Strategy, Environment and Performance in Two Technological Contexts: Contingency Theory in Korea

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Abstract

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This paper examines the range of application of strategic contingency theory. Its thesis is that as technologies and economies become more open to market forces, the tenets of contingency theory become increasingly relevant. The Korean economy seemed an ideal venue for testing this notion as it is very heterogeneous in the effectiveness of its technological regulation. Many Korean companies employing traditional technologies are able to benefit from government intervention, whereas most of those using emergent technologies — even in the same industry — are forced to compete internationally and are very much more subject to competitive market forces. We found that Korean companies using emergent technologies were more likely to do well if they heeded contingency prescriptions in making strategy: specifically, if they employed innovative and marketing differentiation strategies in uncertain environments and cost leadership strategies in stable contexts. On the other hand, companies that used traditional technologies were less apt to benefit from matching strategy to environment. In short, strategic contingency literature was found to apply more to businesses employing emergent technologies than to those using traditional technologies. Notions from institutional and contingency theory and from the literature on cross-cultural management are used to interpret these findings.

Descriptors: strategic contingency theory, cross-cultural management, strategy–environment fit, technology, institutional theory, Korean management

Introduction

Strategic contingency theory is still in its infancy. In part, this is because its range of application has not been very well defined (Kim and Lim 1988). Clearly, there are environments in which tradition and government intervention make performance more a function of adherence to cultural or industry norms rather than to any ability to tailor strategy to customer demands or competitive challenges (Orru et al. 1991). In other settings, however, adaptation of strategy to environment becomes far more important as there is much more exposure to competitive market forces. Here, we believe, strategic contingency theory offers

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useful advice (Hickson and McMillan 1981; Donaldson 1987; Zeffane 1989).

The Korean industrial environment provides an ideal venue for testing these notions. Over the years, Korea has experienced enormous economic growth, in part because of its government's industrial policy and in part because of the remarkable initiative of many of its capitalists. During the 1980s, however, there was a movement towards a less regulated economy, especially in sectors where the newer firms employed emergent technologies (Kwak 1981; Cho 1983; Whang 1985; Kim and Hong 1992). In these more competitive sectors, company and industry performance seem to have become more attributable to astute strategic decision making than to institutional support from government subsidies, regulation or protection (Cho 1983; Whang 1985).

Still, Korea continues to blend the old with the new: tradition and government have been effective in regulating and to some degree protecting established technologies, but companies that employ newer emergent technologies in different niches of the very same industries end up being far more exposed to competitive market forces (Whang 1985; Lee 1987). Our thesis is that the strategy–environment relationships advocated by the strategic contingency theorists will be far more important to performance in firms using emergent technologies than in firms employing established technologies. Because several Korean industries employ a mix of the old and new technologies, these represent an ideal sample for our study.

Strategy and Contingency

Many researchers have discussed how the fit or match between strategy and environment can influence organizational performance (see, e.g., Miles and Snow 1978; Porter 1980; Snow and Hrebiniak 1980; Gupta and Govindarajan 1984; Kim and Lim 1988; Miller 1988, 1991; Lee 1989). Some believe that the same generic strategy can be equally useful in a variety of environments. Porter (1980, 1985), for example, has argued that cost leadership and differentiation may be implemented quite successfully across a broad gamut of markets and industries. Miles and Snow (1978) and Snow and Hrebiniak (1980) believe that the same is true for their defender, prospector and analyser strategies.

However, the universal relevance of generic strategies has been called into question by studies investigating their situational prevalence and appropriateness (see Hambrick 1983; Gupta and Govindarajan 1984; Miller and Friesen 1986; White 1986; Kim and Lim 1988; Miller 1988; Venkatraman and Prescott 1990). These studies have found that strategies have varying utility in different settings. Miller (1988, 1991), for example, suggested that cost leadership would be more advantageous in stable rather than in unstable environments, whereas strategies that differentiate offerings via effective marketing or innovation would thrive in uncertain — i.e. dynamic and unpredictable — settings. Furthermore, Miller (1988, 1991) found that the match between strategy and environment was related to performance, especially in challenging settings. The notion of match is relevant both to firms that tailor their strategies to match their environments (Porter 1985; Miller 1988), and to those that choose their market niches to capitalize on their strategic competences (Child 1972; Weick 1979).

We expect that the contradictory observations concerning the importance of match to performance may be attributed at least in part to differences in the technological context. Some organizations use emergent technologies that invite competition and expose them to the harsh realities of the market. For them, achieving an appropriate match between strategy and environment is essential to success. By contrast, other companies employ technologies that are so well established, subsidized and protected that adaptation to the market may be less important: for them performance does not depend as much on matching strategy to the market environment. Indeed, this distinction may bear upon the situational relevance of strategic contingency theory (Hickson and McMillan 1981; Donaldson 1987; Miller 1988; Zeffane 1989) versus institutional and particularistic views of organizations (Granick 1972; Heydebrand 1973; Meyer and Rowan 1977; Gallie 1978; Hofstede 1991; Orru et al. 1991).

As we noted above, because the Korean business environment evidences a striking contrast between the effectiveness of the institutional protection accorded firms employing traditional versus emergent technologies (Lee 1995), it represents an ideal setting for this research.

Hypotheses

Strategy and Environment

Types of Strategy

There are many ways of characterizing strategy, but the classification scheme that has received the most attention is that of Michael Porter (1980, 1985). Porter's differentiation strategy has firms developing a competitive advantage and gaining customer loyalty through innovative designs or via the uniquely attractive image conferred upon their products by superior marketing. In contrast, firms pursuing Porter's cost leadership strategy are constantly improving their ability to manufacture at costs lower than the competition, thereby earning ample profit margins at prices rivals would find punishing. Porter's focus strategy is really a variant of differentiation or cost leadership applied to a narrowly targeted group of customers for whom a firm tailors its products.

Dess and Davis (1984), Miller (1986, 1988), White (1986) Murray (1988) and others have criticized Porter's scheme as being too simple because it conceals the wide variety of differentiation strategies that are of varying utility under different conditions. Porter (1980) also suggests, without much argument or evidence, that differentiation and cost leadership are mutually exclusive, and he invokes a focus strategy that is really just a minor variant of cost leadership or differentiation.

In order to address these problems, Miller (1986, 1988) modified Porter's framework. He posited two types of differentiation — that based on marketing and similar to Miles and Snow's (1978) analysers, and that founded on innovation and akin to Miles and Snow's (1978) prospectors. Miller (1988) measured these strategies not as absolute types, but as dimensions upon which a firm can score high or low. This paper will use this elaboration of Porter's strategies — cost leadership, innovative differentiation and marketing differentiation. Several recent studies have already shown that these strategic dimensions have emerged within, and have great relevance to, the Korean business context (Y. Kim 1986; Kim and Lim 1988; Lee 1989).

Relating Strategy to Environment

Miller (1988, 1991) has demonstrated that the more uncertain the environment, that is, the more dynamic and unpredictable it is, the more useful it is to employ differentiation strategies based on mass marketing or product–market innovation. Frequent changes in customers' tastes and competitors' offerings demand that firms stay up to date by innovating a good deal and/or by marketing aggressively to continually convince customers of the advantages of new or existing products. In other words, uncertainty demands a differentiation strategy that keeps offerings relevant and attractive in a changing setting. Related arguments have been made by the likes of Miles and Snow (1978), Snow and Hrebiniak (1980), Hambrick (1983), White (1986) and Venkatraman and Prescott (1990).

In contrast to differentiation, cost leadership would be more appropriate to stable and predictable settings in which economies of manufacturing could be most readily realized. Uncertain and changing settings would require too many alterations in products and methods to allow for the efficiency required to attain cost leadership (Hambrick 1983; Miller 1988). Conversely, the costs of differentiation would be unlikely to be recouped in a stable setting where product lines need not change very much.

In summary, the arguments and findings of prior research, all in the American context, suggest that fit is achieved when marketing and innovative differentiation vary directly and positively with the level of environmental uncertainty, and when cost leadership varies inversely with the level of uncertainty.

Fit and Performance

Strategic contingency theorists maintain that an appropriate fit between environment and strategy will result in superior performance, broadly defined. Performance, depending on company goals, might be reflected by profitability and growth relative to competitors, and/or by satisfied customers and employees. The rationale is simply that where firms deliver goods that customers value more highly than the comparable offerings of rivals, then greater financial and personal rewards will accrue to the organization and its employees (Drazin and Van de Ven 1985; Venkatraman 1989; Miller 1991). Conversely, where performance is poor, firms will be induced to realign their strategies with the environment (Hickson and McMillan 1981; Donaldson 1987; Zeffane 1989).

The arguments from strategic contingency theory suggest the first hypothesis:

H1: The match between strategy and environment as defined above is expected to be positively associated with organizational performance.

The Moderating Influence of Industry Technologies

Hypothesis 1 is a rather gross one. In addition, as we suggested at the outset, it is insufficiently contingent, at least in the Korean business context, to take into account important differences in the institutional, competitive and cultural environment caused by firms using emergent versus established production technologies. By technology, we mean the processes used by organizations to convert inputs into outputs (Khandwalla 1977). These involve knowledge of product design as well as techniques of materials processing, manufacturing and assembly. Since the 1960s, most Korean firms have been using *traditional* or mature technologies. These are established, well understood, less valuable to advanced countries and easy to transfer. However, beginning in the 1980s, some firms, motivated by their growing R&D capacities, started to adopt *emergent* or developing technologies, these being far more valuable to potential rivals in advanced countries (Bae 1987; Choi 1989).

Although the challenges faced by firms employing emergent technologies may well demand an acceptable match between strategy and environment to ensure good performance, firms employing traditional technologies have been able to benefit from the government's discretionary interventions. For the latter, the functionalist strategic contingency paradigm may not be very relevant (Cho 1983; Whang 1985). Many firms are so sheltered as to be able to prosper even without effecting a close match between environment and strategy. This notion is entirely consistent with the institutional view of organizations (Meyer and Rowan 1977; DiMaggio and Powell 1983; Zucker 1987; Orru et al. 1991) and with the particularistic idea that some cultures vary so much as to nullify the relevance of contingency paradigms (Granick 1972; Heydebrand 1973; Gallie 1978; Hofstede 1991). There are several reasons why differences in the technological setting, in particular, can influence the applicability of strategic contingency theory.

Domestic Competition

Technologies in flux demand a lot of managerial vigilance (Clark and Fujimoto 1991). When methods are still evolving, firms need to remain alert to their competitors' advances. They must be careful not to fall behind. This makes it more likely that competitors will react to each other along a number of fronts and will try hard to align their strategies to the challenges of the environment. Such increased competition puts pressure on all firms to adapt in order to succeed. Of course, these forces of competition will be reduced where established technologies render managers more complacent (Milliken and Lant 1991). Under such munificent conditions, success may be achieved with a less perfect matching of strategy and environment.

Technology Transfer

Korean firms employing traditional technologies are often able to obtain these processes quite easily from abroad — from organizations that no longer derive much competitive advantage from such established and commonly used methods. This gives the borrowing companies something of a free ride as they avoid the costs of having to develop new processes. More importantly, in competing locally, using foreign technologies, firms do very little to tailor their approaches to their markets, and this is also true for their competitors. Technology transfer standardizes industry methods, and to some degree, products. Firms and their rivals may be driven by norms and standards legitimized by prestigious foreign companies and endorsed by the Korean government, but they are less influenced by the special needs of clients (Meyer and Rowan 1977; DiMaggi and Powell 1983; Zucker 1987). This reduces the dimensions along which firms compete (DiMaggio and Powell 1983). Hence, there is less latitude or pressure to adapt to customers if technology is well established.

However, companies in developed countries are reluctant to transfer emergent technologies from which they still obtain major strategic advantages. Korean firms wishing to use these new methods must develop them for themselves, and so must their competitors. This makes for a good deal of competitive pressure and variety that forces firms to adapt their methods and outputs to market needs (Clark and Fujimoto 1991). Here, any failure to adapt strategy to the demands of the environment can have serious consequences for performance.

Effectiveness of Government Policy

Korean firms employing traditional technologies have received a good deal of government support over the years (Shin 1984; L. Kim 1986; Bae 1987; Lee 1989; Steers et al. 1989; Orru et al. 1991). They are given incentives to borrow methods and processes from foreign competitors, receive much in the way of government funds and loan guarantees, and often benefit from tariffs and favourable import-substitution policies that bring them quasi-monopolistic status. This allows these firms to build up slack resources and to do well for long periods of time without having to do much adjusting to the environment. Indeed, studies have demonstrated that the impact of strategy on performance is weak in such quasi-regulated settings (Fruhan 1972; Lenz 1980; Lee 1989).

Where technologies are changing very quickly, however, the government cannot be as effective in protecting the local market since technologies are in a state of flux. Here the play of free markets dominates, and the resulting local and international competition invokes a good deal of pressure for adaptation (Lee 1989; Steers et al. 1989). Indeed, when many firms are striving avidly to serve a market, it is especially necessary to tailor strategies and offerings to the needs of clients. A good match between strategy and environment will be needed under competitive conditions to ensure good performance (Khandwalla 1977).

The above arguments give rise to the following hypothesis:

H2: The relationship between strategy–environment match and performance will be stronger in industries with emergent technologies than in industries with traditional technologies.

It should be noted that the notions of uncertainty and technological context are quite different. Many firms that operate within traditional technological contexts confront a good deal of uncertainty from great fluctuations in supplies, costs, prices and product lines. Conversely, some organizations using emergent technologies operate in environments with greater stability in product lines and cost structures. This is especially true among the Korean machinery manufacturers who license foreign technologies. In general, emergent technologies will be subject to more free market forces and thus to more technological competitive pressure than will traditional technologies, but this is not to suggest that such emergent technologies invoke other forms of uncertainty.

Method

Sample

The population of this study consisted of 870 Korean manufacturing firms from five major industrial sectors of the economy: textiles, chemicals, machinery, fabricated metal and electronics. These industries were selected for three reasons. First, they were shown to play a key role in the rapid growth of the Korean economy (L. Kim 1986). Second, they reflected, about evenly, both traditional and emergent technologies. Third, they each encompassed a large number of firms. Government enterprises were avoided in the sample.

Given that our intention was to study Korean management practices, no foreign companies were sampled. Also, because our arguments apply mostly to non-trivial organizations, only firms of 200 employees or more were targeted. Finally, since we were interested in business-level rather than corporate-level strategy, companies were selected where over 70 percent of sales came from a single business and where no unit engaged in business other than that related to the dominant business (Rumelt 1974).

The questionnaire was sent out to all 870 firms in the five chosen industries listed in the *Annual Report of Korean Firms* published by the Korea Productivity Center (1990). Questionnaires were completed by the general manager or director general of the companies; these are the Korean top executives who would normally be the most familiar with the strategies and markets of their firms.

Responses were received from 193 firms (22.2 percent), but, of these, 23 companies provided incomplete responses or responses from insufficiently senior executives, and 19 firms were excessively diversified. These companies were excluded from the sample. The final sample consisted of 151 firms: 37 textile firms, 33 chemical producers, 16 machinery manufacturers, 13 fabricated metals producers and 52 electrical and electronics firms.

We determined that 17 of the 151 respondents were members of powerful industrial groups known as *chaebols*. Such organizations used to have advantages due to government protection and greater availability of capital. Recent studies, however, have shown that, since the mid-1980s, *chaebol* firms have not fared any better than their counterparts in the same industries (Cho 1990; Kim 1992; Kim and Hong 1992). Nonetheless, to guard against any biases we ran all our analyses with and without the *chaebol* companies. The analyses shown in the Appendix exclude the *chaebol* companies and they replicate, almost perfectly, those of Table 3.

In order to ensure that responding firms were not systematically different from non-respondents, we made special efforts to obtain data from 24 non-responding firms. We did not find any statistically significant difference between these two groups of respondents along any of our five variables: the *t*-values were –0.45, 1.34, 0.30, 0.62, 1.29, respectively, for uncertainty, cost leadership, marketing differentiation, innovative differentiation and performance.

We also obtained industry-wide data on company size and return on assets and compared these to the information on the firms in our sample. Again, there were few systematic differences between the samples (cf. Table 1C). These data are tentative, however, as industry averages vary according to the Korean databases used.

Firms were classified into two groups according to the maturity of their technology, using a five-category scale. The *emergent* technology group consisted of firms whose executives agreed that: (1) three years had not yet passed since their dominant technology was first developed and commercialized; or (2) their technology is used in developed countries but has not yet been diffused into developing countries. The *traditional* technology group consisted of firms whose executives stated that: (3) the technology has already begun to diffuse into developing countries; (4) the technology is being widely used in developing countries; and (5) the technology has diffused into even the least developed countries (see Bae 1987).

Measures

All measurement scales were based upon previous studies and translated into Korean. They are presented in the Appendix. To determine the objectivity of the responses, we calculated *inter-rater* reliabilities for all our variables using a random subsample of 20 firms from which we obtained another respondent. This party was also an upper-level manager. There was no consultation between the two respondents of any one firm as the pollings were done at different times. The *inter-rater* correlations for the 20 pairs of respondents were as follows: for uncertainty 0.813 ($p = 0.000$), cost leadership 0.482 ($p = 0.01$), marketing differentiation 0.789 ($p = 0.000$), innovative differentiation 0.552 ($p = 0.006$) and performance 0.671 ($p = 0.001$).

Environmental Uncertainty

The literature on organizations stresses the importance of uncertainty as a critical variable to which firms must adapt their strategies in order to perform well (Burns and Stalker 1961; Duncan 1972; Miles and Snow 1978; Miller 1986, 1988). Uncertainty was assessed as the mean of four anchored seven-point Likert scale items adapted from Khandwalla (1977) and Miller (1988) — these included the rate of product obsolescence, the frequency of changes in technology and in the prices of supplies, and the length of the product life-cycle. The Cronbach alpha reliability for the uncertainty variable (Table 1) was 0.56.

Strategy

Recent research (Miller 1988, 1991) has provided conceptual and empirical support for Miller's (1986) elaborated and refined version of Porter's (1980, 1985) generic strategies. (The dimension of focus or scope was irrelevant to this study as all firms were focused.)

To measure Miller's (1986) strategy dimensions, this study used the scales of Y. Kim (1986) and J. Lee (1989). These scales were adapted from Dess and Davis (1984) and Miller and Friesen (1986) to make them suitable for Korean manufacturers. Marketing differentiation was gauged by three items assessing the relative strengths (*vis-à-vis* leading competitors) of a company's brand image, advertising intensity and marketing channels. Innovative differentiation was reflected by two items measuring R&D investment and success in new product development (*vis-à-vis* leading competitors). Cost leadership was measured by two items gauging (*vis-à-vis* leading competitors) cost reduction efforts and price-cutting ability. All these items were gauged using anchored seven-point Likert scales. The relevant subsets of items were averaged to yield the variables of marketing differentiation, innovative differentiation and cost leadership. The Cronbach alpha reliabilities reported in Table 1 were all acceptable. Note that the three strategy dimensions are not mutually exclusive. The same firm can score high (or low) on all of them.

Performance

Performance was measured using the approach suggested by Gupta and Govindarajan (1984). Because of the variety of industries and companies included in our sample, and because the goals and performance criteria of these companies differ, we were required to use a relative, multidimensional and subjective assessment of performance rather than a narrow financial indicator. A two-stage rating system was employed. First, the importance of seven performance factors was rated by the top executives of each firm along five-point scales: these included sales, income and market share growth, return on fixed assets, success in new product development, employee morale and employee welfare. These seven performance factors were deemed to be especially relevant to Korean firms (Steers et al. 1989). We calculated a percentage weighting for each importance scale by dividing the item score by the total of all importance scores for a given company. Second, executives were asked to score, again on five-point scales, how well their firms did along each of these seven performance factors. Performance was summarized as the sum of the products of importance weighting and achievement levels (the type of weighted average endorsed by Gupta and Govindarajan 1984; Ramanujam et al. 1986; and Govindarajan 1988). The correlations among the performance subscales are presented in the Appendix (Cronbach alpha = 0.88).

This subjective multidimensional measure is preferable to return on assets (ROA) figures, in part because ROA is distorted by accounting procedures intended to assuage bankers and shareholders during bad years, and to reduce taxes during good years (P. Lee 1987; Park 1987; J. Lee 1989; J. Lee et al. 1993). Also, there is a good deal of variation among Korean companies and among industries in depreciation policies and in the asset and inventory evaluation methods used (Lee 1992; Lee and Ban 1992). Given the unreliability of ROA we decided not to use it in our analyses. ROA also fails to reflect other important aspects of performance, such as growth, market performance and employee welfare. It is hardly surprising, then, that return on assets as reported in the Korean Productivity Center data correlated with our own mutifaceted performance index at only 0.25 ($p = 0.003$). ROA differed somewhat in our sampled firms across our five industries: fabricated metal and machinery producers scored somewhat higher than average, and electrical and electronics firms somewhat below average. These differences, however, were not statistically significant.

Match Indexes

The notion of fit or 'match' can be made quite concrete. Where normative arguments suggest a positive relationship between environmental uncertainty and a dimension of strategy, 'misfit' can be operationalized as the Euclidean distance between the standardized scores of the strategy dimensions and uncertainty (Drazin and Van de Ven 1985; Venkatraman 1989). The normative literature argues that high uncertainty requires much innovation, whereas low uncertainty demands little innovation. Departures from this prescription would then occur, for example, when a firm has low uncertainty and high innovation, or high uncertainty but low innovation. Moreover, for a given level of uncertainty, too much innovation would contribute as much to the mismatch score as too little. Such 'mismatches' can be reflected by the arithmetic differences between the scores of the uncertainty and innovation variables. For cost leadership, where an inverse relationship with uncertainty is advocated by the literature, the polarity of the strategy scale can be reversed before differencing to ensure consistency with the other components of the index. Our mismatch index is based on such differences between uncertainty and each of the strategy measures.

Our index resembles that of Miller (1991: 43). It measures mismatch or lack of fit according to departures (squared differences) from the norms posited for uncertainty–strategy match by the contingency literature that we discussed above. The index was computed for each firm as follows:

$$\text{Match} = -\ \text{Sum}_{(i,j)\varepsilon A}\ [(x_i) - (y_j)]^2$$

where x and y are scores standardized across the sample for the one (i) environmental uncertainty variable and the three (j) strategic variables, respectively, and A is the set of three pairs of environmental and strategy variables specified by the match relationships of Hypothesis 1 (i.e. uncertainty with cost leadership, uncertainty with marketing differentiation and uncertainty with innovative differentiation). All variables were standardized across the entire sample to have mean 0 and standard deviation 1 so as to weight each equally in the index (Pennings 1987).

Each component of *mismatch* is simply the squared difference between the standardized scores of a pair of environmental and strategy variables specified by the match relationships of Hypothesis 1 — recall that these posited a positive relationship between both differentiation strategies and uncertainty, and a negative relationship between cost leadership and uncertainty. The negative relationship required that the seven-point

Table 1A Descriptive Statistics

	Total Sample		Emergent		Traditional		Cronbach alpha
	mean	s.d.	mean	s.d.	mean	s.d.	
Environment: uncertainty	3.55	0.88	3.55	0.82	3.56	0.91	0.56
Strategy: cost leadership	4.33	0.83	4.31	0.76	4.34	0.87	0.65
Marketing differentiation	4.36	1.17	4.46	1.09	4.32	1.21	0.79
Innovative differentiation	4.13	1.29	4.38	1.34	4.03	1.27	0.82
Match:	–5.90	5.14	–4.92	3.22	–6.34	5.70	n.a.
Performance:	3.32	0.63	3.31	0.66	3.32	0.62	0.88
N	151		44		107		

strategy scales be inverted before standardization so that 1 became 7, 2 became 6, etc. All three mismatch components were summed to give the total mismatch index for each firm, which was then made negative (i.e. reverse-scored) to yield the match index. Differences were squared because large differences are typically more indicative of an important misalignment than small ones (Pennings 1987; Miller 1991). In fact, small differences often represent sampling noise rather than systematic variation.

Our mismatch index has several advantages. First, it aggregates the individual components of match between strategy and environment to yield a convenient summary measure. Drazin and Van de Ven (1985) and Venkatraman (1989) claim that such measures are superior to indexes assessing only one component of mismatch. Second, the indexes do not rely on an average (e.g. regression) baseline from which to calculate mismatch, but rather define it according to the normative literature invoked by Hypothesis 1. Finally, we have not taken match to be an alignment with the profile of the highest performers. Such a measure might yield a baseline having little to do with the hypotheses of strategic contingency theory and would imply a tautological relationship that would make it impossible to test Hypotheses 1 and 2 (Miller 1991).

Findings

Table 1A presents the means and standard deviations of all the variables for the total sample and for the two technology subsamples. It also gives the Cronbach alpha coefficients. Table 1B provides a breakdown of the descriptive statistics by industry and by technological context. Table 2 presents the correlation matrix and Table 3 the multiple regressions.

The descriptive statistics of Table 1A indicate that neither performance, nor environmental uncertainty, nor any of the three strategies vary signi-

Table 1B

1. Industry Comparisons of Variable Means

	Textiles	Chemicals	Machinery	Fabricated Metal	Electrical and Electronics	*F*-ratio	*p*
Variables							
Uncertainty	3.66 (0.76)	3.57 (0.91)	3.41 (1.04)	3.21 (0.52)	3.60 (0.95)	0.82	0.52
Cost lead.	4.08 (0.80)	4.41 (0.57)	4.13 (0.90)	4.71 (1.08)	4.44 (0.88)	2.05	0.09
Mkt. dif.	3.69 (1.02)	4.72 (1.12)	4.44 (1.10)	5.00 (1.08)	4.41 (1.17)	5.15	0.001
Innv. dif.	3.72 (1.38)	4.33 (1.11)	4.03 (1.26)	4.38 (1.49)	4.28 (1.27)	1.47	0.21
Match	−5.94 (3.94)	−5.24 (4.63)	−6.16 (4.47)	−5.11 (4.02)	−6.41 (6.51)	0.34	0.85
Perform.	3.23 (0.48)	3.45 (0.63)	3.42 (0.84)	3.44 (0.95)	3.25 (0.57)	0.83	0.51
N	37	33	16	13	52		

Figures in parentheses are standard deviations.
F-ratios and two-tailed *p*-values from a one-way ANOVA are reported in the last two columns.

2. Industry Comparisons of Variable Means by Technology Context

		Textiles		Chemicals		Machinery		Fabricated Metal		Electrical and Electronics	
		E	T[a]	E	T	E	T	E	T	E	T
Uncert.	M	3.9	3.5	3.8	3.5	3.5	3.3	3.4	3.1	3.0	3.7**
	SD	0.8	0.7	0.9	0.9	0.9	1.2	0.4	0.6	0.6	1.0
Cost lead.	M	4.3	4.0	4.6	4.3	4.1	4.2	4.3	5.0	4.4	4.5
	SD	0.7	0.8	0.5	0.6	0.8	1.1	1.0	1.1	0.9	0.9
Mkt. dif.	M	4.1	3.5*	5.2	4.6	4.2	4.8	4.9	5.1	4.4	4.4
	SD	0.8	1.1	1.2	1.1	1.4	0.6	1.0	1.2	1.0	1.2
Innv. dif.	M	4.6	3.2**	4.8	4.2	3.9	4.1	3.9	4.7	4.4	4.3
	SD	1.2	1.3	1.0	1.1	1.5	0.9	1.7	1.4	1.6	1.3
Match	M	−5.1	−6.4	−4.0	−5.6	−5.8	−6.6	−4.0	−5.9	−5.3	−6.7
	SD	3.5	4.2	1.9	5.2	4.1	5.1	1.8	5.1	3.9	6.9
Perform.	M	3.2	3.2	3.4	3.5	3.3	3.6	3.4	3.5	3.3	3.2
	SD	0.5	0.5	0.6	0.7	0.9	0.8	1.0	1.0	0.6	0.6
N		13	24	8	25	9	7	5	8	9	43

[a] E and T indicate emergent and traditional technology contexts.
* and ** indicate that means are significantly different within the industry at the 0.05 and 0.01 levels, respectively, using a two-tailed *t*-test.

Table 1C
Comparison of Sample and Industry Averages

	Number of Employees	ROA
Textiles		
Our sample	623	3.28
Industry	744	3.85
Chemicals		
Our sample	1,842*	4.85
Industry	1,125	3.89
Machinery		
Our sample	529	6.39
Industry	668	3.45
Fabricated metal		
Our sample	448	8.17*
Industry	612	0.45
Electrical and electronics		
Our sample	1,807*	2.02
Industry	1,079	2.45

* Number is significantly larger at the 0.10 level under a two-tailed *t*-test.

ficantly between the emergent and traditional technology subsamples. Match is slightly higher for the emergent subsample than the traditional one ($p < 0.06$), but this is not borne out by the individual industry comparisons of Table 1B. Recall from Hypothesis 2 that firms using traditional technologies were not expected to be under as much pressure to match environment and strategy.

Table 1B confirms that firms employing emergent technologies do not face more uncertainty, at least in product life-cycles and cost structures, than those using traditional technologies (although the former are subject to greater market forces and more competition). Indeed, the one significant difference in our uncertainty measure occurs in the electronics industry, where firms employing traditional technologies face *more* uncertainty than their counterparts who use emerging technologies. At the intra-industry level, firms employing emergent versus traditional technologies do not usually differ significantly along any of the environmental, strategy, match or performance variables.

Hypothesis 1

Table 2 indicates that the match between strategy and environment is indeed associated with superior performance. The Pearson correlation between performance and match was 0.21 ($p < 0.05$) for the total sample, confirming Hypothesis 1. However, anticipating Hypothesis 2, this relationship was 0.46 ($p < 0.01$) for the emergent technology subsample and only 0.16 ($p < 0.10$) for the subsample of traditional technology firms.

Table 2 also indicates that all strategies were positively correlated with performance at beyond the 0.05 level. However, these results are of little importance since most of the relationships disappear when we

Table 2
Correlation Matrix

	1	2	3	4	5	6
1. Uncertainty	1.00	–0.05	–0.04	0.01	–0.02	–0.14
2. Cost leadership		1.00	0.56	0.28	0.19	0.25
3. Marketing differentiation			1.00	0.51	0.17	0.24
4. Innovative differentiation				1.00	0.11	0.33
5. Strategy match					1.00	0.21
6. Performance						1.00

Sample size of 151. Correlations of 0.17 or more are significant at beyond the 0.05 level under a two-tailed test.

Table 3
Multiple Regression Analyses for Performance

	All Firms	Emergent Technology	Traditional Technology
Independent variables			
Unstandardized beta coefficients (standard errors in parentheses)			
Uncertainty	0.086 (0.058)	0.054 (0.122)	0.106 (0.066)
Technological setting (1 = traditional)	–0.305 (0.197)	n.a.	n.a.
Cost leadership	0.134 (0.074)	0.258 (0.141)	0.071 (0.087)
Marketing differentiation	–0.025 (0.062)	–0.128 (0.120)	0.010 (0.073)
Innovative differentiation	0.140** (0.047)	0.068 (0.082)	0.169** (0.057)
Strategy match	0.088** (0.030)	0.097** (0.033)	0.012 (0.011)
Strategic match × Technical setting	–0.075* (0.032)	n.a.	n.a.
R-squared	0.218	0.306	0.213
F	4.825**	2.738*	4.650**
d.f.	7, 143	7, 36	7, 99

* and ** indicate findings at beyond the 0.05 and 0.01 levels, respectively, under a two-tailed test.

control for environmental uncertainty, technology, the other strategies, and strategy–environment match (Table 3).

It is interesting that all strategies were positively correlated, confirming the findings of Miller (1988) and others that our strategy dimensions are by no means mutually exclusive. Product innovations, for example, may prompt managers to place more emphasis on marketing to convince potential customers of the benefits of the new offerings.

Table 2 also reveals that the correlation between strategies and environmental uncertainty are low, suggesting that the environmental imperative is by no means universally compelling.

Hypothesis 2

According to Hypothesis 2, the relationship between strategy–environment match and performance would be higher among firms using emergent technologies than among firms using traditional technologies. In order to test this hypothesis, we regressed performance on match, a technology dummy variable (emergent = 0, traditional = 1), and a product interaction of the latter variables. Environmental uncertainty and each of the three strategy dimensions were included as control variables.

Table 3 shows that the relationships between match and performance are stronger for the emergent than for the traditional technological settings. The significant result for the interaction term confirms that the findings are stronger for the emergent technology setting, and this result is confirmed by the individual regression analyses for each of the subsamples. Indeed, the findings confirm that match is *not* a significant predictor of performance in the traditional technology sample. Hypothesis 2 is supported.

In contrast with the bivariate results of Table 2, Table 3 indicates that, as a rule, strategy does not predict performance when we control for match, technology and the other strategy dimensions. This may be because the strategy variables correlate positively with one another and this reduces their individual effects in the multiple regression analyses.

Even in Table 3, however, innovative differentiation is associated with success in traditional technology contexts, which, as we have seen, are sometimes more uncertain than emergent technology contexts (Table 1B). One reason for this relationship has been provided by Lee (1989), who has shown that Korean firms that have R&D capabilities are especially likely to obtain competitive advantages by making small innovations that fine-tune their mature technologies.

In comparing Tables 2 and 3 we also find that match becomes a somewhat more important predictor of performance in the latter table. Table 3 factors out the spurious effects of the strategies and controls for technology. However, even in Table 3, there is no significant relationship between match and performance for the traditional technology subsample.

Conclusion

The applicability of strategic contingency theory appears to be very much a function of the technological setting and its relationship to market forces and industrial policy (Granick 1972; Hickson et al. 1974; Donaldson 1987). In the Korean context, many firms using established, traditional technologies benefit from a number of cultural and institutional factors that come into play to decrease competition and protect firms from the need to adapt. Firms are able to succeed because they obtain help from the government in the form of subsidies, tariffs and even technological assistance. This protection allows organizations to do well even if they have not followed the recommendations of the strategic contingency theorists in matching strategy to environment. Indeed, a firm's success in achieving a 'good' strategy–customer match may confer far less competitive advantage than its success in obtaining government help by embracing legitimated technological norms. In these instances, the resource dependence (Pfeffer and Salancik 1978) or even the institutional (DiMaggio and Powell 1983; Orru et al. 1991) paradigms may be of greater relevance than functionalist contingency theories. The procurement of resources and government support becomes crucial to organizational viability. These assets can be obtained more readily via cooptation, politicking, lobbying, legitimacy building and conformity rituals than by tailoring strategy to environment in the manner envisioned by functionalists.

Although some institutionalists argue for strategic isomorphism, our results do not show that strategies are the same among firms in an industry where traditional technologies are used. There seems to be as much strategic variety in our emergent as in our traditional samples. Indeed, isomorphism may be absent in traditional settings where managers, so long as they adhere to government guidelines and industry technology norms, may choose from a wide range of strategies. Thus, institutional effects may be limited to the adoption of select rituals or policies rather than embracing a wide set of strategic or structural attributes (Donaldson 1975: 79–128).

It appears that contingency notions apply more robustly to Korean companies that employ emergent technologies. Here, market forces are allowed to operate: competition is fierce, methods and product lines are in a state of flux and government protectionist intervention is usually ineffective. Firms are only able to succeed if they adapt their strategies to the needs of the marketplace. In short, the contingency paradigm is predictive mostly when firms face the competitive environments typically associated with emerging technologies.

One of the limitations of this research is that it did not directly measure the level of government protectionism. We believe that future studies testing contingency theory in developing economies would indeed benefit from the inclusion of such a potential moderating variable.

It would be useful also to do more research on other organizational variables that might determine the differential application of the various organizational paradigms. Such studies can serve as a basis for a middle-range approach that leads to more cumulative findings (Miller and Friesen 1984). It might also be helpful to conduct research in other cultural settings to establish whether Hickson et al.'s (1974) 'culture-free' thesis holds: that is, to determine if the relationships we found among our organizational and contingency variables hold in other countries (Granick 1972; Heydebrand 1973; Hofstede 1991).

Appendix

Translation of Scales

1. Environmental Uncertainty

(a) How quickly does your product or product line become obsolete?

1	2	3	4	5	6	7
very slowly (> 5 years			medium		very quickly (< 6 months)	

(b) How quickly does industry production technology change?

1	2	3	4	5	6	7
very slowly			medium		very quickly	

(c) How often do prices and suppliers of materials and components change?

1	2	3	4	5	6	7
very rarely			medium		very often	

(d) How long is the life-cycle of your main product?

1	2	3	4	5	6	7
very long (> 5 years)			medium		very short (< 6 months)	

What is the position of your firm *vis-à-vis* your leading competitors, regarding:

2. Cost Leadership

	very high			same		very low	
(a) Manufacturing costs	1	2	3	4	5	6	7
(b) Prices	1	2	3	4	5	6	7

3. Marketing Differentiation

	very low			same		very high	
(a) Brand image	1	2	3	4	5	6	7
(b) Advertising investment	1	2	3	4	5	6	7
(c) Marketing channels and service	1	2	3	4	5	6	7

4. Innovative Differentiation

	very low			same		very high	
(a) R&D expenses/sales	1	2	3	4	5	6	7
(b) Number of new products	1	2	3	4	5	6	7

5. Performance

How important are the following objectives to the management of the firm?

	Importance				
	not important		medium		very important
(a) Sales growth	1	2	3	4	5
(b) Growth in before tax income	1	2	3	4	5
(c) Market share growth	1	2	3	4	5
(d) Pre-tax income/Fixed assets	1	2	3	4	5
(e) New product development	1	2	3	4	5
(f) Employee morale	1	2	3	4	5
(g) Employee welfare	1	2	3	4	5

How well has the firm achieved these objectives *vis-à-vis* its principal competitors over the last 3 years?

	Achievement Level				
	very poor		medium		very good
(a) Sales growth	1	2	3	4	5
(b) Growth in before tax income	1	2	3	4	5
(c) Market share growth	1	2	3	4	5
(d) Pre-tax income/Fixed assets	1	2	3	4	5
(e) New product development	1	2	3	4	5
(f) Employee morale	1	2	3	4	5
(g) Employee welfare	1	2	3	4	5

Correlations Between Performance Items

	1	2	3	4	5	6	7
1. Sales growth	1.0	0.67	0.53	0.62	0.40	0.36	0.31
2. Growth in income		1.0	0.65	0.68	0.42	0.45	0.37
3. Growth in market share			1.0	0.65	0.61	0.46	0.43
4. Income/Fixed assets				1.0	0.49	0.46	0.39
5. New product development					1.0	0.47	0.43
6. Employee morale						1.0	0.70
7. Employee welfare							1.0

Multiple Regressions of Table 3 Excluding the *Chaebol* Companies

	All Firms	Emergent Technology	Traditional Technology
Independent Variables			
Unstandardized beta coefficients (standard errors in parentheses)			
Uncertainty	0.084	0.013	0.109
	(0.062)	(0.127)	(0.071)
Technological setting (1 = traditional)	–0.359	n.a.	n.a.
	(0.213)		
Cost leadership	0.123	0.254	0.057
	(0.079)	(0.147)	(0.093)
Marketing differentiation	–0.006	–0.090	0.014
	(0.067)	(0.132)	(0.079)
Innovative differentiation	0.134*	0.026	0.179**
	(0.050)	(0.086)	(0.061)
Strategy match	0.095**	0.104**	0.013
	(0.033)	(0.035)	(0.012)
Strategic match × Technological setting	–0.081*	n.a.	n.a.
	(0.035)		
R-squared	0.220	0.323	0.223
F	4.310**	2.574*	4.360**

* and ** indicate findings at beyond the 0.05 and 0.01 levels, respectively, under a two-tailed test.

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