	(1.237)
PARTIAL(*)	18.7762	(1.932)	PARTIAL(*)	12.1488	(1.101)
ADR	-2.02111	(-0.148)	ADR	6.65716	(0.430)
LATE	-10.9688	(-1.385)	LATE	-2.8096	(-0.313)
F-statistic	2.47870 ^a		F-statistic	1.36570	
Adj. R ²	0.17789		Adj. R ²	0.05079	

Notes: This table shows the parameters estimated for the regression of three-year CARs for 42 Portuguese privatization offerings against initial underpricing (market-adjusted thirty-day initial returns) (MR); the log of total value of the privatization offer (SIZE); dummy variables distinguishing partial or total privatization (PARTIAL), ADR listing (ADR) and the timing of privatization (LATE); ORDER that equals one for the first share sale privatization offer, two for the second offer, and so forth. Parameters are estimated by ordinary least squares regression. t-tests refer to two-tailed tests. a denotes significance at the 5% level. Results obtained for one and seven-day market-adjusted returns are available upon request.

(*) Statistically significant sign using t-statistics with White heteroskedasticity consistent standard errors.

³¹ The t-statistics with White heteroskedasticity consistent standard errors are very similar.



The coefficient associated with the variable MR is positive, suggesting as expected that when the underpricing is large, and after controlling for other effects, this is perceived by investors as a sign of government commitment to that privatization offering. Yet the large part of the initial positive return is nevertheless reversed (if we sum this effect with the intercept estimate). This negative aftermarket effect is consistent with overreaction and fads in PIPOs.

As for the other explanatory variables, the results are mixed and the signs reverse with the choice of the market benchmark.

In sum, we find that long-term excess returns are negative (but seldom significant), even if Portuguese PIPOs outperform private IPOs³². The statistics for the difference in means tests are also inconclusive and most of the estimates of the OLS regression lack statistical significance. Again, like the analysis in section 4, this lack of significance may result from small sample size. Overall results suggest that the initial price overreaction seems to be corrected in the aftermarket and that investors require a premium when they anticipate further offerings.

6. Conclusions

This paper evaluates the short- and long-term performance of Portuguese privatization offerings and investigates the determinants of the observed performance. Our main findings are:

1. Portuguese privatization offerings show initial positive returns but lack statistical significance.
2. Portuguese privatization IPOs underperform private sector IPOs contradicting most of the previous evidence.
3. Results suggest that the degree of underpricing is greater for initial offerings, when the privatization is partial and when shares are cross-listed. The underpricing is lower for large issues, with right-wing political parties in government and in the years before elections. Overall these results are consistent with information asymmetry and agency predictions.
4. In the long run, privatization offerings have negative abnormal returns, contradicting the most recent evidence. Yet these results lack statistical significance. While in early event months, privatization public offerings yield more negative returns than private sector offerings, this effect is reversed in longer horizon periods.
5. Our results suggest that initial overreaction seems to be partially reversed in the years following the offer and that investors require higher returns in partial privatizations.
6. The small sample size may explain partially why we fail to find statistically significant average excess returns and non-trivial influences for the variables we investigate.

³² Previous studies (for example Kothari and Warner, 1997) show that survivorship bias impacts seriously on long-term performance. In fact, in our study, only 7 of the 19 PIPOs (22 of the 42 privatization offerings) are listed in 2001. If de-listings were related with bad/good performance, correcting the bias would show more/less negative performance. The results for the calendar portfolio-approach are inconclusive and do not illuminate the direction of the bias. We could have repeated the CAR analysis for the survivors but results would be meaningless given the small sample size.

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Ganhos em Saúde em doentes com cataratas*

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resumo

Nos últimos anos, têm sido desenvolvidos instrumentos de medição do estado de saúde e da qualidade de vida obtida pela aplicação de programas de saúde, baseados na Teoria da Utilidade.

O objectivo deste estudo é a avaliação dos ganhos obtidos com a aplicação de um programa de redução de listas de espera. Foi utilizada uma amostra de 70 doentes e foram aplicados, antes e 3 a 5 meses após a operação, dois instrumentos genéricos (*EuroQol* e *SF-12*) e um específico para cataratas (*Catquest*).

Os resultados obtidos evidenciam uma melhoria significativa no estado de saúde específico da maioria dos doentes submetidos à cirurgia. É possível concluir que as percepções do estado de saúde físico e mental dos doentes, a incapacidade visual, a satisfação com a sua visão, a valorização actual da sua saúde e o tipo de cirurgia efectuada são variáveis explicativas da utilidade dos estados de saúde

résumé / abstract

Ces dernières années, quelques instruments ont été développés qui mesurent l'état de la santé aussi bien que la qualité de vie obtenue par l'application de programmes de santé. Leur fondement est la Théorie de l'Utilité.

Cette étude a pour objectif l'évaluation les gains en santé obtenus par l'application d'un programme de diminution de listes d'attente. On a utilisé un échantillon de 70 malades et on a appliqué avant et 3 à 5 mois après l'intervention chirurgicale deux instruments de mesure génériques (*EuroQol* et *SF-12*), un autre spécifique de cataractes (*Catquest*).

Les résultats obtenus révèlent une amélioration significative de l'état de santé spécifique de la plupart des malades soumis à la chirurgie. On peut conclure que les perceptions de l'état physique et mental des malades, leur incapacité visuelle, leur satisfaction avec leur vision, leur valorisation actuelle de leur santé et le type de chirurgie sont des variables explicatives de l'utilité des états de santé.

Over the last years, health outcome instruments have been developed based on the Utility Theory.

This work seeks to evaluate the health gains of a national waiting-list reduction programme. The sample consists of 70 patients who were submitted, before and 3 to 5 months after the surgery, to the application of two generic instruments (*EuroQol* and *SF-12*) and a specific to cataracts (*Catquest*).

The results show a significant improvement in the specific health state of the majority of the patients submitted to surgery. It is possible to conclude that the physical and mental health state self-perceptions, the visual disability, the satisfaction with the current ability to see, the current health valuation and type of surgery are predictors of the health state utility.

JEL Classification: I10

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1. Introdução

A sociedade em geral tem necessidades ilimitadas que não podem ser satisfeitas na sua totalidade, dada a inevitável escassez de recursos. Torna-se, pois, necessário fazer escolhas cuidadosamente fundamentadas. Esta necessidade de fundamentar cuidadosamente as escolhas efectuadas faz com que a avaliação económica de programas de saúde seja uma das áreas mais importantes da economia da saúde.

Contudo, numa área tão vital para a vida da sociedade como é o sector da saúde, a avaliação económica de programas não pode apenas centrar-se em aspectos financeiros, descurando outros aspectos como a utilidade que os indivíduos atribuem aos vários estados de saúde possíveis ou a qualidade de vida obtida pela aplicação de programas de saúde, de terapêuticas e de outras decisões clínicas (Drummond et al., 1997).

Utilidades

Segundo Torrance (1986), as utilidades são valores que representam a “firmeza” das preferências dos indivíduos em relação a determinados resultados, quando confrontados com a incerteza. Ainda segundo este autor, existem dois tipos de utilidades: as ordinais e as cardinais (Torrance et al., 1995). No sector da saúde, as primeiras constituem uma graduação que permite ordenar por ordem de preferência os estados de saúde. As utilidades cardinais são, no contexto da saúde, valores atribuídos aos diversos estados de saúde, representando o “peso” da preferência, numa escala cardinal definida em intervalos ou em rácios, dependendo do método utilizado.

A medição de tais utilidades é uma área considerada complexa; alguns analistas estimam os valores a partir de juízos próprios ou julgamentos, outros utilizam valores publicados na literatura disponível e outros ainda tentam medir estes valores (Torrance, 1986). No caso da utilização de valores já existentes na literatura é, no entanto, importante garantir que os estados de saúde coincidam com os dos referidos estudos, que os indivíduos objecto destes estudos sejam apropriados para o estudo em causa e que os instrumentos de medida utilizados sejam credíveis.

As utilidades ordinais são de fácil obtenção, bastando para isso pedir ao indivíduo que ordene, numa graduação determinada, os estados de saúde apresentados, com a mesma duração e o mesmo prognóstico, de acordo com as suas preferências.

Em relação às utilidades cardinais, existem vários métodos de medição (Ferreira, 2003). O primeiro destes métodos pressupõe a utilização de uma escala de pontuação (rating scale) que consiste na definição de uma linha (ou escala), em que o estado de saúde mais preferido é colocado numa das extremidade da linha e o menos preferido na outra extremidade. Esta linha é normalmente denominada de escala analógica visual. Os restantes estados de saúde são colocados entre estes dois, por ordem de preferência e de forma a que os intervalos entre os estados de saúde correspondam às diferenças em termos de preferência percebidas pelos indivíduos.

Outro método para a obtenção de utilidades cardinais é a aplicação do denominado jogo padrão (standard gamble) para estados de saúde crónicos preferíveis à morte. Consiste num jogo em que o indivíduo é confrontado com duas alternativas, apresentando a primeira delas um tratamento com dois resultados possíveis: ou regressa ao estado de saúde saudável normal e vive por um período adicional de t anos (com probabilidade p) ou morre imediatamente (com probabilidade 1-p). Na segunda alternativa é oferecida ao indivíduo a certeza de ficar no estado de saúde crónico presente i até ao fim da sua vida, isto é, durante os mesmos t anos. Em seguida, varia-se o valor da probabilidade p até o indivíduo ser indiferente entre as duas alternativas, isto é, até ao ponto em que o valor de preferência para o estado i é simplesmente p ($h_i = p$). É possível também aplicar este método a estados de saúde crónicos piores do que a morte e a estados de saúde temporários, com algumas alterações ao seu formato.

Um terceiro método é o que podemos designar compromisso em tempo (time trade-off - TTO), para estados de saúde crónicos considerados melhores que a morte e em que são também oferecidas ao indivíduo duas alternativas. A primeira alternativa consiste em permanecer no estado de saúde i durante o tempo t , seguido pela morte; na segunda alternativa permanece-se saudável por um tempo $x < t$, seguido também pela morte. O tempo x vai sendo alterado até o indivíduo ser indiferente entre as duas alternativas, altura em que o valor de preferência para o estado i é dado por $h_i = x/t$ (Drummond et al., 1997). Também é possível proceder a algumas alterações ao formato deste método, por forma a aplicá-lo a estados de saúde crónicos piores do que a morte e a estados de saúde temporários.

O quarto modelo, denominado compromisso em pessoas (person trade-off), consiste em colocar ao indivíduo uma pergunta do tipo: “Se existirem x pessoas numa situação de doença A e y pessoas numa situação de doença B, e se apenas se poder auxiliar (curar) um dos grupos, devido a uma limitação de tempo ou de recursos, qual dos grupos escolheria para ajudar?”. Um dos números, x ou y , deverá variar até que o indivíduo considere os dois grupos equivalentes em termos de necessidade ou de merecimento de ajuda. Se x e y forem números equivalentes, segundo o julgamento do indivíduo, então a indesejabilidade (ou desutilidade) da situação B é x/y vezes maior do que a da condição A.

Por fim, pode utilizar-se a escala de razão (ratio scaling) em que é pedido aos indivíduos um rácio de indesejabilidade entre estados de saúde. Se estes considerarem que o estado de saúde B é x vezes pior que o estado de saúde A, a indesejabilidade (ou desutilidade) do estado B é x vezes maior que a do estado A. Fazendo uma série de perguntas, consegue-se relacionar todos os estados em termos de indesejabilidade, obtendo-se uma escala dos estados (x), que pode ser convertida numa escala intervalar de preferências (y) através da fórmula $y = 1 - x$.

Medição da qualidade de vida

Há uma grande variedade de instrumentos utilizados para a medição da qualidade de vida. Mas, independentemente dessa variedade, a informação relativa às preferências dos indivíduos pelos diferentes estados de saúde é normalmente obtida através da utilização de questionários, que se socorrem de um ou mais dos métodos anteriormente estudados. Estes instrumentos que procuram medir estados de saúde têm características bastantes diferentes e podem ser genéricos ou específicos (Guyatt et al., 1993).

Os instrumentos genéricos permitem a obtenção de valores de estado de saúde, independentemente de um problema ou doença específica e incidem principalmente em componentes importantes para a saúde, como funções físicas, desempenho social ou estados psíquicos. Como exemplos de instrumentos genéricos existem o Quality of Well Being (QWB) (Kaplan e Anderson, 1993), o EuroQol (EQ-5D) (EuroQol Group, 1990), o Short Form 36 Health Survey Instrument (SF-36) (Ware e Sherbourne, 1992; Ferreira, 2000a, 2000b), o Nottingham Health Profile (NHP) (Hunt et al., 1981; Ferreira e Melo, 1999) ou o Sickness Impact Profile (SIP) (Bergner et al., 1981).

Por outro lado, os instrumentos específicos, incidindo principalmente em sintomas, permitem a obtenção de valores associados a um problema ou doença e são utilizados quando se pretende estabelecer comparações entre indivíduos com características idênticas, e quando estas características são as únicas importantes na definição do resultado, como por exemplo o Catquest (Lundström et al., 2000a) para doentes com cataratas.

Ambos os instrumentos genéricos e específicos podem dar origem a perfis ou a índices. Os perfis são valores individuais de cada dimensão, não sendo feita qualquer comparação entre as diferentes dimensões através do seu peso relativo. Os índices, por outro lado, resultam da agregação das diferentes dimensões pela aplicação de um modelo de medição com pesos relativos associados a cada dimensão (Nunes, 1998).

Os instrumentos gerais que pressupõem o cálculo de um índice, como o QWB, o EQ-5D ou o Health Utilities Index (HUI) (Feeny et al., 2002), podem ser utilizados nas análises custo-





-utilidade, pois são instrumentos que permitem obter um valor correspondente à qualidade de vida, isto é, permitem o cálculo de utilidades dos estados de saúde. Os índices específicos [NHP, SF-36, SIP] embora possam ser utilizados na medição da qualidade de vida, não podem ser utilizados em análises custo-utilidade, uma vez que não permitem o cálculo de utilidades, mas apenas a medição da efectividade. Algumas tentativas teóricas e empíricas para estabelecer uma ponte entre estes dois tipos de instrumentos de medição têm sido, entretanto, levadas a cabo (Brazier et al., 1998; 2002). Como corolário destes estudos têm sido estimados modelos de regressão que permitem obter valores de utilidade através de indicadores de efectividade.

Objectivo do estudo

Este artigo é resultante de um trabalho de dissertação do Mestrado em Gestão e Economia da Saúde da Faculdade de Economia da Universidade de Coimbra. Baseou-se num estudo cujo objectivo foi a avaliação dos ganhos obtidos com a cirurgia às cataratas efectuada durante a aplicação de um programa de redução de listas de espera, o Programa para a Promoção do Acesso (PPA) e a explicação do comportamento das utilidades dos estados de saúde dos indivíduos, relativamente à percepção do estado de saúde físico e mental dos doentes, incapacidade visual, valorização da saúde actual e tipo de cirurgia (Ferreira, 2000). O PPA foi criado em 1999 pelo Ministério da Saúde e visava a recuperação de listas de espera prolongadas e a melhoria global da capacidade de resposta dos serviços de saúde (Portugal, 1999). Sem a integração dos doentes neste programa, a maior parte deles não teria tido a oportunidade de ser operada, mantendo as enormes limitações e incapacidades daí resultantes.

Como as cataratas são uma doença bastante frequente, que ocorre principalmente em pessoas idosas e que origina uma progressiva perda de visão, levando a uma crescente dificuldade no desempenho das actividades habituais dos doentes, representam naturalmente um problema de saúde prioritário em Portugal e constituíam, por isso, uma das prioridades clínicas identificadas no âmbito do PPA. Assim, optou-se por estudar a sua aplicação num grupo de doentes com cataratas submetidos a cirurgia e explicar o comportamento das utilidades dos estados de saúde em relação a algumas variáveis que medem o funcionamento físico e mental, a incapacidade visual, a valorização do estado de saúde actual e o tipo de cirurgia.

Metodologia

O estudo abrangeu uma amostra de 70 indivíduos submetidos à aplicação de dois instrumentos de medição, um genérico, resultante da combinação do EQ-5D com o Short Form 12 Health Instrument (SF-12), outro específico para cataratas denominado Catquest. Foi utilizado um método de amostragem não probabilístico por conveniência, devendo por isso haver algum cuidado na generalização dos resultados deste estudo. De facto, os doentes seleccionados eram os que constavam da lista dos médicos de família dos centros de saúde da região do Algarve e que estavam em lista de espera para serem operados às cataratas numa unidade hospitalar. Trata-se provavelmente de uma população com maiores necessidades em saúde e sem alternativas no sector privado.

O questionário EQ-5D é essencialmente composto por duas páginas contendo um sistema descritivo e a escala EQ VAS. O sistema descritivo mede cinco dimensões de saúde ('mobilidade', 'cuidados pessoais', 'actividades habituais', 'dor ou mal-estar' e 'ansiedade ou depressão'), cada uma delas com três níveis - sem problemas, alguns problemas, muitos problemas (EuroQol Group, 2000). A combinação de um nível em cada uma das cinco dimensões permite definir um estado de saúde de entre as 243 possíveis combinações. Por exemplo, o estado de saúde 21223 corresponde a uma pessoa com alguns problemas em andar, sem problemas ao cuidar de si, alguns problemas no desempenho das actividades habituais, com dores moderadas e um pouco ansiosa ou deprimida. O índice cardinal do estado de saúde obtido funciona como uma medida dos resultados de saúde na avaliação clínica e

económica (Kind et al., 1999), traduz as utilidades dos estados de saúde e permite o cálculo de QALYs. Para a medição da utilidade do estado de saúde do indivíduo, o questionário inclui também uma escala analógica visual de pontuação, EQ VAS sob a forma de um termómetro, em que se pretende que o indivíduo registe o valor que atribui ao seu estado de saúde, numa escala analógica visual vertical e graduada de 0 a 100.

O SF-12 foi desenvolvido a partir do SF-36 e mede efectividade ou a percepção da qualidade de vida relacionada com a saúde através de 12 itens, distribuídos por 8 dimensões ('função física', 'desempenho físico', 'dor física', 'percepção geral da saúde', 'vitalidade', 'função social', 'desempenho emocional' e 'saúde mental'), uma componente sumária física e uma componente sumária mental (Ware et al., 1996).

O Catquest, desenvolvido com o objectivo de analisar os resultados da cirurgia às cataratas, não só no respeitante à acuidade visual, mas também no respeitante aos impactos da cirurgia nas actividades diárias, nas limitações visuais, nos sintomas relacionados com as cataratas e no grau de independência dos doentes (Lundström e Jensen, 1997), inclui questões relativas a actividades diárias e às dificuldades apercebidas pelos doentes no desenvolvimento dessas actividades, como ler, ver preços ou passear. Abrange 21 itens com três sub-escalas ('nível de actividade', 'sintomas das cataratas' e 'grau de independência'), que permitem o cálculo de uma matriz de benefícios para determinar o tipo de benefício obtido ('muito bom', 'bom', 'moderado', 'questionável' ou 'nulo'), consoante as áreas que foram beneficiadas.

A primeira aplicação do questionário constituído pelo EQ-5D e pelo SF-12 foi efectuada no Centro de Saúde da área de residência do doente, onde teve lugar a consulta de selecção efectuada pelo médico de família. Este questionário foi aplicado a 70 doentes enviados posteriormente a uma instituição privada de prestação de cuidados de saúde para serem observados por um médico oftalmologista e para a programação da cirurgia: 63 doentes preencheram o questionário Catquest e, destes, 42 foram submetidos a cirurgia. Como a recuperação da visão após a cirurgia é lenta, os médicos oftalmologistas consideraram que os doentes deveriam ser chamados para nova consulta entre 3 a 5 meses após a cirurgia. Nessa consulta foram então aplicados os dois questionários, tendo ficado constituído um painel de 38 doentes.

Todas as análises estatísticas foram realizadas no programa estatístico Statistical Package for the Social Sciences (SPSS), versão 12.0, tendo sido utilizado um nível de significância de 5%. Para além de uma análise descritiva, testes de independência do qui-quadrado, testes t para amostras emparelhadas, testes t para amostras independentes, testes de Wilcoxon e calculados coeficientes de correlação de Pearson e de Spearman. Por fim, foi utilizado um modelo de regressão linear múltipla.

Resultados

Caracterização da amostra

A análise dos dados recolhidos permitiu verificar que, na amostra final, 23 (60,5%) inquiridos eram do sexo feminino, conforme se pode ver no quadro 1. No que diz respeito às idades, destaca-se os grupo etário dos 70 a 79 anos (classe modal) com 52,6% dos inquiridos, sendo também de referir que 26,3% dos inquiridos tinha mais de 80 anos. A idade média era de 75,5 anos.

Relativamente à actividade profissional, a quase totalidade dos respondentes era reformado (92,1%), sendo os restantes domésticas. A esmagadora maioria dos inquiridos (89,5%) não continuou a sua educação para além da escolaridade mínima, e nunca desenvolveu qualquer actividade na área da saúde ou em serviços sociais. Quando inquiridos sobre os seus hábitos tabágicos, a maioria afirmou nunca ter fumado, sendo que apenas uma percentagem ínfima afirmou ainda fumar. Cerca de 32,9% já eram, no início do estudo, ex-fumadores. Por outro lado, quase todos os doentes não viviam sozinhos (84,2%), mas apenas 10,5% afirmaram



Quadro 1 – Caracterização da amostra		
Variável	1ª aplicação	2ª aplicação
Número de doentes (n)	70	38
Mulheres (%)	43 (61,4%)	23 (60,5%)
Idade média	74,9	75,5
Cirurgia unilateral (%)	–	13 (34,2%)
Possuidor de doenças graves (%)	13 (18,6%)	7 (18,4%)
Familiar com doenças graves (%)	21 (30%)	10 (26,3%)
Contacto com outras pessoas com doenças graves (%)	12 (17,1%)	5 (13,2%)
Possuidor de uma doença para a qual necessita de tomar medicamentos	26 (41,3%)	16 (42,1%)
Possuidor de mais de uma doença para as quais necessita de tomar medicamentos	57 (39,7%)	15 (36,5%)
Trabalho na saúde ou nos serviços sociais (%)	1 (1,4%)	1 (2,6%)
Escolaridade mínima (%)	63 (90%)	34 (89,5%)
Fumador	4 (5,7%)	1 (2,6%)
Nunca fumou	43 (61,4%)	23 (60,5%)
Doméstica	8 (11,4%)	3 (7,9%)
Reformado (%)	61 (87,1%)	35 (92,1%)
Vive sozinho (%)	11 (17,5%)	6 (15,8%)
Ajuda em casa (%)	10 (15,9%)	5 (13,1%)
Não conduz (%)	55 (87,3%)	32 (84,2%)

dispor de uma ajuda de um amigo ou familiar em casa, para além dos familiares da própria casa, e 2,6% declararam necessitar de ajuda de pessoal de lares. Apenas 18,4% afirmaram já ter tido contacto com doenças graves, 13,2% ao cuidarem de outras pessoas, enquanto que em 26,3% dos casos foi a sua família que teve contacto com doenças graves. Todavia, 42,1% sofrem de uma doença para a qual necessitam de tomar medicamentos e 36,5% de mais de uma doença. A maioria dos indivíduos (84,2%) não conduzia nenhum automóvel no último ano, mas 7,9% declarou que conduzia de dia, e igual percentagem que conduzia quer de dia quer de noite. Dos indivíduos que conduziam, apenas um considerou que tinha muita dificuldade devido aos problemas de visão, três manifestaram alguma dificuldade, sendo que dois indivíduos consideraram que os seus problemas de visão não interferiam com a sua capacidade de conduzir.

Ganhos em saúde

A partir da análise das respostas dadas a cada uma das dimensões do EQ-5D, é possível verificar que os indivíduos situam as suas respostas nas primeiras duas opções: sem problemas, ou alguns problemas (quadro 2). De facto, a dimensão ‘cuidados pessoais’ apresenta a quase totalidade das respostas na primeira opção, sendo que mais de metade das respostas à dimensão ‘actividades habituais’ demonstram a não existência de problemas no seu desempenho, tanto antes como após a intervenção cirúrgica. Por outro lado, relativamente à

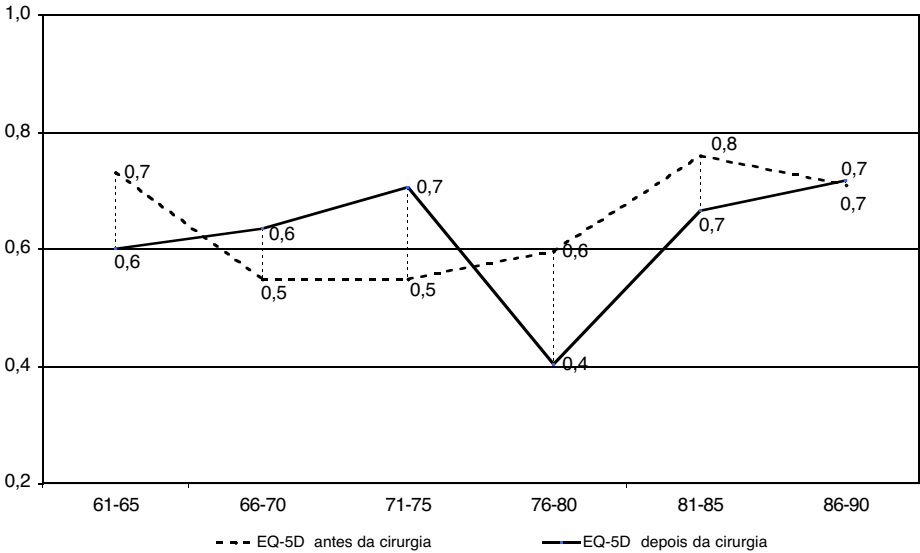
‘mobilidade’, à ‘dor ou mal-estar’ e à ‘ansiedade ou depressão’, os doentes afirmaram apresentar alguns problemas. Poucos indivíduos referiram ter problemas graves, sendo que depois da intervenção nenhum apontou a existência de problemas graves no que respeita a mobilidade ou os cuidados pessoais.



Quadro 2 – Distribuição de frequências das dimensão do EQ-5D						
Dimensão	1: sem problemas		2: alguns problemas		3: problemas graves	
EQ-5D	Antes da cirurgia	Depois da cirurgia	Antes da cirurgia	Depois da cirurgia	Antes da cirurgia	Depois da cirurgia
Mobilidade	36,8%	47,4%	60,5%	52,6%	2,7%	0,0%
Cuidados Pessoais	78,9%	84,2%	18,4%	15,8%	2,7%	0,0%
Actividades Habituais	52,6%	76,3%	44,7%	21,1%	2,7%	2,6%
Dor/Mal Estar	10,5%	23,7%	78,9%	52,6%	10,6%	23,7%
Ansiedade/Depressão	39,5%	52,6%	50,0%	42,1%	10,5%	5,3%

O gráfico 1 apresenta o índice EQ-5D antes e após a cirurgia, distribuído por classes etárias. Os valores obtidos situam-se entre 0,4 e 0,8, sendo que as classes etárias entre 66 e 70 anos e entre 71 e 75 anos apresentam valores superiores para o índice EQ-5D após a cirurgia. Para a faixa etária 61-65 anos, o índice EQ-5D é mais elevado antes da cirurgia do que depois, o que apenas poderá ser justificado pela dimensão reduzida da amostra referente a este grupo etário.

Gráfico 1 – Índice EQ-5D médio por classes etárias



Quando confrontadas com o termómetro EQ VAS, onde era pedido aos inquiridos que atribuíssem um valor à sua própria saúde, a maior parte dos indivíduos valorizou a sua saúde actual entre 40 e 59 (quadro 3).

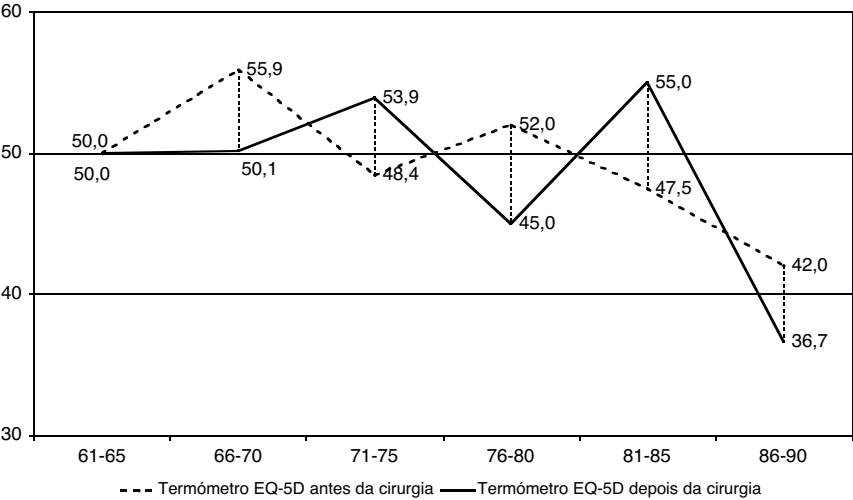
Quadro 3 – Distribuição de frequências do Termómetro EQ-5D		
Termómetro	Antes da cirurgia	Depois da cirurgia
1 – 19	0,0%	5,3%
20 – 39	7,9%	23,7%
40 – 59	73,7%	44,7%
60 – 79	13,2%	10,5%
80 – 100	5,2%	15,8%

A média dos valores escolhidos pelos doentes antes da cirurgia foi de 50,4, situando-se o valor mínimo em 20 e o valor máximo em 100 e sendo de realçar que cerca de 92% dos doentes indicaram valores múltiplos de cinco. Depois da cirurgia, a média baixou ligeiramente para 49,3, verificando-se que apenas uma pessoa afirmou que a sua saúde se situava em 1 e outra a situou em 10, valores inferiores aos que apareciam na primeira aplicação. Após a cirurgia, seis indivíduos são da opinião que a sua saúde se situa entre 80 e 100.

Relacionando a idade com o termómetro (gráfico 2), é possível verificar que, ao contrário do que se poderia pensar, os valores atribuídos após a cirurgia só são superiores aos atribuídos antes da cirurgia nas classes etárias entre 71 e 75 anos e entre 81 e 85 anos. De facto, na classe 86-90 anos o valor do termómetro diminui para um valor médio abaixo dos 40 (36,7). Os valores médios do termómetro registados em todas as classes não são nada elevados: variam entre 55 e 36,7, o que parece denotar uma fraca valorização do estado de saúde actual, quer antes quer após a cirurgia.

As pontuações atribuídas ao termómetro EQ-5D estão relacionadas com algumas das dimensões deste instrumento de medição. Na realidade, os valores do termómetro antes da cirurgia dependem das dimensões ‘mobilidade’ ($\chi^2=17,128$; gl=6;p=0,009), ‘cuidados pessoais’ ($\chi^2=14,640$; gl=6;p=0,023) e ‘actividades habituais’ ($\chi^2=15,415$; gl=6;p=0,017) e, após a cirurgia,

Gráfico 2 – Índice EQ-5D médio por classes etárias



dependem da ‘dor ou mal-estar’ ($\chi^2=16,118$; $gl=8$; $p=0,041$). Existe alguma associação negativa entre o termómetro e as dimensões ‘mobilidade’ ($r=-0,330$; $p=0,043$), ‘cuidados pessoais’ ($r=-0,375$; $p=0,020$), ‘actividades habituais’ ($r=-0,347$; $p=0,033$), ‘dor ou mal-estar’ ($r=-0,395$; $p=0,014$), sendo todas elas estatisticamente significativas. Isto significa, como aliás seria de esperar, que, à medida que aumentam os problemas referenciados em cada dimensão, diminui o valor atribuído à saúde no termómetro.

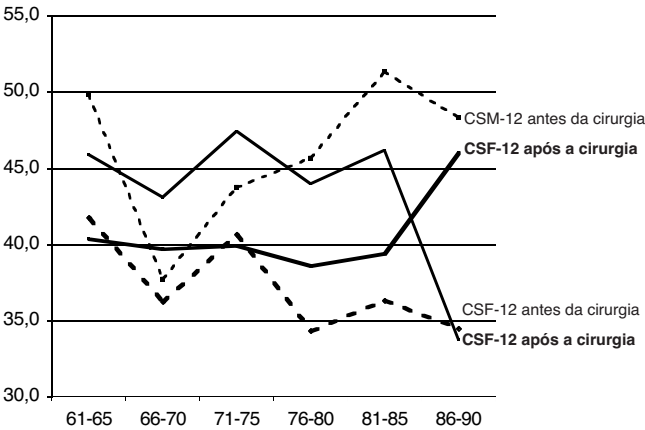
Com base nas respostas dadas ao questionário SF-12, foram calculadas as medidas das componentes sumárias física (CSF-12) e mental (CSM-12), apresentando-se no quadro 4 a distribuição de frequências daquelas componentes.

Quadro 4 – Distribuição de frequências das CSF-12 e CSM-12				
Classes	CSF-12		CSM-12	
	Antes da cirurgia	Depois da cirurgia	Antes da cirurgia	Depois da cirurgia
10 – 20	2,6%	0,0%	0,0%	2,6%
20 – 30	7,9%	13,2%	13,2%	5,3%
30 – 40	63,2%	39,4%	21,1%	34,2%
40 – 50	18,4%	23,7%	28,9%	26,3%
50 – 60	7,9%	23,7%	28,9%	18,4%
60 – 70	0,0%	0,0%	7,9%	13,2%

A média global dos valores da CSF-12 antes da operação situava-se em 36,9, tendo subido para 40 após a cirurgia. De facto, a classe modal após a cirurgia mantém-se entre 30 e 40; contudo, a frequência de valores desta componente nas duas classes imediatamente acima aumentou um pouco após a cirurgia, tal como seria de esperar.

Os valores globais médios da CSM-12 mantêm-se praticamente inalterados após a cirurgia (44,9 antes e 44,2 depois). No entanto, quando relacionados com a idade, é possível verificar que estes valores após a cirurgia são inferiores relativamente aos obtidos antes, especialmente no que se refere às classes etárias mais idosas (76-80 anos; 81-85 anos e 86-90 anos), como se pode ver no gráfico 3.

Gráfico 3 – Índice EQ-5D médio por classes etárias





Pelo contrário, quando relacionados com a idade, verifica-se que os valores da CSF-12 após a cirurgia são superiores aos registados antes da cirurgia para todas as classes etárias, excepto para os doentes entre 71 e 75 anos de idade. Estes resultados são confirmados pelo teste de igualdade de médias para amostras emparelhadas ($t=-2,116$; $gl=37$; $p=0,041$). Os resultados obtidos indiciam a existência de melhoras no estado de saúde físico dos doentes.

Considerando-se que o estado de saúde poderia estar relacionado com a idade, calculou-se o coeficiente de correlação linear de Pearson entre a idade e os indicadores associados ao índice EQ-5D, ao termómetro EQ-5D e às dimensões CSF-12 e CSM-12, não se tendo verificado qualquer relação significativa. Calcularam-se também os coeficientes de correlação linear de Pearson entre aquelas variáveis, tendo-se, antes da cirurgia, verificado a existência de correlação positiva forte e estatisticamente significativa entre o índice EQ-5D e a CSF-12 ($r=0,514$; $p=0,001$), o índice EQ-5D e a CSM-12 ($r=0,714$; $p=0,001$) e entre ambas as componentes CSF-12 e CSM-12 ($r=0,424$; $p=0,008$). Após a cirurgia, o índice EQ-5D surgiu positivamente correlacionado com a CSF-12 ($r=0,485$; $p=0,002$), com a CSM-12 ($r=0,561$; $p=0,000$) e com o termómetro EQ-5D ($r=0,396$; $p=0,014$). Por outro lado, este último indicador esteve também correlacionado com a CSF-12 ($r=0,437$; $p=0,006$) e com a CSM-12 ($r=0,385$; $p=0,017$).

Procedeu-se ainda a uma análise por grupos etários e por tempo entre a cirurgia e a segunda aplicação dos questionários. Relativamente aos grupos etários, os doentes foram distribuídos em dois grupos: doentes com idade igual ou inferior a 75 anos e idade superior a 75 anos, num total de 19 doentes em cada grupo. Relativamente aos grupos por tempo entre a cirurgia e a segunda aplicação dos questionários, procedeu-se a uma distribuição também em dois grupos: doentes em que o tempo entre a cirurgia e a segunda aplicação dos questionários tinha sido de 4 a 5 meses, num total de 24 doentes, e aqueles em que o tempo entre a cirurgia e a segunda aplicação dos questionários tinha sido de 2 a 3 meses, num total de 14 doentes.

Os resultados obtidos na análise por grupos etários evidenciam que não houve melhoria no estado de saúde em geral dos doentes. No entanto, para os doentes com idade superior a 75 anos, parece ter havido melhoras no estado de saúde físico, uma vez que existem diferenças estatisticamente significativas na componente física do SF-12 (CSF-12) ($t=-2,400$; $gl=18$; $p=0,027$). Também para os doentes em que o tempo entre a cirurgia e a segunda aplicação dos questionários foi de 4 a 5 meses parece ter havido melhoras na componente física do SF-12 ($t=-2,608$; $gl=23$; $p=0,016$).

Estado de saúde em relação às cataratas

A análise das respostas do questionário Catquest às questões sobre problemas no desempenho de determinadas actividades (quadro 5), permitiu verificar que, antes da cirurgia, a maior parte dos indivíduos indicava ter extrema dificuldade ou muita dificuldade em desempenhá-las. Após a cirurgia, no entanto, a grande maioria apresenta apenas alguma dificuldade em desempenhar essas actividades. Esta diminuição no nível de dificuldade parece indicar a existência de melhoras.

Também a análise do quadro 6 permite concluir que o nível de dificuldade apercebido pelos indivíduos diminuiu após a cirurgia. Na realidade, cerca de 42% dos indivíduos consideravam que a sua visão não lhes causava dificuldades no desempenho das actividades diárias, contra 5,4% antes da cirurgia. Por outro lado, 34,2% dos doentes estavam muito satisfeitos com a sua visão, e apenas 5,3% estavam muito insatisfeitos. Após a cirurgia, apenas 21,1% consideram que os faróis, lâmpadas, luz do sol e outras luzes lhe provocavam extrema dificuldade, enquanto que antes da cirurgia ascendiam a pouco mais de metade (51,4%). É de referir que antes da cirurgia cerca de 53% dos doentes afirmavam sentir uma grande diferença na acuidade visual entre os dois olhos e que, após a cirurgia, esse valor desceu para 13,2%.

Quadro 5 – Frequências das dificuldades sentidas no desempenho de determinadas actividades, antes e depois da cirurgia

Actividades	Antes da cirurgia	Sentido de variação da dificuldade	Depois da cirurgia
	Extrema e Muita Dificuldade		Alguma dificuldade
Ver as letras dos jornais	76,3%	↘	71,1%
Reconhecer visualmente as pessoas	52,7%	↘	71,1%
Ver os preços das compras	44,7%	↘	73,7%
Ver de modo a caminhar em sítios desconhecidos	60,5%	↘	71,1%
Ver de modo a fazer trabalhos de costura, carpintaria, etc	65,8%	↘	52,6%
Ver as legendas da televisão	65,7%	↘	65,8%
Ver de modo a levar a cabo as actividades ou os passatempos mencionados anteriormente	48,0%	↘	100,0%

Quadro 6 – Frequências da percepção dos indivíduos sobre as dificuldades causadas pela visão no dia-a-dia e dos sintomas das cataratas, antes e depois da cirurgia

Actividades	Antes da cirurgia	Sentido de variação da dificuldade	Depois da cirurgia
Dificuldade de desempenho das actividades diárias			
Muita dificuldade	43,2%	↘	15,8%
Nenhuma dificuldade	5,4%	↗	42,1%
Grau de satisfação com a visão			
Muito insatisfeitos	68,4%	↘	5,3%
Muito satisfeitos	0,0%	↗	34,2%
Distúrbios visuais causados por encadeamento ou ofuscamento			
Extrema dificuldade	51,4%	↘	21,1%
Alguma dificuldade	5,4%	↗	39,5%
Existência de uma grande diferença na acuidade visual entre os dois olhos			
Sim	52,7%	↘	13,2%

Estas questões inseridas no Catquest permitem, como já foi referido, a construção de uma matriz de benefícios em que estes são classificados em ‘muito bons’, ‘bons’, ‘moderados’, ‘questionáveis’ ou ‘nulos’ (quadro 7).

Quadro 7 – Resultado da cirurgia às cataratas, por nível e tipo de benefício

Nível de Benefícios	% doentes	Tipo de Benefícios	% doentes
Muito Bom	42,1%	Significativos	60,5%
Bom	18,4%		
Moderado	21,1%		
Questionável	2,6%	Não Significativos	39,5%
Nenhum	15,8%		

Conforme se pode ver neste quadro, dos 38 indivíduos submetidos à segunda aplicação do Catquest, 16 (42,1%) tiveram um benefício muito bom e 7 (18,4%) tiveram um benefício bom. Apenas 6 (15,8%) não tiveram qualquer benefício. Do total dos 15 homens, 60,0% tiveram um benefício muito bom ou bom e somente 20,0% não tiveram benefício. Das 23 mulheres, 60,8% tiveram um benefício muito bom ou bom e apenas 13,0% não tiveram qualquer benefício.

Na análise dos resultados, considerou-se os benefícios muito bons e bons como benefícios significativos, enquanto que os benefícios moderados, questionáveis e ausência de benefícios eram classificados como benefícios não significativos. Neste sentido, 15 (39,5%) indivíduos não apresentaram benefícios significativos, enquanto que a maioria, 23 (60,5%), apresentou benefícios significativos.

Comparação entre valores socioeconómicos, de ganhos em saúde e de cataratas

Relacionando os benefícios com o género, verifica-se que dos 23 doentes que apresentaram benefícios significativos, 9 (39,1%) eram homens. A distribuição dos 15 indivíduos que não apresentaram benefícios significativos era bastante similar à anterior, sendo 6 (40%) do género masculino. Aplicando o teste do χ^2 , concluiu-se portanto que o tipo de benefícios obtidos é independente do género do doente ($\chi^2=0,003$; gl=1; p=0,957).

Por outro lado, verificou-se também a independência entre o tipo de benefícios e a idade ($\chi^2=1,075$; gl=5; p=0,956), o que significa que o tipo de benefícios obtidos pelos indivíduos não está relacionado com a idade. De facto, verifica-se que dos 15 doentes com benefícios não significativos, 9 (60%) têm idades inferiores ou iguais a 75 anos, e dos 23 que apresentaram benefícios significativos, 13 (56,5%) têm mais de 75 anos.

Tendo como objectivo verificar a existência de relação entre o tipo de benefícios e o tempo que medeia entre a cirurgia e a segunda aplicação dos questionários, aplicou-se o mesmo teste do χ^2 que demonstrou a não existência de relação, ao contrário do que à primeira vista se poderia pensar ($\chi^2=1,103$; gl=1; p=0,294).

Por fim, para verificar a existência de diferenças no estado de saúde genérico dos doentes que obtiveram um benefício significativo ou não significativo, procedeu-se à aplicação de testes estatísticos ao índice EQ-5D e às componentes CSF-12 e CSM-12. Os resultados obtidos demonstram a não existência de melhoras no estado de saúde genérico dos doentes, com excepção da componente física do SF-12, em que existe evidência estatística que permite concluir pela existência de melhoras no estado físico dos doentes com benefícios significativos (z=-2,220; p=0,026). Para se chegar a esta conclusão recorreu-se ao teste de Wilcoxon, aplicado em virtude do não cumprimento dos pressupostos de normalidade, necessários para aplicação do teste t para amostras emparelhadas. Estes resultados estão em consonância com os resultados obtidos anteriormente sobre a existência de melhoras na dimensão física do SF-12, para o total dos 38 doentes.

Modelos de estimação das utilidades dos estados de saúde

Foram também aplicados vários modelos de regressão linear múltipla com o intuito de estudar a relação existente entre as utilidades do estado de saúde e as percepções do estado de saúde físico e mental dos doentes, a valorização actual da sua saúde, a incapacidade visual, a satisfação com a visão, o tipo de cirurgia efectuada (unilateral ou bilateral), o género, a idade e a existência de co-morbididades.

As percepções do estado de saúde físico e mental dos doentes foram medidas a partir das dimensões física e mental do SF-12, a valorização actual da sua saúde a partir do termómetro EQ-5D e o índice de incapacidade visual foi dado directamente pelo Catquest. Definiram-se variáveis dummy para o género (0 se masculino), a co-morbilidade (0 se não tinha mais alguma doença), a satisfação com a visão (0 se satisfeito) e o tipo de cirurgia (0 se bilateral). Em todos os modelos estudados foram incluídas interacções entre as diferentes variáveis. Concluiu-se que a idade, o género e a co-morbilidade não contribuíam significativamente para o modelo, pelo que foram excluídos da análise.

A verificação das hipóteses clássicas do modelo de regressão linear múltipla levou à identificação de ausência de autocorrelação e à detecção de multicolinearidade em alguns modelos. A resolução do problema de multicolinearidade foi conseguida através da eliminação de algumas variáveis menos relevantes.

Porque se trata de uma intervenção com um impacto esperado muito significativo para a qualidade de vida dos doentes, temeu-se que esse facto pudesse interferir no modelo de explicação da utilidade. Assim, foram estudados vários modelos, antes e depois da cirurgia. De entre estes, foram seleccionados os apresentados nos quadros 8 e 9, onde estão listadas

Quadro 8 – Distribuição de frequências do Termómetro EQ-5D

Variáveis	$\hat{\beta}$
Constante	-0,268***
Percepção do estado de saúde físico dos doentes (X_1)	0,008**
Percepção do estado de saúde mental dos doentes (X_2)	0,010*
Interacção entre a incapacidade visual e a satisfação com a sua visão (X_3D_1)	-0,007*
Valorização actual da sua saúde (X_4)	0,004*

*p < 0,05; **p < 0,01; ***p < 0,001

Quadro 9 – Distribuição de frequências do Termómetro EQ-5D

Variáveis	$\hat{\beta}$
Constante	-1,077 *
Percepção do estado de saúde físico dos pacientes (X_1)	0,012 *
Percepção do estado de saúde mental dos pacientes (X_2)	0,012 **
Incapacidade visual (X_3)	0,027 **
Valorização actual da sua saúde (X_4)	0,004 **
Tipo de cirurgia efectuada (D_2)	0,156 ***

*p < 0,05; **p < 0,01; ***p < 0,001





apenas as variáveis em que se obteve uma explicação significativa. As percepções do estado de saúde físico (X1) e mental (X2) dos doentes, a interacção entre a incapacidade visual (X3) e a satisfação com a sua visão (D1), e a valorização actual da sua saúde (X4) foram as variáveis explicativas da utilidade dos estados de saúde antes da cirurgia; as percepções do estado de saúde físico (X1) e mental (X2), a incapacidade visual (X3), a valorização actual da sua saúde (X4) e o tipo de cirurgia efectuada (D2) foram as variáveis explicativas da utilidade dos estados de saúde depois da cirurgia.

Ambos os modelos foram analisados, por forma a detectar problemas de multicolinearidade, autocorrelação e heterocedasticidade, apesar da autocorrelação não dever ser um problema dado os indivíduos poderem ser considerados neste estudo independentes. O modelo 1 não apresentou quaisquer problemas de multicolinearidade, autocorrelação e heterocedasticidade. Relativamente ao modelo 2 não foram também detectados problemas de multicolinearidade e de autocorrelação, embora o teste geral de White tenha detectado existência de heterocedasticidade. Neste sentido, foi utilizado o estimador consistente de heterocedasticidade de White para estimar a matriz de covariâncias assintótica dos parâmetros do modelo. A utilização do estimador robusto de White permitiu verificar a significância dos parâmetros do modelo 2.

Os modelos foram estimados pelos método dos mínimos quadrados ordinários, tendo-se obtido um coeficiente de determinação R^2 de 0,683 para o modelo 1 e de 0,635 para o modelo 2, o que significa que a qualidade do ajustamento é relativamente boa.

De acordo com os resultados provenientes destes modelos, foi possível verificar que:

antes da cirurgia, um aumento da utilidade dos estados de saúde depende de um aumento das percepções do estado de saúde físico e mental e da valorização actual da saúde dos doentes, para além de uma diminuição da interacção entre a incapacidade visual e a satisfação com a sua visão;

depois da cirurgia, um aumento da utilidade dos estados de saúde depende de um aumento das percepções do estado de saúde físico e mental, da incapacidade visual, da valorização actual da saúde dos doentes e do tipo de cirurgia.

Conclusões

A maioria dos indivíduos neste estudo (60,5%) obteve benefícios significativos (muito bons ou bons) com a cirurgia às cataratas enquanto que 39,5% apresentaram benefícios não significativos (moderados, questionáveis ou nulos). Neste sentido, é possível concluir que os resultados obtidos evidenciam uma melhoria significativa no estado de saúde específico da maioria dos doentes submetidos a este tipo de cirurgia. Estes resultados vão ao encontro do que se esperava obter, uma vez que uma extracção de cataratas resulta normalmente numa melhoria da acuidade visual, no olho intervencionado, de cerca de 90% (Lundström et al., 1999).

Na avaliação do estado de saúde genérico, apenas se registaram melhoras significativas na dimensão física do SF-12, especialmente nos doentes com idade superior a 75 anos e naqueles em que o tempo entre a cirurgia e a segunda aplicação dos questionários foi maior (entre 4 e 5 meses). O facto de se terem observado benefícios significativos nestes doentes após as intervenções está também em consonância com as investigações de Lundström et al. (2000b), que afirmam que a cirurgia às cataratas é considerada mais efectiva na melhoria da qualidade de vida dos mais idosos. Na realidade, parece verificar-se a existência de uma relação próxima entre a acuidade visual e a capacidade de desempenhar determinadas actividades em doentes com 80 anos ou mais, estando esta relação, contudo, um pouco condicionada pelo aumento da idade.

Os resultados obtidos relativamente ao estado de saúde genérico, que evidenciam, por um lado, a não existência de melhoras no índice do EQ-5D e na componente mental do SF-12 e, por

outro, a existência de melhoras apenas na componente física do SF-12, podem ter sua razão de ser na idade avançada dos indivíduos da amostra em estudo. Na realidade, o facto de se tratar de uma amostra muito idosa, situando-se a média de idades nos 75 anos, poderá estar por detrás destes resultados: provavelmente os indivíduos sofrem de outras doenças mais graves do que as cataratas, o que pode levar a que a percepção do seu estado de saúde genérico não sofra melhoras significativas. Em idosos é frequente observar-se a existência de alguns problemas por vezes mais a nível psíquico que físico, como a ansiedade e a depressão, o que pode explicar a não existência de melhoras na dimensão mental do SF-12 e no índice EQ-5D, que também mede, para além de outras coisas, a ansiedade e a depressão. Talvez até o tempo que medeou entre a cirurgia e a segunda aplicação dos questionários tivesse contribuído para isso pois, em doentes idosos, dois, três ou quatro meses podem levar a uma rápida deterioração do seu estado de saúde.

Por outro lado, uma melhoria no estado de saúde específico e genérico deveria traduzir-se por níveis de actividade bastante elevados, desempenho de uma actividade profissional e condução de um automóvel. Ora, a idade avançada e outras doenças de que os doentes padecem não possibilitam que estas actividades sejam retomadas, o que poderá levar a concluir-se que não existiram melhoras, quando elas podem ter existido, mas não com aquela magnitude, tal como ainda defendem Lundström et al., (1999). É de realçar que o tempo que ocorreu entre a cirurgia e a segunda aplicação dos questionários, que variou num intervalo de dois a cinco meses, pode ter sido pequeno para se notarem as melhoras possibilitadas pela cirurgia às cataratas. Na realidade, os autores do questionário Catquest consideram que a cirurgia é benéfica a partir do momento em que permite que os doentes realizem determinadas actividades, nomeadamente as suas actividades habituais. Ora, se o tempo que medeia entre a cirurgia e a avaliação dos seus resultados não é suficiente para que tenham recuperado da intervenção e retomado as suas actividades, então os resultados da avaliação não serão muito favoráveis. Também a combinação de casos de intervenções unilaterais e bilaterais pode ter condicionado os resultados, pois o tempo de recuperação dos doentes pode ser diferente entre os dois tipos de intervenção. É de realçar a possibilidade de alguns doentes terem expectativas muito elevadas em relação aos resultados da cirurgia e que talvez isso possa ter contribuído para que considerassem que a cirurgia não lhes permitiu atingir os seus objectivos. Se, por exemplo, esperassem que a sua acuidade visual se assemelhasse à que tinham quando eram mais jovens, provavelmente viram goradas as suas expectativas.

As condições em que o Programa foi aplicado também podem ter contribuído para os resultados, induzindo a que algumas pessoas não tenham obtido o benefício máximo da cirurgia. De facto, na altura e no local em que o estudo foi efectuado, o Programa ainda estava numa fase quase embrionária. Por outro lado, consideramos que não foi feita uma avaliação rigorosa do estado de saúde dos doentes e da possibilidade dos doentes puderem participar no Programa. Os resultados obtidos levantam uma séria questão, que deve ser tomada em conta se se pretender continuar a aplicar este Programa, ou um semelhante: será que as intervenções efectuadas foram de facto prioritárias? Contudo, os resultados obtidos aproximam-se dos apresentados por Lundström et al., (1999; 2000b), que afirmam que os resultados da cirurgia são fortemente condicionados pela idade, existência de outras doenças, tempo que medeia entre a aplicação dos questionários e tipo de intervenção (unilateral ou bilateral). Os resultados obtidos nos seus estudos corroboram a teoria avançada previamente de que existe uma relação entre benefício nulo e idade avançada e existência de outras doenças.

Por outro lado, é possível concluir que as percepções do estado de saúde físico e mental dos doentes, a incapacidade visual, a satisfação com a sua visão, a valorização actual da sua saúde e o tipo de cirurgia efectuada são variáveis explicativas da utilidade dos estados de saúde.

Em trabalhos de investigação futura, pretende-se aumentar a dimensão da amostra utilizada, aplicar um método de amostragem probabilístico, alargar o tempo entre a cirurgia e a segunda aplicação dos questionários e analisar a existência de outras patologias concomitantes, que poderão influenciar a obtenção de ganhos em saúde. Pretende-se ainda aplicar outro



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instrumento de medição de utilidades, por forma a analisar e comparar resultados de diferentes formas de medição de utilidades neste tipo de doentes. Como os resultados demonstraram que é possível encontrar variáveis explicativas das utilidades dos estados de saúde dos doentes com incapacidades visuais, haverá também uma aposta no desenvolvimento de mais investigação nesta área.

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Implicit Logic in Managerial Discourse. A Case Study in Choice of Selection Criteria

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resumo

A grande maioria das teorias de selecção têm dado pouco atenção ao modo como gestores como seleccionadores identificam e justificam critérios de selecção e até que ponto existem evidências para a sua consistência e lógica. Este artigo, na base de um quadro conceptual sócio-cognitivo, propõe uma reflexão sobre estas questões. Foi desenvolvido um código de análise para explicar o discurso utilizado por 22 gestores no que se refere à justificação de critérios de selecção para operadores de câmara numa empresa europeia de comunicação social. Os resultados do estudo evidenciam, ainda que se trate de uma função técnica, que os gestores com experiência na função para a qual os candidatos estão a ser seleccionados se manifestam mais preocupados com valores, crenças e personalidade; e que estes critérios, independentemente do nível de hierarquia na gestão e da experiência em entrevistas de selecção, todos os gestores estão mais preocupados com a articulação pessoa-organização para necessidades presentes e futuras da organização do que com a especificidade pessoa-trabalho para o desempenho imediato. A consistência dos resultados sugere a existência de uma 'lógica implícita' no modo como os gestores justificam critérios que resultam de uma aprendizagem implícita e conhecimento tácito de ambas as experiências organizacionais e operacionais.

La théorie de la sélection n'a pas tellement approfondi les justifications avancées par les recruteurs en termes de choix des critères de sélection des candidats, ou ni s'il y a en évidence une logique ou une cohérence dans ces procédures. Cet article analyse ces questions dans un cadre socio-cognitif. On avance une nouvelle méthodologie de codification pour analyser et expliquer le discours de 22 managers en ce qui concerne

résumé / abstract

la justification des critères de sélection de techniciens dans une station de radio et télévision en évolution permanente. Même pour un poste de travail de haut niveau technique, on trouve que les managers sont surtout concernés par les valeurs, les convictions et la personnalité des candidats. De plus, indépendamment de leur niveau de responsabilité et expérience de sélection ou de recrutement, tous les managers donnent priorité aux critères concernant l'adaptation des candidats aux besoins futurs et actuels de l'organisation plutôt qu'à leur adaption au poste. La cohérence de ces conclusions suggère la présence d'une 'logique implicite' dans la façon par laquelle les managers adoptent des critères dérivés d'un apprentissage implicite et d'une connaissance tacite de l'expérience en même temps opérationnelle et organisationnelle.

Little attention has been paid in mainstream selection theory to how selectors choose to justify criteria and whether there is evidence of any consistency or logic in the manner in which they do so. This paper addresses these questions within a socio-cognitive framework. A newly developed coding system is used to analyse and explain the discourse of 22 managers in justifying selection criteria for technical operators in a European broadcasting company. It was found that, even for a very technical position, managers with experience of the job for which candidates were being selected were more concerned with the values, beliefs and personalities of candidates. It also was found that, independently of their different levels of seniority and experience of selection or interviewing, all managers are more concerned with Person-Organisation Fit for both present and future needs than with immediate Person-Job Fit. The consistency of the findings suggests that there is an 'implicit logic' in the manner in which managers as selectors adopt criteria derived from implicit learning and tacit knowledge of both operational and organisational experience.

JEL Classification: M12; M51



1. Introduction*

Throughout management studies there is an increasing concern that explicit, inferential paradigms are not capturing what really counts for managers in a world of increasing competitive pressures. In his *Managers Not MBAs* (2004), Henry Mintzberg claims that: 'Organizations are complex phenomena. Managing them is a difficult nuanced business, requiring all kinds of tacit understanding that can only be gained in context' (Mintzberg, 2004:9). Nonaka (1994; 1998), giving examples from NEC, Sharp, Canon, Matsushita, Honda and other companies, had claimed that it is when tacit and explicit knowledge interact that: 'something powerful happens', and that: 'It is precisely this exchange between tacit and explicit knowledge that Japanese companies are good at developing... What's more, as new explicit knowledge is shared throughout an organization, other employees begin to internalize it – that is, they use it to broaden, extend and reframe their own tacit knowledge' (Nonaka, 1998: 29-31). Although not even mentioned by Michael Porter (1980; 1990; 1998), tacit knowledge already has a wide resonance in management theory as a key basis of competitive advantage (e.g. Baumard, 1999; Ambrosini and Bowman, 2001; Edmonson, Winslow, Bohmer and Pisano, 2003). And this is precisely because tacit knowing or know-how is not readily identifiable and replicable in the manner of explicit knowledge, such as a formula for a process, a patent, or licence.

Fincham and Rhodes (2005), contrast explicit knowledge as formally expressed in some form that can be 'codified' and manipulated by logical reasoning, with tacit knowledge as a kind of knowing that cannot be easily transmitted or interpreted without a 'knowing subject'. Yet such 'knowing' by individuals or groups is central to Nonaka's (1998) case on interfacing the tacit and explicit. Does this then limit the operability of the concept of tacit knowledge? Or, are there methodologies that can offset Fincham and Rhodes' (2005) claims and that could explicate, classify and code such knowledge in a consistent manner? For instance, are Ambrosini and Bowman (2001) claim that identifying and enhancing tacit knowledge within organisations may not be as difficult as widely presumed since, in large part, knowledge, abilities or skills may be tacit simply because "people never thought of what they were doing, they never asked themselves what they were doing, and nobody else ever asked it either"? (2001: 816).

This case study addresses such issues in one of the most vital areas for any organization: personnel selection. It introduces the still dominant 'normative' selection theory paradigm which claims that only explicit criteria should be adopted in selection (e.g. Guion, 1965, 1997; Dipboye, 1994, 1997; Anderson, 1997; Anderson and Shackleton, 1990, 1993) and that managers should be trained and experienced in such techniques if they are to be able to interview rationally and well. It then considers the socio-cognitive basis of theories of tacit knowledge; suggests that insights into this may be gained from Ignacio Matte Blanco's (1975; 1988) concept of 'unconscious logic', and introduces the concept of 'implicit logic' in discourse analysis. In explaining and advocating the methodology of a 'grounded theory' approach it relates this to the debate within management literature between those who espouse a 'critical realist' approach to discourse (e.g. Reed, 2005) and those following Derrida (1978) who claim that discourse is only a 'social construction' (e.g. Gergen, 1994, 2000; Contu and Wilmott, 2005). In introducing the case study, it describes the method of a newly developed coding system for analysis of managers' discourse concerning choice of selection criteria in a major service organization. It then presents and discusses the findings on which criteria managers implicitly prioritise and sets of criteria in their discourse on what is important for choice of candidates in selection before drawing conclusions on what may be the wider relevance of such findings to how organisations need to adapt to changing operational needs and competitive pressures.

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2. Normative Selection Theory



The methodology of self-styled 'normative' selection theory is rational in the sense of being conscious, inferential and overt. Its rationale is that explicitly identifying and prioritising selection criteria *ex ante*, before an interview, will lead to a higher quality of selection decision-making and better predictors of performance. Yet the widespread lament of the advocates of such a normative approach (e.g. Guion, 1965, 1997; Dipboye, 1994, 1997; Anderson, 1997) is that managers rarely do this. Guion (1965) himself allows that choice in selection entails some final integrating judgement, and that 'the final integration represents either an implicit or an explicit prediction of how the candidate will perform' (Guion, 1965: 474; our emphasis), but also has observed that an advance weighting of 'the values that valid criterion measurement should reflect are rarely articulated and may not even be considered in making (candidate) choice.' (Guion, 1997: 276).

Guion (1965) has been rare among the advocates of normative selection theory in claiming that interviewers should be concerned with the personality of candidates, whereas those favouring a normative approach claim that selectors are likely to be unduly influenced, or biased, by the personal characteristics or appearance of candidates during an interview rather than focussing on whether they meet explicit criteria for job-fit. Normative theory therefore claims that personality should be determined by pre-interview psychometric tests. By contrast, within selection literature, Ulrich and Trumbo, (1965), and Thompson, Warhurst and Callaghan (2001) have claimed that assessing personality in interviewing is of paramount importance, while Robertson (1994) also has called for criteria concerning Personality in Context (Robertson, 1994), where the context is both the needs of the organisation as well as the needs of the job.

Also, whereas normative methodology in selection presumes that explicit criteria have general validity, it may be that such criteria, like any proposition or expression, are meaningful only in the context of their use (Wittgenstein, 1953; Mintzberg, 2004). Yet, in such a context, managers as selectors also face the challenge of appointing to jobs which are becoming less clear cut, change rapidly and whose criteria may be difficult or impossible to know in advance (Bridges, 1996; Fletcher, 1997; Colenso, 2000). This reinforces the case, claimed by Schein (1980, 1992, 1994) and Schneider (1994), that mainstream models of criteria choice and predictive validity in selection need to be re-thought. As Fletcher (1997) already put the issue a decade ago, 'the organizational rules are changed so quickly and so often that the job analysis is outdated before the selection methods are in place' (Fletcher, 1997: 9). If this is the case, exclusive insistence on normative *ex ante* prioritisation of specific criteria for selection may be misplaced, while it may be mistaken to neglect qualitative judgement derived by managers from recent and current experience, at whatever tacit level.

3. Implicit Logic in Tacit Knowledge

A range of researchers in organizational decision-making (e.g., Cowan, 1991) and in selection (e.g., Altink, Visser and Castelijns, 1997) have claimed that organizational and operational culture will tend to affect the choice and application of criteria for selection. Yet, according to Tsoukas and Vladimirou (2001), such corporate culture is implicit rather than explicit. Like corporate 'ethos' (Schneider, 1994; Pichault and Schoenaers, 2003), it tends to 'underlie' corporate or group experience. It also may be that such culture will imply common rationalities on how things are to be done or should be done, or norms that are implicit in custom and practice rather than overt and 'up front' such as codes of practice or mission statements (Oliveira, 2002a). In the context of what counts in personnel selection, this suggests the research question:

RQ1: Can analysis of managers' discourse reveal common rationalities that are implicit in their choice of selection criteria?

If it were found that such rationalities are implicit rather than explicit, this could be consistent with the conceptual framework of tacit knowledge and implicit learning. Before WW2, Thorndike and Rock (1934) had identified the process of learning without awareness of how we have learned, or



without conscious intent to learn. The physicist Michael Polanyi then developed the concept of tacit knowledge (Polanyi, 1958; 1962) and in so doing suggested that there was a 'tacit coefficient' which the mind correlated previous tacit knowledge. Reber (1967; 1993) has claimed that implicit learning is an unconscious process of abstraction by which we categorise new experience on the basis of patterns of past experience. Following Nonaka (1994, 1998), Baumard (1999) has stylised individual and collective 'knowledge modes' which are either explicit or tacit, claiming that individuals assimilate tacit knowledge and interiorise collective knowledge at a less than conscious level, and that implicit learning is a two way organisational process, from groups to individuals and from individuals to groups (Baumard, *ibid.*). Herriot (2003), with Klimoski and Brickner (1987), has suggested that the 'natural' predisposition of managers in interviewing is to use 'implicit constructs' based in organizational culture. Ashforth and Johnson (2001) claim that a workgroup and its occupational identity will tend to be a sub-set of organizational identity.

Ashforth and Johnson's (*ibid.*) claim is paralleled by the clinical analysis of Ignacio Matte Blanco (1975; 1988) who has claimed that the unconscious mind is logical in terms similar to mathematical set theory, and correlates sets-within-sets of meaning for us without us having to follow how it does so. Bartlett's (1995) data driven analysis of recognition and remembering found that those participating in his experimental work tended to relate incoming cognition to 'schema' or 'schemata' of previously stored experience, and do so at varying levels of consciousness. Matte Blanco was unaware of Bartlett's work but his concept of sets-within-sets of stored experience and Bartlett's schema and schemata are identical, if inverse in their focus. Bartlett (1995) is concerned with how people relate the sense data of current experience to schema of previously organised experience, i.e. how people relate current to previous experience. Matte Blanco (1975; 1988) is more concerned with how sets of previously stored experience unconsciously influence current perception.

– Implicit Logic

In terms of personnel selection, analysis of what is implicit in managers' discourse may illuminate otherwise casual reference to 'explicit' or 'implicit' in discussion of selection criteria. For instance, Dewberry (1998) has claimed that: 'The few available existing models of the relation between personality and job performance proposed, implicitly or explicitly, that there is a causal relationship' (Dewberry, 1998: 5). Similarly, Chan (1996) found that 'recruitment personnel are driven by questions (albeit sometimes implicitly) like will this person make a good organizational citizen?' In the same way, in looking at recruitment decisions, O'Reilly, Chatman and Caldwell (1991) found that 'recruiters made implicit judgements about a candidate on the basis of how congruent they perceived their values to be with those of the organization' (*cit.*, Millward and Alexander, 1998).

Managers may explicitly justify selection criteria similarly or differently. If they are unwilling to rank them ordinally *ex ante* in an explicit manner, but it is found from *ex post* analysis that such a ranking is implicit in their discourse, this may reflect shared values and meanings (*c.f.*, Schein, 1994) and a shared set of meanings and norms (*c.f.*, Alvesson, 1996). Discourse analysis thereby should make it possible to explicate Klimoski and Brickner's (1987), and Herriot's (2003) suggestion that the 'natural' predisposition of managers as interviewers is to use 'implicit constructs' based in organizational culture, and Ashforth and Johnson's (2001) claim that a workgroup and its occupational identity will tend to be a sub-set of organizational identity. This would be consistent with Alvesson and Kärreman's (2001) stress on knowledge as a situated, community based set of meanings. If it were found to be the case, it should be evident in the manner in which managers identify selection criteria, and any such implicit rationale or 'implicit logic' (Oliveira, 2000; 2001; 2002a; 2002b; 2005) liable to *ex post* identification and coding or what Pichault and Schoenaers (2003) allow as coding or de-coding in context.

Therefore, although mainstream normative selection theory presumes that only explicitly adopted criteria are rational, this presumption is not self-evident. They may be rational in the sense of inference and explicit logic but neglect a referential implicit logic by which managers are less than

consciously drawing on schema (Bartlett, 1995) or sets, or sets-within-sets (Matte Blanco, 1975; 1988) of previous experience. Also, in principle, discourse analysis should be able to identify the influence of such experience in managers' implicit prioritisation of criteria, and especially whether this prioritisation is influenced more by operational than organisational experience, or experience of interviewing, in what way, and in relation to which criteria. Therefore the research question:

RQ2: Can analysis of managers' discourse on selection criteria reveal an implicit ranking of the importance in context of such criteria?

Also, if Matte Blanco (1975, 1988) is correct in claiming that the unconscious mind correlates sets-within-sets of meaning of previous experience, there is the further research question:

RQ3: Are implicit priorities in managers' choice of selection criteria identifiable from sets-within-sets of meaning in their discourse?

4. Methodology

Addressing such questions needs a methodology that can capture, classify and code both explicit and implicit meaning in managers' discourse. It is within such a conceptual framework that the methodology of the case study in this paper adopted a grounded theory approach within a socio-cognitive perspective.

– A Grounded Theory Approach

As a method developed among others by Charmaz (1990; 1994), Henwood and Pidgeon (1995), grounded theory involves procedures such as interviews, observations and discourse analysis. It includes: (1) generation of low level categories, to interrelate the relevant features of the data corpus; (2) definitions and linkages between the categories at the different levels of abstraction; (3) comparisons between cases, instances and categories, in order to explore the complexities of a data domain, and (4) theoretical sampling of new cases, to seek data to support or disconfirm the emergent conceptual framework or theory. The case study applied this approach in generating, interrelating and comparing cases, concepts and categories. The newly developed coding system was designed to determine whether there was an implicit logic in managers' discourse concerning selection criteria.

– Social Construction of Discourse

A grounded theory approach to discourse analysis shares some features with the 'social construction' analysis of discourse (Derrida, 1978; Gergen, 1994, 2000). This has much to support it in claiming within an existentialist tradition that what matters is 'the self and the other', and that we construct our own perceptions of 'the other'. Davies and Harré (2001 [1990]) have reason to claim that discourse and life are not linear, and that people tend to organize dialogue in at least two modes: 'the 'logic' of the ostensible topic and the story lines which are embedded in fragments of the participants' autobiographies' (Davies and Harré, 2001: 264). Identifying implicit logic in such fragments within discourse and seeking to draw out their implications is central to the 'grounded theory' approach of this case study.

In this regard, therefore, we also support Bakhtin (1981 [1935]) in claiming that dialogue is fundamentally dialogic and that it creates meanings that previously 'were not there' : e.g. an interviewer may gain an insight into what is rhetoric in top managers' claims that they run a 'learning organization' while, through discourse, a middle manager may come to realise that he or she is not alone in having thought, at varying levels of consciousness, that something both 'should be done' without articulating and acting jointly on it with others. For such reasons we also therefore agree with Gergen (1994; 2000) that the more capable people are in constructing and reconstructing narratives of themselves, the more broadly capable they may be in both thought and action. In a selection context, such discourse should be able to demonstrate whether





candidates 'believe in themselves' in Riesman's (1954) sense of being 'self-directed', rather than are 'other directed' and likely to be dependent on direction or supervision by others. It also should be able to indicate whether they value the challenge of multi-tasking, multi-skilling, job variation and flexible methods of work operation (Womack, Roos and Jones, 1990) rather than routine job definition and task segmentation (Taylor, 1911).

– 'Critical Realism'

Yet there also can be problems within a social constructionist approach. As Reed (2005) stresses, some advocates of such a methodology insist not only that discourses but also organizations are discursive constructions and cultural forms that have no status or significance 'beyond their textually created and mediated existence' (Reed, 2005: 1622). This not only may intentionally go to extremes, such as Derrida's claiming that the (first) Iraq war 'did not happen' in the sense that there were different Iraq wars for different actors or observers. It also implies that no generalisations can be made about economic systems or modes of management that can be known to have a basis in reality rather than only as our construction of such reality.

In supporting a social constructionist rather than critical realist approach Contu and Wilmott (2005: 1650) reasonably enough ask one of the longest standing questions of philosophy: 'How do you know the world is the way you say it is; and why should we believe you?' But it may be that analysis of one-to-one discourse with managers finds that they consistently perceive 'their reality' in the same or a closely similar way, which could imply that they are addressing the same reality rather than only a mutual social construction of such a reality. It also could be that if such managers independently identify and interpret 'their reality' in the same or similar ways, this would constitute an 'implicit verifier' of such a reality.

5. Method: The Research Context: Selection of TV Operators in a Public Broadcasting Corporation

This study analyses the content and process of managers' identification and justification of criteria for selection of candidates for posts as TV operators in a European public broadcasting corporation. The tasks in question were not simply camera operation, but included also handling video, sound and lighting equipment, live studio and outside broadcasting, editing film or video tapes for entire programmes or programme inserts, graphic design and animation, staging studio programmes, selecting and assembling scenery, and selecting or storing archive material. The job therefore was less a job-in-itself, than multiple 'sets-within-sets' of job roles demanding multi-skilling, multi-tasking and flexible work practices of a kind which are typical of broadcasting but also increasingly demanded throughout the service sector, and in several front line sectors of manufacturing industry (c.f. Womack, Jones and Roos, 1990; Fletcher, 1997; Colenso, 2000; Womack and Jones, 2005).

The corporation offered 'laboratory' conditions for the research questions of this case study inasmuch as (1) although its overall selection process was modelled on that of the BBC (1996), with highly structured pre-interview screening, trainability and psychometric tests, managers as selectors still were free to adopt and deploy their own criteria for selection in giving information and asking it of candidates; (2) its managers were not trained in selection methods or interviewing techniques in the manner considered mandatory in normative selection theory; (3) the interview panels for selection included managers with a range of different operational and organisational experience. The selection procedures had proven highly successful over a period of some three decades in retaining selected personnel through their two year probationary period and in their later employment.

– Participants

The participants in the research interviews were (n=22) twenty two managers in the broadcasting company at different levels of organizational and operational responsibility, with differing degree

of experience of the organisation, and seniority. Seniority was defined in the terms of practice in the organization. Thus senior managers were heads of departments and members of the board of the company. Middle managers were heads of units. Junior managers had narrower operational experience.

The managers had been within the organization for an average of fifteen years. Most of them (n = 16) had themselves been selected for and done the job of TV operators for which they were interviewing. Of the twenty two, 4 were senior managers (two of them with experience of having been a TV operator); 10 were middle managers (eight of them with experience of having been a TV operator), and 8 were junior managers (six of them with experience of having been a TV operator). Thirteen of the 22 either currently were involved in selection, including panel interviewing, or had been so. The other 9 either were managing or had managed TV operators.

5.1. Data Collection Procedures

Individual semi-structured interviews were carried out with the managers concerned. Permission to record the interview on audio-tape was given by the interviewee as the basis for later discourse analysis. The discourse analysed related to the following questions:

- What in your view should be the selection criteria for TV Operators?
- How should suitable candidates identified and selected?
- What information is it important to give to and receive from the candidates during the selection process?

The research interviews with managers took place in their own offices on a one-to-one basis, and lasted on average 45 minutes.

5.2. Data Analysis and Coding Procedures

Data analysis was undertaken for all interviews on the basis of the classification system for coding managers' discourse. A provisional system was defined after listening to, transcribing and analysing five randomly chosen interviews. In order to check the reliability of the provisional system, five interviews were given to a senior independent assessor, who was asked to code the interviews on this basis. The assessor found the provisional coding robust in relation to the main individual categories, but recommended one modification: the introduction of 'context' as a separate code. This took account of the degree to which managers were concerned to stress the nature of the post in terms of changing operational and organizational needs. The initial interviews then were re-coded, and the rest of the interviews also coded on this basis. All the audio-taped interviews were transcribed verbatim. Responses to questions which related directly to the research topic - identifying and justifying selection criteria in terms of what managers needed from prospective TV operators – were then analysed and coded.

The selection of three mutually exclusive categories for the content analysis was both 'data driven' and 'theory driven'. It was 'data driven' in the sense that the codes of the category in relation to identifying and justifying the choice of selection criteria (Category 1) were grounded in the managers' discourse. It was 'theory driven' in the sense that the codes for the other categories (Categories 2-3) were derived from the conceptual framework of Bartlett's (1932, 1995) schemata and Matte Blanco's (1975, 1998) sets-within-sets of meaning, while the ex post discourse analysis was concerned to understand the meaning of managers' statements and answers in the context (Wittgenstein, 1953) both of the interview with them, and their implicit prioritisation of the same criteria in different operational or organizational contexts. None of the managers was prepared to give an explicit ranking of the importance to them of specific criteria rather than affirm that something was 'vital', 'important', 'really important' or 'must be taken into account'.





The three categories used in coding analysis of managers' discourse in the research interviews are summarised below. Each of the categories includes sets and sub-sets of meaning. Each category also is complementary to the others, and therefore may interrelate different meanings in the sense of Polanyi's (1958, 1962) 'tacit coefficient' which, in turn, may be made explicit by the discourse analysis. But within each category the codes are mutually exclusive. It is in this sense that each statement or sequence of meaning in discourse is coded in relation to the three main categories of the coding system.

Category 1: Specific criteria identifiable from ex post discourse analysis.

Within this category explicit or implicit use of criteria by managers is identified in terms of eight different codes.

- (1) Values: moral, ethical, aesthetic principles or dispositions underlying and influencing behaviour;
- (2) Beliefs: criteria concerning something believed in and conveying conviction;
- (3) Personality: the character and characteristics of a person, such as motivation, commitment, readiness to learn, adaptability, flexibility, aptitude for team-working, sociability.
- (4) General Knowledge: criteria concerning knowledge that is not specifically related to job-fit, but is considered necessary to perform the job well.
- (5) Specific Knowledge: criteria concerning knowledge that relates directly to job-fit, and is necessary to perform that job.
- (6) Abilities: criteria concerning the capacities and capabilities to be able to perform given tasks.
- (7) Skills: being able to think and act creatively above a given level of competence or ability, and including cognitive, social and life skills rather than simply technical job capability.
- (8) Context: The lifestyle, conditions and working environment of the job, including the nature and changing context of multiple job roles; objective conditions rather than subjective attributes of candidates.

Category 2: How criteria relate to sets concerning Person-Organisation Fit or Person-Job Fit.

Within this category, managers' discourse is analysed in relation to two different codes:

- (1) Person-Organisation Fit regards criteria concerning the candidate's understanding of and potential to fulfil a range of roles within the organisation or part of the organisation which serve, enhance or safeguard its mission. These requirements are based on managers' discourse concerning organisational needs.
- (2) Person-Job Fit regards criteria concerning the candidate's understanding and/or potential to perform a particular task. These requirements are based on managers' discourse concerning operational needs.

Category 3: How the discourse relates to sets of criteria such as Values, Beliefs and Personality (VBP) or Knowledge, Abilities and Skills (KAS).

The first three codes above within Category 1 form a set of Values, Beliefs and Personality (VBP). Codes 4 through 7 form another set of Knowledge, Abilities and Skills (KAS), including the further sub-set distinguishing general from specific knowledge. The use of Knowledge, Abilities and Skills or KAS inverts the more familiar sequence in selection literature of Knowledge, Skills and Abilities on the grounds that progress normally is not from knowledge through skill to ability but from knowledge through ability to skill, i.e. knowledge in knowing

something, ability in being able to do it, and skill in being able to do it well. In practice, skill does not come before ability. This inverted sequence informed the newly developed coding system for discourse analysis of Knowledge, Abilities and Skills in the case study.

Managers' discourse was analysed in terms of all 3 complementary categories rather than one category. Within each of the 3 categories, the codes are mutually exclusive.

In applying the coding system to examine the selection criteria explicit or implicit in managers' discourse, there was an overall 84% (Cramer's $V=.825$; $p<.001$) of inter-coder reliability between the initial coding of the researcher and that of the independent assessor after mutual agreement to introduce the category of Context. Both the researcher and assessor independently recoded a further sample of interviews after the adoption of the criterion of Context in Category 1 of the Coding System. Inter-coder reliability for Category 1 was 81% agreement (Cramer's $V=.826$; $p<.001$); reliability for Category 2 was 86% agreement (Cramer's $V=.822$; $p<.001$); for Category 3 it was 87% agreement (Cramer's $V=.838$; $p<.001$).

5.3. Working Hypotheses

In addressing the research questions the case study undertook a content analysis of managers' discourse in terms of the following research hypotheses.

H1 Discourse analysis may reveal common rationalities in managers' implicit prioritisation of specific criteria for candidate selection.

H1 would be supported by finding that managers implicitly prioritise the same criteria for selection despite their reluctance to rank criteria in order of importance in their research interview discourse. Finding such common rationalities would be consistent with tacit knowledge implicitly learned from mutually shared experience (Polanyi, 1958, 1962; Reber, 1967; Nonaka, 1994, 1998; Baumard, 1999; Mintzberg, 2004). Consistency in such findings would suggest that there is a referential unconscious logic (Matte Blanco, 1975, 1978) in their prioritisation of criteria and thereby challenge the claim of normative theory (e.g. Guion, 1965, 1997; Dipboye, 1994, 1997; Anderson, 1997; Anderson and Shackleton, 1990, 1993) that only the inferential adoption of explicit criteria can assure rationality in selection decision-making. Common rationalities would enhance the case of Reed (2005) that discourse is not only a 'social construction' (Gergen, 1994, 2000; Contu and Wilmott, 2005) but relates to a shared reality underlying the implicit derivation by managers of the same criteria from similar experience.

It also may be found that the individual criteria commonly prioritised by managers are the personality and skills needed from candidates for their job roles in organisational and operational context. Prioritising personality would be consistent with the claims of Ulrich and Trumbo (1965) that assessing personality in interviewing is of paramount importance, while prioritising personality and context would be consistent with what Robertson calls the need for criteria concerning 'personality in context' (Robertson, 1994). Such a finding would contest the counter claim of normative theory that selectors should prioritise candidate's knowledge, abilities and skills in relation to their suitability for job-fit. A high degree of concern for both context and skills would indicate support for Fletcher's (1997) claim that selectors increasingly need to be concerned with candidates' skill in adapting to multiple job roles and more flexible organisational and operational needs.

H2 Discourse analysis may reveal that managers implicitly prioritise sets of criteria for candidate selection.

H2 would be supported by finding from discourse analysis that managers implicitly prioritise interrelated criteria and sets of criteria for selection. This could confirm the claim of Bartlett (1995) that the mind at varying levels of consciousness relates current cognition to schemata of previously stored experience. It also would be consistent with Matte Blanco's (1975, 1988) claim that the mind interrelates sets (schemata) of previously stored experience which unconsciously





influence current perception. For instance, it may be found in terms of Category 2 that managers implicitly prioritise sets of criteria concerning Person-Organisation Fit rather than Person-Job Fit and, in terms of Category 3, do the same for sets of criteria which prioritise Values, Beliefs and Personality (VBP) rather than Knowledge, Ability and Skills (KAS). In which case, the higher implicit ordinal ranking of criteria concerning VBP than KAS would suggest that, even for a highly technical job, managers are more concerned not only with individual criteria (H1) but also wider ranging sets of such criteria concerning who people are in terms of their values, beliefs and personality, rather than only what they may be able to do in terms of their current knowledge, abilities and skills.

H3 Managers' discourse concerning Values, Beliefs and Personality (VBP) may correspond with sets of criteria concerning Person-Organisation Fit, and their discourse concerning Knowledge, Ability and Skills (KAS) with sets of criteria concerning Person-Job Fit.

If **H3** is supported, it would further support Matte Blanco's (1975; 1988) claim that the unconscious mind interrelates sets-within-sets of meaning in a logical manner, which also is consistent with the claim of Polanyi (1958; 1962) that there is a 'tacit coefficient' within knowing and understanding that may interrelate present and past knowledge without our being aware of it. It also would demonstrate support for the claims of Charmaz (1990; 1994), and Henwood and Pidgeon (1995), that grounded theory not only (i) can generate low level categories, and (ii) interrelate the relevant features of the data corpus, but do so (iii) with linkages between categories at their different levels of abstraction.

H4 Analysis of implicit logic within managers' discourse may demonstrate that their common rationalities concerning criteria for selection derive from their experience of the organisation and of the job rather than from experience of interviewing.

If **H4** is supported in the context that the managers concerned had achieved a high success rate in selecting appropriate candidates, it would contest the claim of 'normative' selection theory (e.g. Guion, 1965, 1997; Dipboye, 1994, 1997; Anderson, 1997; Anderson and Shackleton, 1990, 1993) that managers should be trained to interview and suggest that the expertise needed for successful selection is less in general interviewing technique than based in and implicitly derived from the grounded reality (Charmaz, 1990, 1994; Henwood and Pidgeon, 1995) of their experience of the organisation and of the job.

6. Findings¹

A total of 513 statements and sequences of discourse were extracted and coded from the 22 research interview transcripts. Where the data permitted, a Chi-Square test was performed. Moreover, cross-tabulated data for differences in (a) seniority, (b) experience of the organisation and of the job and (c) experience of selection and interviewing was also analysed to permit a higher degree of disaggregation of linkages between categories and codes.

H1 Discourse analysis may reveal common rationalities in managers' implicit prioritisation of specific criteria for candidate selection.

For **H1** there was an overall highly significant difference (Chi-Square=329.5, $p<.001$) between the different criteria explicitly or implicitly identified by all managers, with clear priority for Personality, Context and Skills, in that order.

Example of Personality: 'TV operators not only need to be able to learn, but also be able to act. They need to be people with a sense of show and for the spectacular.'

¹ Taking into account that the nature of the data for this paper is categorical, the statistical analysis is based on non-parametric tests. The statistical test used is Chi-Square (c.f. Bryman and Cramer, 1997). On the few occasions where the data is not Chi-Square tested, this is because the frequencies in the cells had an expected count of less than 5.

Example of Context: 'It is vital when we select people to describe the context of what they will do. They need to know what sort of company they are coming to work for. It is important to tell them that they need to travel a lot, they need to work during week-ends and evenings, and we need to find out their availability for such a kind of work.'

Example of Skill: 'A TV operator needs a basic training to be able to perform a specific function which has a technical component of some kind. But, more than technical ability, he also needs creative skills. This is important, and the selection process needs to reflect this.'

Within the limits of the sample, the results support **H1**.

H2 Discourse analysis may reveal that managers implicitly prioritise sets of criteria for candidate selection.

For **H2** nearly three-quarters (73.5%) of the coded discourse of managers concerned sets of criteria in terms of VBP or KAS (of 376 statements 216 concerned VBP). It was found that managers in general implicitly prioritised criteria concerning VBP rather than KAS (Chi-Square=8.340; $p < .01$).

Of the 513 identified selection criteria in terms of P-Org Fit and P-Job Fit, 396 concerned P-Org Fit and that, therefore, managers in general are more concerned with criteria concerning P-Org Fit than P-Job Fit (Chi-Square=151.737; $p < .001$).

Example of Person-Organisation Fit: 'If I want to select TV operators, I'm not going to give tests to see if the candidate would be good as a producer. This is obvious. But now, in a company needing to rejuvenate itself and move, I believe that it is a tremendous mistake to select an operator on the basis that he is going to do one job for ever.'

Example of Person-Job Fit: 'There is a need for continual job up-dating without effort.'

Within the limits of the sample, the results support **H2**.

H3 Managers' discourse concerning Values, Beliefs and Personality (VBP) may correspond with sets of criteria concerning Person-Organisation Fit, and their discourse concerning Knowledge, Ability and Skills (KAS) with sets of criteria concerning Person-Job Fit.

For **H3**, the finding that managers are more likely to associate VBPs with P-Org Fit and KAS with P-Job Fit is highly significant (Chi-Square=40.07; $p < .001$). Managers' are more concerned with sets of criteria relating to VBPs than KAS in relation to Person-Organisation Fit by a factor of 2:1.

Example of P-Org Fit in relation to VBP: 'We like to select people who are motivated to work in the TV business, and we take the selection process seriously because we want successful candidates to do well in the training course and stay with the company. We also need to remember that the training course takes a lot of time, is demanding in resource terms and expensive'.

Example of P-Job Fit in relation to KAS: 'A cameraman directly influences the product with his own initiative and decision about which image the producer wants, and even may suggest the image. Therefore this operator has a direct influence on the outcome. He fulfils himself as an operator through his own capacity and creativity for the benefit of the final product which is the programme'.

Within the limits of the sample the findings very clearly support **H3**.

H4 Analysis of implicit logic within managers' discourse may demonstrate that their common rationalities concerning criteria for selection derive from their experience of the organisation and of the job rather than from experience of interviewing.

For **H4**, Chi-Square tests also show that there is no significant difference in the implicit prioritisation of specific criteria (Category 1) that can be attributed to different seniority, experience of the organisation and of the job and whether or not managers have been engaged in interviewing. This implies that there are common rationalities between managers in their



prioritisation of the criteria which are important for selection. However, there are differing rationalities in terms of the degree to which managers assign relative importance to specific criteria, which can be attributed to whether or not they have experience of the job for which candidates are being interviewed.

Chi-Square tests suggest that there is no significant difference in terms of implicit prioritisation of VBP rather than KAS (Category 3) in relation to managers' seniority, whether or not they have done the job in question, and whether or not they have interviewed and selected candidates for the job. This indicates a common rationality between managers in their implicit prioritisation of VBP as more important than KAS in the sets of criteria which are important for selection.

Table 1 – Managers' Seniority in Relation to their Discourse Concerning VBP and KAS				
Managers	Managers Seniority			
Identified Criteria Sets for VBP and KAS	Senior n=4	Middle n=10	Junior n=8	Total
VBP	54	108	54	16
KAS	42	82	36	160
Total	96	190	90	376

However, as shown in Table 1, disaggregating the sets of criteria by cross tabulation reveals that there are differences in the degree to which managers implicitly assign relative importance to VBP rather than KAS, and that this varies in relation to different levels of seniority.

Table 1 reveals a descending order of importance for implicit ranking of VBP of 13.5 for senior managers, to less than 11 for middle managers, and 6.5 for junior managers. A similar descending scale obtains for senior managers whose implicit ranking of the importance of KAS is 10.5 whereas for middle managers it is just over 8 and for junior managers only 4.

Table 2 illustrates the cross-tabulation of managers' discourse in terms of VBP and KAS with their different experience of selection and interviewing.

Table 2 – Managers' Experience of Selection and Interviewing in relation to their Discourse Concerning VBP and KAS			
Managers	Managers Experience of Selection and of Interviewing		
Identified Selection Criteria in Terms VBP and KAS	with experience n=13	with experience n=9	Total
VBP	144	72	216
KAS	115	45	160
Total	259	118	118

Chi-Square tests for Table 2 show that there is no significant difference in their discourse in terms of their preference for VBPs rather than KAS (Category 3) which can be attributed to whether or not they have been engaged in interviewing.

This implies that there are common rationalities between managers with and without experience of interviewing in their identification of VBPs as more important than KAS of the criteria which are important for selection.

Table 3 illustrates the cross-tabulation of managers' discourse in terms of P-Org and P-Job Fit with their different degrees of seniority.

Table 3 – Managers' Seniority in Relation to their Discourse concerning P-Org and P-Job Fit

Managers	Managers Seniority			
Identified Selection Criteria in Terms of P-Org and P-Job Fit	Senior n=4	Middle n=10	Junior n=8	Total
P-Org Fit	111	204	81	396
P-Job Fit	17	51	49	117
Total	128	255	130	513



A Chi-Square Test shows that there is a highly significant difference (Chi-Square=24.1; $p < .001$; Cramer's $V = .217$; $p < .001$). Averaging the sets of criteria by managers' seniority, gives the following ratios of their higher preference for criteria in terms of P-Org Fit than P-Job Fit: senior managers: over 6:1; middle managers 4:1; junior managers well under 2:1, i.e., again, a consistent and marked descending scale.

Table 4 illustrates the cross-tabulation of managers' discourse in terms of P-Org and P-Job Fit with their different experience of selection and interviewing.

Table 4 – Managers' Experience of Selection and Interviewing in relation to their Discourse Concerning VBP and KAS

Managers	Managers Experience of Selection and of Interviewing		
Identified Selection Criteria in Terms of P-Org and P-Job Fit	with experience n=13	with experience n=9	Total
P-Org Fit	263	133	396
P-Job Fit	87	30	117
Total	350	163	513

Chi-Square tests show that there is no significant difference between managers' justification of criteria concerning P-Org and P-Job Fit and whether or not they have been engaged in interviewing.

Within the limits of the sample, the findings very clearly support **H4**.

6.1. Discussion of Findings

The findings support the case that while there may be an explicit logic in the ex ante adoption of selection criteria which is conscious, inferential and overt, there also may be an implicit logic in the manner in which managers less than consciously draw on tacit knowledge derived from experience of the organisation and the job in prioritising selection criteria, and that this is of more importance than whether or not they have previous experience of interviewing. The findings also support the case that implicit logic is wider ranging than inference alone in interrelating multiple criteria and sets of criteria in varying operational and organisational contexts, and thereby suggest that when managers 'think that they know' what they need from candidates, yet cannot explicitly rate or rank it, they have multiple reasons at varying levels of consciousness for knowing well what they need and prioritising it in their discourse.

The evidence in these regards supports the conceptual framework of Bartlett's (1932) analysis of



the processing of memory, and Matte Blanco's (1975, 1988) claims for an 'unconscious logic' interrelating past and present experience. It is consistent with the claims for the pervasiveness of tacit knowledge of Polanyi (1962), Baumard (1999), and Ambrosini and Bowman (2001), and supports Reber's (1967; 1993) principle of implicit learning. By contrast with the reluctance of managers as selectors to rank the importance of criteria *ex ante* in the manner recommended by normative selection theory, or during discourse, the case study demonstrates that *ex post* coding and classification of their discourse can do so (Oliveira, 2000; 2001; 2002a; 2002b; 2005). It also confirms the claims of Charmaz (1990; 1994), Henwood and Pidgeon (1995), concerning the scope of a grounded theory method, and the viability of the newly developed coding system.

The implicit logic in managers' ranking of criteria reveals a consistency in the manner in which, even for a job demanding a high level of technical qualification, they are more concerned with sets of criteria concerning Values, Beliefs and Personality than Knowledge, Abilities and Skills, and with Person-Organisation Fit than with Person-Job Fit. There is a constant stress in their discourse on the need for personality, creativity, imagination, and capacity to adapt to changing organisational needs, rather than only concern with current job competence.

Granted that none of the managers in the research sample had been formally trained in selection techniques, the findings indicate that such common rationalities were derived from implicit learning (Reber, 1993) and tacit knowledge (Polanyi, 1958; 1962) which they had gained from operational and organizational experience. This supports what Baumard (1999) has stylised as individual and collective 'knowledge modes' by which individuals interiorise collective knowledge at a tacit level. The consistency with which they tacitly share such knowledge modes is reflected in their implicit prioritisation of individual criteria and sets of criteria. It tends to confirm Alvesson and Kärreman's (2001) case that knowledge constitutes a 'situated, community based set of meanings' and the claim of Tsoukas and Vladimirov (2001) that the 'givens' of corporate practice 'underlie' group experience. They also tend to support the presumption of Herriot (2003), with Klimoski and Brickner (1987), that the 'natural' predisposition of managers in interviewing is to use 'implicit constructs' based in organizational culture, and Ashforth and Johnson's (2001) claim that a workgroup and its occupational identity will tend to be a sub-set of organizational identity.

The evidence justifies the claims of Guion (1965), Ulrich and Trumbo (1965), Robertson (1994) and Thompson, Warhurst and Callaghan (2001) concerning the importance of personality and skills in organizational context. It also supports the findings of Cable and Judge (1997) and Schneider, Kristof-Brown, Goldstein and Smith (1997) that managers are more concerned with sets of criteria concerning Person-Organisation Fit rather than with Person-Job Fit. That managers develop criteria with concern for both operational and organizational context is consistent with the views of Pichault and Schoenaers (2003). It supports the view of Altink, Visser and Castelijns (1997) that criterion development competencies and achievements are communicated through the organization and the claim of Schein (1980; 1992) and Schneider, Kristof-Brown, Goldstein and Brent Smith (1997) that efficient organizations select staff to fit the company culture and ethos.

– Adapting to Change

The findings illustrate the case expressed by Bridges (1996) and Fletcher (1997) that jobs are becoming less clear cut and changing rapidly with the implication that managers increasingly may be concerned more with Person-Organisation Fit than with Person-Job Fit. This also may be a reason why managers are reluctant to take time to pre-define selection criteria explicitly in the manner recommended by Anderson (1997), Dipboye (1994; 1997) and others. This is suggested by managers' statements such as 'Today we have one job. Next year we have others. And if we stop adapting, 'goodbye''. And, 'There is a need for continual job up-dating without effort.' The presumption that job up-dating needs be done 'without effort' suggests also that managers assume and need implicit learning (Reber, 1967; 1993) and that such learning, whether less than conscious, or unconscious, is taking place according to an implicit operational rationale or logic.

7. Conclusions



This article suggests that analysis of managers' discourse reveals common rationalities in their choice of selection criteria (RQ1); that there is an implicit logic in their ranking of the importance of such criteria (RQ2); that implicit priorities in managers' choice of selection criteria are identifiable from sets-within-sets of meaning in their discourse (RQ3).

Although the selection process in the organization in question was modelled on one of the most sophisticated in Europe (that of the BBC), the findings are based on one service organisation study. Its outcomes may or may not be replicated in other cultures. Nonetheless, some general implications are suggested by the results.

Overall, the findings tend to support Nonaka's (1994; 1998) claims for interfacing tacit and explicit knowledge, and what Mintzberg (2004) claims should be the primacy of explicating tacit knowledge derived from actual experience. They indicate that Fincham and Rhodes' (2005) claim that tacit knowledge cannot be 'codified' and manipulated by logical reasoning is overdrawn, and suggest that this can be achieved by identifying an implicit logic within managers' discourse. They support the principles of the social construction of discourse, but indicate that there are identifiable realities within such discourse (e.g. Reed, 2005), rather than only a social construction (Gergen, 1994; 2000). In response to Contu and Wilmott's (2005: 1650) question 'How do you know the world is the way you say it is; and why should we believe you?', the findings that managers consistently find perceive 'their reality' in the same way, indicates an 'implicit verifier' of such a reality.

The implications are that a socio-cognitive analysis within a 'critical realist' (Reed, 2005) perspective can better identify and profile what really counts for managers at varying levels of consciousness than normative theory claiming what they ought to do according to explicit behaviour paradigms, and do so within the social context in which perceptions are mediated (Augoustinos and Walker, 1995). They tend to confirm that specific meaning needs to be contextualised in terms of the organizational and the personal agendas of the individuals involved (Harré and Gillett, 1994), such as front line operational managers. The coding system confirms the claim of Wittgenstein (1953) that words or expressions need to be understood in the specific context of their use and that such use and meaning may be identified within the implicit logic of managers' discourse. This tends to confirm related findings on implicit logic in discourse in actual interviewing of candidates (Oliveira, 2000; 2001; 2002a; 2005) and that identifying this may be relevant to assessment of whether or not there has been procedural justice in selection (Oliveira, 2002b). The methodology also may be found in further case studies to have wider relevance in the context in which there is increased attention to the claim that tacit knowledge is a key factor in competitive advantage of companies.



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Human Capital and Corruption: A microeconomic model of the bribes market with democratic contestability

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resumo

Para ultrapassar eventuais falhas de mercado, a sociedade cria leis que estimulam ou penalizam os comportamentos dos indivíduos no sentido da eficiência. No nosso modelo que tem fundamentação microeconómica, comparamos os desvios das entidades públicas em duas situações opostas: autocracia vs. democracia. Assumimos que em autocracia os governantes têm um monopólio sobre o mercado das 'influências' enquanto que em democracia há concorrência entre o governo e a oposição. Os nossos resultados parecem compatíveis com factos estilizados bem conhecidos: (1) em democracia o nível de corrupção é menor que em autocracia, mantendo-se positivos; (2) em situações em que o nível de capital humano é maior, os regimes são mais democráticos e o nível de corrupção é menor; e (3) o nível de corrupção é maior em economias mais reguladas.

Pour surmonter les lacunes du marché la société crée des droits coutumiers qui stimulent ou pénalisent l'action des individus et dont l'application dépend de l'action des pouvoirs publics qui peuvent être ouverts à la

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corruption. Nous modelons ce comportement dans le cas d'une autocratie et d'une démocratie, en utilisant un cadre micro-économique. Nous supposons que dans le cas d'une autocratie les décideurs ont le monopole du marché de corruption, tandis que dans une démocratie des groupes contradictoires entrent en concurrence pour le marché de corruption. Les modèles construits produisent des résultats qui sont compatibles avec des faits stylisés bien connus, nommément que (1) dans une démocratie, par rapport à une autocratie, le niveau de corruption est inférieur quoique toujours positif, (2) dans les environnements où le niveau du capital humain est plus élevé, le régime politique est plus proche de la démocratie et le niveau de corruption est plus bas, et que (3) le niveau de corruption est plus élevé pour les économies plus réglées.

To overcome market failures society creates common laws that stimulate or penalize individual actions, the enforcement of which depends on the actions of public authorities who may be susceptible to corruption. We model this behaviour for an autocracy versus a democracy, using a microeconomic framework. We assume that in an autocracy rulers have a monopoly over the bribes market, whereas in a democracy conflicting groups compete in the bribes market. The models constructed produce results that are compatible with the well-known stylized facts, namely that (1) in a democracy the level of corruption is lower than in an autocracy, although still positive, that (2) in environments where the level of human capital is higher, regimes are closer to democracies and the level of corruption is lower, and that (3) the level of corruption is higher in more regulated economies.

JEL Classification: J24; D73; C63

1. Introduction



Researchers have been interested in the determinants and effects of corruption for quite some time – Aidt (2003), Jain (2001), Rose-Ackerman (1999), Bardhan, (1997), and Ades and Di Tella (1997) provide excellent and comprehensive surveys on the subject. Recently, the availability of adequate data on corruption, especially indices of corruption perceptions for different countries, boosted new and interesting studies (Goel and Nelson, 2005; Xin and Rudel, 2004; Fisman and Svensson, 2002).

Corruption, although unethical, may be perfectly rational from an individual frame of reference (Barreto, 2000). Corruption can therefore take place in any economic transaction involving the public sector, since any economic transaction brings mutual benefits to both parties.

Given that natural resources are a factor in production, by imposing restrictions on their use governments create economic incentives for producers to overcome these restrictions. In addition, economic incentives also exist for producers to adjust the production process (for example, through the division of labour) and the level of output. The producers therefore have an incentive for attempting to corrupt the government agents who control the consumption rate for natural resources and the level of competition.

A government strategy which maximizes the potential for corruption involves imposing very strict limits on the use of natural resources and, in addition, a concentrated market. In this way, the value of a natural resource (its shadow price) is enhanced and comes to represent a greater gain when the imposed limits are overcome. It is easy for governments to justify such policies. In the first place, it is easy to convince the public that they should economize on natural resources and that policies should therefore be restrictive. Secondly, it is also easy to convince the public that the existence of economies of scale means that production is more efficient if it is in the hands of one sole producer.

We assume that government controls the use of natural resources but this concept can be conceptually extended to accommodate any market regulation policy.

Despite having imposed tight restrictions on the use of the natural resource, government officials can organize ways of “selling” permission to overstep these limits. For example, the measurements of the natural resource used are not directly observed by the public and “inspectors” can alter the figures.

Thus, the enforcement of law depends on the actions of public authorities who could be corrupted. A new market emerges where ‘influences’ are traded. Legislators have incentives to deviate from the goal of efficiency and produce laws that maximize the gains that can be expected from bribes. We model this behaviour for an autocracy versus a democracy, using a microeconomic framework. We assume that in an autocracy rulers have a monopoly over the bribes market, whereas in a democracy conflicting groups compete in the bribes market.

The present paper is structured as follows. In the next section we formalize the model. In the Section 3, using simulation techniques, we analyse the level of social welfare that occurs when a government imposes a maximum level of use for a natural resource, which is distributed amongst various producers. The Section 4 details a reduced model of interaction between government officials and the opposition and Section 5 concludes the paper.

2. Formalization of the model

In our economy there is a natural resource and decisions on how it is assigned are the responsibility of the government. The use of this natural resource has, on the one hand, a positive effect in terms of company output and, on the other hand, a negative externality for people. The government therefore has to make a ruling on the use of this natural resource that takes both the positive and the negative effects into account.



In abstract terms, the production of goods and services requires capital, labour and the natural resource whose use causes environmental damage (e.g. air pollution) that has a negative effect on the welfare of citizens.

Since environmental damage is not taken into account in the producers' decisions, there is a need for the government to intervene. Let us suppose that technology allows for the partial substitution of factors that may be condensed into a Cobb-Douglas production function and that there are increasing returns to scale.

In technological terms, assuming increasing returns to scale implies that the existence of several producers in the market conducts to a higher output and a less efficient outcome that imply greater use of the natural resource. Such circumstances enable corrupt government officials to convince the electorate to adopt policies that are not the best in terms of social welfare, i.e. a monopolistic market structure, but increase the potential gains for these individuals.

One of these policies concerns the level of market concentration. The existence of economies of scale introduces the officials' argument for the existence of a "natural monopoly" which favours market concentration. If we observe the situation in various different countries, it can be seen that this justification has been used frequently by governments (together with the Schumpeterian issue of appropriate investment in innovation and development) to justify awarding concessions to just a few companies. In Portugal, for example, this argument is used to justify the existence of monopolies in water supply, waste collection, rail transport, urban public transport and port authorities, amongst others.

A second policy is associated with the natural resource's consumption rate. The fact that there is a positive relationship between consumption of the natural resource and output emerges here as a justification on the part of governments for allowing a level of use of the natural resource that is beyond that which is socially beneficial, causing environmental damage.

Both of these policies favour the producers who are already operating in the market and who therefore push for the situation to be maintained by paying bribes.

In formal terms, let us assume that a producer using a level of capital k , labour supply l and amount m of the natural resource, has the output level y :

$$y(k, l, m) = A \cdot k^\alpha \cdot l^\beta \cdot m^\gamma, \quad \alpha + \beta + \gamma > 1, \quad (1)$$

As there are economies of scale, this implies $\alpha + \beta + \gamma > 1$.

Assuming that the market rate for capital is rate r , which includes depreciation and risk, that the hourly-paid market wage is w and that the private sector price of the natural resource is zero, the profits of a producer whose production function is represented by the expression (1) will be:

$$\pi(k, l, m) = y(k, l, m) \cdot p - k \cdot r - l \cdot w, \quad (2)$$

Concentrating on market structure, let us assume, still in general terms, that the aggregate market demand is known and decreases linearly according to price:

$$D = D_0 - b \cdot p \Rightarrow p = (D_0 - D) / b \quad (3)$$

Thus the selling price of the product depends on aggregate output.

Assuming, additionally, that the producers compete according to Cournot, it follows that the

profits of a producer who assumes D^+ as a reference, this being the level of output of the other producers, will be expressed as follows:

$$\pi = y \cdot (D_0 - D^+ - y) | b - k \cdot r - l \cdot w \quad (4)$$

The level of activity of each producer will depend on the price of the factors they use, the level of aggregate production amongst the other producers, D^+ , which is assumed to be exogenous, and the total amount of the natural resource that the government allows them to use.

Assuming that each unit of the natural resource consumed causes the environmental damage Pa , that the wages received by employees is equal to the effort expended (i.e. working does not lead to a direct increase in employee welfare, only in the consumption of goods and services) and that the capital is "neutral" (capital interest do not lead to any increase in social welfare because they represent remuneration for the sacrifice of saving), in overall social terms welfare is expressed by the sum of the producer's profit added to the consumer gains, from which the environmental damage is subtracted:

$$F = \sum_{i=1}^n y(k_i, l_i, d_i) + 0,5 \cdot (D_0 / b - p) \cdot D - \sum_{i=1}^n d_i \cdot Pa \quad (5)$$

If we take into consideration the fact of the market economy and the fact that producers, even in a monopoly, have little influence on the labour and capital market, we can assume that capital remuneration, r , the hourly-paid wages, w , and the unitary environmental damage, Pa , are exogenous factors. Note that any discussion on the level of efficiency/inefficiency of public planning in terms of the production of goods and services lies beyond the scope of this study.

In this context, producers aspire to a government which imposes the simplest possible laws in order to allow producers to maximize the aggregate benefits defined in equation (5).

As scale economies are present in the production process, if the size of a producer increases, fewer resources will be needed for each output unit produced. Therefore, if concessions for the use of the natural resource are granted to various producers with the eventual possibility of mergers or the acquisition of rights to the natural resource, the market will tend towards a monopoly structure. Government officials take advantage of this situation to justify the existence of one sole producer in the market, an argument that is easily accepted by the electorate.

However, the lack of competition in the market is socially harmful since the monopolist will set a level of output whose marginal production costs are lower than the market price. Regulation apparently allows this problem to be overcome but, on the one hand, it attracts corruption and, on the other hand, it requires the regulator to have previous knowledge of the most socially beneficial performance.

3. Simulation of market behaviour

In this section, using simulation techniques we will analyse the level of social welfare that occurs when a government imposes a maximum level of use for a natural resource, which is distributed amongst various producers. These compete but cannot merge (i.e. the government controls the level of market concentration).

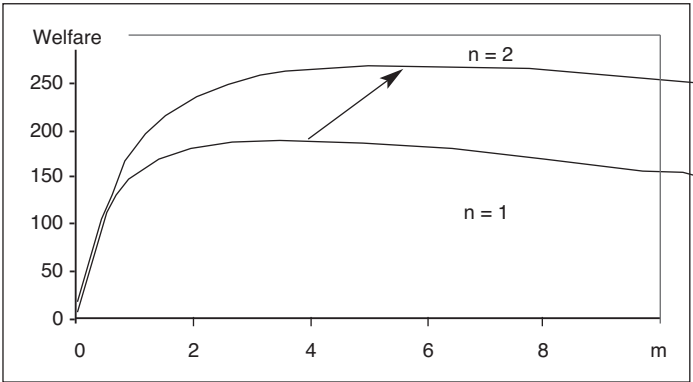
Starting with equations (1)-(5) and setting the model to, $\alpha = \beta = \gamma = 0,5$, $D_0 = 100$, $b = 10$, $r = 15\%$ ¹ e $w = 10$, we see a rise in social welfare when the situation changes from a monopoly to a duopoly ($n=1$ para $n=2$). As can be seen in Figure 1, this is accompanied by the use of larger amounts of the natural resource (m):

¹ We consider here 15% which is the Internal Rate of Return for new firm risky private investments – approximately, 4% of interest without risk within a 8 year amortization period.



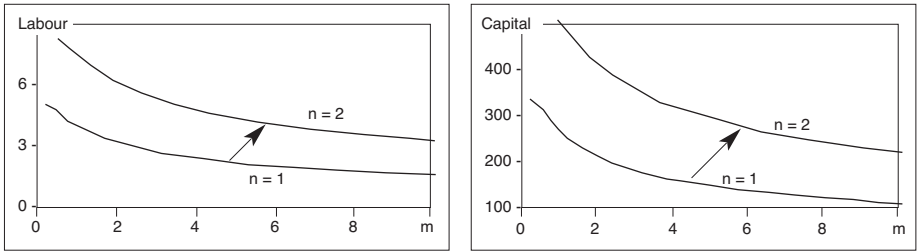


Figure 1 – Relationship between the level of social welfare, number of producers and use of the natural resource



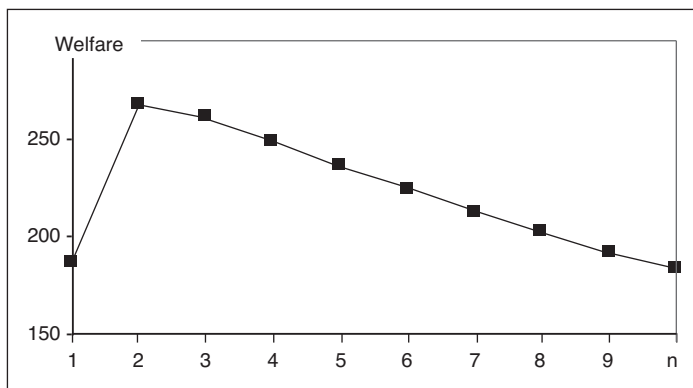
However, it is possible to see from the same figure that even if the consumption level for the natural resource remains steady (i.e. veers from the vertical), the transition from monopoly to duopoly increases social welfare. This is due to the fact that even though there is no increase in the consumption of the natural resource, there will be an increase in production through the greater use of labour and capital, as the next figure shows.

Figure 2 – Relationship between the use of labour and capital, number of producers and use of the natural resource



It is possible to observe from Figure 1 that, with a given number of producers in the market, there is an optimum level for consumption of the natural resource. Restricting ourselves to these optimum points, in Figure 3 we can see the evolution of social welfare according to the number of producers operating in the market. In concrete terms, the existence of a certain amount of competition favours social welfare. In our simulation, the evolution of the level of welfare together with the number of producers reaches a maximum at $n = 2$. At up to $n = 10$, social welfare is higher than in a monopoly ($n = 1$). However, the existence of economies of scale in the production process means that the number of competitors has to be limited ($n \leq 10$) so that technological inefficiency is not superimposed on the gains created by the existence of competition.

Figure 3 – Relationship between social welfare and number of producers



Another important issue that our model enables us to analyse is whether, as an alternative to maintaining a fixed level for the use of the natural resource, it would be in society's interests for the government to set a price for the use of the natural resource (internalise the impact) and to use this money to compensate for the environmental damage caused, whilst making the producers responsible for setting the criteria for the amount used. In this case, the cost of the natural factor has to be added to the profit function:

$$\pi = y \cdot (D_0 - D^+ - y) \mid b - k \cdot r - l \cdot w - m \cdot p_a \quad (6)$$

In the simulation it can be seen that when social damage is incorporated into the optimization model for producers, consumption of the natural resource falls slightly and is partially replaced by labour and capital. However, in terms of social welfare, the policies are identical.

To conclude, the best policy for a government is to set reasonable limits on the levels of use of the natural resource and to distribute the rights to more than one producer (at least two but less than ten, in the case of our settings), or else to set the price of the natural resource as environmental damage and let the producers decide on the best ratios for labour, capital and natural resource. However, the producers must not be allowed to merge towards monopoly or create a cartel.

Given the theoretical equivalence of the two policies (imposing either a maximum level of use or a price), in empirical terms it is to be expected that approximately 50% of governments would opt for each of them. However, the vast majority of governments (and in the case of some resources, all of them) opt to limit use. In our opinion, this is due to the fact that putting a price on use reduces the potential gains for corrupt government officials.

From this micro-foundation model we illustrate how a policy which favours the existence of corruption is unfavourable to social welfare. This being the case, in a second step we may, in abstract terms, condense possible government policies into the variable c which has the value of 1 if the policy is optimum and 0 if it promotes the highest possible levels of corruption and lower levels of social welfare.

3. Simulation of market behaviour

In this reduced model, the gains of government officials during the present period, B , are shown as a decreasing function of government policy c , when social welfare, WF , rises:



$$\begin{cases} B(\chi), B'(\chi) < 0 \\ WF(\chi), WF'(\chi) > 0 \end{cases} \quad (7)$$

If the government policy veers away from the optimum (i.e. if the value of c veers from 1), the likelihood of the government being replaced by the opposition increases. This happens because the public reacts to the reduced level of welfare in relation to its optimum level WF^* , increasing the probability of the government falling as the distance between $WF^* - WF$ increases.

As the optimum value is difficult to observe (the information is not fully accurate), the likelihood of a government defeat also increases in line with the level of political activity on the part of the opposition (measured by the parameter ψ) and the receptivity of the public to opposition activities (measured by the parameter ξ). This receptivity, in empirical terms, may be measured by the average level of education of the electorate, since a more educated electorate tends to be able to understand and discern the relevant information better than a less educated one (Gibbons and Johnston, 1974). As Welch (1970: 42) argues, "... increased education may enhance a [person]'s ability to acquire and decode information about costs and ... characteristics of other inputs."

The opposition incurs costs in informing the electorate (e.g. pamphlets, announcements and speeches) which are derived from the unit price of creating opposition, po , multiplied by the amount of opposition realized, $po \cdot \psi$.

The government determines the value of c which maximizes its expected gains, VG , with ξ , ψ and po given, whilst the opposition determines the level of political activity ψ which maximizes its expected gains, VO , with ξ , χ and po given (assuming that the government does not influence po).

In this way, the expected gains from being in power, VG , and from being in opposition, VO , are shown in the resolution of the following dynamic optimization problem:

$$f = P(Gov - out) = f(\chi, \psi, \xi)$$

$$\begin{cases} VG = \max_{\chi} [B(\chi) + \beta \cdot \{VG \cdot (1 - f) + VO \cdot f\}] \\ VO = \max_{\psi} [-po \cdot \psi + \beta \cdot \{VO \cdot (1 - f) + VG \cdot f\}] \end{cases} \quad (8)$$

$$f_{\chi} < 0, f_{\psi}(\chi, 0, \xi) > 0, f_{\xi} > 0, \quad (9)$$

$$f(\chi, 0, \xi) = 0, f_{\psi}(\chi, 0, \xi) = \infty, f_{\chi}(\chi, \infty, \xi) = 0$$

This represents a symmetry in which all the agents (government and opposition) adopt the same strategy – for the government, the policy is represented by χ and for the opposition, ψ .

Therefore, the level of good governance (as opposed to the level of corruption) will result from the interaction between the government and the opposition in a similar way to the competition that takes place between companies to win market leadership.

From the results shown below, the model demonstrates that the level of corruption in a democracy is lower than in an autocracy and is very much dependent on the ability of the opposition groups to captivate the electorate.

$$f = f(\chi_0, \psi_0, \xi_0)$$

$$\begin{cases} VG(\chi_0, \psi_0) = B(\chi_0) + \beta \cdot \{VG(\chi_1, \psi_1) \cdot (1-f) + VO(\chi_1, \psi_1) \cdot f\} \\ VO(\chi_0, \psi_0) = -po \cdot \psi_0 + \beta \cdot \{VO(\chi_1, \psi_1) \cdot (1-f) + VG(\chi_1, \psi_1) \cdot f\} \end{cases} \quad (10)$$

In an analysis of comparative statics, $\chi_1 = \chi_0 = \chi$, $\psi_1 = \psi_0 = \psi$:

$$\begin{cases} VG(\chi, \psi) = B(\chi) + \beta \cdot \{VG(\chi, \psi) \cdot (1-f) + VO(\chi, \psi) \cdot f\} \\ VO(\chi, \psi) = -po \cdot \psi_0 + \beta \cdot \{VO(\chi, \psi) \cdot (1-f) + VG(\chi, \psi) \cdot f\} \end{cases}$$

$$\begin{cases} VG(\chi, \psi) \cdot [1 - \beta \cdot (1-f)] = B(\chi) + \beta \cdot VO(\chi, \psi) \cdot f \\ VO(\chi, \psi) \cdot [1 - \beta \cdot (1-f)] = -po \cdot \psi_0 + \beta \cdot VG(\chi, \psi) \cdot f \end{cases} \quad (11)$$

$$\begin{cases} VG(\chi, \psi) = [B(\chi) + \beta \cdot VO(\chi, \psi) \cdot f] [1 - \beta \cdot (1-f)] \\ VO(\chi, \psi) = [-po \cdot \psi_0 + \beta \cdot VG(\chi, \psi) \cdot f] [1 - \beta \cdot (1-f)] \end{cases}$$

the first optimization condition can be derived:

$$\begin{cases} VG_\chi = [B_\chi + \beta \cdot VO_\chi \cdot f + \beta \cdot VO \cdot f_\chi] [1 - \beta \cdot (1-f)] = 0 \\ VO_\psi = [-po + \beta \cdot VG_\psi \cdot f + \beta \cdot VG \cdot f_\psi] [1 - \beta \cdot (1-f)] = 0 \end{cases} \quad (12)$$

$$\begin{cases} \chi : B_\chi = -\beta \cdot [VO_\chi \cdot f + VO \cdot f_\chi] \\ \psi : po = \beta \cdot [VG_\psi \cdot f + VG \cdot f_\psi] \end{cases}$$

This demonstrates that when the price of creating opposition, po , is infinite we are faced with a strong dictatorship and when po is reduced, the level of democracy rises.

When po is infinite, the government adopts the most corrupt policy possible. In the second equation the level of opposition activity is zero:

$$\beta \cdot [VG_\psi \cdot f + VG \cdot f_\psi] = \infty \Rightarrow f_\psi = \infty \Rightarrow [\psi = 0, f = 0, VO = 0] \quad (13)$$

meaning that the government remains in power regardless of its politics and government officials adopt whatever maximizes their level of corruption:





$$B_{\chi} = -\beta \cdot [VO_{\chi} \cdot 0 + 0 \cdot f_{\psi}] = 0 \Rightarrow \chi = 0 \quad (14)$$

When the price of creating opposition, p_o , is zero, we are faced with a «perfect» democracy and the government adopts a form of politics that only contains a certain level of corruption (no government is incorruptible). In the second equation, there is a positive level of opposition which makes it likely that the government will change and that it is worth creating an opposition.

$$\beta \cdot [VG_{\psi} \cdot f + VG \cdot f_{\psi}] = 0 \Rightarrow \frac{f_{\psi}}{f} = -\frac{VG_{\psi}}{VG} \Rightarrow [\infty > \psi^* > 0; 1 > f^* > 0; VO^* > 0] \quad (15)$$

Note that, if taken to absurd lengths, the level of opposition would be infinite and the government would fall immediately, thus implying that there are no gains for government officials. Therefore it would not be worth forming an opposition, since there would be no gains to be had from forming a government. If the government implements optimum policies, the government officials remain in power but still gain nothing, and so there are no incentives to form any opposition. However, if the opposition is finite, the likelihood of the government officials who have maintained a certain level of corruption losing office is lower when the units representing the gains to be had from remaining in office and the gains to be had from creating an opposition are positive.

From these two limited cases, it may be concluded that when the cost of forming an opposition is lower, the level of opposition is greater, as are the chances of government officials being removed from office and their level of corruption being reduced.

$$\beta \cdot [VG_{\psi} \cdot f + VG \cdot f_{\psi}] = p \Rightarrow \frac{f_{\psi}}{f} = -\frac{VG_{\psi}}{VG} + \frac{p}{\beta \cdot VG \cdot f} > -\frac{VG_{\psi}}{VG} \quad (16)$$

$$\Rightarrow [\psi < \psi^*; f < f^*; VO < VO^*] \Rightarrow [\chi > \psi^*; VG > VO^*]$$

Note that when opposition agents are subsidized, there are no longer incentives to become government and government officials no longer concern themselves with re-election (as it is equally optimal to be in the opposition), thus increasing the level of corruption (the incumbent government does not care in pleasing the electorate). In addition, it may also be concluded that when the level of «education» of a population, as reflected in the parameter ξ , is higher, the level of opposition and of government corruption will be lower. In this sense, formal education may be seen here as a means of tempering the discrepancy between the actual levels of corruption in particular countries in relation to the optimum levels (Dewey, 1985; Parker, 2003). Perversely, it may also justify a lack of investment, on the part of dictatorships, in policies to promote levels of human capital in their respective populations, as was the case with the Salazar regime in Portugal (Carreira, 1996).

5. Conclusion

Corruption tends to be a factor in economic inefficiency, since the economic incentives for corruption only exist when governments do not commit themselves to optimum policies.

In our work, we have aimed to study, in theoretical terms, the implications of the existence of opposition to a government (i.e. a democracy) in relation to the corruption level of government officials and the social welfare of a nation. To this end, we have constructed a dynamic theoretical model in which two groups alternate between the positions of government/opposition with probability f . We assume that the probability of the government being thrown out rises in line with the level of inefficiency (corruption), the level of opposition activity and the level of education of the electorate.

Using computational methods and algebraic manipulation on a reduced model, we concluded that the freedom to create opposition leads to a fall in the level of corruption amongst government officials (and a rise in efficiency) without, however, totally eliminating it. In addition, the level of education (the human capital) of the electorate equates with a fall in the cost of creating opposition, thus contributing towards a reduction in the level of corruption and consequently a rise in economic efficiency.

Our results therefore appear to accord with the empirical stylized facts, namely that in less democratic countries people tend to be less educated (Parker, 2003), governments only loose power when there are very high levels of opposition and the level of development and economic growth tends to be lower than in more «democratic» countries (Barro, 1991; Repkine, 2003). Conversely, as a rule, the autocratic government officials benefit from obviously higher levels of welfare and wealth than the most of the population, as well as officials in the more democratic countries (Barro, 1994).





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