Cultural Risk versus Cost in IT Offshore Outsourcing

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Abstract

A number of IT offshore outsourcing projects fall short of being successful due to cultural issues. We performed an analysis of variance on Global Outsourcing Index data of CIOInsight.com and found that while cost is significantly important in determining the index as expected, the best scenario/treatment surprisingly is low cost and high cultural risk. Furthermore, such a treatment is found to be significantly better than the next best treatment which is low cost and low cultural risk. Taken together, these findings suggest that rather than culture, cost alone ought to significantly influence the decision to outsource given the index. This type of cost-driven recommendations may partly contribute to how IT offshore outsourcing phenomenon has been somewhat troubling. Organizational leaders should be cautious when making a decision to offshore outsource IT by considering cultural factors more seriously.

Keywords: IT Offshore Outsourcing, Culture, Cost, Analysis of Variance

Introduction

A number of IT offshore outsourcing projects fall short of being successful (Davis et al., 2006). Due to the frustration basically caused by the difference between the host and the home country's culture, some companies have brought back home their outsourced projects such as Dell and its customer support services. Thus, prior to making a decision, managers should ask themselves whether they consider the role of culture in IT offshore outsourcing seriously enough. Also, when managers seek out advice from consulting firms, do managers know if or how well such firms consider the role of culture in IT offshore outsourcing? In short, do people in IT offshore outsourcing consider the role of culture enough?

This study uses the Global Outsourcing Index (GOI) data prepared by CIOInsight.com (by Minevich and Richter, 2005), in which information such as cost and risks of best countries recommended for IT outsourcing in 2005 was analyzed and used to rank the countries. The risk analyzed was broken into subcategories such as geopolitical, human capital, and cultural risk. Unfortunately, in generating the GOI, only 6% emphasis was given to cultural risk (and no more than 10% for each subset of risks), while 30% emphasis was solely to cost. While that method appears reasonable, recent academic literature seems to stress that *culture is not just a problem – but a leading problem in offshore outsourcing* and should be considered more seriously than previously thought (Beulen and Ribbers, 2003; Metters, 2008). We recognize the contribution of the original GOI study that provides managers a convenient list of best twenty countries for IT offshore outsourcing. However, we encourage the users of this type of reports to be vigilant and consider factors such as culture more seriously before making a decision to outsource IT functions or projects (Davis et al., 2006).

Therefore, this study aims to examine the role of cultural risk versus cost in global IT outsourcing by analyzing secondary data from a well-known source that is likely to be used by many managers. Specifically, this paper empirically assesses whether cost to outsource and/or cultural risk are influential in determining which country is recommended best for IT outsourcing in the GOI study. In attempting to provide a more conclusive answer, this paper frames the following specific three research questions which will be simultaneously compared via analysis of variance technique:

1. What treatment yields the lowest GOI (i.e. the best scenario for IT offshore outsourcing)?
2. Is cost important in determining the GOI?
3. Is the best treatment significantly better than the second best?

The remainder of this paper is organized as follows. First, we discuss the literature background of the role of cost and culture in IT outsourcing. Second, the methodology regarding the design and coding scheme of the study is discussed. Third, the results from the assumption check, the analysis, and the discussion are provided. Finally, the limitations and conclusion of the study are discussed.

Literature Background

Cost

Many researchers have focused on the determinants, the contracts, and the benefits/risks associated with the IT outsourcing phenomenon. In addition, researchers appear to pay more attention to the benefits than the risks. While the key benefit an organization immediately expects to receive from outsourcing is reduced costs (Susarla et al., 2003; Tafti, 2005), it appears that some of the prominent negative consequences over time are nonetheless cost escalation and even service debasement (e.g. Aubert et al., 1996, 1998; Bahli and Rivard, 2003). Researchers have attempted to draw from several theories such as transaction cost theory and agency theory to explain such a contradictory situation as follows.

Transaction cost theory is useful to explain and justify why an organization performs a business activity or a transaction either from the market or within the firm. Transaction is not free of charge, but entails costs of making each contract (Coase, 1937). Transaction cost accrues when contractual parties search, evaluate, negotiate, control, and so on. Furthermore, although a client whose goal is to save costs decides to outsource an IT project to a contractor, the overall cost is still likely to rise due to the information asymmetry, bounded rationality and opportunism intrinsic to each transaction as each one has a different structure of costs (Williamson, 1985). In the context of IT outsourcing, an outsourcer may find challenging not only choosing an outsourcee, but also managing the projects while maintaining the relationships. Non-intelligence or un-equilibrium in a transaction might not only limit complete consideration of all possible alternatives, but also lead to opportunistic behavior of the other party. To exploit such opportunistic behaviors, one party might hide or even exaggerate its experience, expertise, and resources to maximize its profits at the expense of the other party (Bahli and Rivard, 2003). As a result, the cost would rather increase over time.

Agency theory (Eisenhardt, 1989) also suggests that cost is a crucial determinant in identifying the interaction between an agent and a principal. Agency theory assumes that either the agent or the principal has its own self-interest or motive for participating business activities. In some cases in which the agent’s goals are not identical to the principal’s, the principal must coordinate, monitor, and control the agent’s activities to ensure that the agent pursues the principal’s goals. This indicates, in the case of IT outsourcing project, that it will cost the principal (outsourcer) to coordinate and monitor the agent (outsourcee)’s activities.

As discussed, both transaction cost theory and agency theory emphasize the importance of cost in understanding business activities. Drawing upon these theories, many researchers (i.e., Bahli and Rivard, 2003; Aubert, 1999, 2001; Earl, 1996) have explored the impact of various types of costs such as supplier search cost, transition cost, post-outsourcing cost (Tafti, 2005), hidden or potential cost, and coordination cost (Grover and Teng, 1993). In conclusion, it is rather established that cost is a critical factor in the outsourcing phenomenon.

Cultural Risk

Intrinsically, cultural differences can cause a variety of problems in IT offshore outsourcing. As cultural differences refer to "*dissimilarity of partner nationality*" (Hanvanich et al., 2003, p. 1), cultural risk can be defined as the possibility of social, financial, and/or physical loss caused by cultural differences. Hofstede (2001) proposes that national cultural differences can affect organizational beliefs, norms, attitudes, decisions, and behaviors.

Previous studies in various disciplines (e.g., global Management, International Economics/Finance, Knowledge Management, and International Marketing) generally suggest that as firms internationalize to acquire resources, they are more likely to face risks embedded within cultural differences (Daniels & Radebaugh, 1998). As mentioned, most studies use transaction cost theory and agency theory to explain the causal relationship between cultural risk and cost escalation. For example, transaction cost theory proposes that a client pays additional costs to search for, investigate into, negotiate with, and contract with an appropriate supplier. Agency theory also explains that principal (client) has to pay for observing, monitoring, or controlling cost to ensure that the agent (supplier) perform its best for the principals' interests. In fact, some researchers suggest that cultural risk may be the culprit of miscommunication and mistrust which then result in reduced or disconnected information flow which in turn leads to poor performance (Buckley and Casson, 1996; Hanvanich et al., 2003).

Moreover, researchers have long acknowledged that the stronger cultural similarity between host and home country, the less cultural risk, and the more benefits to both firms (Hymer, 1976, Hanvanich et al., 2003; Hahn and Bunyaratavej, 2010). Thus, a client would attempt to select a contractor that has similar culture in order to mitigate the risk. Taken together, the amount of such collateral risk is more likely to increase when a firm outsources its IT projects and resources from international market rather than domestic market, not only because the client is not accustomed to the cultural environment of its suppliers, but also because it is difficult to handle the cultural uncertainty. In conclusion, it would be wiser to consider the role of cultural risk as the less the cultural difference, the less the risks.

METHODOLOGY

This paper analyzes the average of the GOI of nineteen countries by two levels of cost (high and low) and three levels of cultural risk (high, medium, and low) (i.e. an unbalanced ANOVA 2 x 3 study). It is important to note that such a 2 x 3 design intends to be slightly more sensitive to the culture factor yet still being sensitive to the cost factor. Thus, if the cost factor were found to be influential, then it was not because the study was designed to be especially sensitive to the cost factor and not the culture factor. Note that the original GOI study included twenty countries around the world recommended best for IT outsourcing. Mexico was removed from the data used in this paper, because doing so allowed the statistical assumptions to be met, thereby increasing the strength of the analysis while to some extent preserving the merit of the analysis (that is, Mexico is low cost and medium cultural risk, making it fairly neutral to the analysis). Nonetheless, this decision is a caveat to the findings of this study.

The criteria to code the GOI data are as follows. Regarding cost, those countries with assigned score of 1 and 2 are considered Low cost, while those with score of 3, 4, and 5 are considered High cost. Regarding cultural risk, those with assigned score of 1 are considered Low risk, those with score of 2 are considered Medium risk, and those with score of 3 and 4 are considered High risk. The averages of the GOI are shown in Table 1 as well as the number of the countries in each treatment is in the corresponding parentheses. Note that this paper follows the original GOI study in that *the lower value of the GOI indicates the better the country is for IT outsourcing*.

Cultural Risk	Cost		Average
	High (H)	Low (L)	
High (1)	2.66 (2)	2.18 (2)	2.42 (4)
Medium (2)	2.35 (5)	2.45 (3)	2.40 (8)
Low (3)	2.60 (5)	2.29 (2)	2.45 (7)
Average	2.54 (12)	2.31 (7)	2.42 (19)

Table 1 The averages of the GOI and the number of countries in each treatment

Assumption Check

The original untransformed data is coded using indicator variables for cost and cultural risk factor and then analyzed via multiple regression. Both all the normality tests suggest at 0.20 significance level and the normal probability plot provide no evidence of violation of normality assumption. In addition, the coefficient of correlation of the model is acceptable (0.546) to assume approximate normality. Also, the residual against the fitted values plot does not suggest any strong systematic pattern; thus, there is no evidence of unequal variance. Then, with log transformed response variable (transformation is due to significant and importance interaction effects; discussed in the next section), the normality tests, performed at 0.20 significance level, and normality plots also reveal no evidence of violation, and the residual plot does not suggest strong evidence against unequal variance. Also, the coefficient of correlation of the model is still virtually the same as that of the original data (0.548).

It is important to note that this paper uses the same 0.20 significance level for assumption testing as used in the latest version of NCSS based on the argument that if assumptions are found to be violated (or satisfied) at 80%, then it is unnecessary to check at 95% any longer. On the basis of these diagnostics for ANOVA model, it is reasonable to proceed with the inference procedures.

Analysis and Discussion

The analysis in this section follows the procedure in Kutner et al. (2005, p. 848) (see the Appendix for the analysis of custom comparisons). The initial ANOVA analysis shows that the interactions between cost and cultural risk factor are *significantly present* (suggested by the plots and p-value of 0.0336 for the ordinary ANOVA F test), *relatively important* for some treatments (particularly, when cost is high and cultural risk is high, when cost is low and cultural risk is high, and when cost is low and cultural risk is low), and *non-transformable* (full output of transformed data is available upon request). Therefore, the evidence suggests at significance level 0.05 that the interaction effects are unlikely to exist by chance. Moreover, error of degree of freedom (13) is greater than 5, and F ratio of the interaction term (4.46 for original and 4.58 for transformed data) is greater than 2. Therefore, comparison models should be made among treatment means without pooling error and interaction sums of squares and degree of freedom.

The mean GOI significantly differs by cost factor alone (statistically significant), but does not significantly differ by cultural risk factor alone (not statistically significant). In other words, the difference in mean GOI by cost factor is unlikely due to chance, but the difference in mean GOI by cultural risk factor is likely due to chance. Even though at this point it is found that the main effect of cultural risk is not significant, to analyze the three custom comparisons, the Bonferroni procedure is used, because the family of custom comparisons, or the three research questions, in this study is not all pairwise and not all contrast (see the Appendix). Nonetheless, assessing the main effects also suggests that cultural risk factor is unlikely to be influential. With the three custom comparisons being analyzed next, the findings of how much the role of cultural risk is considered in determining the GOI will be more conclusive.

For the first question, the lowest mean GOI (i.e. best for outsourcing) is the combination of low cost and high cultural risk (mean GOI = 2.18). The 95% simultaneous Bonferroni confidence interval estimate is from 1.91 to 2.49. Additionally, since, from the data, the greatest mean GOI (2.66) with the combination of high cost and high cultural risk is outside the range of simultaneous confidence intervals of the lowest mean GOI, the countries in this treatment (high cost, high cultural risk) should be strongly considered risky for IT outsourcing.

For the second question, to determine the cost effect, the treatment means of high cost with all levels of cultural risk and low cost with all levels of cultural risk are examined. The 95% simultaneous Bonferroni confidence intervals for those differences in geometric mean are from 1.002 to 1.21. Thus, cost is significantly influential in determining GOI. This question in the family of custom comparisons confirms the main effect of cost factor also found significant in the initial ANOVA analysis.

For the third question, to test whether the best treatment (low cost, high cultural risk) is significantly better than the second best treatment (mean GOI = 2.29; low cost, low cultural risk) is performed with log transformed response variable. Since the simultaneous Bonferroni confidence intervals do not contain zero, the test suggests that the two best treatments are significantly different (i.e. the best treatment is significantly better than the second best treatment). The difference between the geometric mean of the best and second best treatment is estimated to be from 0.865 to 1.262. From this comparison, it reveals that if cost is low, cultural risk does not seem to be influential at all since the treatment of low cultural risk is not even better than the treatment of high cultural risk when cost is equally low. Together with the second comparison, it appears conclusive that cost is very influential but cultural risk is not. Table 2 summarizes the findings.

Questions	Findings	Implications
What treatment yields the lowest GOI (i.e. best for IT outsourcing)?	Low cost, high cultural risk.	In determining the GOI, cost is influential, while cultural risk is not. Such a finding is strongly confirmed when the treatment of low cost, *low cultural risk* (second best) is not even significantly better than the treatment of low cost, *high cultural risk* (best treatment).
Is cost important in determining GOI?	Yes, cost is important.	
Is the best treatment significantly better than the second best treatment (low cost, low cultural risk)?	Yes, the best treatment (low cost, high cultural risk) is significantly better than the second treatment.	

Table 2 Summary of the findings

LIMITATIONS

First, given the limited amount of the data used in this study, any interpretations of the results outside this data should be used with extra caution. Second, the design and coding scheme of this study are subjective and may raise issues of bias in the findings. Incidentally, some of the confidence intervals are in geometric base or log base, making it impractical to interpret. Nevertheless, the overall pattern of the findings can be established. Finally, although this study examines only cost and cultural risk factors and in reality there are many more factors to be considered, this study aims to point out that one should not overvalue cost factor while devaluing other important factors such as culture. Further analysis on this topic is strongly recommended before making IT outsourcing decisions.

CONCLUSION

Based on the Global Outsourcing Index (GOI) data in 2005 by CIOInsight.com, this paper counterintuitively found that, in determining the GOI, cost is significantly important, that the treatment found best for outsourcing is low cost and high cultural risk, and that the best treatment is significantly better than the second best that is low cost and low cultural risk. Taken together, these findings suggest that rather than culture, cost alone ought to significantly influence the decision to outsource given the GOI. Perhaps, this type of cost-driven reports partly contributes to how IT offshore outsourcing phenomenon has become unsettling. This paper shows such an issue and encourages managers to be cautious when seeking out advice from consulting firms and making a decision to offshore outsource IT by considering culture factor more seriously.

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APPENDIX

Custom Comparisons

Since the interaction effects are significant, important, and non-transformable, the comparisons below should be performed with the transformed data. Although this may reduce our ability to interpret the results, the research questions can still be overall answered with geometric means and their simultaneous confidence intervals. Also, since the family of custom comparisons (three research questions) in this study is not all pairwise and not all contrast, only the Bonferroni procedure is used.

RQ 1: What treatment yields the lowest mean GOI (i.e. best for IT outsourcing)?

The model for this research question is $L_1 = \mu_{L1}$

$$NH: L_1 = 0$$

$$AH: L_1 \neq 0$$

To estimate the above to find the comparison value, $\hat{L}_1 = \bar{Y}_{L1} = 0.338$

Find a B multiplier via the following steps:

B = t [1-(0.05/ (2*3)); 13] = t [0.9917; 13]

From the probability calculator in NCSS, t [0.9917; 13] = 2.748 = B

To find the standard error of the comparison, use the following formula:

$$\hat{s}.e._{L1} = \sqrt{0.0009} * \sqrt{\frac{1}{2}} = 0.021$$

Then, to test the hypothesis, the confidence interval with B may be used as follows:

$$0.338 - (2.748 * 0.021) \leq \mu_{L1} \leq 0.338 + (2.748 * 0.021)$$

$$0.338 - 0.058 \leq \mu_{L1} \leq 0.338 + 0.058$$

$$0.28 \le \mu_{L1} \le 0.396$$

The margin of error after the antilog is $10^{0.058}$ = 1.14

Note that the simultaneous confidence interval above is still in log transformation, so perform antilog as follows:

$$10^{0.28} \le \mu_{LH} \le 10^{0.396}$$

$$1.91 \le \mu_{LH} \le 2.49$$

Since these confidence intervals above do not contain 0 in the range, the test suggests that the NH be rejected. The reasonable estimate of the lowest average GOI is when the treatment is low cost and high cultural risk (L, 1) and is estimated to be in between 1.91 and 2.49.

RQ 2: Is cost important in determining GOI?

The model for this research question is $L_2 = \left(\frac{\mu_{H1} + \mu_{H2} + \mu_{H3}}{3}\right) - \left(\frac{\mu_{L1} + \mu_{L2} + \mu_{L3}}{3}\right)$

$$NH : L_2 = 0$$

$$AH : L_2 \ne 0$$

To estimate the above to find the comparison value,

$$\hat{L}_2 = \left(\frac{\overline{Y}_{H1} + \overline{Y}_{H2} + \overline{Y}_{H3}}{3}\right) - \left(\frac{\overline{Y}_{L1} + \overline{Y}_{L2} + \overline{Y}_{L3}}{3}\right)$$

$$= \left(\frac{0.425 + 0.37 + 0.415}{3}\right) - \left(\frac{0.338 + 0.388 + 0.357}{3}\right) = 0.403 - 0.361 = 0.042$$

To find the standard error of the comparison, use the following formula:

$$\hat{s}.e._{\hat{L}2} = \sqrt{0.0009} * \sqrt{\frac{(1/3)^2}{2} + \frac{(1/3)^2}{5} + \frac{(1/3)^2}{5} + \frac{(-1/3)^2}{2} + \frac{(-1/3)^2}{3} + \frac{(-1/3)^2}{2}} = 0.015$$

Then, to test the hypothesis, the confidence interval with B may be used as follows:

$$0.042 - (2.748 * 0.015) \le L_2 \le 0.042 + (2.748 * 0.015)$$

$$0.042 - 0.041 \le L_2 \le 0.042 + 0.041$$

$$0.001 \le L_2 \le 0.083$$

The margin of error after the antilog is $10^{0.041}$ = 1.099

Note that the simultaneous confidence interval above is still in log transformation, so perform antilog as follows:

$$10^{0.001} \le L_2 \le 10^{0.083}$$

$$1.002 \le L_2 \le 1.21$$

Note that the mean in log now is geometric mean. Since these confidence intervals above do not contain 0 in the range, the test suggests that the NH be rejected. Thus, on average, cost is influential in determining the GOI.

RQ 3: Is the GOI from best treatment significantly better than the second best treatment?

The model for this research question is $L_3 = \mu_{L3} - \mu_{L1}$

$$NH : L_3 = 0$$

$$AH : L_3 \ne 0$$

To estimate the above to find the comparison value, $\hat{L}_3 = \overline{Y}_{L3} - \overline{Y}_{L1} = 0.357 - 0.338 = 0.019$

To find the standard error of the comparison, use the following formula:

$$\hat{s}.e._{\hat{L}3} = \sqrt{0.0009} * \sqrt{\frac{1}{2}+\frac{1}{2}} = 0.03$$

Then, to test the hypothesis, the confidence interval with B may be used as follows:

$$0.019 - (2.748 * 0.03) \leq \mu_{L3} - \mu_{L1} \leq 0.019 + (2.748 * 0.03)$$

$$0.019 - 0.082 \leq \mu_{L3} - \mu_{L1} \leq 0.019 + 0.082$$

$$-0.063 \leq \mu_{L3} - \mu_{L1} \leq 0.101$$

The margin of error after the antilog is $10^{0.082} = 1.21$

Note that the simultaneous confidence interval above is still in log transformation, so perform antilog as follows:

$$10^{-0.063} \leq \mu_{L3} - \mu_{L1} \leq 10^{0.101}$$

$$0.865 \leq \mu_{L3} - \mu_{L1} \leq 1.262$$

Note that the mean in log now is geometric mean. Since these confidence intervals above do not contain 0 in the range, the test suggests that the NH be rejected. Thus, on average, the GOI from best treatment (low cost, high cultural risk) is significantly better than the second best treatment (low cost, low cultural risk). Thus, on average, cultural risk is unlikely to be influential.