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Information Systems Outsourcing Reasons and Risks: An Empirical Study

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***Abstract*—**Outsourcing, a management practice strongly consolidated within the area of Information Systems, is currently going through a stage of unstoppable growth. This paper makes a proposal about the main reasons which may lead firms to adopt Information Systems Outsourcing. It will equally analyse the potential risks that IS clients are likely to face. An additional objective is to assess these reasons and risks in the case of large Spanish firms, while simultaneously examining their evolution over time.

***Keywords*—**Information Systems, Information Technologies, Outsourcing, Reasons, Risks, Survey.

I. Introduction

A wide range of facts and figures confirm the status of Information Systems (IS) or Information Technology (IT) outsourcing as a growing, increasingly global phenomenon in the new millennium. Thus, for example, the IT market moved ca. 185 billion € worldwide in 2005 [1]. Forrester estimates that the value of the world's outsourcing market is 120 billion $ per year [2] and predicts that European firms will increase the expenses derived from outsourcing in 2008. The Gartner Group expects the outsourcing market to grow from 180.5 billion $ in 2003 to 253.1 billion $ in 2008 [3]. 87% of the companies interviewed by KPMG plan to maintain —or increase— their current outsourcing level [4], since 42% of them thought that their outsourcing contracts had definitely improved their financial performance, and another 27% stated that outsourcing had enhanced their competitiveness [5][6]. Although the numerical estimates of outsourcing figures vary across sources, no one can deny their magnitude or the expectations for growth in the coming years.

In the light of the above, the present study has as its main aim to focus on the understanding and explanation of the reasons underlying IS outsourcing contracts and the main risks that they entail —from the client's perspective. In this way, it is connected to one of the research lines most often explored in the area of IS outsourcing during the last few years [7], though it introduces an innovation because, through the replication of previous works, this paper seeks to describe the evolution of those reasons and risks over time. In short, the objective of this study is to propose a set of outsourcing reasons and risks, and to assess their importance and evolution over time within the context of the largest Spanish firms. For that purpose, a previous examination must be made of the position occupied by those firms in relation to IS outsourcing. The paper is structured as follows: after a review of the literature devoted to this topic which will help to identify the reasons and risks associated with IS outsourcing, a presentation will be made of the methodology and the results of the empirical work, along with a summary of the main conclusions.

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II. IS Outsourcing Reasons and Risks: One Proposal

As has already been said, quite a few authors have researched into the possible reasons leading firms to outsource their IS [8][9][10] and into the multiple risks that this decision involves [11][12][13]. All these studies have served as a reference to propose a number of reasons and risks that will later be evaluated during the empirical work.

A. Reasons

Based on the literature we have reviewed and on our previous research, we propose the following reasons for outsourcing:

Focusing on Strategic Issues. Market forces are somehow driving firms to outsource everything but the core business [14]. And outsourcing makes it easier for these firms to focus on their basic competences [15][16][17][18][19]. In the computer area, for instance, this liberates line managers —who do not have to coordinate with a large IS department— thus simplifying the organisation. Likewise, the outsourcing of the most routine activities allows computer experts to dedicate their time to key IS activities [20]. Therefore, clients can concentrate on their business and the outsourcing company assumes the responsibility to update both hardware and software and to meet the business requirements specified in the outsourcing contract [21].

Increasing Flexibility. The great change experienced by technology in recent years gives many firms a chance to obtain a considerable advantage from outsourcing, as they will prevent becoming technologically obsolete without having to make large investments in technology. Business organisations can increase their flexibility through a continuous redesign of their contracts that will allow them to meet their information needs at any given time [22]. Outsourcing additionally

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provides a large degree of flexibility in the utilisation of IT resources and makes it easier to face business level volatility, as the provider is left to deal with fluctuations in IT workloads [23]. Firms can equally use outsourcing as a strategy to achieve flexibility during a restructuring or reorganisation process [10]. Finally, business organisations also see outsourcing as a way to respond to the ever-changing needs of their clients and to those of IS users.

Outsourcing can *Improve the Quality* delivered by IS services. There are several reasons for this. For example, the provider can access more advanced technologies and count on more motivated staff and better management systems in order to be able to achieve a better service coordination or control, or, simply, is more strongly committed than the internal staff to make the alliance with the client work properly [22]. At least in theory, firms outsource so that they can have at their disposal high-quality IT services and knowledge [24]. This reason is supported by those who think that, contrary to the conventional view which emphasises the importance of savings and cost control, outsourcing occurs in firms which regard IS as a basic function and believe that outsourcing can improve IS capabilities beyond those internally owned by their organisations.

Despite what has just been said about the previous reason, outsourcing very often serves to *Get Rid of Routine Tasks* —which are very time-consuming— in IT management [15][16][20][25]. Some authors even argue that outsourcing not only allows firms to get rid of routine tasks, but also, if the IS function is seen as something difficult to manage —often regarded by the top management as a 'headache'— [17], outsourcing can remove or minimise a function that is considered clearly problematic [23][26].

Facilitating Access to Technology. Outsourcing brings client firms advantages related to technology [23], as these business organisations can have access to specialised, state-of-the-art technology which is supposedly supplied to them by the provider. On the other hand, the efficient use of outsourcing will most probably reduce the need to make investments in mature technology, simultaneously increasing the availability of resources related to new technologies for the client [22]. Additionally, the most 'timid' organisations —which prefer to wait and see what happens with state-of-the-art technology— may resort to outsourcing as a way to minimise the risks incurred if the technology used is not the most appropriate [14]. In this respect, outsourcing is likely to emerge as a way to experiment with new technologies [24].

Reducing the Risk of Obsolescence is another important reason to outsource. It is precisely the fast pace of change in the field of technology that places firms in front of a dilemma: either making investments on new technologies very often or working with very mature technology. This problem can equally be minimised with technological outsourcing, since the technology accessed by the client is owned by the provider, which means that this risk is assumed by the latter and not by the former [15][20][22]. Firms can increase their level of flexibility through a process of continuous redesign of the contracts that will help them to cover their information requirements [16].

One of the most oft-cited outsourcing reasons is *Saving Staff Costs.* Outsourcing paves the way to a more specialised IT management, as the provider firm finds itself in a better position to select, train and manage its technological staff; in this way, clients can have at their disposal high-level specialists without them having to be permanent members of their staff [21][27]. Clients have in mind a staff reduction which will mean significant cost savings. Computer work is additionally characterised by the deterioration of knowledge and, particularly, by the shortage of specific knowledge. The ability of firms to identify and acquire the IS knowledge required is very important too. In these circumstances, the effort to retain a permanent workforce with a high-level, up-to-date training is likely to end up becoming too expensive for many companies [28][29]. This is one of the strongest reasons that have led many organisations to adopt global or offshore outsourcing [30].

It helps to *Have Alternatives to the IS staff*. This reason is closely related to the above-mentioned increase in IS management flexibility. It is undeniable that, thanks to outsourcing, a firm does not have to depend exclusively on its internal IS resources [31][32].

Saving Technology Costs. This is also one of the reasons that authors have most frequently mentioned. Service providers are exposed to a wider variety of problems and experiences associated with IS, which is why a greater volume of knowledge and skills can be obtained that will help to solve these problems. Likewise, service providers dedicate all their capacity to the provision of IS services, as a result of which greater economies of scale and scope can be obtained [18]. It is assumed that part of these economies are transferred to the client through lower prices in the achievement of the same services through outsourcing and through the work of the IS internal department [16]. Outsourcing equally makes it possible to turn fixed costs (to maintain an IS department) into variable ones (depending on client needs) and, if the contract has been properly designed, into predictable costs [15][20][26]. What is more, outsourcing contracts will probably mean an injection of liquidity for the client firm when it transfers software licenses and staff to the provider [21].

Following the fashion. This last argument is not a trivial one [33][34]; firms decide to adopt outsourcing in order to copy the success of other organisations that have already outsourced [17]. In addition to this imitating behaviour, consideration should be given to the pressure exerted by the providers of these services, the positive attitude of the Stock Exchange toward the phenomenon of outsourcing, and the great coverage in the popular press as well as in the economic press [18] which have made outsourcing become a really 'fashionable' management form [10].

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B. Risks

Together with the multiple reasons, one can also list various risks, since it is precisely the same reasons driving a firm to outsource certain tasks (because they are complex, expensive, largely inefficient or difficult) that make it also difficult for the provider to perform them [35].

We must firstly consider the problem of *Provider Staff Qualification*. Although outsourcing theoretically facilitates the access to the technical knowledge and expertise of IS specialists, it very often happens that the outsourcing firm is supported by the same staff as before [36][37][38], because that staff has been transferred from the client firm to the service provider. Some authors [33] warn that many of the firms which decide to outsource feel that they have lost business knowledge and experience, because after signing a contract, providers send their most highly qualified workers to achieve new clients in other firms within the sector. Additionally, providers hardly ever take the initiative when it comes to adopting business strategies; instead, they prefer to follow specific instructions. Seeing all this, the fact that various authors insist on the problems associated with lack of experience among providers should not surprise anybody [39].

The *Lack of Compliance with the Contract by the Provider* is another potential risk. This problem is inherent to any contract: when an agent performs a task for a principal, the latter always faces the risk that the agent might not carry out the task as expected or that the agent might pay less attention and monitor the process less closely than the principal would have done [22]. Additionally, in the case of IS outsourcing, client needs may not be properly met, or priorities may be erroneously established, because the provider does not quite understand what the business is all about [40].

Problems are likely to arise in relation to the *Dependence* generated by this service. This dependence has to do with the fact that firms have difficulty in quantifying and defining their needs in terms of information services, which additionally tend to evolve over time. Therefore, if not all the services have been agreed in the original contract, an extra fee will be applied, thus increasing the total costs [36]. Or the internal improvements in the IS of the client firm might be neglected [37]. This is why some authors [33] claim that external providers are not strategic partners, since the interest in benefits is not a shared one —when clients' costs grow, so do providers' benefits. Along the same lines, some authors [41] suggests that providers try to ensure that clients have more, and not fewer, additional expenses.

The *Loss of Technical Knowledge* is another relevant problem. When a service is outsourced, clients gradually lose their understanding of the service over time. Even if the provider delivers innovative services to the client, a large proportion of the new knowledge required remains in the hands of the provider and cannot be transferred to the client. What is more serious, the firm may lose its capacity to stay up to date with the technological breakthroughs [22]. Furthermore, the innovation capability of the firm itself can be reduced, since every innovation requires a sufficient availability of technical and economic resources, something that is not precisely favoured by outsourcing [42]. For this reason, the client needs to retain some specific, technical as well as managerial, knowledge and internal capabilities (provider management, hiring) in order to handle the outsourcing relationship properly [43]. Retaining these capabilities is the essential means which makes it possible to identify and value the possible risks of outsourcing, as well as to apply practices that can palliate these risks [44].

Another risk is the *Provider's inability to adapt to the New Technologies*. It was mentioned above that one of the advantages derived from outsourcing is the possibility to access state-of-the-art technology, but this is not always the case. If providers do not identify clear benefits in the incorporation of new technologies, they may be reluctant to adopt them, their main concern being to exploit to the full the service that they already offer. What is more, if the contract does not include a clause specifically devoted to technological evolution, the latter will most probably not be completed [37].

Although one of the main purposes of outsourcing is to control computer costs or flexibilise fixed costs —converting them into variable ones— outsourcing may also have *Hidden Costs*, among which stand out the following [45][46][47]a) Search for vendors and hiring —many firms underestimate the costs associated with the identification and evaluation of suitable IT vendors; b) Transition costs —the time that internal employees spend helping the outsourcing vendor is a transition cost. The costs resulting from the interruptions and from the lack of skill on the part of the vendor to react in a fast, appropriate way, as the IS internal department did at the beginning of the contract term, are transition costs as well. We could also include the costs related to providers' learning of the style, regulations and organisational culture of their clients [48]; c) Costs linked to provider control and coordination —these are perhaps the largest hidden costs, as they imply checking that providers fulfil their contractual duties and negotiating any necessary changes with them; d) Transition costs after outsourcing —when the outsourcing contract expires and the client firm decides to perform its IT activities internally again or change its provider.

Another risk refers to an *Unclear Cost-Benefit Relationship*. Taking into account all the relevant outsourcing factors and trying to translate them into monetary terms is no easy task —for instance, how to value the potentially better service delivered by the provider or how to measure the consequences derived from a poor quality service on the part of the provider [14]. Faced with these difficulties, numerous firms admit that they base their decision to outsource exclusively on the explicit costs generated, leaving aside both the tacit costs and the profits [22].

Possible *Security* problems deserve to be mentioned. They are important when a provider attends to several direct competitors, which is why the confidentiality for the information related to all of them must be strictly kept [20][21][25]. Security in the IS externalised services will depend on the provider firm and, therefore, a negotiation must take place within the framework of the outsourcing contract for the purpose of establishing policies and procedures to ensure that IS security aims (effectiveness, efficiency, adequacy, integrity, validity, authorisation and

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privacy) continue to be achieved [49].

Taking all this into account, it is hardly surprising to check that many firms fear the *Irreversibility of the Decision* to outsource IS, especially if users have got rid of the technical and human infrastructure needed to reconstruct their IS 'in house' [46][36]. There are three reasons for this irreversibility, namely: the high costs involved in the reconstruction of the IS department, the difficulty to attract the necessary staff, and the time required.

Outsourcing generates various *Staff Problems*, as workers face an uncertain situation which provokes anxiety, low morale, and a feeling of insecurity which can lead to a decrease in their productivity levels during the period that precedes the signature of the contract, and even after the contract has been signed [10][50][51]. When only a part of the staff is transferred, it is easy to detect lack of motivation among the employees who stay in the client firm. These professionals may even feel offended because it seems to them that they are not considered good enough to form part of a specialised firm like a computer service provider [52]. Those who remain in the firm can change their responsibilities, and even their status, and very often perform new tasks to which they are not accustomed. This is logical, since the IS department has to be reorganised. The employees who are transferred from one firm to another may go through a number of changes ranging from those affecting their seniority or any beneficial conditions that they might have in their previous company to those associated with the need to adapt to a new corporate culture. All changes will mean stress and insecurity for workers, but this can be offset if the new firm offers more opportunities for a specialised career and the possibility to use more sophisticated technical resources, along with a wider range of jobs [40], which makes sense because these are computer service firms. The IT managers who stay at the client firm usually improve their status and have to reorient their knowledge [53].

Many firms thus fear a *Possible Opposition of their Staff* to the outsourcing decision, which poses a threat to their job [20][31][54][55], this being a risk that becomes even greater in the case of global outsourcing.

III. Methodology

Based on the assumption that the largest firms are also the most prone to outsource [56], a decision was made to send a questionnaire to the largest Spanish firms. The directory *Las 5.000 Mayores Empresas* [The 5,000 largest firms] of the *Actualidad Económica* magazine served to select the study population. This directory was later collated with other databases such as Duns and Bradstreet's *50.000 Principales Empresas Españolas* [50,000 main Spanish firms]. 893 of the 5,000 firms with the highest turnover appearing on the first database were discarded, because their addresses and telephone numbers coincided with those of other organisations, which suggested that they were affiliate or subsidiary companies.

The remaining 4,107 firms received a questionnaire, along with a stamped addressed envelope for the questionnaire to be returned. The questionnaire is largely based on a previous one prepared by the same authors which, the same as this one, was constructed taking the literature on the topic as a reference. Furthermore, some experts in IS Management analysed the questionnaire. Only 6 of the 26 questions included in the final questionnaire have been used in the present paper, as this is part of a larger study which deals with a wide range of issues related to IS outsourcing. Table I shows the measures for the two main study variables.

TABLE I
Measures of Variables and Reliability

Construct	Source	Measure	Reliability (Cronbach's α)
IS Outsourcing Reasons	Literature Review, 2001 year questionnaire and own materials	10 Items measured with a 1-to-7 Likert scale	0.801
IS Outsourcing Risks	Idem	11 Items measured with a 1-to-7 Likert scale	0.818

The questionnaire addressee was the IS manager of the selected firms. Unfortunately, unlike what happens in other countries, no lists of these managers are available in Spain, as a result of which the identity of the questionnaire addressee was unknown. The information obtained in the questionnaire was later elaborated upon with the statistical program SPSS for Windows and treated with univariant and multivariant methods. Table II offers the technical specifications of the empirical work.

TABLE II
Study Technical Specifications

	Year 2001	Year 2006
Scope	Spain	Spain
Population	4,416 largest Spanish business (by sales)	4,107 largest Spanish business (by sales)
Sample size	357 valid answers (8.08%)	329 valid answers (8.01%)
Sampling error	5%	5%
Survey date	June-October, 2001	September-December, 2006

329 valid answers were obtained, which represents an 8% response ratio. Low as it may seem, this ratio is similar or even superior to ratios achieved in other studies about IT outsourcing [57][58][59].One should additionally bear in mind the difficulty to obtain answers in surveys carried out among executives, especially when they are IS executives, due to the fact that the rapid technological change, the considerable IT-related investments carried out by firms, and the great interest aroused by outsourcing, have made these executives become the target of many surveys [60]. Because a part of this paper focuses on analysing the evolution over time of the answers given by interviewees about outsourcing reasons and risks, Table II offers the characteristics, not only of this survey, but also of the previous one which served as a reference for this paper, in order to assess the said evolution. It is impossible to know for sure if the firms answering the

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present and past questionnaires are the same. Previous longitudinal studies [61] were equally addressed to the same population, though this does not necessarily mean that the samples coincide. The firms which answered the questionnaire were representative of the total population in terms of size (sales and number of employees) and sector. A T-test was used to verify the possible differences in means regarding number of employees, both for firms which answered the survey and for those which did not, with T having a value of -1.080 with a 0.280 significance level. In the case of sales, a non-parametric test ―Mann-Whitney's U-test― with a value of 444732.5 and a 0.338 significance level was used. A Chi-square test served to see the connection between the industrial sector and the response or lack of response by firms. The Chi-square value was 2.802 and the significance level, 0.246. All this implies that there is no response bias in these three values.

IV. Results and Discussion

A. General Characteristics of the Firms and their IS Departments

Table III shows the general features of the interviewed firms, their IS departments and IS managers, both in the present study and in that of 2001. It is confirmed that outsourcing has become a widespread phenomenon on a national scale, as 83.6% of the interviewed firms outsource some of their IS activities nationally. However, a comparison with previous years reveals signs of stagnation, i.e. the outsourcing volume has not increased during the last few years. Additionally, Spanish firms still show a 'timid' attitude toward global or offshore outsourcing [62][63]. The variable 'degree of outsourcing' will help to determine if the reasons and risks linked to outsourcing are perceived differently by firms, depending on their outsourcing levels (above or below the mean).

Firm size can be measured by number of workers and by sales. As seen in Table III, the interviewed firms have a considerable size according to both variables, as the lowest percentages correspond to firms with the least employees (only 8.5% of the firms have less than 50 workers) and the lowest sales volume (9.4% of the firms have an annual turnover below 30 million € per annum, while 44.3% of them turns over between 30 and 60 million € annually, and another 35%, between 60 and 300 million €).

Most of the firms interviewed belong to the industrial sector (57.4%). A distinction has been made within the service sector between general services and IT-intensive ones (financial and insurance institutions; tourism, legal and publishing sectors, etc.), as these firms depend much more than the rest on their ICT, due to the type of product/good/service they offer and its elaboration process [64]. 11.6% of the responses come from this third sector.

Despite the size of firms, their IS departments are mostly low-staffed ―the vast majority of them (76%) have 10 or fewer employees. Neither do firms allocate a large proportion of their budget to this area, as a large proportion of the organisations (41%) dedicate 4% or less of their overall budget to IS. It can thus be said that, although these firms have a considerable size, they allocate few financial and human resources to their IS departments. As it happened in 2001, many interviewees did not answer questions about the percentage dedicated to IS in 2006. This is, in fact, frequent in other studies which have analysed this same issue [65].

TABLE III
General Characteristics of the Firms

		2001		2006	
		N	%	N	%
National Outsourcing	No	51	14.3	54	16.4
	Yes	306	85.7	275	83.6
Global Outsourcing	No	-	-	275	83.6
	Yes	-	-	54	16.4
Outsourcing level	Below the mean	175	49.0	165	50.2
	Above the mean	182	51.0	164	49.8
Staff	0-50	22	6.2	28	8.5
	51-500	202	56.6	218	66.2
	More than 500	132	36.9	76	23.1
	Lost	1	0.3	7	2.1
Sales (million €)	Up to 30	36	10.1	31	9.4
	Between 31 and 60	227	63.6	146	44.3
	Between 61 and 300	38	10.6	129	39.2
	Above 300	55	15.4	16	4.9
	Lost	1	0.3	7	2.1
Sector	Industry	210	58.8	189	57.4
	Services	118	33.1	102	31.0
	Intensive IT Services	29	8.1	38	11.6
IS Staff	1-10 Workers	240	67.2	250	76.0
	11-100 Workers	96	26.9	66	20.1
	101-250 Workers	5	1.4	6	1.8
	Lost	16	4.5	7	2.1
Budget percentage allocated to IS	0-4	133	37.2	138	41.9
	5-10	61	17.1	56	17.0
	11-56	18	5.1	13	4
	Lost	145	40.6	122	37.1

B. IS Outsourcing Reasons

The reasons that interviewees identify as being behind IS outsourcing can be found in Table IV and Fig. 1. IS managers were asked to give a score between 1 and 7 depending on whether they considered those reasons *not important at all* or *very important* when the time comes to decide whether or not to outsource their IS. Taking a look at the descriptive statistics provided in Table IV, one can see that, with the exception of

TABLE IV
Outsourcing Reasons

Not important at all 1 2 3 4 5 6 7 Very important

	Mean	Median	Mode
Focus on Strategic Issues	6.03	6	7
Increased IS Department Flexibility	5.37	6	7
Improved IS Quality	5.11	5	7
Elimin. Troublesome, Everyday Problems	4.88	5	7
Increased Access to Technology	4.78	5	6
Decreased Obsolescence Risk	4.66	5	7
Staff Cost Savings	4.34	5	6
Providing Alternatives to in-house IS	4.19	4	5
Technology Cost Savings	4.04	4	5
Following the Fashion	1.67	1	1

'following the fashion', all the reasons proposed are regarded as 'Important' or 'Very Important' determining factors for outsourcing. This is demonstrated by the fact that, except for the above-mentioned item, their mean, median, and mode is situated above 4. Especially outstanding is the advantage of being able to focus on the most strategic IS issues instead of dedicating time to routine tasks. There are also possibilities to increase IS department flexibility and, ultimately, to improve the IS services delivered by companies. At the other end, the least valued reasons were 'following the fashion' (as has already been pointed out) and 'technology or staff cost savings', along with 'possible alternatives to the internal IS'. In any case, despite deserving to be taken into account, the last three reasons are not the most essential factors when a decision to outsource needs to be made.

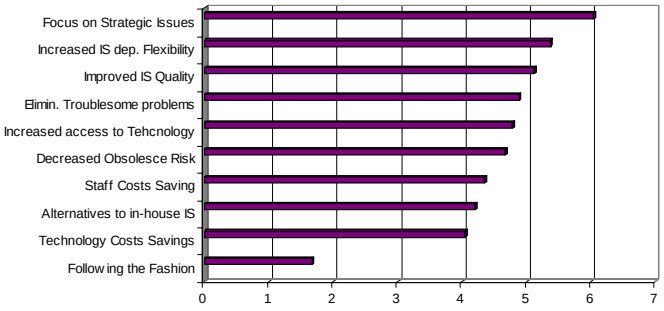


Fig. 1 Outsourcing Reasons

A principal components factor analysis was carried out next using the information about the items related to IS Outsourcing reasons. The aim of this analysis is to reduce the information offered by the original variables in a series of factors or constructs underlying that information, and with a smaller number of final factors than of original variables. In this way, each factor can be treated as a combination of several original variables. Highlighting the underlying factors in each group has as its aim to avoid less important or redundant information. The factor analysis was proved to be pertinent (the correlation matrix determinant was 0.044, the Kaiser-Meyer-Olkin Index was 0.767 and the Bartlett's Test of Sphericity was 837.563, with a significance of 0.000).

The Kaiser criterion indicates the convenience of extracting three factors, as there are three eigenvalues above 1 which account for 61.19% of the information supplied by the original variables (a ratio that can be considered satisfactory, since it exceeds 50%). A varimax rotation served to interpret the factors better. The results of this analysis appear in Table V, where the lowest values of the rotated factor matrix have been excluded for the purpose of improving the interpretation. The score for the item related to quality improvement has also been excluded because it contributes to the same extent to the formation of two factors —1 and 3, which makes it more difficult to interpret its contribution.

The first factor has been called *Strategic Reasons*, as it comprises the outsourcing reasons related to the possibility of focusing on strategic issues, increasing the flexibility of the department, getting rid of routine tasks, and having alternatives to IS, all of which can help to improve IS services.

The second factor is formed above all by the contribution of two items; on the one hand, that referring to the facilitation of access to technology and the reduction of the risk of technological obsolescence and, to a lesser extent, the one related to following the fashion. This factor has been given the name *Technological Reasons*, as these are the most influential ones here.

The third factor has to do with cost savings, either in staff or in technology, which can derive from outsourcing. This is why it has been referred to as *Economic Reasons*. All three factors are equally important insofar as they contribute in the same proportion (20% of the explained variance each) to the total variance.

TABLE V
TOTAL VARIANCE EXPLAINED AND ROTATED COMPONENT MATRIX IN FACTOR REASONS

Total Variance Explained							Rotated Component Matrix			
	Initial Eigenvalues			Rotation Sum of Squared Loadings			Variable	Component		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %		1	2	3
1	3.670	36.700	36.700	2.078	20.784	20.784	Focus on Strategic Issues	0.805		
2	1.388	13.884	50.584	2.021	20.208	40.992	Increased IS Depart. Flexi.	0.564		
3	1.061	10.609	61.193	2.020	20.200	61.193	Elimin. Trouble. Problem	0.789		
4	0.976	9.755	70.948				Access to Technology		0.826	
5	0.794	7.944	78.892				Decreased Obsolesc. Risk		0.803	
6	0.642	6.418	58.310				Staff Cost Savings			0.900
7	0.474	4.743	90.054				Providing Alternatives	0.427		
8	0.416	4.165	94.218				Technology Cost Savings			0.825
9	0.297	2.969	97.187				Following the Fashion		0.446	
10	0.281	2.813	100.000							

After obtaining these factors, an attempt was made to check the possible existence of links between the said factors and the general characteristics of the firms and their IS departments, for which Table VI was prepared. The dependence associations identified revealed the following relationships:

- The smallest firms in the sample (in terms of sales and number of employees) see outsourcing as a way to solve technology problems and reduce costs, rather than a means to be better (it must be remembered,

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TABLE VI
EQUALITY OF MEANS TEST (REASONS)

	Sales	Mean	Levene F	Sign.	T (student)	Sign.
Factor 1: Strategic Reasons	Up to 90	0.120	0.006	0.939	2.446	0.015
	More than 90	-0.177				
Factor 2: Technological Reasons	Up to 90	0.274	0.800	0.372	5.826	0.000
	More than 90	-0.402				
Factor 3: Economic Reasons	Up to 90	0.248	0.142	0.707	5.229	0.000
	More than 90	-0.365				
	Staff					
Factor 1: Strategic Reasons	Up to 500	0.015	1.374	0.242	0.423	0.673
	More than 500	-0.042				
Factor 2: Technological Reasons	Up to 500	0.862	0.480	0.489	2.368	0.019
	More than 500	-0.233				
Factor 3: Economic Reasons	Up to 500	0.126	0.000	0.994	3.515	0.001
	More than 500	-0.342				
	IS Staff					
Factor 1: Strategic Reasons	Below the mean	0.076	2.245	0.135	1.329	0.185
	Above the mean	-0.084				
Factor 2: Technological Reasons	Below the mean	0.201	0.579	0.447	3.593	0.000
	Above the mean	-0.223				
Factor 3: Economic Reasons	Below the mean	0.188	1.127	0.289	3.343	0.001
	Above the mean	-0.208				
	Outsourcing Level					
Factor 1: Strategic Reasons	Below the mean	-0.109	0.423	0.516	-1.623	0.106
	Above the mean	0.086				
Factor 2: Technological Reasons	Below the mean	0.016	0.033	0.855	0.249	0.803
	Above the mean	-0.013				
Factor 3: Economic Reasons	Below the mean	0.112	1.223	0.270	1.657	0.099*
	Above the mean	-0.088				

*Significance level 9.9%

though, that all the firms examined in the present study fall into the category of large business organisations).

- The firms with the least staff in their IS departments also assign more value to technological reasons and cost reductions.
- It can be equally observed that the firms which mostly adopt outsourcing for the purpose of reducing costs are also the ones which outsource the least (with outsourcing levels below the mean).

C. IS Outsourcing Risks

The observation of Table VII and Fig. 2 tells us the outsourcing risks that are regarded as the most relevant ones. The first aspect which stands out is the importance given to

TABLE VII
OUTSOURCING RISKS

ot important at all 1 2 3 4 5 6 7 Very important

	Mean	Median	Mode
Provider staff qualification	6.56	7	7
The provider does not comply the contract	6.27	7	7
An excessive dependence on the provider	5.45	6	6
Loss of critical skills and competences	4.93	5	6
Inability to adapt to new technologies	4.67	5	5
Hidden costs in the contract	4.52	5	6
Unclear cost-benefit relationship	4.47	5	5
Security issues	4.08	4	4
Irreversibility of the outsourcing decision	3.68	3	2
Staff issues	2.55	2	2
Possible IS staff opposition	2.48	1	1

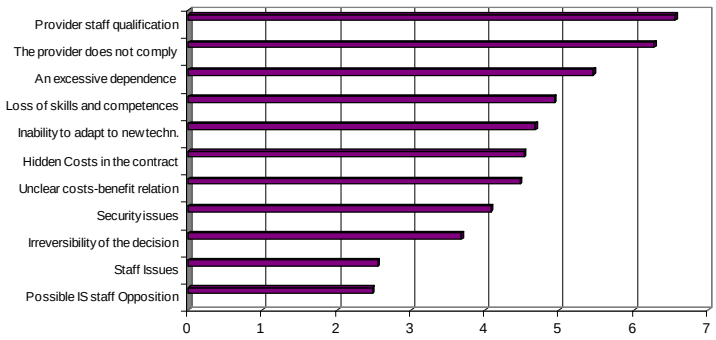


Fig. 2 Outsourcing Risks

nearly all these risks with the exception of the last three (the only ones with scores below 4, as can be seen in their mean, median and mode). This implies the need to take into account most of these risks before facing a decision to outsource. The interviewees seem to be reluctant to outsource before the possible lack of qualification of the provider firm and its potential lack of compliance with the agreements reached. Aspects such as the excessive dependence that the client may feel with respect to the provider and the loss of knowledge that the outsourcing of services can mean for the client are also worth highlighting. On the opposite side, not too much attention seems to be assigned to the potential existence of problems in the client firm derived from its own staff's objections to outsourcing, and neither is this decision regarded as excessively risky in terms of irreversibility.

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The same as in the previous case, when the focus was on outsourcing reasons, the procedure used was to carry out a factor analysis of the outsourcing risks by means of the Principal Components method, prior to which it was necessary to check that such an analysis was pertinent from a statistical point of view (Correlation Matrix Determinant was 0.021, the Kaiser-Meyer-Olkin Index was 0.777, the Bartlett's Test of Sphericity was 956.829 with a significance of 0.000).

Three factors have been extracted (Table VIII), as three eigenvalues above 1 were obtained that served to explain 61.475% of the initial information about the original variables. After carrying out a varimax rotation, an effort was made to interpret all three factors.

The first factor, labelled *Outsourcing Generic Risks*, is formed by a large number of items, all of which turned out to be those which were least important in the previous descriptive analysis, as they refer to what interviewees consider 'not important at all'. Nevertheless, due to the great amount of items included in this factor, it actually explains a high proportion (28.393%) of the information coming from the initial variables.

The second factor was given the name of *Risks Derived from the Provider*, as it has to do with the lack of qualification among the providers' staff, as well as their lack of compliance, and their possible inability to adapt to new technologies.

As for the third factor, it covers the *Risks Derived from the Client*, which relate to a fear of losing knowledge and, consequently, of having to depend too much on the provider. The risks derived from the provider are seen as having a greater weight or being more important than those derived from the client (19.523% of the variance, as opposed to 13.560%), which does nothing but confirm the conclusions of the unidimensional analysis (Table VII), which reflects the prevalence of objections based on the provider over those linked to the client.

TABLE VIII
TOTAL VARIANCE EXPLAINED AND ROTATED COMPONENT MATRIX IN FACTOR RISKS

Total Variance Explained							Rotated Component Matrix			
	Initial Eigenvalues			Rotation Sum of Squared Loadings			Variable	Component		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %		1	2	3
1	4.093	37.208	37.208	3.123	28.393	28.393	Qualific. of the provider's staff		0.717	
2	1.508	13.712	50.921	2.148	19.523	47.915	The provider does not comply		0.745	
3	1.161	10.554	61.475	1.492	13.560	61.475	An excessive dependence			0.815
4	0.889	8.085	69.561				Loss of skills and competences			0.630
5	0.729	6.632	76.192				Inability to adapt to new techn.		0.821	
6	0.663	6.024	82.216				Hidden costs in the contract	0.578		
7	0.584	5.307	87.523				Unclear cost-benefit relation.	0.568		
8	0.486	4.422	91.945				Security issues	0.571		
9	0.382	3.471	95.417				Irreversibility of the decision	0.650		
10	0.295	2.682	98.099				Staff issues	0.874		
11	0.209	1.901	100.000				Possible IS staff opposition	0.846		

TABLE IX
EQUALITY OF MEANS TEST (RISKS)

			Levene			
	Sales	Mean	F	Sgn.	T student or Mann-Whitney's U test	Sign.
Factor 1: General Risks	Up to 90	0.115	3.214	0.074	2.234 (T)	0.026
	More than 90	-0.169				
Factor 2: Providers' Risks	Up to 90	0.196	22.015	0.000	5947.0(U)	0.003
	More than 90	-0.289				
Factor 3: Clients' Risks	Up to 90	-0.000	0.047	0.828	-0.013(T)	0.990
	More than 90	0.000				
	Staff					
Factor 1: General Risks	Up to 500	0.076	1.071	0.302	2.022(T)	0.044
	More than 500	-0.210				
Factor 2: Providers' Risks	Up to 500	0.050	1.181	0.278	1.322(T)	0.187
	More than 500	-0.138				
Factor 3: Clients' Risks	Up to 500	-0.014	0.013	0.909	-0.375(T)	0.708
	More than 500	0.039				
	Outsourcing Level					
Factor 1: General Risks	Below the mean	0.105	0.225	0.635	1.405(T)	0.161
	Above the mean	-0.074				
Factor 2: Providers' Risks	Below the mean	-0.045	0.250	0.617	-0.611(T)	0.542
	Above the mean	0.032				
Factor 3: Clients' Risks	Below the mean	-0.173	0.108	0.743	-2.327(T)	0.021
	Above the mean	0.121				

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A means difference test was carried out after obtaining these factors (using Student's T-test or Mann-Whitney's non-parametric U-test, which turns out to be pertinent when Levene's statistic reflects the heteroskedasticity of variables – Levene's significance levels close to zero). This test served to verify whether or not the risks detected were more characteristic of a certain type of firms. The following relationships emerged in the results obtained through the test:

- Those firms which have the least sales highlight generic risks as well as risks derived from providers, especially the latter.
- Those firms which have the smallest number of workers also emphasise above all the importance of the most generic risks.
- On the contrary, those firms which outsource the most —their outsourcing level is above the mean— assign more importance to the risks derived from clients.

D. IS Outsourcing Reasons and Risks: A comparative analysis (2001-2006)

Finally, a comparison was drawn between the results obtained for IS Outsourcing Reasons and Risks in 2001 and in 2006. Following the advice of the experts interviewed, a new item was added for each area in 2006. The new item in the reasons area referred to the prevention of technological obsolescence. The introduction of this new item —which had not been considered in 2001— was clearly a good idea because, as seen above, although it does not appear among the most highly valued reasons, it has indeed achieved a significant degree of support among interviewees (with a mean of 4.66, a median of 5, and a mode of 7), which proves its importance. As for the risks area, the experts pointed out that it would be convenient to include the risk of finding staff problems due to outsourcing. That item was not as successful as the previous one and did not rank high on the list of most highly valued risks. In fact, its average score is only 2.55 (within a scale ranging between 1 —not important at all— and 7 —very important—).

The comparison of the results obtained for IS outsourcing reasons and risks in 2001 and in 2006 was based on a study of the *rankings* for the reasons and risks that scored the highest values in both years, as can be seen in Table X.

It follows from the above that the importance of reasons regarded as essential in IS Outsourcing has not varied. Reasons based on the possible improvement of IS services and strategic reasons are the most highly valued, followed by those related to the potential improvement in technology, and in last place —the same as in 2001— those focused on cost savings. What is more, issues related to cost savings obtained a lower score in 2006 than in 2001.

No dramatic changes have occurred with respect to the risks regarded as the most important in 2001 and in 2006, though a subtle difference does seem to exist in their valuation. Whereas in 2001, firms associated the most relevant risks with clients (of themselves) —as they could feel an excessive dependence and suffer a loss of knowledge with respect to their providers— in 2006, the main risks had to do with providers —as there is great concern about their poor qualification level and potential lack of compliance. It deserves to be mentioned that the item corresponding to the potential inability on the part of the provider to adapt to the New Technologies, which was not particularly outstanding in 2001, obtained a much higher score in 2006 —once again, a risk mainly linked to the provider.

V. CONCLUSION

IS Outsourcing has become a widespread phenomenon on a worldwide scale that is equally present among the largest Spanish firms. This is a strategic decision within the business context that should not be adopted without carrying out a thorough, rigorous analysis of the pros and cons or, to put it in another way, of the reasons and risks entailed by this decision.

The largest Spanish firms consider that outsourcing gives their organisations the opportunity to focus on strategic issues, the chance to have better IS services and the possibility to achieve technological improvements and, although economic reasons, like cost savings in staff and technology, are generally seen as very important [21][24][27], they do not emerge as priority reasons for outsourcing in the present study. Only the smallest companies which have the fewest staff in their IS departments and outsource the least support

TABLE X
OUTSOURING REASONS AND RISKS (2001-2006)

Reasons			*Risks*		
	2006 Ranking	2001 Ranking		2006 Ranking	2001 Ranking
Focus on strategic issues	1st	1st	Provider staff qualification	1st	3rd
Increased IS dep. Flexibility	2nd	2nd	The provider does not comply	2nd	4th
Improved IS quality	3rd	3rd	An excessive dependence	3rd	1st
Elimin. troublesome problems	4th	4th	Loss of skills and competences	4th	2nd
Increased access to technology	5th	6th	Inability to adapt to new techn.	5th	10th
Decreased obsolesc. risk	6th	-	Hidden costs in the contract	6th	6th
Staff cost saving	7th	5th	Unclear cost-benefit relation.	7th	5th
Alternatives to in-house IS	8th	8th	Security issues	8th	7th
Technology cost Saving	9th	7th	Irreversibility of the decision	9th	8th
Following the fashion	10th	9th	Staff issues	10th	-
			Possible IS staff opposition	11th	9th

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cost savings as essential reasons to outsource.

Regarding risks, interviewees suggested that they are mainly associated with providers, with great concern being expressed about the lack of qualification among their providers' staff, the potential lack of compliance with contracts, and the inability to adapt to the New Technologies. This conclusion is in tune with those obtained in previous works, according to which most of the outsourcing problems have to do with the people involved in the projects [5]. In fact, once the decision to outsource has been made, the next critical activity consists in selecting a suitable provider that, in addition to being able to meet the needs of the organisation, is reliable and has enough technical competence and financial stability [66].

As for the evolution of IS Outsourcing reasons and risks over time, on the whole, no dramatic changes seem to have taken place between the opinions expressed by IS managers in 2001 and in 2006. Regarding reasons, more value continues to be assigned to the improvement made possible by outsourcing, which allows the firm to have access to better IS services and more up-to-date technology, i.e. the focus is on strategic reasons which have little to do with mere cost savings. In the case of risks, instead, there seems to have been a slight but significant change in recent years. Whereas in the past, interviewees were above all concerned about their own weaknesses when the time came to outsource, with such fears as developing an excessive dependence on the provider or losing relevant IS knowledge items, at present an increasingly high number of firms assign more importance to the risks derived from the provider, and more precisely, to the concern about the provider's poor qualification or lack of compliance. The reason for this 'U-turn' in the valuation of these motives for concern could lie in the experience accumulated in the practice of outsourcing by client firms, which know increasingly well their providers, and particularly their possible weaknesses.

Many of the reasons and risks mentioned in this study are difficult to measure [35], although it is worth making the effort to list and value them so that they can be taken into account and serve as a guide for managers in future outsourcing processes. In this sense, an important contribution made by this study is not only the specification of those reasons and risks but also the fact that they are considered important by the firms interviewed. Additionally, being able to draw a comparison about the reality of outsourcing within this five-year horizon makes it possible to identify certain trends.

Most of the literature has studied outsourcing reasons and risks from the point of view of the client, often ignoring risks for the provider. However, the increasing dynamism of the IS outsourcing market means that a significant proportion of the risks and responsibilities associated with outsourcing are going to fall upon the provider [67]. This is actually a limitation of the study that can be overcome by carrying out new analyses from the perspective of the provider.

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